




# ALUMINUM ELECTROLYTIC CAPACITORS

CAT. No. E1001K



The current part numbering system is changed to new part numbering system.  
As to old and new part number, you can refer to our Internet website.

| INDEX                  |                                                                 |  |
|------------------------|-----------------------------------------------------------------|--|
| PRODUCT SEARCH         | SERIES TABLE                                                    |  |
|                        | GROUP CHART                                                     |  |
| PRODUCT GUIDE          | PRECAUTIONS AND GUIDELINES<br>(Conductive Polymer)              |  |
|                        | PRECAUTIONS AND GUIDELINES<br>(Aluminum Electrolytic Capacitor) |  |
|                        | PART NUMBERING SYSTEM                                           |  |
|                        | ENVIRONMENTAL CONSIDERATION                                     |  |
|                        | PACKAGING                                                       |  |
|                        | TAPING SPECIFICATIONS                                           |  |
|                        | AVAILABLE TERMINALS FOR SNAP-IN TYPE                            |  |
|                        | RECOMMENDED REFLOW CONDITION                                    |  |
|                        | STANDARDIZATION                                                 |  |
|                        | WORLD-WIDE MANUFACTURING LOCATIONS                              |  |
| PRODUCT SPECIFICATIONS | CONDUCTIVE POLYMER TYPE                                         |  |
|                        | CHIP TYPE                                                       |  |
|                        | RADIAL LEAD TYPE                                                |  |
|                        | SNAP-IN TYPE                                                    |  |
|                        | SCREW TERMINAL TYPE                                             |  |
| RELIABILITY DATA       |                                                                 |  |
| APPENDIX (PART NUMBER) |                                                                 |  |



## CAPACITOR SERIES TABLE, CONTENTS

[Next page](#)

| Series                              |                     |                               | Features                                                               | Endurance<br>(+R=With ripple)  | Standard Type | Low impedance | Solvent resistant | Terminal type | Rated voltage range (Vdc) | Capacitance range (μF) |
|-------------------------------------|---------------------|-------------------------------|------------------------------------------------------------------------|--------------------------------|---------------|---------------|-------------------|---------------|---------------------------|------------------------|
| Conductive Polymer Electrolyte Type | Surface Mount Type  | PXK <small>(NEW!)</small>     | Super low ESR, high ripple current, downsized                          | 105°C 1,000 to 2,000 hours     |               | ●             | ●                 | SMD           | 2.5 to 16                 | 100 to 560             |
|                                     |                     | PXS                           | Long life, super low ESR, high ripple current                          | 105°C 5,000 hours              |               | ●             | ●                 | SMD           | 4 to 16                   | 22 to 560              |
|                                     |                     | PXF <small>(Upgrade!)</small> | Super low ESR, high ripple current                                     | 105°C 2,000 hours              |               | ●             | ●                 | SMD           | 2.5 to 6.3                | 220 to 1,000           |
|                                     |                     | PXE                           | Super low ESR, high ripple current                                     | 105°C 2,000 hours              |               | ●             | ●                 | SMD           | 2.5 to 16                 | 33 to 2,700            |
|                                     |                     | PXA                           | Super low ESR, high ripple current                                     | 105°C 1,000 to 2,000 hours     | ●             | ●             | ●                 | SMD           | 2.5 to 25                 | 3.3 to 1,500           |
|                                     |                     | PXH                           | 125°C, super low ESR, high ripple current                              | 125°C 1,000 hours              |               | ●             | ●                 | SMD           | 2.5 to 20                 | 22 to 1,000            |
|                                     | Radial Lead Type    | PSK <small>(NEW!)</small>     | Long life, super low ESR, high ripple current                          | 105°C 5,000 hours              |               | ●             | ●                 | Radial        | 2.5                       | 220 to 560             |
|                                     |                     | PSF <small>(Upgrade!)</small> | Long life, super low ESR, high ripple current                          | 105°C 5,000 hours              |               | ●             | ●                 | Radial        | 2.5 to 16                 | 100 to 1,600           |
|                                     |                     | PSE                           | Long life, super low ESR, high ripple current                          | 105°C 5,000 hours              |               | ●             | ●                 | Radial        | 2.5 to 6.3                | 470 to 820             |
|                                     |                     | PSC                           | Super low ESR, high ripple current                                     | 105°C 2,000 hours              |               | ●             | ●                 | Radial        | 2.5 to 16                 | 270 to 2,700           |
|                                     |                     | PSA                           | Super low ESR, high ripple current                                     | 105°C 2,000 hours              | ●             | ●             | ●                 | Radial        | 2.5 to 16                 | 47 to 1,500            |
|                                     |                     | PS                            | Super low ESR, high ripple current                                     | 105°C 2,000 hours              | ●             | ●             | ●                 | Radial        | 2.5 to 35                 | 18 to 1,500            |
| Surface Mount Type                  | General Purpose     | MVS                           | 4.5mm height, downsized                                                | 85°C 2,000 hours               |               |               | ●                 | SMD           | 4 to 50                   | 1.0 to 220             |
|                                     |                     | MVA                           | 85°C, standard                                                         | 85°C 2,000 hours               | ●             |               | ▲                 | SMD           | 4 to 450                  | 1.0 to 10,000          |
|                                     |                     | MV                            | To be discontinued                                                     | 85°C 1,000 to 2,000 hours      |               |               | ●                 | SMD           | 4 to 63                   | 1.0 to 1,000           |
|                                     |                     | MVE                           | 105°C, standard                                                        | 105°C 1,000 to 2,000 hours     | ●             |               | ▲                 | SMD           | 6.3 to 450                | 1.0 to 6,800           |
|                                     |                     | MVK                           | To be discontinued                                                     | 105°C 1,000 to 2,000 hours     |               |               | ●                 | SMD           | 6.3 to 50                 | 1.0 to 1,000           |
|                                     | Low Impedance       | MZJ <small>(NEW!)</small>     | Super low ESR                                                          | 105°C 2,000 hours              |               | ●             | ●                 | SMD           | 6.3 to 35                 | 10 to 1,800            |
|                                     |                     | MZA                           | Super low impedance                                                    | 105°C 2,000 hours              |               | ●             | ●                 | SMD           | 6.3 to 80                 | 3.3 to 1,500           |
|                                     |                     | MVY                           | Low impedance, standard, Case size φ4 to 18mm                          | 105°C 1,000 to 5,000 hours     | ●             | ●             | ▲                 | SMD           | 6.3 to 100                | 1.0 to 8,200           |
|                                     |                     | MZF <small>(NEW!)</small>     | 10,000 hours, Long life, low impedance                                 | 105°C 10,000 hours             |               | ●             | ●                 | SMD           | 6.3 to 50                 | 10 to 470              |
|                                     |                     | MZE                           | 7,000/8,000 hours, Long life, low impedance                            | 105°C 7,000 to 8,000 hours     |               | ●             | ●                 | SMD           | 6.3 to 50                 | 10 to 470              |
|                                     |                     | MZK <small>(NEW!)</small>     | 5,000 hours, Long life, low impedance                                  | 105°C 5,000 hours              |               | ●             | ●                 | SMD           | 6.3 to 35                 | 10 to 150              |
|                                     |                     | MLA                           | 3,000 hours, Long life, low impedance                                  | 105°C 3,000 hours              |               | ●             | ●                 | SMD           | 6.3 to 50                 | 10 to 1,000            |
|                                     | Long Life           | MLF <small>(NEW!)</small>     | 10,000 hours, Long life                                                | 105°C 10,000 hours             |               |               | ●                 | SMD           | 6.3 to 50                 | 1.0 to 1,000           |
|                                     |                     | MLE                           | 7,000/8,000 hours, Long life                                           | 105°C 7,000 to 8,000 hours     |               |               | ●                 | SMD           | 6.3 to 50                 | 1.0 to 1,000           |
|                                     |                     | MLK <small>(NEW!)</small>     | 5,000 hours, Long life                                                 | 105°C 5,000 hours              |               |               | ●                 | SMD           | 6.3 to 35                 | 4.7 to 100             |
|                                     |                     | MVL                           | 3,000/5,000 hours, Long life                                           | 105°C 3,000 to 5,000 hours     |               |               | ●                 | SMD           | 6.3 to 50                 | 1.0 to 1,000           |
|                                     |                     | MVJ                           | 2,000 hours, Long life                                                 | 105°C 2,000 hours              |               |               | ●                 | SMD           | 6.3 to 50                 | 1.0 to 100             |
|                                     | Special Application | MVH                           | 125°C, Case size φ6.3 to 18mm                                          | 125°C 1,000 to 5,000 hours     | ●             |               | ▲                 | SMD           | 10 to 450                 | 3.3 to 4,700           |
|                                     |                     | MHB <small>(Upgrade!)</small> | 125°C, Specified ESR after endurance                                   | 125°C 2,000 hours              |               |               | ●                 | SMD           | 10 to 35                  | 47 to 470              |
|                                     |                     | MKB                           | Specified ESR at low temperature                                       | 105°C 3,000 hours              |               |               |                   | SMD           | 400                       | 2.2 to 4.7             |
|                                     |                     | MV-BP                         | Bi-polar                                                               | 85°C 2,000 hours               |               |               | ●                 | SMD           | 6.3 to 50                 | 1.0 to 47              |
|                                     |                     | MVK-BP                        | Bi-polar                                                               | 105°C 1,000 hours              |               |               | ●                 | SMD           | 6.3 to 50                 | 1.0 to 47              |
| Radial Lead Type                    | Low Profile         | SRM                           | 5mm height, downsized                                                  | 85°C 1,000 hours               |               |               | ●                 | Radial        | 4 to 50                   | 1.0 to 330             |
|                                     |                     | SRE                           | 85°C, 5mm height, standard                                             | 85°C 1,000 hours               | ●             |               |                   | Radial        | 4 to 50                   | 1.0 to 100             |
|                                     |                     | KRE                           | 105°C, 5mm height, standard                                            | 105°C 1,000 hours              | ●             |               | ●                 | Radial        | 6.3 to 50                 | 1.0 to 100             |
|                                     |                     | SRA                           | 85°C, 7mm height, standard                                             | 85°C 1,000 hours               | ●             |               |                   | Radial        | 4 to 63                   | 1.0 to 470             |
|                                     |                     | KMA                           | 105°C, 7mm height, standard                                            | 105°C 1,000 hours              | ●             |               | ●                 | Radial        | 4 to 63                   | 1.0 to 220             |
|                                     |                     | SRG                           | φ4×7 to φ18×25mm, low profile                                          | 85°C 1,000 to 2,000 hours      |               |               | ●                 | Radial        | 4 to 50                   | 1.0 to 10,000          |
|                                     |                     | KRG                           | φ4×7 to φ18×25mm, low profile                                          | 105°C 1,000 hours              |               |               | ●                 | Radial        | 6.3 to 50                 | 1.0 to 10,000          |
|                                     | General Purpose     | SMQ                           | 85°C, Downsized                                                        | 85°C 2,000 hours               |               |               |                   | Radial        | 6.3 to 450                | 1.0 to 47,000          |
|                                     |                     | KMQ                           | 105°C, Downsized                                                       | 105°C 1,000 to 2,000 hours +R  |               |               | ▲                 | Radial        | 6.3 to 450                | 1.0 to 47,000          |
|                                     |                     | SMG                           | 85°C, standard                                                         | 85°C 2,000 hours               | ●             |               | ▲                 | Radial        | 6.3 to 450                | 1.0 to 39,000          |
|                                     |                     | KMG                           | 105°C, standard                                                        | 105°C 1,000 to 2,000 hours +R  | ●             |               | ▲                 | Radial        | 6.3 to 450                | 1.0 to 22,000          |
|                                     |                     | SME-BP                        | Bi-polar, downsized                                                    | 85°C 2,000 hours               |               |               | ●                 | Radial        | 6.3 to 100                | 1.0 to 6,800           |
|                                     |                     | KME-BP                        | Bi-polar, downsized                                                    | 105°C 1,000 hours              |               |               | ●                 | Radial        | 6.3 to 100                | 1.0 to 6,800           |
|                                     | High Frequency Use  | KZM                           | Long life, super low impedance                                         | 105°C 6,000 to 10,000 hours +R |               | ●             |                   | Radial        | 6.3 to 50                 | 27 to 10,000           |
|                                     |                     | KZH                           | Super low impedance, downsized                                         | 105°C 5,000 to 6,000 hours +R  |               | ●             |                   | Radial        | 6.3 to 35                 | 47 to 8,200            |
|                                     |                     | KZE                           | Low impedance, downsized                                               | 105°C 1,000 to 5,000 hours +R  |               | ●             |                   | Radial        | 6.3 to 100                | 6.8 to 6,800           |
|                                     |                     | KY                            | Low impedance, standard                                                | 105°C 4,000 to 10,000 hours +R | ●             | ●             |                   | Radial        | 6.3 to 100                | 1.0 to 18,000          |
|                                     |                     | LZA <small>(NEW!)</small>     | Low impedance, downsized<br>(Ask Engineering Bulletin No804 in detail) | 105°C 4,000 to 5,000 hours +R  |               | ●             | ●                 | Radial        | 6.3 to 35                 | 330 to 6,800           |
|                                     |                     | LXZ                           | Low impedance, downsized                                               | 105°C 2,000 to 8,000 hours +R  | ●             | ●             | ●                 | Radial        | 6.3 to 63                 | 12 to 18,000           |
|                                     |                     | LXY                           | Low impedance                                                          | 105°C 2,000 to 8,000 hours +R  |               | ●             | ●                 | Radial        | 10 to 63                  | 10 to 8,200            |
|                                     |                     | LXV                           | Low impedance                                                          | 105°C 2,000 to 5,000 hours +R  |               | ●             | ●                 | Radial        | 6.3 to 100                | 5.6 to 15,000          |

: Recommendation products

▲ : Some of range are solvent resistant.



## CAPACITOR SERIES TABLE, CONTENTS

[Previous page](#)

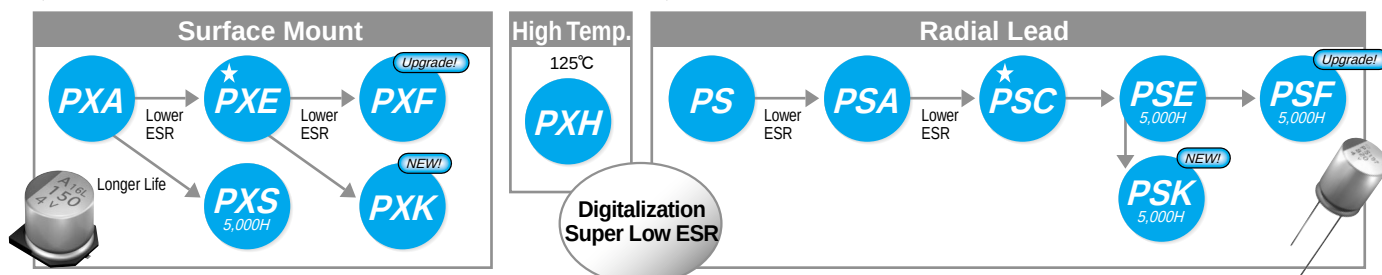
| Series           |                     |                | Features                                                                              | Endurance<br>(+R=With ripple)   | Standard Type | Low impedance | Solvent resistant | Terminal type | Rated voltage range<br>(V <sub>dc</sub> ) | Capacitance range<br>(μF) |
|------------------|---------------------|----------------|---------------------------------------------------------------------------------------|---------------------------------|---------------|---------------|-------------------|---------------|-------------------------------------------|---------------------------|
| Radial Lead Type | High Reliability    | KXJ            | Long life, downsized, for input filtering                                             | 105°C 10,000 to 12,000 hours +R |               |               |                   | Radial        | 160 to 450                                | 6.8 to 680                |
|                  |                     | KXG            | Long life, downsized, for input filtering                                             | 105°C 8,000 to 10,000 hours +R  | ●             |               |                   | Radial        | 160 to 450                                | 6.8 to 330                |
|                  |                     | SMH            | For input filtering, φ20×20 to φ22×50mm<br>(Ask Engineering Bulletin No808 in detail) | 85°C 2,000 hours +R             |               |               |                   | Radial        | 160 to 450                                | 33 to 470                 |
|                  |                     | KMH            | For input filtering, φ20×20 to φ22×50mm<br>(Ask Engineering Bulletin No810 in detail) | 105°C 2,000 hours +R            |               |               |                   | Radial        | 160 to 450                                | 33 to 470                 |
|                  |                     | PAG            | Low profile, for input filtering                                                      | 105°C 2,000 hours +R            |               |               |                   | Radial        | 200 to 450                                | 18 to 560                 |
|                  |                     | KLJ            | No sparks with DC overvoltage, downsized                                              | 105°C 2,000 hours +R            |               |               |                   | Radial        | 200 & 400                                 | 4.7 to 330                |
|                  |                     | KLG            | No sparks with DC overvoltage                                                         | 105°C 2,000 hours +R            |               |               |                   | Radial        | 200 & 400                                 | 22 to 330                 |
|                  |                     | FL             | Long life, downsized                                                                  | 105°C 3,000 hours +R            |               |               | ●                 | Radial        | 6.3 to 50                                 | 1.0 to 270                |
|                  |                     | GPA            | 125°C, low impedance, downsized                                                       | 125°C 3,000 to 5,000 hours +R   | ●             | ●             |                   | Radial        | 25 to 50                                  | 470 to 6,800              |
|                  |                     | GXE            | 125°C, low impedance, downsize                                                        | 125°C 2,000 to 5,000 hours +R   | ●             | ▲             |                   | Radial        | 10 to 450                                 | 4.7 to 4,700              |
|                  |                     | GXL            | 125°C                                                                                 | 125°C 5,000 hours +R            |               |               | ●                 | Radial        | 10 to 50                                  | 100 to 1,000              |
|                  |                     | GXH (NEW!)     | 135°C                                                                                 | 135°C 1,500 / 2,000 hours +R    |               |               | ●                 | Radial        | 10 to 50                                  | 100 to 4,700              |
|                  | Special Application | LBG            | For airbag                                                                            | 105°C 5,000 hours +R            |               | ●             | ●                 | Radial        | 25 & 35                                   | 1,000 to 11,000           |
|                  |                     | KZA            | For PC motherboard<br>(Ask Engineering Bulletin No809 in detail)                      | 105°C 2,000 hours +R            |               | ●             |                   | Radial        | 6.3 to 16                                 | 470 to 3,300              |
|                  |                     | LLA            | Low DC leakage, general<br>(Ask Engineering Bulletin No575 in detail)                 | 85°C 1,000 hours                |               |               | ●                 | Radial        | 6.3 to 50                                 | 1.0 to 15,000             |
|                  |                     | PH             | For photo flash                                                                       | 55°C 5,000 times charging       |               |               |                   | Radial        | 300 & 330                                 | —                         |
| Snap-in Type     | General Purpose     | SMQ            | 85°C, standard                                                                        | 85°C 2,000 hours +R             | ●             |               |                   | Pin           | 160 to 450                                | 82 to 3,900               |
|                  |                     | KMW (NEW!)     | Super downsized<br>(Ask Engineering Bulletin No806 in detail)                         | 105°C 2,000 hours +R            |               |               |                   | Pin           | 400 to 450                                | 120 to 1,000              |
|                  |                     | KMR            | Super downsized                                                                       | 105°C 2,000 hours +R            |               |               |                   | Pin           | 160 to 450                                | 100 to 3,300              |
|                  |                     | KMQ            | 105°C, standard                                                                       | 105°C 2,000 hours +R            | ●             |               |                   | Pin           | 35, 50, 160 to 450                        | 68 to 33,000              |
|                  |                     | KMT (NEW!)     | High ripple<br>(Ask Engineering Bulletin No807 in detail)                             | 105°C 2,000 hours +R            |               |               |                   | Pin           | 420 & 450                                 | 56 to 470                 |
|                  |                     | SMM            | Downsized                                                                             | 85°C 3,000 hours +R             | ●             |               |                   | Pin           | 160 to 450                                | 47 to 3,300               |
|                  |                     | KMS            | 105°C, Downsized                                                                      | 105°C 3,000 hours +R            | ●             |               |                   | Pin           | 160 to 450                                | 82 to 3,300               |
|                  |                     | KMM            | 105°C, Downsized                                                                      | 105°C 2,000 to 3,000 hours +R   | ●             |               |                   | Pin           | 160 to 450                                | 39 to 3,300               |
|                  |                     | SMH            | 85°C, standard<br>(Ask Engineering Bulletin No585 for 160 to 450V)                    | 85°C 2,000 hours +R             |               |               |                   | Pin           | 6.3 to 100                                | 820 to 100,000            |
|                  |                     | KMH            | 105°C, standard<br>(Ask Engineering Bulletin No584 for 160 to 450V)                   | 105°C 2,000 hours +R            |               |               |                   | Pin           | 6.3 to 100                                | 560 to 82,000             |
|                  | Low Profile         | SLM            | 15mm height, low profile                                                              | 85°C 2,000 hours +R             |               |               |                   | Pin           | 160 to 400                                | 47 to 560                 |
|                  |                     | KLM            | 15mm height, low profile                                                              | 105°C 2,000 hours +R            |               |               |                   | Pin           | 160 to 400                                | 39 to 390                 |
|                  | High Reliability    | LXM            | Long life, downsized                                                                  | 105°C 7,000 hours +R            |               |               |                   | Pin           | 160 to 450                                | 47 to 2,200               |
|                  |                     | LXS            | Long life, downsized                                                                  | 105°C 5,000 hours +R            | ●             |               |                   | Pin           | 160 to 450                                | 82 to 3,300               |
|                  |                     | LXQ            | Long life, downsized                                                                  | 105°C 5,000 hours +R            |               |               |                   | Pin           | 160 to 450                                | 82 to 2,700               |
|                  |                     | LXG            | Long life                                                                             | 105°C 5,000 hours +R            |               |               |                   | Pin           | 10 to 100                                 | 390 to 47,000             |
|                  |                     | CHA (Upgrade!) | No sparks with DC overvoltage, downsized                                              | 105°C 2,000 hours +R            |               |               |                   | Pin           | 200 to 450                                | 56 to 1,200               |
|                  |                     | LXH            | No sparks with DC overvoltage                                                         | 105°C 3,000/5,000 hours +R      |               |               |                   | Pin           | 200 & 400                                 | 68 to 1,500               |
|                  |                     | KMV (NEW!)     | For charge and discharge application                                                  | 105°C 3,000 hours +R            |               |               |                   | Pin           | 350 to 450                                | 82 to 1,200               |
| Screw-mount Type | General Purpose     | SME            | 85°C, standard<br>(Ask Engineering Bulletin No548 for 160 to 250V)                    | 85°C 2,000 hours +R             | ●             |               |                   | Screw         | 10 to 100                                 | 2,200 to 680,000          |
|                  |                     | KMH            | 105°C, standard                                                                       | 105°C 2,000 hours +R            | ●             |               |                   | Screw         | 10 to 400                                 | 180 to 680,000            |
|                  | For Inverter        | RWG            | Long life, high ripple, downsized                                                     | 85°C 5,000 hours +R             |               |               |                   | Screw         | 350 to 450                                | 1,500 to 18,000           |
|                  |                     | RWF            | Long life, high ripple                                                                | 85°C 5,000 hours +R             |               |               |                   | Screw         | 350 to 450                                | 820 to 22,000             |
|                  |                     | RWQ            | High ripple, downsized                                                                | 85°C 2,000 hours +R             | ●             |               |                   | Screw         | 350 to 550                                | 390 to 15,000             |
|                  |                     | RWE            | High ripple                                                                           | 85°C 2,000 hours +R             | ●             |               |                   | Screw         | 350 to 550                                | 100 to 12,000             |
|                  |                     | RWY            | Long life, high ripple, low cost                                                      | 85°C 5,000 hours +R             |               |               |                   | Screw         | 350 to 450                                | 500 to 14,000             |
|                  |                     | RWL            | Long life, high ripple                                                                | 85°C 20,000 hours +R            |               |               |                   | Screw         | 350 to 450                                | 2,200 to 12,000           |
|                  |                     | FTP            | Ellips can shape, high ripple                                                         | 85°C 5,000 hours +R             |               |               |                   | Screw         | 63 to 450                                 | 270 to 21,000             |
|                  |                     | LXA            | 105°C, long life                                                                      | 105°C 2,000/5,000 hours +R      |               |               |                   | Screw         | 10 to 525                                 | 330 to 390,000            |
|                  |                     | LXR            | 105°C, long life, high ripple                                                         | 105°C 5,000 hours +R            |               |               |                   | Screw         | 350 to 450                                | 2,200 to 15,000           |
|                  |                     | RWV (NEW!)     | For charge and discharge application                                                  | 85°C 5,000 hours +R             |               |               |                   | Screw         | 350 to 450                                | 820 to 18,000             |

: Recommendation products

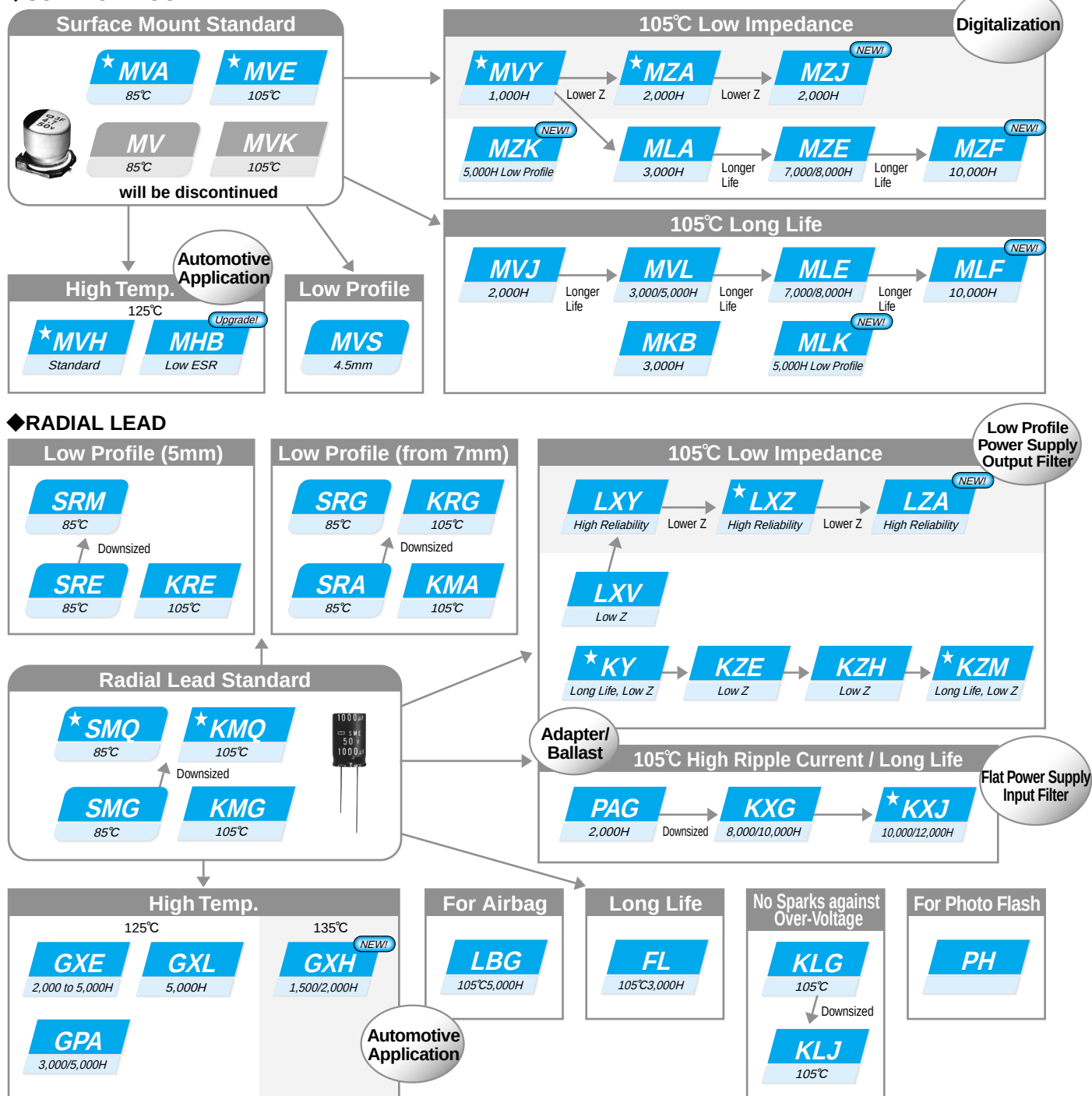
: Some of range are solvent resistant.

## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

◆ **RADIAL LEAD**



## ◆SURFACE MOUNT



CAT. No. E1001K

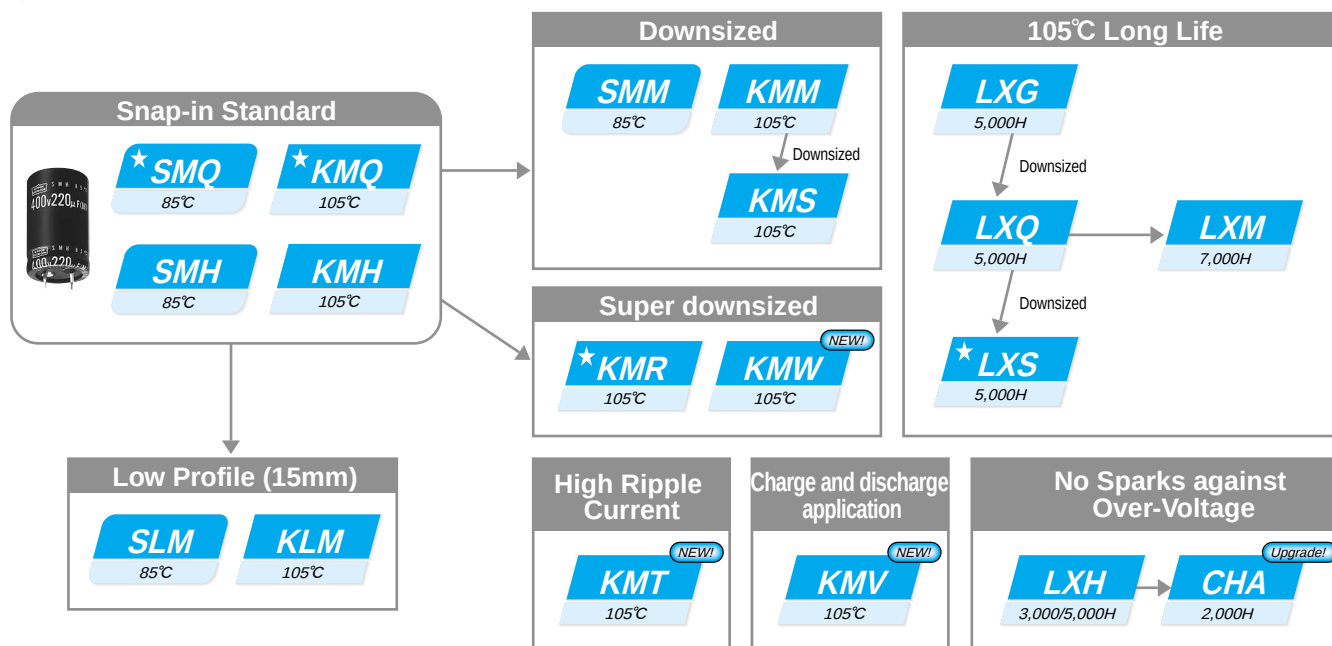


## GROUP CHART

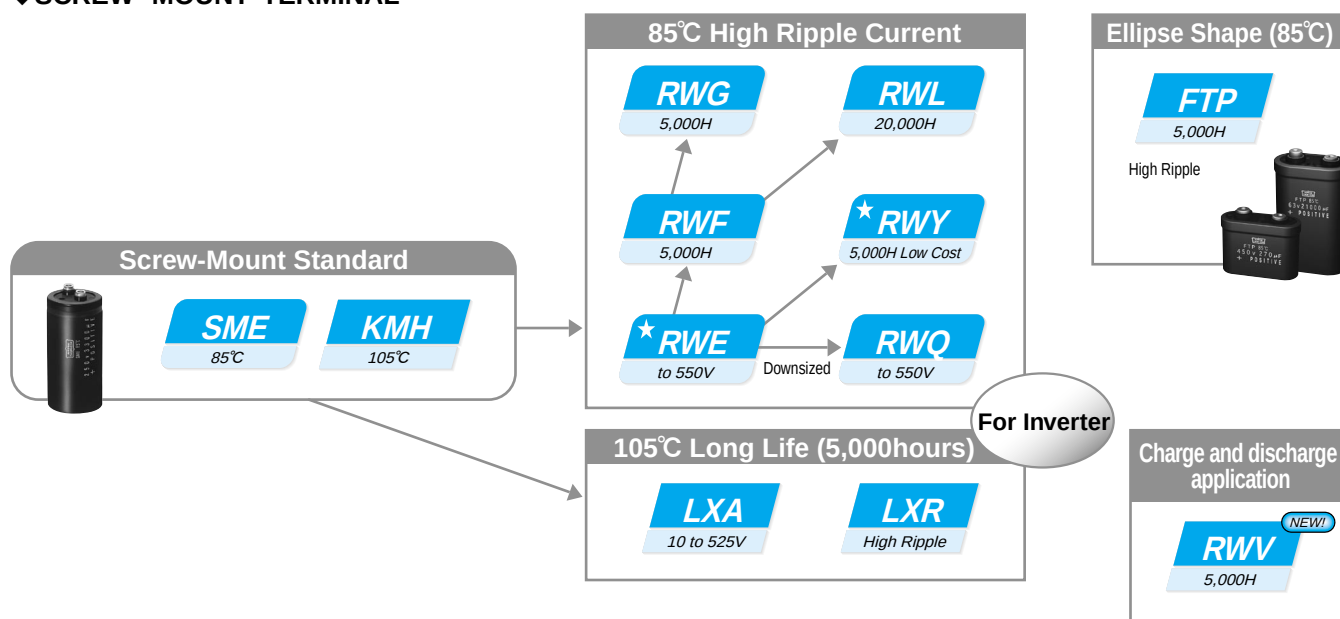
[Previous page](#)

## ALUMINUM ELECTROLYTIC CAPACITORS

## ◆SNAP-IN



## ◆SCREW-MOUNT TERMINAL



☆: Recommendation products



## PART NUMBERING SYSTEM

### Part numbering system

Our part numbering system is common to all of Nippon Chemi-Con's subsidiaries worldwide, and has been switching the conventional part numbering system. The part number uses 18-digit codes to express information of principal product specifications such as product category, series name, rated voltage, capacitance, case size and RoHS compliance.

#### ●Categories

|                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
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| Code | Details                                              |
|------|------------------------------------------------------|
| A    | Conductive Polymer Aluminum Solid Capacitors (Polar) |
| E    | Aluminum Electrolytic Capacitors (Polar)             |
| B    | Aluminum Electrolytic Capacitors (Bi-polar)          |
| K    | Multilayer Ceramic Capacitors                        |
| F,W  | Film Capacitors                                      |
| D    | Electric Double Layer Capacitors                     |
| T    | Metal Oxide Varistors                                |
| L    | Amorphous Choke Coils                                |

\* For digits 2 to 18, please see "Product code guide".

#### ●Example

| Product type              | Part number (Example) | Conventional part number (Ref.) |
|---------------------------|-----------------------|---------------------------------|
| Surface mount type        | EMVE160ADA100MD55G    | MVE16VC10MD55E0                 |
| Radial lead type          | EKMQ6R3ETC102MHB5D    | TC04RKMQ6. 3VB1000MF50E0        |
| Snap-in type              | EKMQ201VSN471MP30S    | KMQ200VSSN470M22BE0             |
| Screw mount terminal type | ERWE551LGC821MCD0M    | RWE550LGSN820MCC13EA            |



## ENVIRONMENTAL CONSIDERATION

### Environment friendly capacitors

Nippon Chemi-Con always considers the environment in product materials, designs and manufacturing. In fact, our factories already have received ISO 14000 certificate. Cadmium, Mercury, Hexavalent Chromium, PBB and PBDE have never been used in our products. Furthermore, lead-containing materials have been eliminated from all our aluminum electrolytic capacitors including Conductive Polymer Aluminum Solid Capacitors to comply with RoHS. If you need "Halogen-Free" products, please consult with us.

#### ◆Lead free and Non-PVC Products

##### 1. Lead wire (Plating)

| Category    |                          | Plating material on lead wires |
|-------------|--------------------------|--------------------------------|
| Chip        | case code : D46 to JA0   | Sn-Bi                          |
|             | case code : KE0 to MN0   | Sn                             |
| Radial      | case dia : $\sim\phi 8$  | Sn-Bi                          |
|             | case dia : $\phi 10\sim$ | Sn                             |
| Snap-in     |                          | Sn                             |
| Screw-Mount |                          | Originally lead-free           |

\*Please consult with us when you need "Lead-free parts" other than the above mentioned terminal plating materials.

(Note) **Sn** : Tin, **Bi** : Bismuth

##### 2. Sleeve

| Category    |                           | Sleeve material          |
|-------------|---------------------------|--------------------------|
| Chip        |                           | Sleeveless(Coating case) |
| Radial      | $\phi 8 \times 5L$        | Sleeveless(Coating case) |
|             | except $\phi 8 \times 5L$ | PET                      |
| Snap-in     |                           | PET                      |
| Screw-Mount |                           | PVC(Lead-free)           |

\* Please consult with us when you need "Non-PVC parts" other than the above mentioned outer sleeve materials.

The colors of a PET sleeve are "Black", "Brown", and "Dark blue".

Standard designs of "lead-free" Snap-in type are not equipped with a plastic disc.

Please consult with us when you need nonflammable grade for outer sleeve material.

Identification of friendly parts is given by a supplement code (18th digit) of the part number.

For details, please refer to "Product code guide" for each type.

#### ◆Regarding compliance for EU REACH Regulation

a) According to the content of REACH handbook (Guidance on requirements for substances in articles which is published on May 2008), our electronic components are "articles without any intended release". Therefore they are not applicable for "Registration" for EU REACH Regulation Article 7 (1).

Reference: Electrolytic Condenser Investigation Society

"Study of REACH Regulation in EU about Electrolytic Capacitor" (publicized on 13 March 2008)

b) DEHP (CAS No.117-81-7) is a high concern substance (SVHC) in the EU REACH rules. DEHP is contained as a plasticizer in PVC sleeve covering material etc.. Nippon Chemi-Con will abolish use of DEHP by June, 2011. Please consult with us about an alternate product.



## PACKAGING

## TAPING SPECIFICATIONS

## SURFACE MOUNT TYPE (TAPING)



## ◆CARRIER TAPE [mm]

Fig.1

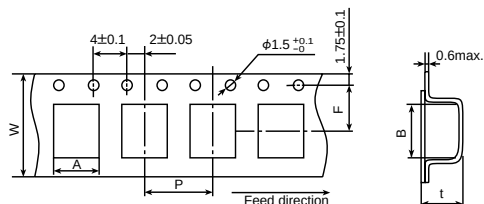


Fig.3

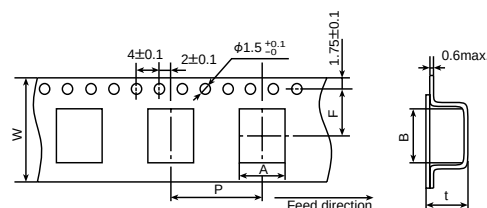


Fig.2

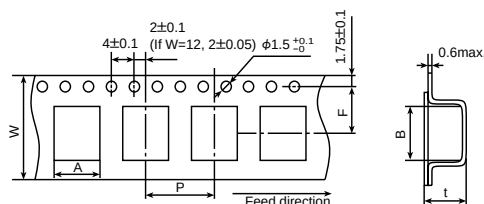
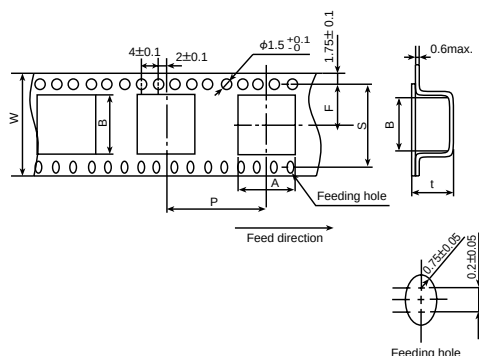


Fig.4



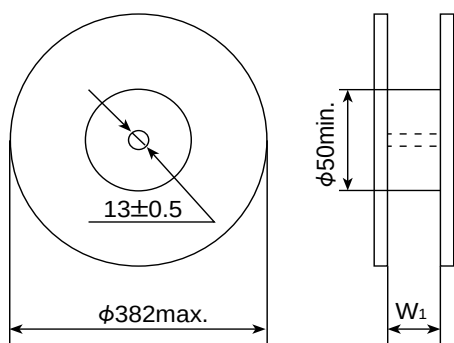
[mm]

| Series                                                                                                                                  | Items   | W    | A    | B    | F    | P    | t    | S    | Fig. |
|-----------------------------------------------------------------------------------------------------------------------------------------|---------|------|------|------|------|------|------|------|------|
|                                                                                                                                         |         | ±0.3 | ±0.2 | ±0.2 | ±0.1 | ±0.1 | ±0.2 | ±0.1 |      |
| Alchip™<br>MVS/MVA<br>MV/MVE<br>MVK/MZJ<br>MZA/MVY<br>MZF/MZE<br>MZK/MLA<br>MLF/MLE<br>MLK/MVL<br>MVJ/MVH<br>MHB/MKB<br>MV-BP<br>MVK-BP | D46     | 12.0 | 4.7  | 4.7  | 5.5  | 8.0  | 4.9  | —    | 1    |
|                                                                                                                                         | D55     | 12.0 | 4.7  | 4.7  | 5.5  | 8.0  | 5.7  | —    | 1    |
|                                                                                                                                         | D60,D61 | 12.0 | 4.7  | 4.7  | 5.5  | 8.0  | 6.3  | —    | 1    |
|                                                                                                                                         | D73     | 12.0 | 4.6  | 4.6  | 5.5  | 8.0  | 7.5  | —    | 1    |
|                                                                                                                                         | E46     | 12.0 | 5.7  | 5.7  | 5.5  | 12.0 | 4.9  | —    | 2    |
|                                                                                                                                         | E55     | 12.0 | 5.7  | 5.7  | 5.5  | 12.0 | 5.7  | —    | 2    |
|                                                                                                                                         | E60,E61 | 12.0 | 5.7  | 5.7  | 5.5  | 12.0 | 6.3  | —    | 2    |
|                                                                                                                                         | E73     | 16.0 | 5.7  | 5.7  | 7.5  | 12.0 | 7.5  | —    | 2    |
|                                                                                                                                         | F45     | 16.0 | 7.0  | 7.0  | 7.5  | 12.0 | 4.8  | —    | 2    |
|                                                                                                                                         | F46     | 16.0 | 7.0  | 7.0  | 7.5  | 12.0 | 4.9  | —    | 2    |
|                                                                                                                                         | F55     | 16.0 | 7.0  | 7.0  | 7.5  | 12.0 | 5.7  | —    | 2    |
|                                                                                                                                         | F60,F61 | 16.0 | 7.0  | 7.0  | 7.5  | 12.0 | 6.3  | —    | 2    |
|                                                                                                                                         | F73     | 16.0 | 7.0  | 7.0  | 7.5  | 12.0 | 7.5  | —    | 2    |
|                                                                                                                                         | F80     | 16.0 | 7.0  | 7.0  | 7.5  | 12.0 | 8.2  | —    | 2    |
|                                                                                                                                         | F90     | 16.0 | 7.0  | 7.0  | 7.5  | 12.0 | 9.2  | —    | 2    |
|                                                                                                                                         | H63     | 16.0 | 8.7  | 8.7  | 7.5  | 12.0 | 6.8  | —    | 2    |
|                                                                                                                                         | H70     | 24.0 | 8.7  | 8.7  | 11.5 | 12.0 | 7.3  | —    | 2    |
|                                                                                                                                         | H80     | 24.0 | 8.7  | 8.7  | 11.5 | 12.0 | 8.3  | —    | 2    |
|                                                                                                                                         | HA0     | 24.0 | 8.7  | 8.7  | 11.5 | 16.0 | 11.0 | —    | 3    |
|                                                                                                                                         | HC0     | 24.0 | 8.7  | 8.7  | 11.5 | 16.0 | 12.7 | —    | 3    |
| NPCAP™<br>PXX/PXS<br>PXF/PXE<br>PXA/PXH                                                                                                 | J80     | 24.0 | 10.7 | 10.7 | 11.5 | 16.0 | 8.3  | —    | 3    |
|                                                                                                                                         | JA0     | 24.0 | 10.7 | 10.7 | 11.5 | 16.0 | 11.0 | —    | 3    |
|                                                                                                                                         | JC0     | 24.0 | 10.7 | 10.7 | 11.5 | 16.0 | 12.8 | —    | 3    |
|                                                                                                                                         | KE0     | 32.0 | 13.4 | 13.4 | 14.2 | 24.0 | 14.0 | 28.4 | 4    |
|                                                                                                                                         | KG5     | 32.0 | 13.4 | 13.4 | 14.2 | 24.0 | 16.5 | 28.4 | 4    |
|                                                                                                                                         | LH0     | 44.0 | 17.5 | 17.5 | 20.2 | 28.0 | 16.8 | 40.4 | 4    |
|                                                                                                                                         | LN0     | 44.0 | 17.5 | 17.5 | 20.2 | 28.0 | 22.1 | 40.4 | 4    |
|                                                                                                                                         | MH0     | 44.0 | 19.5 | 19.5 | 20.2 | 32.0 | 17.1 | 40.4 | 4    |
|                                                                                                                                         | MN0     | 44.0 | 19.5 | 19.5 | 20.2 | 32.0 | 22.1 | 40.4 | 4    |



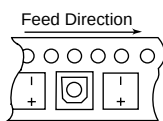
## PACKAGING

## ◆ REEL DIMENSIONS [mm]



## ◆ POLARITY

Alchip™- MVS/MVA/MV  
MVE/MVK/MZJ  
MZA/MVY/MZF  
MZE/MZK/MLA  
MLF/MLE/MLK  
MVL/MVJ/MVH  
MHB/MKB  
MV-BP/MVK-BP  
NP CAP™  
PXK/PXS/PXF  
PXE/PXA/PXH

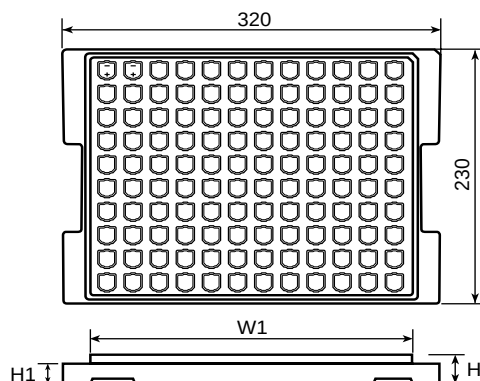


## ◆ QUANTITY PER REEL/BOX

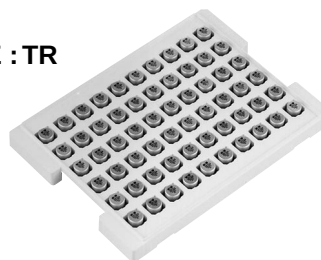
| Series  | Size code           | Quantity (pcs/reel) | Quantity (pcs/box) | W <sub>1</sub> (mm) |
|---------|---------------------|---------------------|--------------------|---------------------|
| Alchip™ | D46,D55,D60,D61     | 2,000               | 10,000             | 14                  |
|         | D73                 | 1,500               | 7,500              | 14                  |
|         | E46,E55,E60,E61     | 1,000               | 5,000              | 14                  |
|         | E73                 | 1,000               | 5,000              | 18                  |
|         | F46,F55,F60,F61,F73 | 1,000               | 5,000              | 18                  |
|         | F80                 | 900                 | 4,500              | 18                  |
|         | F90                 | 800                 | 4,000              | 18                  |
|         | H63                 | 1,000               | 5,000              | 18                  |
|         | HA0                 | 500                 | 1,500              | 26                  |
|         | JA0                 | 500                 | 1,500              | 26                  |
|         | KE0                 | 200                 | 600                | 34                  |
|         | KG5                 | 150                 | 450                | 34                  |
|         | LH0                 | 125                 | 250                | 46                  |
|         | LN0                 | 75                  | 150                | 46                  |
|         | MH0                 | 125                 | 250                | 46                  |
|         | MN0                 | 75                  | 150                | 46                  |
| NPCAP™  | D55                 | 2,000               | 20,000             | 14                  |
|         | E60,E61             | 1,000               | 10,000             | 14                  |
|         | F45,F55,F60,F61     | 1,000               | 7,000              | 18                  |
|         | F80                 | 900                 | 6,300              | 18                  |
|         | H70                 | 1,000               | 6,000              | 26                  |
|         | H80                 | 900                 | 5,400              | 26                  |
|         | HA0                 | 500                 | 3,000              | 26                  |
|         | HC0                 | 400                 | 1,200              | 26                  |
|         | J80                 | 500                 | 3,000              | 26                  |
|         | JA0                 | 500                 | 3,000              | 26                  |
|         | JC0                 | 400                 | 1,200              | 26                  |

## SURFACE MOUNT TYPE (TRAY)

## ◆ DIMENSIONS [mm]



## ● TRAY CODE : TR

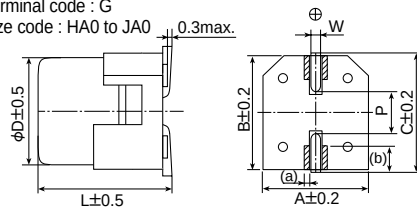


| Size code | H [mm] | W <sub>1</sub> [mm] | H <sub>1</sub> [mm] | Quantity [pcs/tray] | Quantity [pcs/box] |
|-----------|--------|---------------------|---------------------|---------------------|--------------------|
| KE0 & KG5 | 21.0   | 284                 | 18.5                | 120                 | 600                |
| LH0 & LN0 | 28.0   | 284                 | 24.0                | 80                  | 400                |
| MH0 & MN0 | 28.0   | 284                 | 24.0                | 60                  | 300                |

## VIBRATION RESISTANT STRUCTURE (Terminal code : G)

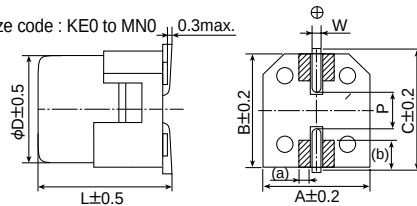
## ◆ DIMENSIONS [mm]

- Terminal code : G
- Size code : HA0 to JA0



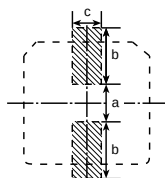
▨ : Dummy terminals

- Size code : KE0 to MN0



▨ : Dummy terminals

## ◆ RECOMMENDED SOLDER LAND



▨ Solder land on PC board

| Size code | Dimensions of products (mm) |      |      |      |      |            |     |       |       | Solder land (mm) |     |     |
|-----------|-----------------------------|------|------|------|------|------------|-----|-------|-------|------------------|-----|-----|
|           | D                           | L    | A    | B    | C    | W          | P   | (a)   | (b)   | a                | b   | c   |
| HA0       | 8.0                         | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 | (0.5) | (1.8) | 3.1              | 4.2 | 3.5 |
| JA0       | 10.0                        | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 | (0.5) | (2.1) | 4.5              | 4.4 | 3.5 |
| KE0       | 12.5                        | 13.5 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 | (1.3) | (3.0) | 3.4              | 6.3 | 9.3 |
| KG5       | 12.5                        | 16.0 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 | (1.3) | (3.0) | 3.4              | 6.3 | 9.3 |
| LH0       | 16.0                        | 16.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 | (2.0) | (3.0) | 4.7              | 7.8 | 9.6 |
| LN0       | 16.0                        | 21.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 | (2.0) | (3.0) | 4.7              | 7.8 | 9.6 |
| MH0       | 18.0                        | 16.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 | (2.0) | (4.0) | 4.7              | 8.8 | 9.6 |
| MN0       | 18.0                        | 21.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 | (2.0) | (4.0) | 4.7              | 8.8 | 9.6 |

( ) : Ref.



## TAPING SPECIFICATIONS

## RADIAL LEAD TYPE (TAPING)

## ◆DIMENSION [mm]

Fig.1

Taping Code : TA, TC  
 $\phi D = \phi 4$  to 8

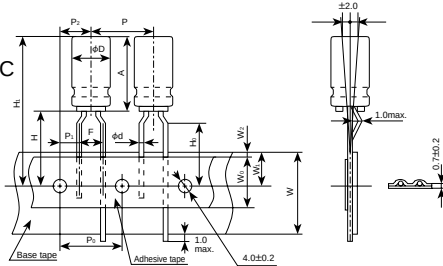


Fig.2

Taping Code : TD  
 $\phi D = \phi 5$   
 $\phi D \times L = \phi 4 \times 7$

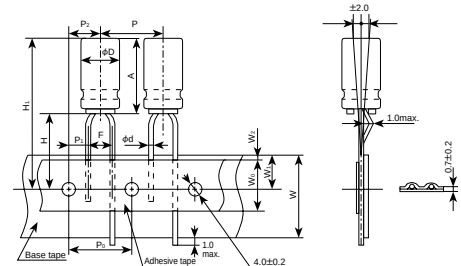


Fig.3

Taping Code : TD  
 $\phi D = \phi 6.3$  to 12.5

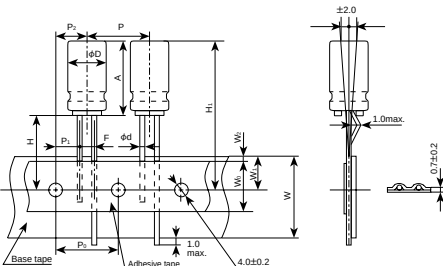
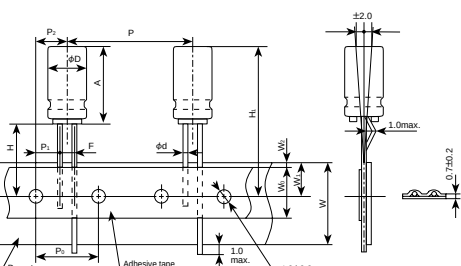


Fig.4

Taping Code : TE  
 $\phi D = \phi 12.5$



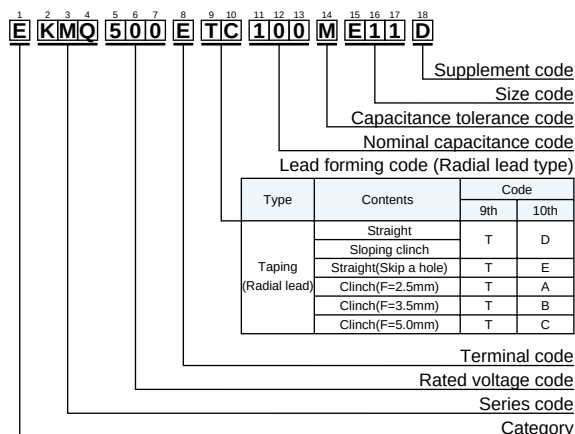
| Code    | Taping Code | Case size |         | $\phi d$   | P                | P <sub>0</sub> | P <sub>1</sub> | P <sub>2</sub> | F                | W         | W <sub>0</sub> | W <sub>1</sub> | W <sub>2</sub> | H                          | H <sub>0</sub> | H <sub>1</sub>                                        | Fig. |
|---------|-------------|-----------|---------|------------|------------------|----------------|----------------|----------------|------------------|-----------|----------------|----------------|----------------|----------------------------|----------------|-------------------------------------------------------|------|
| tol.    |             | $\phi D$  | A       | $\pm 0.05$ | $\pm 1.0$        | $\pm 0.2$      | $\pm 0.7$      | $\pm 1.0$      | $+0.8$<br>$-0.2$ | $\pm 0.5$ | min.           | $\pm 0.5$      | max.           | $\pm 0.75$                 | $\pm 0.5$      |                                                       |      |
| Nominal | TA          | 4         | 5       | 0.45       | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 6.0            | 9.0            | 1.5            | 17.5                       | 16.0           | H <sub>1</sub> =H+A<br>Check insertion machine specs. | 1    |
|         | TC          |           | 7       | 0.45       | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 6.0            | 9.0            | 1.5            | 18.5 <sup>*1</sup><br>17.5 | 16.0           |                                                       | 2    |
|         | TD          |           | 11.5    | 0.45       | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 10.0           | 9.0            | 1.5            | 17.5                       | 16.0           |                                                       | 1    |
|         | TC          |           |         |            |                  |                |                |                |                  |           |                |                |                |                            |                |                                                       | 1    |
|         | TD          | 5         | 5 to 7  | 0.45       | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 6.0            | 9.0            | 1.5            | 18.5<br>17.5               | 16.0           |                                                       | 2    |
|         | TC          |           | 9 to 15 | 0.5        | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 10.0           | 9.0            | 1.5            | 18.5<br>16.0               | 16.0           |                                                       | 1    |
|         | TD          |           | 5 to 7  | 0.45       | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 6.0            | 9.0            | 1.5            | 18.5<br>17.5               | 16.0           |                                                       | 2    |
|         | TC          |           | 9 to 15 | 0.5        | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 10.0           | 9.0            | 1.5            | 18.5<br>16.0               | 16.0           |                                                       | 1    |
|         | TD          | 6.3       | 5 to 7  | 0.45       | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 6.0            | 9.0            | 1.5            | 18.5<br>17.5               | 16.0           |                                                       | 3    |
|         | TC          |           | 9 to 15 | 0.5        | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 10.0           | 9.0            | 1.5            | 18.5<br>16.0               | 16.0           |                                                       | 1    |
|         | TD          |           | 5 to 7  | 0.45       | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 6.0            | 9.0            | 1.5            | 18.5<br>17.5               | 16.0           |                                                       | 3    |
|         | TC          |           | 9 to 15 | 0.5        | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 10.0           | 9.0            | 1.5            | 18.5<br>16.0               | 16.0           |                                                       | 1    |
| Nominal | TD          | 8         | 5       | 0.45       | 12.7             | 12.7           | 5.1<br>3.85    | 6.35           | 2.5<br>5         | 18.0      | 6.0            | 9.0            | 1.5            | 18.5<br>17.5               | 16.0           |                                                       | 3    |
|         | TC          |           | 7       | 0.45       | 12.7             | 12.7           | 3.85           | 6.35           | 5                | 18.0      | 6.0            | 9.0            | 1.5            | 17.5                       | 16.0           |                                                       | 1    |
|         | TD          |           | 9 to 20 | 0.6        | 12.7             | 12.7           | 3.85           | 6.35           | 3.5<br>5         | 18.0      | 10.0           | 9.0            | 1.5            | 20.0                       | 16.0           |                                                       | 1    |
|         | TC          |           |         |            |                  |                |                |                |                  |           |                |                |                |                            |                |                                                       | 1    |
| tol.    |             | $\pm 0.5$ | max.    | $\pm 0.05$ | $\pm 1.0$        | $\pm 0.3$      | $\pm 0.7$      | $\pm 1.3$      | $+0.8$<br>$-0.2$ | $\pm 0.5$ | min.           | $\pm 0.5$      | max.           | $+2.0$<br>$-0$             | —              |                                                       |      |
| Nominal | TD          | 10        | 21      | 0.6        | 12.7             | 12.7           | 3.85           | 6.35           | 5                | 18.0      | 12.5           | 9.0            | 1.5            | 18.0                       | —              |                                                       | 3    |
|         | TD          | 12.5      | 26      | 0.6        | 15 <sup>*2</sup> | 15             | 5.0            | 7.5            | 5                | 18.0      | 12.5           | 9.0            | 1.5            | 18.0                       | —              |                                                       | 3    |
|         | TE          |           |         | 0.6        | 25.4             | 12.7           | 3.85           | 6.35           | 5                | 18.0      | 12.5           | 9.0            | 1.5            | 18.0                       | —              |                                                       | 4    |

\* 1 : For  $\phi 4 \times 7$  (A=7, F=25), shall be 18.5<sup>-0.5/+0.75</sup> (Taping code : TD) at Fig.2.

\* 2 : P=15 taping is not standard. Use P=25.4 taping.

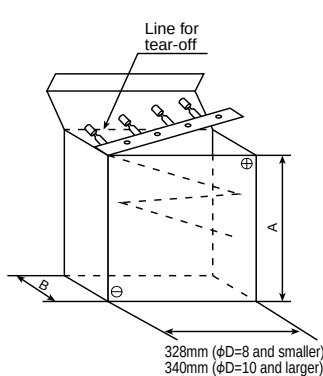
## TAPING CODE

## Example



## QUANTITY PER AMMO PACK

## Ammo pack box



## Typical example

| Case size<br>$\phi D \times L$ (mm)                                 | A (mm)                   | B (mm)               | Quantity (pcs.)                |
|---------------------------------------------------------------------|--------------------------|----------------------|--------------------------------|
| $\phi 4$<br>L=5 & 7mm<br>L=11.5mm                                   | 183<br>183               | 42<br>51             | 2,000                          |
| $\phi 5$<br>L=5 & 7mm<br>L=9 to 15mm                                | 232<br>232               | 42<br>51             | 2,000                          |
| $\phi 6.3$<br>L=17mm<br>L=5 & 7mm<br>L=9 to 15mm                    | 235<br>282<br>284        | 60<br>42<br>51       | 2,000                          |
| $\phi 8$<br>L=17mm<br>L=5 & 7mm<br>L=9 to 15mm                      | 284<br>232<br>232        | 55<br>42<br>51       | 1,000                          |
| $\phi 10$<br>L=16mm<br>L=17 to 20mm<br>L=21 to 25mm<br>L=26 to 30mm | 308<br>308<br>308<br>308 | 56<br>62<br>67<br>71 | 800(500)*<br>800<br>800<br>500 |
| $\phi 12.5$<br>L=16mm<br>L=17 to 25mm                               | 308<br>308               | 62<br>67             | 500<br>500                     |

\*Minimum order quantity  
 for PSK/PSF/PSE/PSC/PSA/PS series



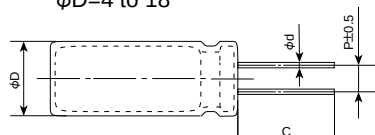
## PACKAGING

## RADIAL LEAD TYPE (CUT/FORMED LEAD)

The following lead configurations are available. When ordering, please indicate the type of lead configurations by using the appropriate supplement code, such as C5, FC, MC or RC in the product part number.

[mm]

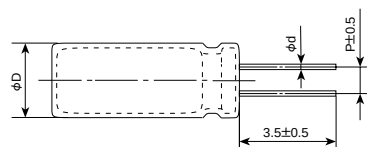
## ●Lead code : C5

 $\phi D=4$  to 18

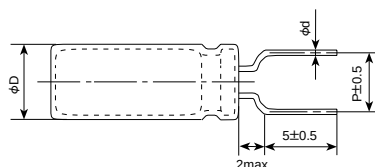
Case diameter C: Lead length

 $\phi D=4$  to 8 :  $5.0 \pm 0.5$  $\phi D=10$  to 18 :  $5.0^{+1.0}_{-0}$ 

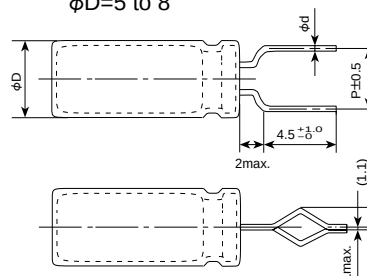
## ●Lead code : C3

 $\phi D=4$  to 18

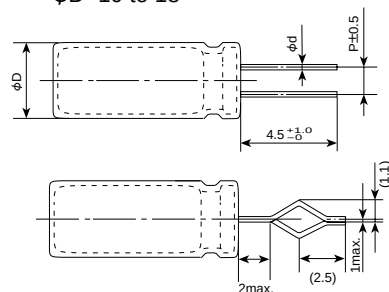
## ●Lead code : FC

 $\phi D=5$  to 8

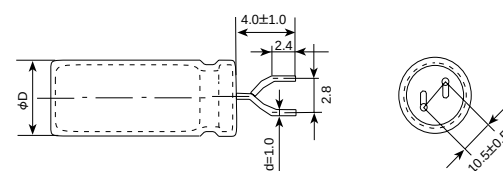
## ●Lead code : FM

 $\phi D=5$  to 8

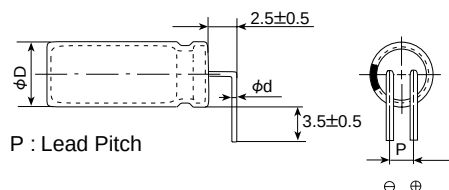
## ●Lead code : MC

 $\phi D=10$  to 18

## ●Lead code : RC

 $\phi D=20$  & 22

## ●Lead code : BC

 $\phi D=10, 12.5$  :  $P=5.0 \pm 0.5$  $\phi D=14.5, 16, 18$  :  $P=7.5 \pm 0.5$ 



## PACKAGING

### MINIMUM ORDER QUANTITY

Please order by minimum order quantity.

#### ◆SURFACE MOUNT

##### ●Vertical



| Series                                                                                                                                                                  | Size code                    | Quantity (pcs) |                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------|----------------|
|                                                                                                                                                                         |                              | Taping         | Tray (pcs/box) |
| Alchip™<br>MVS/MVA/MV<br>MVE/MVK/MZJ<br>MZA/MVY/MZF<br>MZE/MZK/MLA<br>MLF/MLE/MLK<br>MVL/MVJ/MVH<br>MHB/MKB<br>MV-BP/MVK-BP<br><br>NPCAP™<br>PXK/PXS/PXF<br>PXE/PXA/PXH | D46, D55, D60, D61           | 2,000          | —              |
|                                                                                                                                                                         | D73                          | 1,500          | —              |
|                                                                                                                                                                         | E46, E55, E60, E61, E73      | 1,000          | —              |
|                                                                                                                                                                         | F45, F46, F55, F60, F61, F73 | 1,000          | —              |
|                                                                                                                                                                         | F80, H80                     | 900            | —              |
|                                                                                                                                                                         | F90                          | 800            | —              |
|                                                                                                                                                                         | H63, H70                     | 1,000          | —              |
|                                                                                                                                                                         | HA0                          | 500            | —              |
|                                                                                                                                                                         | HC0                          | 400            | —              |
|                                                                                                                                                                         | J80, JA0                     | 500            | —              |
|                                                                                                                                                                         | JC0                          | 400            | —              |
|                                                                                                                                                                         | KE0                          | 200            | 600            |
|                                                                                                                                                                         | KG5                          | 150            | 600            |
|                                                                                                                                                                         | LH0                          | 125            | 400            |
|                                                                                                                                                                         | LN0                          | 75             | 400            |
|                                                                                                                                                                         | MH0                          | 125            | 300            |
|                                                                                                                                                                         | MN0                          | 75             | 300            |

#### ◆RADIAL



| Size  |               | Quantity (pcs) |                 |
|-------|---------------|----------------|-----------------|
|       |               | Bagged*1       | Taping          |
| φ4    |               | 200            | 2,000           |
| φ5    |               | 200            | 2,000           |
| φ6.3  |               | 200 (200)*2    | 2,000 (2,000)*2 |
| φ8    |               | 200 (100)*2    | 1,000 (1,000)*2 |
| φ10   | Height ≤ 25mm | 200 (100)*2    | 800 (500)*2     |
|       | Height ≥ 30mm | 200            | 500             |
| φ12.5 |               | 100            | 500             |
| φ14.5 |               | 50             | 250             |
| φ16   |               | 50             | 250             |
| φ18   |               | 50             | 250             |

\*1 Standard bagged quantity.

\*2 Minimum order quantity for PSK/PSF/PSE/PSC/PSA/ PS series.

#### ◆SNAP-IN

200 pieces





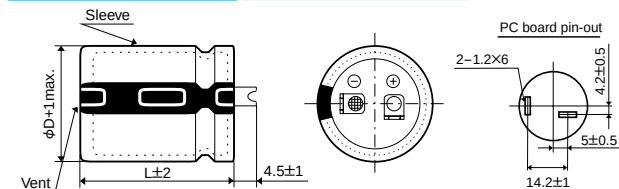
## AVAILABLE TERMINALS FOR SNAP-IN TYPE [mm]

The following terminal options can be selected.

Please consult with us before purchase.

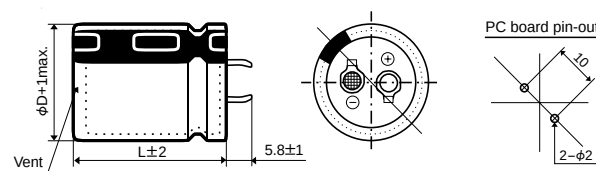
D=φ30 to φ40mm

Terminal Code : LIN



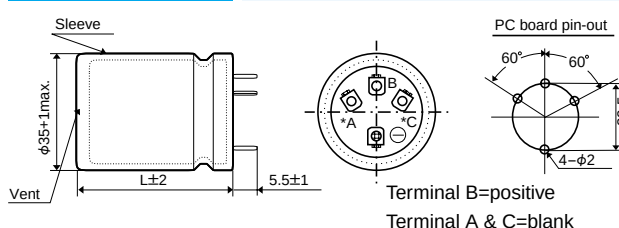
D=φ22 to φ35mm

Terminal Code-Dummy Terminal Code : VNN



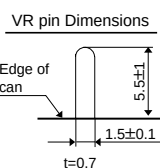
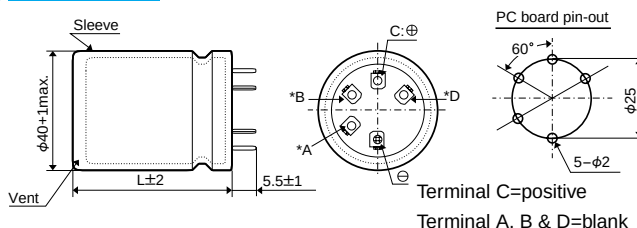
D=φ35 & φ40mm

Terminal Code-Dummy Terminal Code : VRD



D=φ40mm

Terminal Code-Dummy Terminal Code : VRT



### CAUTION

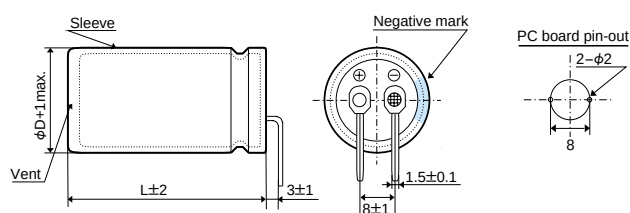
\* Use the blank terminals for mechanical support only.

The blank terminals must not be connected to any copper trace on PC board.

Be sure to electrically isolate from the negative and the positive terminals.

D=φ20×30 to φ50 φ mm, φ22×30 to φ50 φ mm

Terminal Code-Dummy Terminal Code : LCN



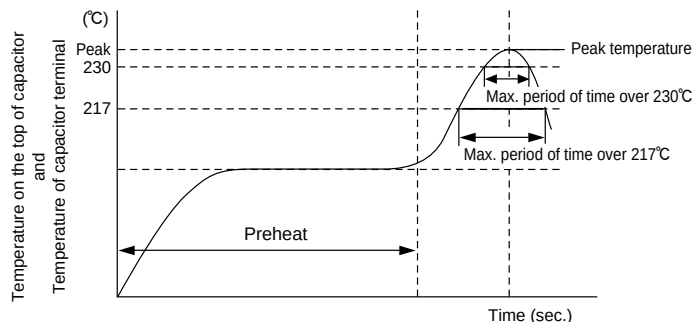
## RECOMMENDED REFLOW SOLDERING CONDITIONS

### NPCAP™-PXX/PXS/PXF/PXE/PXA/PXH Series

The following conditions are recommended for air or infrared reflow soldering PXX/PXS/PXF/PXE/PXA/PXH series onto a glass epoxy circuit board of 90×50×0.8mm (with resist) by cream solder. The temperatures shown are the surface temperature values on the top of the can and temperature of capacitor terminal.

Reflow should be performed twice or less.

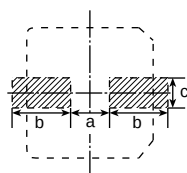
Please ensure that the capacitor became cold enough to the room temperature (5 to 35°C) before the second reflow.



| Voltage range (Vdc) | Preheat                      | Time maintained above 217°C  | Time maintained above 230°C  | Peak temp.  | Reflow number   |
|---------------------|------------------------------|------------------------------|------------------------------|-------------|-----------------|
| 2.5 to 16V          | 150 to 180°C<br>120 sec.max. | 50 sec.max.                  | 40 sec.max.                  | 260°Cmax.   | 1-cycle only    |
|                     |                              |                              |                              | 250°Cmax.   | 2-cycle allowed |
| 20 to 25V           | 150 to 180°C<br>120 sec.max. | 50 sec.max.<br>(40 sec.max.) | 40 sec.max.<br>(30 sec.max.) | 250°Cmax.   | 1-cycle only    |
|                     |                              | 40 sec.max.                  | 30 sec.max.                  | (240°Cmax.) | 2-cycle allowed |
|                     |                              |                              |                              |             |                 |

( ) : Applies for 20V 82μF(J80) and 25V 39μF(J80)

### ●Recommended Solder Land on PC Board



Solder land on PC board

| Size code                      | a   | b   | c   |
|--------------------------------|-----|-----|-----|
| D55                            | 1.0 | 2.6 | 1.6 |
| E60,E61                        | 1.4 | 3.0 | 1.6 |
| F45, F46, F55<br>F60, F61, F80 | 1.9 | 3.5 | 1.6 |
| H70, H80, HA0, HC0             | 3.1 | 4.2 | 2.2 |
| J80, JA0, JC0                  | 4.5 | 4.4 | 2.2 |

### ◆PRECAUTIONS FOR USERS

#### Soldering method

The capacitors of NPCAP™-PXX/PXS/PXF/PXE/PXA/PXH series have no capability to withstand such dip or wave soldering as totally immersing components into a solder bath.

#### Reflow soldering

Reflow the capacitors within Recommended Reflow Soldering Conditions. Verify there is no temperature stress to the capacitors because the following differences might degrade capacitors electrically and mechanically. Please consult with us if other reflow conditions are employed.

1. Location of components : Temperature increases at the edge of PC board more than the center.
2. Population of PC board : The lower the component population is, the more temperature rises.
3. Material of PC board : A ceramic-made board needs more heat than a glass epoxy-made board. The heat increase may cause damage to the capacitors.
4. Thickness of PC board : A thicker board needs more heat than a thinner board. The heat may damage the capacitors.
5. Size of PC board : A larger board needs more heat than a smaller board. The heat may damage the capacitors.
6. Solder thickness  
If very thin cream solder paste is to be used for SMD types, please consult with us.
7. Location of infrared ray lamps : IR reflow as well as hot plate reflow heats only on the reverse side of the PC board to lessen heat stress to the capacitors.
8. Case leakage current will increase (~mA) after the reflow process, the leakage current which rose gradually decreases when voltage is applied.
9. Vapor phase soldering (VPS) is not used.

#### Rework of soldering

Use a soldering iron for rework. Do not exceed an iron tip temperature of 380±10°C and an exposure time of 3±0.5 seconds.

#### Mechanical stress

Do not grab the capacitors to lift the PC board and give stress to the capacitor. Avoid bending the PC board. This may damage the capacitors.

#### Cleaning assembly board

Immediately after solvent cleaning, remove residual solvent with an air knife for at least 10 minutes. If the solvent is insufficiently dry, the capacitors may corrode.

#### Coating on assembly board

1. Before curing coating material, remove the cleaning solvents from the assembly board.
2. Before conformal coating, a chloride free pre-coat material is recommended to decrease the stress on the capacitors.

#### Molding with resin

Internal chemical reaction gradually produces gas in the capacitor; increasing internal pressure. If the end seal of the capacitor is completely covered by resin the gas will be unable to escape causing a potentially dangerous situation. The chlorine in resin will penetrate the end seal, reach the element, and damage of the capacitor.

#### Glue

The followings are requirements for glue.

1. A low curing temperature over a short period of time
2. Strong adhesion and heat resistance after curing
3. Long shelf life
4. No corrosion

#### Others

Refer to PRECAUTIONS AND GUIDELINES(Conductive Polymer).



## RECOMMENDED REFLOW SOLDERING CONDITIONS

### Alchip™-MVS/MVA/MV/MVE/MVK/MZJ/MZA/MVY/MZF/MZE/MZK/MLA/MLF/MLK/MLV/MLVJ/MVH/MHB/MKB/MV-BP/MVK-BP

The following conditions are recommended for air convection and infrared reflow soldering on the SMD products on to a glass epoxy circuit boards by cream solder. The dimensions of the glass epoxy boards with resist are 90×90×0.8mm for D46 to KG5 case code SMD capacitors and 180×90×0.8mm for LH0 to MN0 case codes SMD capacitors.

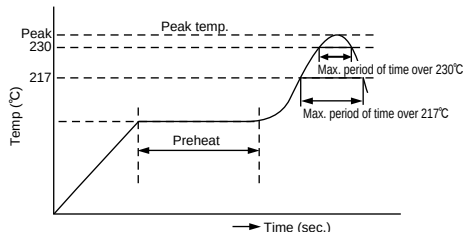
The temperatures shown are the surface temperature values on the top of the can and on the capacitor terminals.

Reflow should be performed twice or less.

Please ensure that the capacitor became cold enough to the room temperature (5 to 35°C) before the second reflow.

Consult with us when performing reflow profile in IPC / JEDEC (J-STD-020)

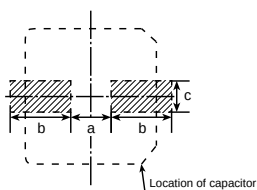
#### ●Recommended soldering heat conditions (Except for Conductive Polymer Aluminum Solid Capacitors)



| SMD type | Case code     | Voltage range (Vdc) | Preheat                      | Time maintained above 217°C | Time maintained above 230°C | Peak temp. | Reflow number   |
|----------|---------------|---------------------|------------------------------|-----------------------------|-----------------------------|------------|-----------------|
| Vertical | D46, E46, F46 | 4 to 50V            | 150 to 180°C<br>120sec. max. | 40sec. max.                 | 30sec. max.                 | 250°Cmax.  | 2 times or less |
|          | D55 to F90    | 4 to 50V            |                              | 90sec. max.                 | 60sec. max.                 | 260°Cmax.  | 2 times or less |
|          |               | 63 to 80V           |                              | 60sec. max.                 | 40sec. max.                 | 250°Cmax.  | 2 times or less |
|          | H63 to JA0    | 4 to 50V            |                              | 60sec. max.                 | 30sec. max.                 | 245°Cmax.  | 2 times or less |
|          |               | 63 to 100V<br>400V  |                              | 30sec. max.                 | 20sec. max.                 | 240°Cmax.  | 2 times or less |
|          | KE0 to MN0    | 6.3 to 50V          |                              | 30sec. max.                 | 20sec. max.                 | 240°Cmax.  | 2 times or less |
|          |               | 63 to 450V          |                              | 20sec. max.                 | —                           | 230°Cmax.  | 2 times or less |

#### ●Recommended Solder Land on PC Board

Series : MVS/MVA/MV/MVE/MVK/MZJ/MZA/MVY/MZF/MZE/MZK  
MLA/MLF/MLK/MLV/MLVJ/MVH/MHB/MKB/MV-BP  
MVK-BP



: Solder land on PC board

| Case code                         | Terminal code : A |     |     | Terminal code : G |     |     |
|-----------------------------------|-------------------|-----|-----|-------------------|-----|-----|
|                                   | a                 | b   | c   | a                 | b   | c   |
| D46, D55, D60, D61, D73           | 1.0               | 2.6 | 1.6 |                   |     |     |
| E46, E55, E60, E61, E73           | 1.4               | 3.0 | 1.6 |                   |     |     |
| F46, F55, F60, F61, F73, F80, F90 | 1.9               | 3.5 | 1.6 |                   |     |     |
| H63                               | 2.3               | 4.5 | 1.6 |                   |     |     |
| HA0                               | 3.1               | 4.2 | 2.2 | 3.1               | 4.2 | 3.5 |
| JA0                               | 4.5               | 4.4 | 2.2 | 4.5               | 4.4 | 3.5 |
| KE0, KG5                          | 4.0               | 5.7 | 2.5 | 3.4               | 6.3 | 9.3 |
| LH0, LN0                          | 6.0               | 6.9 | 2.5 | 4.7               | 7.8 | 9.6 |
| MH0, MN0                          | 6.0               | 7.9 | 2.5 | 4.7               | 8.8 | 9.6 |

## ◆PRECAUTIONS FOR USERS

### Soldering method

The capacitors of Alchip-series have no capability to withstand such dip or wave soldering as totally immerses components into a solder bath.

### Reflow soldering

Reflow the capacitors within recommended reflow soldering conditions. Verify there is no temperature stress to the capacitors because the following differences might degrade capacitors electrically and mechanically. Please consult us if other reflow conditions are employed.

1. Location of components : Temperature increases at the edge of PC board more than the center.
2. Population of PC board : The lower the component population is, the more temperature rises.
3. Material of PC board : A ceramic made board needs more heat than a glass epoxy made board. The heat increase may cause damage to the capacitors.
4. Thickness of PC board : A thicker board needs more heat than a thinner board. The heat increase may damage the capacitors.
5. Size of PC board : A larger board needs more heat than a smaller board. The heat increase may damage the capacitors.
6. Solder thickness  
If very thin cream solder paste is to be used for SMD types, please consult with us.
7. Location of infrared ray lamps : IR reflow as well as hot plate reflow heats only on the reverse side of the PC board to lessen heat stress to the capacitors.
8. Vapor phase soldering (VPS) is not used.

### Rework of soldering

Use a soldering iron for rework. Do not exceed an iron tip temperature of 380±10°C and an exposure time of 3±0.5 seconds.

### Mechanical stress

Do not use the capacitors for lifting the PC board and give stress to the capacitor. Avoid bending the PC board. This may damage the capacitors.

### Cleaning assembly board

Immediately after solvent cleaning, remove residual solvent with an air knife for at least 10 minutes. If the solvent is insufficiently dry, the capacitors may corrode.

### Coating on assembly board

1. Before curing coating material, remove the cleaning solvents from the assembly board.
2. Before conformal coating, a chloride free pre-coat material is recommended to decrease the stress on the capacitors.

### Molding with resin

Internal chemical reaction gradually produces gas in the capacitor; then, increasing internal pressure. If the end seal of the capacitor is completely covered by resin the gas will be unable to escape causing a potentially dangerous situation. The chlorine contained resin will penetrate into the end seal, reach the inside element, and cause damage of the capacitor.

### Others

Refer to PRECAUTIONS AND GUIDELINES.



## STANDARDIZATION

The following series are discontinued. Please use the replacements in the table.

### ◆CONDUCTIVE POLYMER REPLACEMENT(CHIP TYPE)

| Discontinued series | Characteristics     | Replacements |
|---------------------|---------------------|--------------|
| PX                  | 105°C Super low ESR | PXA          |

### ◆CHIP TYPE REPLACEMENTS

| Discontinued series | Characteristics          | Replacements |
|---------------------|--------------------------|--------------|
| MKA                 | 105°C Standard           | MVE          |
| MVZ                 | Low impedance            | MZA          |
| MLD                 | Long life                | MLE          |
| MZD                 | Low impedance, Long life | MZE          |

### ◆LEAD TYPE REPLACEMENTS



| Discontinued series | Characteristics  | Replacements | Discontinued series | Characteristics              | Replacements |
|---------------------|------------------|--------------|---------------------|------------------------------|--------------|
| SL                  | 85°C standard    | SMG          | KX                  | High heat resistance         | GXE          |
| SM                  |                  |              | KXC                 |                              |              |
| SMC                 |                  |              | GX                  |                              |              |
| SME                 |                  |              | EX                  |                              |              |
| KM                  | 105°C standard   | KMG          | GXC                 |                              |              |
| KMC                 |                  |              | GXD                 |                              |              |
| KME                 |                  |              | GHA                 | High temperature performance | *            |
| USM                 |                  |              | EU                  | 150°C high heat resistance   | LXY          |
| BSM                 | 95°C L=7mm       | LXY/LXZ      | LL                  | Low leakage current          | LLA/KY       |
| SHA                 |                  |              | LR                  |                              | LLA          |
| SM-BP               | 85°C bi-polar    | SME-BP       | KHA                 | High ripple current          | KXG          |
| KM-BP               | 105°C bi-polar   | KME-BP       | KXB                 |                              |              |
| SR                  | 85°C low profile | SRG          | KMF(160 to 450Vdc)  | Long life                    | KMG          |
| SRC                 |                  |              | LX(160 to 250Vdc)   |                              |              |
| SRJ                 |                  |              | BX                  | JIS B-X characteristics      | SMG          |
| SX                  |                  |              | KRF                 | 105°C large radial           |              |
| SXA                 | Low impedance    | KY/LXV       | SM(VP-type)         | 85°C large radial            | *            |
| SXC                 |                  |              | SRF                 |                              |              |
| RX                  |                  |              | GX-VH               | High operating temperature   |              |
| RXC                 |                  |              | SD                  | 2 volt                       |              |
| LXE                 |                  |              | SB                  | For memory backup            |              |
| LXJ                 |                  |              | KRL                 | 105°C low leakage current    |              |
| SXE                 |                  |              | KSA                 | Bi-polar high ripple         |              |
| KMF(6.3 to 100Vdc)  |                  |              | SRE(5.2L)           | L=5.2mm                      |              |
| LXF                 | Low impedance    | LXY          |                     |                              |              |
| KMY                 | Long life        | KY           |                     |                              |              |
| LXA                 | Long life        | KY/LXY       |                     |                              |              |
| LX(10 to 100Vdc)    |                  | *            |                     |                              |              |

### ◆SNAP-IN REPLACEMENTS



| Discontinued series | Characteristics                   | Replacements |
|---------------------|-----------------------------------|--------------|
| SM                  | 85°C standard                     | SMH/SMM      |
| SME                 |                                   |              |
| SMG                 |                                   |              |
| KM                  |                                   |              |
| KME                 | 105°C standard                    | KMH/KMM      |
| KMG                 |                                   |              |
| NMA                 | Long case size                    | SMH          |
| LX                  | Long life                         | LXG/LXQ      |
| LXA                 |                                   |              |
| KLH                 | Overvoltage resistant design      | CHA          |
| KLH                 |                                   |              |
| RZ                  | Low impedance                     | *            |
| GX                  | High heat resistance              |              |
| VD                  | voltage doubler rectifier circuit |              |

### ◆SCREW-MOUNT TERMINAL REPLACEMENTS

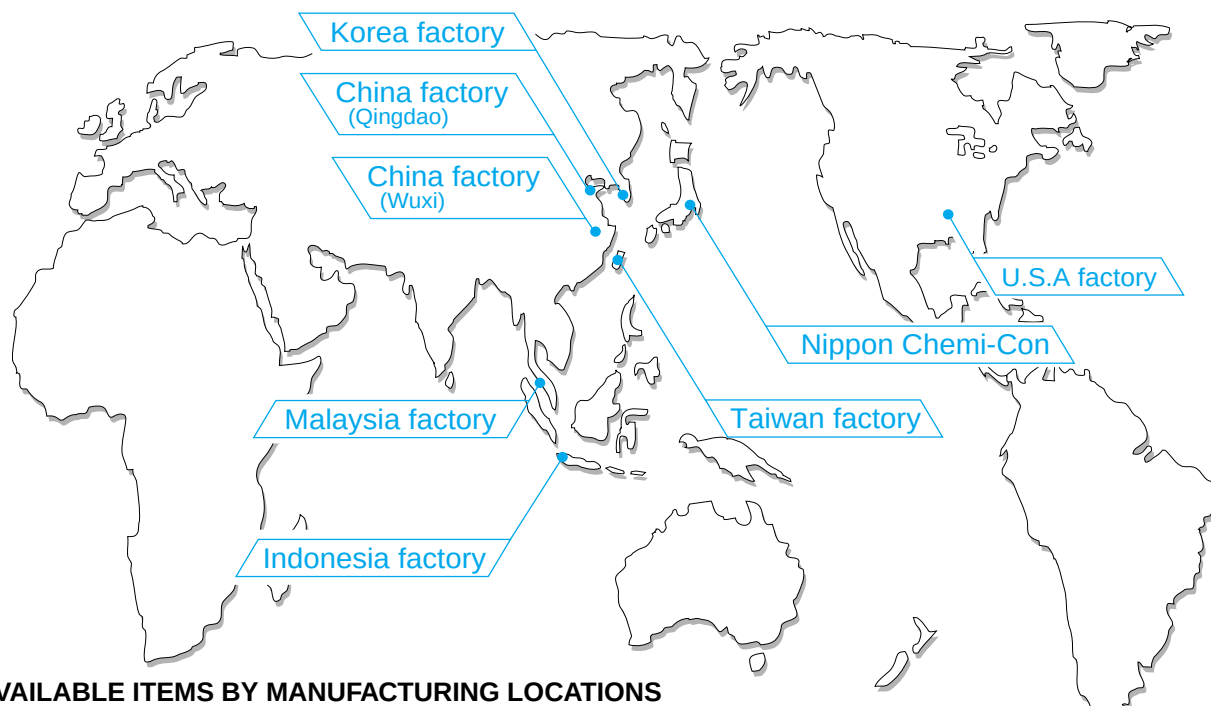


| Discontinued series | Characteristics          | Replacements |
|---------------------|--------------------------|--------------|
| GW                  | 85°C standard            | SME          |
| SW                  | 100°C                    | KMH          |
| RW                  | For inverters            | RWE/RWF      |
| RWA                 |                          |              |
| KM                  | High reliability         | KMH          |
| KME                 |                          |              |
| LX                  | 105°C Long life          | LXA/LXR      |
| LWY                 |                          |              |
| KW                  | Low impedance, Long life | *            |
| FW                  | Low impedance            |              |

\* Please contact us.



## WORLD-WIDE MANUFACTURING LOCATIONS



### ◆AVAILABLE ITEMS BY MANUFACTURING LOCATIONS

| Classification                      | Series | Korea factory | China factory (Qingdao) | China factory (Wuxi) | Indonesia factory | Taiwan factory | Malaysia factory | U.S.A. factory |
|-------------------------------------|--------|---------------|-------------------------|----------------------|-------------------|----------------|------------------|----------------|
| Conductive Polymer Electrolyte Type | PSA    |               |                         |                      |                   | ●              |                  |                |
|                                     | PSC    |               |                         |                      |                   | ●              |                  |                |
|                                     | PSE    |               |                         |                      |                   | ●              |                  |                |
|                                     | PSF    |               |                         |                      |                   | ●              |                  |                |
| SMD                                 | MVA    | ●             |                         |                      | ●                 |                |                  |                |
|                                     | MVE    | ●             |                         |                      | ●                 |                |                  |                |
|                                     | MOV    |               |                         | ●                    | ●                 |                |                  |                |
|                                     | MVY    |               |                         |                      | ●                 |                |                  |                |
| Low Profile                         | SRM    |               |                         |                      | ●                 |                |                  |                |
|                                     | SRE    |               |                         |                      | ●                 |                |                  |                |
|                                     | SRA    |               |                         |                      | ●                 |                |                  |                |
|                                     | KMA    |               |                         |                      | ●                 |                |                  |                |
|                                     | SRG    |               |                         |                      | ●                 |                |                  |                |
| General purpose                     | SMG    | ●             | ●                       | ●                    | ●                 | ●              |                  |                |
|                                     | KMG    | ●             | ●                       | ●                    | ●                 | ●              |                  |                |
|                                     | SMQ    |               |                         | ●                    | ●                 |                |                  |                |
|                                     | KMQ    |               |                         | ●                    | ●                 |                |                  |                |
| Bi-polar                            | SME-BP | ●             | ●                       |                      | ●                 | ●              |                  |                |
|                                     | KME-BP | ●             | ●                       |                      | ●                 | ●              |                  |                |
| Low impedance, High ripple          | LXY    |               |                         | ●                    | ●                 |                |                  |                |
|                                     | LXV    |               |                         | ●                    | ●                 | ●              |                  |                |
|                                     | KY     | ●             | ●                       | ●                    | ●                 | ●              |                  |                |
|                                     | KZE    | ●             | ●                       | ●                    | ●                 | ●              |                  |                |
|                                     | KZH    |               |                         | ●                    | ●                 | ●              |                  |                |
|                                     | KZM    |               |                         |                      |                   | ●              |                  |                |
|                                     | KXG    |               |                         | ●                    |                   |                |                  |                |
| Snap-in                             | SMQ    |               |                         |                      |                   |                | ●                | ●              |
|                                     | KMQ    |               |                         |                      |                   |                | ●                | ●              |
|                                     | SMM    |               |                         |                      |                   |                | ●                | ●              |
|                                     | KMM    |               |                         |                      |                   |                | ●                | ●              |
| Screw-mount Terminal                | KMH    |               |                         |                      |                   |                |                  | ●              |
|                                     | RWE    |               |                         |                      |                   |                |                  | ●              |
|                                     | RWF    |               |                         |                      |                   |                |                  | ●              |
|                                     | RWL    |               |                         |                      |                   |                |                  | ●              |
|                                     | LXA    |               |                         |                      |                   |                |                  | ●              |

Please be sure to contact us before ordering as our product range is continuously improved and the product you require may have been superseded.



## Conductive Polymer Aluminum Solid Capacitors





## PRECAUTIONS AND GUIDELINES (Conductive Polymer)

The NPCAP™ is a Conductive Polymer Solid Aluminum Capacitor that uses highly conductive polymer electrolytic material. Please read the following in order to get the most out of your NPCAP™ capacitor.  
For aluminum electrolytic capacitors, please refer to PRECAUTIONS AND GUIDELINES.

### Designing Device Circuits

#### 1 Types of Circuits Where NPCAP™ Capacitors are Not to be Used

The leakage current in conductive polymer solid aluminum capacitors (hereafter called capacitors) may vary depending on thermal stresses during soldering. Avoid the use of capacitors in the following types of circuits:

- a) High-impedance circuits that are to sustain voltages.
- b) Coupling circuits
- c) Time constant circuits

Because the capacitance varies depending on the environment the capacitors are used in, there is a possibility that the capacitor can affect a time constant circuit where sensitivity to variation in capacitance is required.

- d) Other circuits that are significantly affected by leakage current

#### 2 Circuit Design

Verify the following before designing the circuit:

- a) The electrical characteristics of the capacitor will vary depending on differences in temperature and frequency. You had better design after verifying the scope of these factors.
- b) When connecting two or more capacitors in parallel, ensure that the design takes current balancing into account.
- c) When two or more capacitors are connected in series, variability in applied voltage may cause over-voltage conditions. Contact Nippon Chemi-Con before using capacitors connected in series.
- d) Avoid putting heat generating parts either around the capacitor or on the reverse of the circuit board.

#### 3 Use in High Reliable and Critical Applications

Consult with Nippon Chemi-Con before using these capacitors in applications involving human life: Aviation/space equipment, Nuclear power equipment, Medical equipment and Automotive equipment, or in applications where capacitor failure could have a major impact.

#### 4 Polarity

The NPCAP™ is a polarized solid aluminum electrolytic capacitor. Do not apply either reverse voltages or AC voltages to the polarized capacitors, using reversed polarity may cause a short circuit. Refer to the catalog, product specifications or capacitor body to confirm the polarity prior to use.

#### 5 Operating Voltage

Do not apply a greater than rated voltage, if a voltage greater than the rated voltage is suddenly applied the leakage current increases causing shorting. The peak voltage of superimposed AC voltages (ripple voltages) on DC voltages must not exceed the full rated voltage. While there are specifications for surge voltages exceeding the rated voltage, usage conditions apply, and continued operation for extended periods of time under such conditions cannot be guaranteed.

#### 6 Ripple Current

Do not apply currents in excess of the rated ripple current. The superimposition of a large ripple current increases the rate of heating within the capacitor. When excessive ripple current is imposed the internal temperature increases which can shorten life and shorting may occur.

#### 7 Operating Temperature

Use within the stated category temperature range, if used outside this range, characteristics can deteriorate potentially leading to problems.

#### 8 Charging and Discharging the Capacitor

Do not use the NPCAP™ capacitor in circuits where the capacitor is repetitively charged and discharged rapidly. Repetitive charging and discharging the capacitor rapidly may reduce the capacitance or may cause damage due to internal heating. Use of a protective circuit to ensure reliability is recommended when rush currents exceed 20A.

#### 9 Leakage current

The leakage current may increase when the capacitors are subjected to the conditions below. After that, however, the leakage current will gradually decrease by self-healing action of the dielectric oxide layer when the capacitors are applied with a voltage less than the rated voltage within the Category Temperature range. As the voltage is closer to the rated voltage and the temperature is closer to the upper limit of Category Temperature range, the leakage current decreases faster.

The leakage current will increase by the following factors,

- a) Soldering
- b) Testing of high temperature exposure with no voltage applied, high temperature/humidity storage, temperature cycles, etc.

#### 10 Failures and Service Life

Based on the JIS C 5003 Standard, the failure rate for NPCAP™ capacitors (with a 60% reliability standard) is as follows:

0.5%/1,000 hours (applied the rate voltage at the upper limit of Category Temperature range)

##### a) Failure Modes

- (1) The principal failure mode is wear-out failure, that is, capacitance decreases and ESR increases, and eventually the capacitors become open circuit failure. In addition, short circuit failure may happen with over-voltage and excessive current applied to the capacitors.
- (2) The failure rate would be reduced by reducing ambient temperatures, ripple current and applying voltage.
- (3) If the short-circuited capacitor, which may be caused by over-voltages higher than the rated voltage or other conditions, has a large amount of current passed through, the aluminum can of the capacitor bulges and might be expelled with odor gas emitted.
- (4) The product contains flammable materials. If the short causes a spark it may ignite.

Please be careful when installing the product, its position and the layout design.

- Increase safety by using in conjunction with a protective circuit or protective equipment.
- Install measures such as redundant circuits so that the failure of a part of the equipment will not cause unstable operation.

##### b) Service Life

NPCAP™ uses rubber as the sealing material, so the service life depends on the thermal integrity of this rubber. Consequently, it is recommended to use the capacitor at a lower temperature than the maximum temperature for the capacitor category.

#### 11 Capacitor Insulation

Insulation of the capacitor's case is not guaranteed. Ensure electrical insulation between the capacitor case, negative electrode, positive electrode and circuit pattern.



## PRECAUTIONS AND GUIDELINES (Conductive Polymer)

### 12 Capacitor Usage Environment

Do not use/expose capacitors to the following conditions.

- a) Oil, water, salty water, take care to avoid storage in damp locations.
- b) Direct sunlight
- c) Toxic gases such as hydrogen, sulfide, sulfurous acids, nitrous acids, chlorine and chlorine compounds, bromine and bromine compounds, ammonia, etc.
- d) Ozone, ultraviolet rays and radiation.
- e) Severe vibration or mechanical shock conditions beyond the limits advised in the product specification section of the catalog.

### 13 Capacitor mounting

- a) For the surface mount capacitor, design the copper pads on the PC board in accordance with the catalog or the product specification
- b) For radial capacitors, design the terminal holes on the PC board to fit the terminal pitch of the capacitor.

## Installing Capacitors

### 1 Installing

- a) Do not reuse capacitors already assembled in equipment that have been exposed to power.
- b) The capacitor may have self charge. If this happens, discharge the capacitor through a resistor of approximately 1kΩ before use.
- c) If capacitors are stored at a temperature of 35°C or more and more than 75%RH, the leakage current may increase. This may also occur if the capacitors are stored for a longer period than the period which is specified in the catalog or the product specification. In this case, they can be reformed by the voltage treatment through a resistor of approximately 1kΩ.
- d) Verify the rated capacitance and voltage of the capacitors when installing.
- e) Verify the polarity of the capacitors.
- f) Do not use the capacitors if they have been dropped on the floor.
- g) Do not deform the case of the capacitors.
- h) Verify that the lead spacing of the capacitor fits the hole spacing in the PC board before installing the capacitors.
- i) Do not apply any mechanical force in excess of the limits prescribed in the catalog or the product specification of the capacitors. Avoid subjecting the capacitor to strong forces, as this may break the electrode terminals, bend or deform the capacitor, or damage the packaging, and may also cause short/open circuits, increased leakage current, or damage the appearance. Also, note the capacitors may be damaged by mechanical shocks caused by cut the lead wire, the vacuum/insertion head, component checker or centering operation of an automatic mounting or insertion machine.

### 2 Heat Resistance during Soldering

Ensure that the soldering conditions meet the specifications recommended by Nippon Chemi-Con. Note that the leakage current may increase or capacitance may decrease due to thermal stresses that occur during soldering, etc. Furthermore, the leakage current which rose gradually decreases, when voltage is applied at below the category upper limit temperature. Additionally the self repairing action is faster when voltage near the rated voltage rather than at a higher voltage is applied at below the category's upper temperature limit.

- a) Verify the following before using a soldering iron:
  - That the soldering conditions (temperature and time) are within the ranges specified in the catalog or product specifications.

fications.

- That the tip of the soldering iron does not come into contact with the capacitor itself.
- b) Verify the following when flow soldering:
    - Do not dip the body of a capacitor into the solder bath only dip the terminals in. The soldering must be done on the reverse side of PC board.
    - Soldering conditions (preheat, solder temperature and dipping time) should be within the limits prescribed in the catalog or the product specifications.
    - Do not apply flux to any part of capacitors other than their terminals.
    - Make sure the capacitors do not come into contact with any other components while soldering.
  - c) Verify the following when reflow soldering:
    - Soldering conditions (preheat, solder temperature and soldering time) should be within the limits prescribed in the catalogs or the product specification.
    - The heat level should be appropriate. (Note that the thermal stress on the capacitor varies depending on the type and position of the heater in the reflow oven, and the color and material of the capacitor.)
    - Vapor phase soldering (VPS) is not used.
    - Except for the surface mount type, reflow soldering must not be used for the capacitors.
  - d) Do not reuse a capacitor that has already been soldered to PC board and then removed. When using a new capacitor in the same location, remove the flux, etc. first, and then use a soldering iron to solder on the new capacitor in accordance with the specifications.
  - e) Confirm before running into soldering that the capacitors are SMD for reflow soldering.

### 3 Handling After Soldering

Do not apply any mechanical stress to the capacitor after soldering onto the PC board.

- a) Do not lean or twist the body of the capacitor after soldering the capacitors onto the PC board.
- b) Do not use the capacitors for lifting or carrying the assembly board.
- c) Do not hit or poke the capacitor after soldering to PC board. When stacking the assembly board, be careful that other components do not touch the aluminum electrolytic capacitors.
- d) Do not drop the assembled board.

### 4 Cleaning PC boards

- a) Do not wash capacitors by using the following cleaning agents. Solvent resistant capacitors are only suitable for washing using the cleaning conditions prescribed in the catalog or the product specification. In particular, ultrasonic cleaning will accelerate damage to capacitors.

- Halogenated solvents; cause capacitors to fail due to corrosion.
- Alkali system solvents; corrode (dissolve) an aluminum case.
- Petroleum system solvents; cause the rubber seal material to deteriorate.
- Xylene; causes the rubber seal material to deteriorate.
- Acetone; erases the markings.

CFC alternatives or the other cleaners above; please consult with us

- b) Verify the following points when washing capacitors.
  - Monitor conductivity, pH, specific gravity and the water content of cleaning agents. Contamination adversely affects these characteristics.
  - Be sure not to expose the capacitors under solvent rich conditions or keep capacitors inside a closed container. In addition, please dry the solvent sufficiently on the PC board and the capacitor with an air knife (temperature



## PRECAUTIONS AND GUIDELINES (Conductive Polymer)

should be less than the maximum rated category temperature of the capacitor) for 10 minutes. Aluminum electrolytic capacitors can be characteristically and catastrophically damaged by halogen ions, particularly by chlorine ions, though the degree of the damage mainly depends upon the characteristics of the electrolyte and rubber seal material. When halogen ions come into contact with the capacitors, the foil corrodes when a voltage is applied. This corrosion causes an extremely high leakage current which results venting and an open circuit.

If the new types of cleaning agents mentioned below are used, the following are recommended as cleaning conditions for some of new cleaning agents.

### -Higher alcohol cleaning agents

Pine Alpha ST-100S (Arakawa Chemical)

Clean Through 750 H, 750K, 750L, and 710M (Kao)

Technocare FRW-14 through 17 (Momentive performance material)

Cleaning Conditions:

Using these cleaning agents, capacitors are capable of withstanding immersion or ultrasonic cleaning for 10 minutes at a maximum liquid temperature of 60°C. Find optimum condition for washing, rinsing, and drying. Be sure not to rub the marking off the capacitor which can be caused by contact with other components or the PC board. Note that shower cleaning adversely affects the markings on the sleeve.

### -Non-Halogenated Solvent Cleaning

AK225AES (Asahi Glass)

Cleaning Conditions:

Immersion, ultrasonic or vapor cleaning for 5 minutes. However, from an environmental point of view, these types of solvent will be banned in near future. We would recommend not using them if at all possible.

### -Isopropyl Alcohol (IPA)

IPA (Isopropyl Alcohol) is one of the most acceptable cleaning agents; it is necessary to maintain a flux content in the cleaning liquid at a maximum limit of 2 Wt.%.

## 5 Precautions for using adhesives and coating materials

- Do not use any adhesive and coating materials containing halogenated solvent.
- Verify the following before using adhesive and coating material.
  - Remove flux and dust left over between the rubber seal and the PC board before applying adhesive or coating materials to the capacitor.
  - Dry and remove any residual cleaning agents before applying adhesive and coating materials to the capacitors. Do not cover over the whole surface of the rubber seal with the adhesive or coating materials.
  - For permissible heat conditions for curing adhesives or coating materials, follow the instructions in the catalog or the product specification for the capacitors.
  - Covering over the whole surface of the capacitor rubber seal with resin may result in a hazardous condition because the inside pressure cannot be completely released. Also, a large amount of halogen ions in resins will cause the capacitors to fail because the halogen ions penetrate into the rubber seal and the inside of the capacitor.
  - Some coating materials, it cannot be implemented to the capacitor. Please note change on the surface might be caused according to the kind of solvents used for mounting adhesives and coating agents.

## 6 Fumigation

In many cases when exporting or importing electronic devices, such as capacitors, wooden packaging is used. In order to con-

trol insects it may become necessary to fumigate the shipment. Precautions during "Fumigation" using halogenated chemical such as Methyl Bromide must be taken. Halogen gas can penetrate packaging materials such as cardboard boxes and vinyl bags. Penetration of the halogenated gas can cause corrosion of Electrolytic capacitors. Nippon Chemi-Con gives consideration to the packaging materials not to require the Fumigation. Verify whether the assembled PC board, products and capacitors themselves are subjected to Fumigation during their transportation or not.

## The Operation of Devices

- Do not touch the capacitor terminals directly.
- Do not short-circuit the terminal of a capacitor by letting it come into contact with any conductive object. Also, do not spill electric-conductive liquid such as acid or alkaline solution over the capacitor.
- Do not use capacitors in circumstances where they would be subject to exposure to the following materials
  - Oil, water, salty water or damp location.
  - Direct sunlight.
  - Ozone, ultraviolet rays or radiation.
  - Toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine or its compounds, and ammonium.
  - Severe vibration or mechanical shock conditions beyond the limits prescribed in the catalog or product specification.

## Maintenance Inspection

- Make periodic inspections of capacitors that have been used in industrial applications. Before inspection, turn off the power supply and carefully discharge the electricity in the capacitors. Verify the polarity when measuring the capacitors with a volt-ohm meter. Do not apply any mechanical stress to the terminals of the capacitors.
- The following items should be checked during the periodic inspections.
  - Significant damage in appearance
  - Electrical characteristics: leakage current, capacitance,  $\tan\delta$  and other characteristics prescribed in the catalog or product specification.
  - We recommend replacing the capacitors if the parts are out of specification.

## Contingencies

- If gas has vented from the capacitor during use, there is a short circuit and burning, or the capacitor discharges an odor or smoke, turn off the main power supply to the equipment or unplug the power cord.
- If there is a problem with the capacitor or a fire breaks out, the capacitor may produce a burning gas or reactive gas from the outer resin, etc. If this happens, keep your hands and face away from the gas. If vented gas is inhaled or comes into contact with your eyes, flush your eyes immediately with water and/or gargle. If vented gas comes into contact with the skin, wash the affected area thoroughly with soap and water.

## Storage

We recommend the following conditions for storage.

- Store capacitors in a cool, dry place. Store at a temperature between 5 and 35°C, with a humidity of 75% or less.

(table-1)

|        | Before the bag is opened           | After the bag is opened                 |
|--------|------------------------------------|-----------------------------------------|
| SMD    | Within 3 years after manufacturing | Within 6 months after the bag is opened |
| Radial | Within 3 years after manufacturing | —                                       |



## PRECAUTIONS AND GUIDELINES (Conductive Polymer)

SMD products are sealed in a special laminated aluminum bag. Use all capacitors once the bag is opened. Return unused capacitors to the bag, and seal it with a zipper. Please refer to (Table -1) for storage conditions. Be sure to follow our recommendations for reflow soldering.

- b) Store the capacitors in a location free from direct contact with water, salt water, and oil.
- c) Store in a location where the capacitor is not exposed to toxic gas, such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine or chlorine compounds, bromine or other halogen gases, methyl bromide or other halogen compounds, ammonia, or similar.
- d) Store in a location where the capacitor is not exposed to ozone, ultraviolet radiation, or other radiation.
- e) It is recommended to store capacitors in their original packaging wherever possible.
- f) The JEDEC J-STD-020 (Rev. C) standard does not apply.

### Disposal

Please consult with a local industrial waste disposal specialist when disposing of aluminum electrolytic capacitors.

### Catalogs

Specifications in the catalogs may be subject to change without notice. For more details of precautions and guidelines for aluminum electrolytic capacitors, please refer to Engineering Bulletin No. 634A.

Catalog data are typical. This value does not guarantee the performance.

### Regarding compliance for EU REACH Regulation

- a) According to the content of REACH handbook (Guidance on requirements for substances in articles which is published on May 2008), our electronic components are "articles without any intended release". Therefore they are not applicable for "Registration" for EU REACH Regulation Article 7 (1).

Reference: Electrolytic Condenser Investigation Society

"Study of REACH Regulation in EU about Electrolytic Capacitor"  
(publicized on 13 March 2008)

- b) DEHP (CAS No.117-81-7) is a high concern substance (SVHC) in the EU REACH rules. DEHP is contained as a plasticizer in PVC sleeve covering material etc.. Nippon Chemi-Con will abolish use of DEHP by June, 2011. Please consult with us about an alternate product.

## Product code guide (Conductive polymer)

**(Example : PXA series, 4V-150 $\mu$ F,  $\phi$ 6.3X5.7L)**

Please refer to the following table

Diagram illustrating the marking code for a 100V 100% humidity rated capacitor. The code is split into 18 segments, each representing a specific attribute:

- Category①
- Series code②
- Voltage code③
- Terminal code④
- Lead forming / Taping code⑤
- Capacitance code⑥
- Capacitance tolerance⑦
- Size code⑧
- Supplement code⑨

①Category

|          |      |
|----------|------|
| Contents | Code |
|          | 1st  |
| Polar    | A    |

②Series code

| Series name | Code |     |     |
|-------------|------|-----|-----|
|             | 2nd  | 3rd | 4th |
| PXA         | P    | X   | A   |
| PS          | P    | S   | —   |

### ③Voltage code

| Voltage<br>(V) | Code |     |     |
|----------------|------|-----|-----|
|                | 5th  | 6th | 7th |
| 2.5            | 2    | R   | 5   |
| 4              | 4    | R   | 0   |
| 6.3            | 6    | R   | 3   |
| 10             | 1    | 0   | 0   |
| 16             | 1    | 6   | 0   |
| 20             | 2    | 0   | 0   |
| 25             | 2    | 5   | 0   |
| 35             | 3    | 5   | 0   |

④Terminal code

| Type        | Code |
|-------------|------|
|             | 8th  |
| SMD         | A    |
| Radial lead | F    |

⑤Lead forming code (Radial lead type)

| Type                                   | Contents  | Code |      |
|----------------------------------------|-----------|------|------|
|                                        |           | 9th  | 10th |
| Lead forming<br>(Radial lead<br>/Bulk) | Straight  | L    | L    |
|                                        | CC(3.5mm) | C    | 3    |
|                                        | CC(5.0mm) | C    | 5    |
| Taping<br>(Radial lead)                | Straight  | T    | D    |

### ⑤Taping code (SMD)

| Type                    | Taping contents | Reel dia.<br>(mm) | Code |      | Application size<br>φD (mm) |
|-------------------------|-----------------|-------------------|------|------|-----------------------------|
|                         |                 |                   | 9th  | 10th |                             |
| <b>Taping<br/>(SMD)</b> | Reel for reuse  | 380               | R    | A    | φD=4 to 10                  |
|                         | Reel for reuse  | 330               | R    | B    | φD=8 to 10                  |

Refer to product guide for taping specifications.

### ⑥Capacitance code

| Cap.<br>(μF) | Code |      |      |
|--------------|------|------|------|
|              | 11th | 12th | 13th |
| 10           | 1    | 0    | 0    |
| 22           | 2    | 2    | 0    |
| 27           | 2    | 7    | 0    |
| 33           | 3    | 3    | 0    |
| 39           | 3    | 9    | 0    |
| 47           | 4    | 7    | 0    |
| 56           | 5    | 6    | 0    |
| 68           | 6    | 8    | 0    |
| 82           | 8    | 2    | 0    |
| 100          | 1    | 0    | 1    |
| 120          | 1    | 2    | 1    |
| 150          | 1    | 5    | 1    |
| 180          | 1    | 8    | 1    |
| 220          | 2    | 2    | 1    |
| 270          | 2    | 7    | 1    |
| 330          | 3    | 3    | 1    |
| 390          | 3    | 9    | 1    |
| 470          | 4    | 7    | 1    |
| 560          | 5    | 6    | 1    |
| 680          | 6    | 8    | 1    |
| 820          | 8    | 2    | 1    |
| 1,000        | 1    | 0    | 2    |
| 1,200        | 1    | 2    | 2    |
| 1,500        | 1    | 5    | 2    |

⑦Capacitance tolerance

|             |      |
|-------------|------|
| Tol.<br>(%) | Code |
|             | 14th |
| ±20         | M    |

⑧Size code (Radial lead type)

| φD  | Code |
|-----|------|
|     | 15th |
| 5   | E    |
| 6.3 | F    |
| 8   | H    |
| 10  | J    |

| L    | Code |      |
|------|------|------|
|      | 16th | 17th |
| 5    | 0    | 5    |
| 6    | 0    | 6    |
| 8    | 0    | 8    |
| 10.5 | A    | 5    |
| 11.5 | B    | 5    |
| 12.5 | C    | 5    |

⑧Size code (SMD)

| $\phi D$ | Code |
|----------|------|
|          | 15th |
| 5        | E    |
| 6.3      | F    |
| 8        | H    |
| 10       | J    |

⑨Supplement code

|                       |             |
|-----------------------|-------------|
| <b>Classification</b> | <b>Code</b> |
| <b>Type</b>           | <b>18th</b> |
| <b>SMD</b>            | G           |
| <b>Radial lead</b>    | S           |

\* Refer to the appendix (Part number) for codes not listed here.



## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Surface Mount

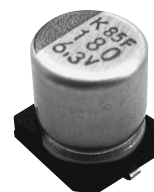
New!

NPCAP™-PXX Series

- Super low ESR, impedance and high heat resistance have been obtained by using conductive polymer as electrolyte.
- Rated voltage range : 2.5 to 16V<sub>dc</sub>, Capacitance range : 100 to 560μF
- Suitable for DC-DC converters, voltage regulators and decoupling applications used to computer motherboards etc.
- RoHS Compliant

PXX

↑  
Downsized  
PXE



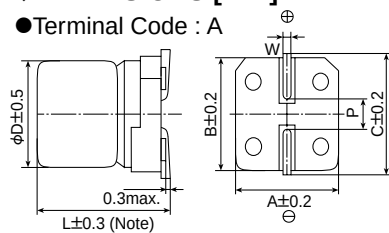
## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------|--------------------|----------------------------|-----------|--------------------------------------|-----|--------------------------------------|-----------------|------------------------------|
| Category                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Temperature Range                                      | -55 to +105°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Rated Voltage Range                                    | 2.5 to 16V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Surge Voltage                                          | Rated voltage×1.15V (at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage Current                                        | Shall not exceed values shown in STANDARD RATINGS. (at 20°C after 2 minutes)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Dissipation Factor (tanδ)                              | 0.12 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Low Temperature Characteristics (Max. Impedance Ratio) | Z(-25°C)/Z(+20°C)≤1.15<br>Z(-55°C)/Z(+20°C)≤1.25 (at 100kHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours (F46 : 1,000 hours) at 105°C. <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                         | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Bias Humidity                                          | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to the DC rated voltage at 60°C, 90 to 95% RH for 1,000 hours (F46 : 500hours). <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                    | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Surge Voltage                                          | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Failure Rate                                           | 0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |

\*Note : If any doubt arises, measure the leakage current after following voltage treatment.  
Voltage treatment : DC rated voltage are applied to the capacitors for 120 minutes at 105°C.

## ◆DIMENSIONS [mm]

●Terminal Code : A

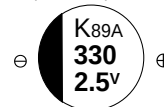


Note : L=0.1/-0.2 for F46

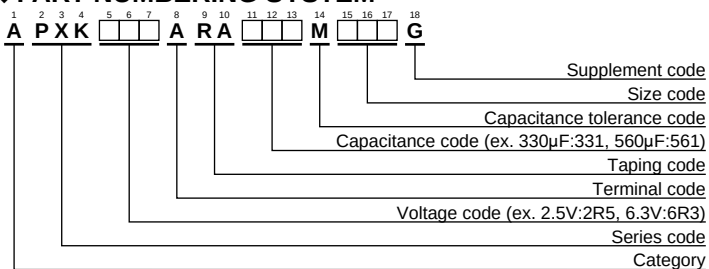
| Size Code | φD  | L   | A   | B   | C   | W          | P   |
|-----------|-----|-----|-----|-----|-----|------------|-----|
| E61       | 5   | 5.8 | 5.3 | 5.3 | 5.9 | 0.5 to 0.8 | 1.4 |
| F46       | 6.3 | 4.5 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |
| F61       | 6.3 | 5.8 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |

## ◆MARKING

EX) 2.5V330μF



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (conductive polymer type)"



## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Surface Mount

New!  
NPCAP™-PXX Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Size<br>code | Leakage current<br>(μAmax/after 2min.) | ESR<br>(mΩmax/20°C, 100k to 300kHz) | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|-------------|-------------|--------------|----------------------------------------|-------------------------------------|------------------------------------------------------------|--------------------|
| 2.5         | 220         | F46          | 300                                    | 19                                  | 2,780                                                      | APXK2R5ARA221MF46G |
|             | 330         | E61          | 412                                    | 16                                  | 3,500                                                      | APXK2R5ARA331ME61G |
|             | 330         | F46          | 700                                    | 16                                  | 3,500                                                      | APXK2R5ARA331MF46G |
|             | 560         | F61          | 700                                    | 16                                  | 3,500                                                      | APXK2R5ARA561MF61G |
| 4           | 180         | F46          | 360                                    | 19                                  | 2,780                                                      | APXK4R0ARA181MF46G |
|             | 220         | E61          | 440                                    | 17                                  | 3,390                                                      | APXK4R0ARA221ME61G |
|             | 390         | F61          | 780                                    | 17                                  | 3,390                                                      | APXK4R0ARA391MF61G |
| 6.3         | 150         | F46          | 472                                    | 19                                  | 2,780                                                      | APXK6R3ARA151MF46G |
|             | 180         | E61          | 567                                    | 17                                  | 3,390                                                      | APXK6R3ARA181ME61G |
|             | 220         | F46          | 700                                    | 18                                  | 3,200                                                      | APXK6R3ARA221MF46G |
|             | 330         | F61          | 1,040                                  | 17                                  | 3,390                                                      | APXK6R3ARA331MF61G |
| 16          | 100         | F61          | 320                                    | 24                                  | 2,490                                                      | APXK160ARA101MF61G |



## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Surface Mount

## NPCAP™-PXS Series

- Super low ESR, high ripple current capability
- Longer life (5,000 hours at 105°C)
- Rated voltage range : 4 to 16V<sub>dc</sub>, Capacitance : 22 to 560μF
- Case size : φ5×5.8L to φ8×6.7L
- Suitable for DC-DC converters, voltage regulators and decoupling applications for computer motherboards etc.
- RoHS Compliant

PXS  
↑  
Longer life  
PXA/PXE



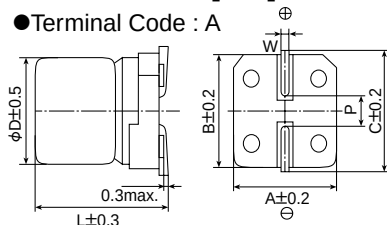
## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------|--------------------|----------------------------|-----------|--------------------------------------|-----|--------------------------------------|-----------------|------------------------------|
| Category                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Temperature Range                                      | -55 to +105°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Rated Voltage Range                                    | 4 to 16V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Surge Voltage                                          | Rated voltage×1.15 (at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage Current                                        | I=0.2CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V <sub>dc</sub> ) (at 20°C after 2 minutes)                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Dissipation Factor (tanδ)                              | 0.12 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Low Temperature Characteristics (Max. Impedance Ratio) | Z(-25°C)/Z(+20°C)≤1.15<br>Z(-55°C)/Z(+20°C)≤1.25 (at 100kHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 5,000 hours at 105°C. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr><td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                             | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Bias Humidity                                          | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to the DC rated voltage at 60°C, 90 to 95% RH for 1,000 hours. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr><td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                     | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Surge Voltage                                          | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr><td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Failure Rate                                           | 0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.  
Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C.

## ◆DIMENSIONS [mm]

- Terminal Code : A



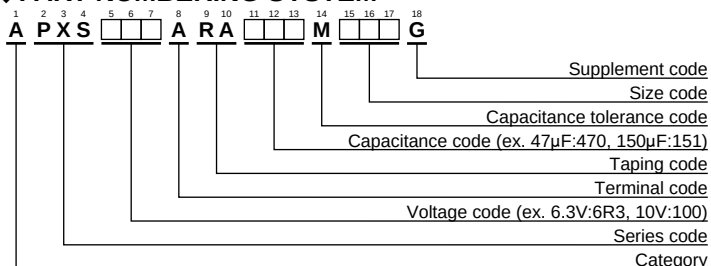
| Size Code | φD  | L   | A   | B   | C   | W          | P   |
|-----------|-----|-----|-----|-----|-----|------------|-----|
| E61       | 5.0 | 5.8 | 5.3 | 5.3 | 5.9 | 0.5 to 0.8 | 1.4 |
| F61       | 6.3 | 5.8 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |
| H70       | 8.0 | 6.7 | 8.3 | 8.3 | 9.0 | 0.7 to 1.1 | 3.1 |

## ◆MARKING

EX) 6.3V390μF



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (conductive polymer type)"



## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Size<br>code | ESR<br>(mΩmax/20℃, 100k to 300kHz) | Rated ripple current<br>(mA <sub>rms</sub> /105℃, 100kHz) | Part No.           |
|-------------|-------------|--------------|------------------------------------|-----------------------------------------------------------|--------------------|
| 4           | 150         | E61          | 25                                 | 2,150                                                     | APXS4R0ARA151ME61G |
|             | 560         | H70          | 22                                 | 3,220                                                     | APXS4R0ARA561MH70G |
| 6.3         | 47          | E61          | 30                                 | 1,970                                                     | APXS6R3ARA470ME61G |
|             | 100         | E61          | 25                                 | 2,150                                                     | APXS6R3ARA101ME61G |
|             | 120         | F61          | 22                                 | 2,570                                                     | APXS6R3ARA121MF61G |
|             | 220         | F61          | 22                                 | 2,570                                                     | APXS6R3ARA221MF61G |
|             | 390         | H70          | 22                                 | 3,220                                                     | APXS6R3ARA391MH70G |
|             |             |              |                                    |                                                           |                    |
| 10          | 33          | E61          | 70                                 | 1,100                                                     | APXS100ARA330ME61G |
|             | 68          | E61          | 30                                 | 1,970                                                     | APXS100ARA680ME61G |
|             | 120         | F61          | 27                                 | 2,320                                                     | APXS100ARA121MF61G |
|             | 150         | H70          | 30                                 | 2,760                                                     | APXS100ARA151MH70G |
| 16          | 22          | E61          | 90                                 | 1,060                                                     | APXS160ARA220ME61G |
|             | 39          | E61          | 35                                 | 1,820                                                     | APXS160ARA390ME61G |
|             | 39          | F61          | 37                                 | 2,050                                                     | APXS160ARA390MF61G |
|             | 68          | F61          | 30                                 | 2,200                                                     | APXS160ARA680MF61G |
|             | 82          | H70          | 30                                 | 2,760                                                     | APXS160ARA820MH70G |
|             | 120         | H70          | 27                                 | 2,900                                                     | APXS160ARA121MH70G |



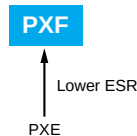
## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Surface Mount

Upgrade!

NPCAP™-PXF Series

- Super low ESR, impedance and high heat resistance have been obtained by using conductive polymer as electrolyte.
- Rated voltage range : 2.5 to 6.3V<sub>dc</sub>, Capacitance range : 220 to 1,000μF
- Case size range : φ6.3×5.8L to φ8×7.7L
- Suitable for DC-DC converters, voltage regulators and decoupling applications used on computer motherboards etc.
- RoHS Compliant



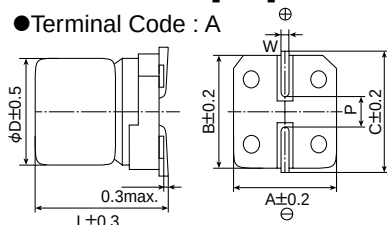
## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------|--------------------|----------------------------|-----------|--------------------------------------|-----|--------------------------------------|-----------------|------------------------------|
| Category                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Temperature Range                                      | -55 to +105°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Rated Voltage Range                                    | 2.5 to 6.3V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Surge Voltage                                          | Rated voltage×1.15 (at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage Current                                        | Shall not exceed values shown in STANDARD RATINGS. (at 20°C after 2 minutes)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Dissipation Factor (tanδ)                              | 0.12 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Low Temperature Characteristics (Max. Impedance Ratio) | Z(-25°C)/Z(+20°C)≤1.15<br>Z(-55°C)/Z(+20°C)≤1.25 (at 100kHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C. <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                             | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Bias Humidity                                          | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to the DC rated voltage at 60°C, 90 to 95% RH for 1,000 hours. <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                     | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Surge Voltage                                          | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Failure Rate                                           | 0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.  
Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C.

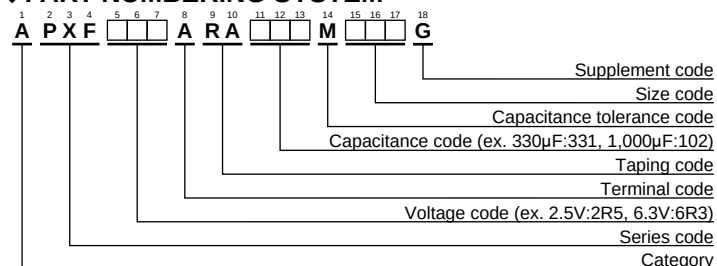
## ◆DIMENSIONS [mm]

- Terminal Code : A



| Size Code | φD  | L   | A   | B   | C   | W          | P   |
|-----------|-----|-----|-----|-----|-----|------------|-----|
| F61       | 6.3 | 5.8 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |
| F80       | 6.3 | 7.7 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |
| H70       | 8   | 6.7 | 8.3 | 8.3 | 9.0 | 0.7 to 1.1 | 3.1 |
| H80       | 8   | 7.7 | 8.3 | 8.3 | 9.0 | 0.7 to 1.1 | 3.1 |

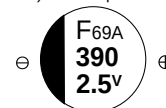
## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (conductive polymer type)"

## ◆MARKING

EX) 2.5V390μF





## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Size<br>code | Leakage current<br>(μAmax/after 2min.) | ESR<br>(mΩmax/20°C, 100k to 300kHz) | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|-------------|-------------|--------------|----------------------------------------|-------------------------------------|------------------------------------------------------------|--------------------|
| 2.5         | 390         | F61          | 292                                    | 10                                  | 3,900                                                      | APXF2R5ARA391MF61G |
|             | 470         | F80          | 352                                    | 9                                   | 4,200                                                      | APXF2R5ARA471MF80G |
|             | 560         | F61          | 700                                    | 10                                  | 3,900                                                      | APXF2R5ARA561MF61G |
|             | 560         | F80          | 420                                    | 9                                   | 4,200                                                      | APXF2R5ARA561MF80G |
|             | 560         | H70          | 420                                    | 9                                   | 4,500                                                      | APXF2R5ARA561MH70G |
|             | 680         | H70          | 510                                    | 9                                   | 4,500                                                      | APXF2R5ARA681MH70G |
| 4           | 1,000       | H80          | 750                                    | 9                                   | 4,500                                                      | APXF2R5ARA102MH80G |
|             | 330         | F61          | 396                                    | 10                                  | 3,900                                                      | APXF4R0ARA331MF61G |
|             | 390         | F80          | 468                                    | 9                                   | 4,200                                                      | APXF4R0ARA391MF80G |
|             | 470         | H70          | 564                                    | 9                                   | 4,500                                                      | APXF4R0ARA471MH70G |
|             | 560         | H70          | 672                                    | 9                                   | 4,500                                                      | APXF4R0ARA561MH70G |
|             | 680         | H80          | 816                                    | 9                                   | 4,500                                                      | APXF4R0ARA681MH80G |
| 6.3         | 220         | F61          | 415                                    | 10                                  | 3,900                                                      | APXF6R3ARA221MF61G |
|             | 270         | F80          | 510                                    | 9                                   | 4,200                                                      | APXF6R3ARA271MF80G |
|             | 330         | F61          | 700                                    | 10                                  | 3,900                                                      | APXF6R3ARA331MF61G |
|             | 330         | F80          | 623                                    | 9                                   | 4,200                                                      | APXF6R3ARA331MF80G |
|             | 330         | H70          | 623                                    | 9                                   | 4,500                                                      | APXF6R3ARA331MH70G |
|             | 390         | H70          | 737                                    | 9                                   | 4,500                                                      | APXF6R3ARA391MH70G |
|             | 470         | H80          | 888                                    | 9                                   | 4,500                                                      | APXF6R3ARA471MH80G |
|             | 560         | H80          | 1,050                                  | 9                                   | 4,500                                                      | APXF6R3ARA561MH80G |

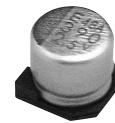
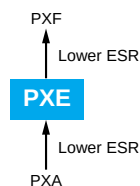


## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Surface Mount

## NPCAP™-PXE Series

- Super low ESR, impedance and high heat resistance have been obtained by using conductive polymer as electrolyte.  
(ESR and rated ripple current values are improved from PXA series.)
- Rated voltage range : 2.5 to 16V<sub>dc</sub>, Capacitance range : 33 to 2,700μF
- Case size range : φ5×5.8L to φ10×12.2L
- Suitable for DC-DC converters, voltage regulators and decoupling applications used on computer motherboards etc.
- RoHS Compliant



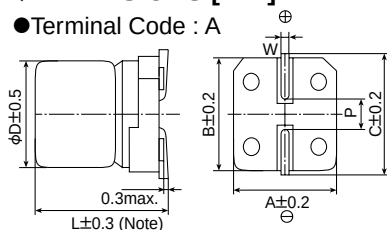
## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------|--------------------|----------------------------|-----------|--------------------------------------|-----|--------------------------------------|-----------------|------------------------------|
| Category                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Temperature Range                                      | -55 to +105°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Rated Voltage Range                                    | 2.5 to 16V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Surge Voltage                                          | Rated voltage×1.15 (at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage Current                                        | Shall not exceed values shown in STANDARD RATINGS. (at 20°C after 2 minutes)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Dissipation Factor (tanδ)                              | 0.12 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Low Temperature Characteristics (Max. Impedance Ratio) | Z(-25°C)/Z(+20°C)≤1.15<br>Z(-55°C)/Z(+20°C)≤1.25 (at 100kHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr><td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                             | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Bias Humidity                                          | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to the DC rated voltage at 60°C, 90 to 95% RH for 1,000 hours. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr><td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                     | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Surge Voltage                                          | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr><td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr><td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr><td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Failure Rate                                           | 0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.  
Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C.

## ◆DIMENSIONS [mm]

- Terminal Code : A



(Note) L±0.5 for HA0, HC0, JA0, JC0

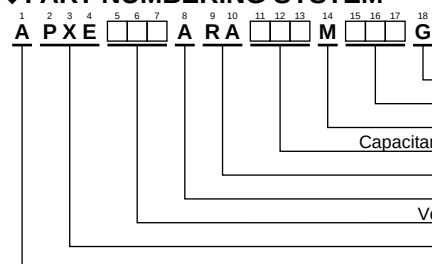
| Size Code | φD  | L    | A    | B    | C    | W          | P   |
|-----------|-----|------|------|------|------|------------|-----|
| E61       | 5   | 5.8  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F61       | 6.3 | 5.8  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F80       | 6.3 | 7.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| H70       | 8   | 6.7  | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| H80       | 8   | 7.7  | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| HA0       | 8   | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| HC0       | 8   | 12.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| J80       | 10  | 7.7  | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |
| JA0       | 10  | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |
| JC0       | 10  | 12.2 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆MARKING

EX) 2.5V390μF



## ◆PART NUMBERING SYSTEM



Supplement code

Size code

Capacitance tolerance code

Capacitance code (ex. 47μF:470,100μF:101)

Taping code

Terminal code

Voltage code (ex. 6.3V:6R3,10V:100)

Series code

Category

Please refer to "Product code guide (conductive polymer type)"



## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Size<br>code | Leakage current<br>(μAmax/after 2min.) | ESR<br>(mΩmax/20°C, 100k to 300kHz) | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|-------------|-------------|--------------|----------------------------------------|-------------------------------------|------------------------------------------------------------|--------------------|
| 2.5         | 180         | E61          | 90.0                                   | 21                                  | 2,670                                                      | APXE2R5ARA181ME61G |
|             | 390         | F61          | 195                                    | 15                                  | 3,160                                                      | APXE2R5ARA391MF61G |
|             | 470         | F80          | 235                                    | 13                                  | 3,600                                                      | APXE2R5ARA471MF80G |
|             | 560         | F80          | 280                                    | 13                                  | 3,600                                                      | APXE2R5ARA561MF80G |
|             | 560         | H70          | 280                                    | 13                                  | 4,100                                                      | APXE2R5ARA561MH70G |
|             | 680         | H70          | 340                                    | 13                                  | 4,100                                                      | APXE2R5ARA681MH70G |
|             | 820         | H80          | 410                                    | 12                                  | 4,260                                                      | APXE2R5ARA821MH80G |
|             | 820         | HC0          | 410                                    | 9                                   | 5,400                                                      | APXE2R5ARA821MHC0G |
|             | 1,000       | H80          | 500                                    | 12                                  | 4,260                                                      | APXE2R5ARA102MH80G |
|             | 1,200       | J80          | 600                                    | 13                                  | 4,450                                                      | APXE2R5ARA122MJ80G |
|             | 1,500       | HA0          | 750                                    | 10                                  | 5,220                                                      | APXE2R5ARA152MHA0G |
|             | 1,500       | HC0          | 750                                    | 9                                   | 5,400                                                      | APXE2R5ARA152MHC0G |
| 4           | 2,200       | JA0          | 1,100                                  | 10                                  | 5,500                                                      | APXE2R5ARA222MJA0G |
|             | 2,700       | JC0          | 1,350                                  | 9                                   | 5,600                                                      | APXE2R5ARA272MJC0G |
|             | 100         | E61          | 80.0                                   | 22                                  | 2,610                                                      | APXE4R0ARA101ME61G |
|             | 150         | E61          | 120                                    | 22                                  | 2,610                                                      | APXE4R0ARA151ME61G |
|             | 270         | F61          | 216                                    | 15                                  | 3,160                                                      | APXE4R0ARA271MF61G |
|             | 330         | F61          | 264                                    | 15                                  | 3,160                                                      | APXE4R0ARA331MF61G |
|             | 390         | F80          | 312                                    | 14                                  | 3,470                                                      | APXE4R0ARA391MF80G |
|             | 470         | H70          | 376                                    | 14                                  | 3,950                                                      | APXE4R0ARA471MH70G |
|             | 560         | H70          | 448                                    | 14                                  | 3,950                                                      | APXE4R0ARA561MH70G |
|             | 680         | H80          | 544                                    | 13                                  | 3,950                                                      | APXE4R0ARA681MH80G |
|             | 1,000       | HA0          | 800                                    | 10                                  | 5,220                                                      | APXE4R0ARA102MHA0G |
|             | 1,000       | J80          | 800                                    | 14                                  | 4,300                                                      | APXE4R0ARA102MJ80G |
| 6.3         | 1,200       | HC0          | 960                                    | 9                                   | 5,400                                                      | APXE4R0ARA122MHC0G |
|             | 1,200       | JA0          | 960                                    | 10                                  | 5,500                                                      | APXE4R0ARA122MJA0G |
|             | 1,500       | JA0          | 1,200                                  | 10                                  | 5,500                                                      | APXE4R0ARA152MJA0G |
|             | 1,800       | JA0          | 1,440                                  | 10                                  | 5,500                                                      | APXE4R0ARA182MJA0G |
|             | 1,800       | JC0          | 1,440                                  | 9                                   | 5,600                                                      | APXE4R0ARA182MJC0G |
|             | 100         | E61          | 126                                    | 24                                  | 2,500                                                      | APXE6R3ARA101ME61G |
|             | 120         | E61          | 151                                    | 24                                  | 2,500                                                      | APXE6R3ARA121ME61G |
|             | 220         | F61          | 277                                    | 15                                  | 3,160                                                      | APXE6R3ARA221MF61G |
|             | 270         | F80          | 340                                    | 14                                  | 3,470                                                      | APXE6R3ARA271MF80G |
|             | 330         | F80          | 415                                    | 14                                  | 3,470                                                      | APXE6R3ARA331MF80G |
|             | 330         | H70          | 415                                    | 14                                  | 3,950                                                      | APXE6R3ARA331MH70G |
|             | 390         | H70          | 491                                    | 14                                  | 3,950                                                      | APXE6R3ARA391MH70G |
| 10          | 470         | H80          | 592                                    | 13                                  | 3,950                                                      | APXE6R3ARA471MH80G |
|             | 820         | HA0          | 1,030                                  | 12                                  | 4,770                                                      | APXE6R3ARA821MHA0G |
|             | 820         | HC0          | 1,030                                  | 10                                  | 5,150                                                      | APXE6R3ARA821MHC0G |
|             | 820         | J80          | 1,030                                  | 14                                  | 4,300                                                      | APXE6R3ARA821MJ80G |
|             | 1,200       | JA0          | 1,510                                  | 12                                  | 5,025                                                      | APXE6R3ARA122MJA0G |
|             | 1,500       | JA0          | 1,890                                  | 12                                  | 5,025                                                      | APXE6R3ARA152MJA0G |
|             | 1,500       | JC0          | 1,890                                  | 10                                  | 5,500                                                      | APXE6R3ARA152MJC0G |
|             | 47          | E61          | 94.0                                   | 28                                  | 2,310                                                      | APXE100ARA470ME61G |
|             | 56          | E61          | 112                                    | 28                                  | 2,310                                                      | APXE100ARA560ME61G |
|             | 68          | E61          | 136                                    | 28                                  | 2,310                                                      | APXE100ARA680ME61G |
|             | 120         | F61          | 240                                    | 25                                  | 2,530                                                      | APXE100ARA121MF61G |
|             | 150         | F80          | 300                                    | 21                                  | 2,880                                                      | APXE100ARA151MF80G |
| 16          | 220         | H70          | 440                                    | 21                                  | 3,220                                                      | APXE100ARA221MH70G |
|             | 270         | H70          | 540                                    | 21                                  | 3,220                                                      | APXE100ARA271MH70G |
|             | 330         | H80          | 660                                    | 19                                  | 3,390                                                      | APXE100ARA331MH80G |
|             | 390         | HA0          | 780                                    | 17                                  | 4,000                                                      | APXE100ARA391MHA0G |
|             | 470         | J80          | 940                                    | 19                                  | 3,800                                                      | APXE100ARA471MJ80G |
|             | 680         | JA0          | 1,360                                  | 13                                  | 4,820                                                      | APXE100ARA681MJA0G |
|             | 33          | E61          | 105                                    | 35                                  | 2,070                                                      | APXE160ARA330ME61G |
|             | 39          | E61          | 124                                    | 35                                  | 2,070                                                      | APXE160ARA390ME61G |
|             | 68          | F61          | 217                                    | 28                                  | 2,390                                                      | APXE160ARA680MF61G |
|             | 82          | F80          | 262                                    | 24                                  | 2,700                                                      | APXE160ARA820MF80G |
|             | 100         | F80          | 320                                    | 24                                  | 2,700                                                      | APXE160ARA101MF80G |
|             | 100         | H70          | 320                                    | 24                                  | 3,010                                                      | APXE160ARA101MH70G |
| 16          | 120         | H70          | 384                                    | 24                                  | 3,010                                                      | APXE160ARA121MH70G |
|             | 150         | H80          | 480                                    | 22                                  | 3,150                                                      | APXE160ARA151MH80G |
|             | 180         | HA0          | 576                                    | 18                                  | 3,890                                                      | APXE160ARA181MHA0G |
|             | 220         | HA0          | 704                                    | 18                                  | 3,890                                                      | APXE160ARA221MHA0G |
|             | 220         | J80          | 704                                    | 22                                  | 3,450                                                      | APXE160ARA221MJ80G |
|             | 330         | JA0          | 1,050                                  | 16                                  | 4,350                                                      | APXE160ARA331MJA0G |

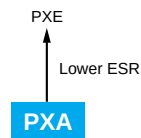


## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Surface Mount

## NPCAP™-PXA Series

- Super low ESR, impedance and high heat resistance have been obtained by using conductive polymer as electrolyte
- Rated voltage range : 2.5 to 25V<sub>dc</sub>, case size range :  $\phi 4 \times 5.2\text{L}$  to  $\phi 10 \times 12.2\text{L}$
- Suitable for DC-DC converters, voltage regulators and decoupling applications used on computer motherboards etc.
- RoHS Compliant



## ◆SPECIFICATIONS

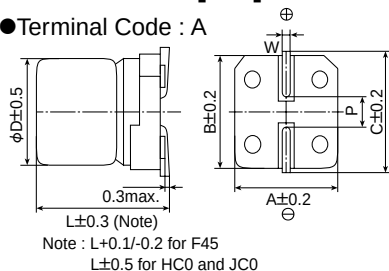
| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------|--------------------|--------------------------------------|--------------------|---------------------------------------------|-----|---------------------------------------------|-----------------|------------------------------------|
| Category                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Temperature Range                                      | -55 to +105°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Rated Voltage Range                                    | 2.5 to 25V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Surge Voltage                                          | Rated voltage×1.15 (Rated voltage 2.5 to 20V <sub>dc</sub> , 25V <sub>dc</sub> ) / Rated voltage×1.00 (Rated voltage 23V <sub>dc</sub> ) (at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Leakage Current                                        | Shall not exceed values shown in STANDARD RATINGS. (at 20°C after 2 minutes)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Dissipation Factor (tan $\delta$ )                     | 0.12 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Low Temperature Characteristics (Max. Impedance Ratio) | $Z(-25^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.15$<br>$Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ (at 100kHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours (F45 : 1,000 hours) at 105°C. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td><math>\leq \pm 20\%</math> of the initial value</td></tr> <tr><td>DF (tan<math>\delta</math>)</td><td><math>\leq 150\%</math> of the initial specified value</td></tr> <tr><td>ESR</td><td><math>\leq 150\%</math> of the initial specified value</td></tr> <tr><td>Leakage current</td><td><math>\leq</math> The initial specified value</td></tr> </table>                                                   | Appearance | No significant damage | Capacitance change | $\leq \pm 20\%$ of the initial value | DF (tan $\delta$ ) | $\leq 150\%$ of the initial specified value | ESR | $\leq 150\%$ of the initial specified value | Leakage current | $\leq$ The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Capacitance change                                     | $\leq \pm 20\%$ of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| DF (tan $\delta$ )                                     | $\leq 150\%$ of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| ESR                                                    | $\leq 150\%$ of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Leakage current                                        | $\leq$ The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Bias Humidity                                          | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to the DC rated voltage at 60°C, 90 to 95% RH for 1,000 hours (F45 : 500 hours). <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td><math>\leq \pm 20\%</math> of the initial value</td></tr> <tr><td>DF (tan<math>\delta</math>)</td><td><math>\leq 150\%</math> of the initial specified value</td></tr> <tr><td>ESR</td><td><math>\leq 150\%</math> of the initial specified value</td></tr> <tr><td>Leakage current</td><td><math>\leq</math> The initial specified value</td></tr> </table>                             | Appearance | No significant damage | Capacitance change | $\leq \pm 20\%$ of the initial value | DF (tan $\delta$ ) | $\leq 150\%$ of the initial specified value | ESR | $\leq 150\%$ of the initial specified value | Leakage current | $\leq$ The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Capacitance change                                     | $\leq \pm 20\%$ of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| DF (tan $\delta$ )                                     | $\leq 150\%$ of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| ESR                                                    | $\leq 150\%$ of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Leakage current                                        | $\leq$ The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Surge Voltage                                          | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor (R=1k $\Omega$ ) and discharge for 5 minutes 30 seconds. <table border="1"> <tr><td>Appearance</td><td>No significant damage</td></tr> <tr><td>Capacitance change</td><td><math>\leq \pm 20\%</math> of the initial value</td></tr> <tr><td>DF (tan<math>\delta</math>)</td><td><math>\leq 150\%</math> of the initial specified value</td></tr> <tr><td>ESR</td><td><math>\leq 150\%</math> of the initial specified value</td></tr> <tr><td>Leakage current</td><td><math>\leq</math> The initial specified value</td></tr> </table> | Appearance | No significant damage | Capacitance change | $\leq \pm 20\%$ of the initial value | DF (tan $\delta$ ) | $\leq 150\%$ of the initial specified value | ESR | $\leq 150\%$ of the initial specified value | Leakage current | $\leq$ The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Capacitance change                                     | $\leq \pm 20\%$ of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| DF (tan $\delta$ )                                     | $\leq 150\%$ of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| ESR                                                    | $\leq 150\%$ of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Leakage current                                        | $\leq$ The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |
| Failure Rate                                           | 0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                       |                    |                                      |                    |                                             |     |                                             |                 |                                    |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.

Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C.

## ◆DIMENSIONS [mm]

## ●Terminal Code : A

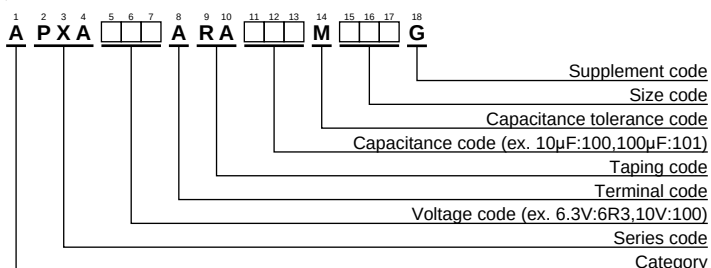


| Size code | $\phi D$ | L    | A    | B    | C    | W          | P   |
|-----------|----------|------|------|------|------|------------|-----|
| D55       | 4        | 5.2  | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E60       | 5        | 5.7  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F45       | 6.3      | 4.4  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F55       | 6.3      | 5.2  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F60       | 6.3      | 5.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| H70       | 8        | 6.7  | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| HC0       | 8        | 12.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| J80       | 10       | 7.7  | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |
| JC0       | 10       | 12.2 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆MARKING

EX) 16V39 $\mu$ F

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (conductive polymer type)"



## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Surface Mount

NPCAP™-PXA Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Size<br>code | Leakage<br>current<br>(μAmax/<br>after<br>2 min.) | ESR<br>(mΩmax/ 20°C,<br>100k to 300kHz) | Rated ripple<br>current<br>(mA <sub>RMS</sub> /105°C,<br>100kHz) | Part No.           |
|-------------|-------------|--------------|---------------------------------------------------|-----------------------------------------|------------------------------------------------------------------|--------------------|
| 2.5         | 220         | F55          | 110                                               | 25                                      | 2,500                                                            | APXA2R5ARA221MF55G |
|             | 220         | F60          | 110                                               | 25                                      | 2,500                                                            | APXA2R5ARA221MF60G |
|             | 560         | H70          | 280                                               | 23                                      | 3,100                                                            | APXA2R5ARA561MH70G |
|             | 680         | HC0          | 340                                               | 12                                      | 4,770                                                            | APXA2R5ARA681MHC0G |
|             | 1,000       | J80          | 500                                               | 19                                      | 4,240                                                            | APXA2R5ARA102MJ80G |
|             | 1,500       | JC0          | 750                                               | 10                                      | 5,500                                                            | APXA2R5ARA152MJC0G |
| 4           | 33          | D55          | 66.0                                              | 200                                     | 740                                                              | APXA4R0ARA330MD55G |
|             | 100         | F55          | 80.0                                              | 26                                      | 2,450                                                            | APXA4R0ARA101MF55G |
|             | 100         | F60          | 80.0                                              | 26                                      | 2,450                                                            | APXA4R0ARA101MF60G |
|             | 120         | F45          | 240                                               | 38                                      | 1,710                                                            | APXA4R0ARA121MF45G |
|             | 150         | E60          | 120                                               | 30                                      | 1,490                                                            | APXA4R0ARA151ME60G |
|             | 150         | F55          | 120                                               | 26                                      | 2,450                                                            | APXA4R0ARA151MF55G |
|             | 150         | F60          | 120                                               | 26                                      | 2,450                                                            | APXA4R0ARA151MF60G |
|             | 220         | H70          | 176                                               | 25                                      | 3,020                                                            | APXA4R0ARA221MH70G |
|             | 330         | H70          | 264                                               | 25                                      | 3,020                                                            | APXA4R0ARA331MH70G |
|             | 470         | J80          | 376                                               | 20                                      | 4,130                                                            | APXA4R0ARA471MJ80G |
|             | 560         | HC0          | 448                                               | 12                                      | 4,770                                                            | APXA4R0ARA561MHC0G |
|             | 680         | J80          | 544                                               | 20                                      | 4,130                                                            | APXA4R0ARA681MJ80G |
|             | 820         | JC0          | 656                                               | 10                                      | 5,500                                                            | APXA4R0ARA821MJC0G |
|             | 1,200       | JC0          | 960                                               | 10                                      | 5,500                                                            | APXA4R0ARA122MJC0G |
| 6.3         | 22          | D55          | 69.0                                              | 200                                     | 740                                                              | APXA6R3ARA220MD55G |
|             | 47          | E60          | 59.2                                              | 35                                      | 1,380                                                            | APXA6R3ARA470ME60G |
|             | 68          | F60          | 85.6                                              | 27                                      | 2,400                                                            | APXA6R3ARA680MF60G |
|             | 82          | F45          | 267                                               | 40                                      | 1,670                                                            | APXA6R3ARA820MF45G |
|             | 82          | F55          | 103                                               | 27                                      | 2,400                                                            | APXA6R3ARA820MF55G |
|             | 82          | F60          | 103                                               | 27                                      | 2,400                                                            | APXA6R3ARA820MF60G |
|             | 100         | E60          | 126                                               | 35                                      | 1,380                                                            | APXA6R3ARA101ME60G |
|             | 100         | F45          | 315                                               | 40                                      | 1,670                                                            | APXA6R3ARA101MF45G |
|             | 100         | F55          | 126                                               | 27                                      | 2,400                                                            | APXA6R3ARA101MF55G |
|             | 100         | F60          | 126                                               | 27                                      | 2,400                                                            | APXA6R3ARA101MF60G |
|             | 120         | F60          | 151                                               | 27                                      | 2,400                                                            | APXA6R3ARA121MF60G |
|             | 150         | H70          | 189                                               | 25                                      | 3,020                                                            | APXA6R3ARA151MH70G |
|             | 220         | H70          | 277                                               | 25                                      | 3,020                                                            | APXA6R3ARA221MH70G |
|             | 330         | J80          | 416                                               | 20                                      | 4,130                                                            | APXA6R3ARA331MJ80G |
|             | 390         | HC0          | 491                                               | 12                                      | 4,770                                                            | APXA6R3ARA391MHC0G |
|             | 470         | HC0          | 592                                               | 12                                      | 4,770                                                            | APXA6R3ARA471MHC0G |
|             | 470         | J80          | 592                                               | 20                                      | 4,130                                                            | APXA6R3ARA471MJ80G |
|             | 680         | JC0          | 857                                               | 10                                      | 5,500                                                            | APXA6R3ARA681MJC0G |
|             | 820         | JC0          | 1,030                                             | 10                                      | 5,500                                                            | APXA6R3ARA821MJC0G |

| WV<br>(Vdc) | Cap<br>(μF) | Size<br>code | Leakage<br>current<br>(μAmax/<br>after<br>2 min.) | ESR<br>(mΩmax/ 20°C,<br>100k to 300kHz) | Rated ripple<br>current<br>(mA <sub>RMS</sub> /105°C,<br>100kHz) | Part No.           |                    |
|-------------|-------------|--------------|---------------------------------------------------|-----------------------------------------|------------------------------------------------------------------|--------------------|--------------------|
| 10          | 4.7         | D55          | 24.0                                              | 240                                     | 670                                                              | APXA100ARA4R7MD55G |                    |
|             | 6.8         | D55          | 34.0                                              | 240                                     | 670                                                              | APXA100ARA6R8MD55G |                    |
|             | 10          | D55          | 50.0                                              | 220                                     | 700                                                              | APXA100ARA100MD55G |                    |
|             | 15          | D55          | 75.0                                              | 200                                     | 740                                                              | APXA100ARA150MD55G |                    |
|             | 33          | E60          | 66.0                                              | 40                                      | 1,270                                                            | APXA100ARA330ME60G |                    |
|             | 47          | E60          | 94.0                                              | 40                                      | 1,270                                                            | APXA100ARA470ME60G |                    |
|             | 47          | F45          | 235                                               | 41                                      | 1,560                                                            | APXA100ARA470MF45G |                    |
|             | 47          | F60          | 94.0                                              | 31                                      | 2,250                                                            | APXA100ARA470MF60G |                    |
|             | 56          | F55          | 112                                               | 31                                      | 2,250                                                            | APXA100ARA560MF55G |                    |
|             | 56          | F60          | 112                                               | 31                                      | 2,250                                                            | APXA100ARA560MF60G |                    |
|             | 120         | H70          | 240                                               | 27                                      | 2,800                                                            | APXA100ARA121MH70G |                    |
|             | 150         | H70          | 300                                               | 27                                      | 2,800                                                            | APXA100ARA151MH70G |                    |
|             | 270         | HC0          | 540                                               | 14                                      | 4,420                                                            | APXA100ARA271MHC0G |                    |
|             | 270         | J80          | 540                                               | 24                                      | 3,770                                                            | APXA100ARA271MJ80G |                    |
| 16          | 330         | HC0          | 660                                               | 14                                      | 4,420                                                            | APXA100ARA331MHC0G |                    |
|             | 330         | J80          | 660                                               | 24                                      | 3,770                                                            | APXA100ARA331MJ80G |                    |
|             | 470         | JC0          | 940                                               | 12                                      | 5,300                                                            | APXA100ARA471MJC0G |                    |
|             | 560         | JC0          | 1,120                                             | 12                                      | 5,300                                                            | APXA100ARA561MJC0G |                    |
|             | 3.3         | D55          | 26.0                                              | 260                                     | 660                                                              | APXA160ARA3R3MD55G |                    |
|             | 22          | E60          | 70.4                                              | 45                                      | 1,210                                                            | APXA160ARA220ME60G |                    |
|             | 22          | F45          | 176                                               | 45                                      | 1,490                                                            | APXA160ARA220MF45G |                    |
|             | 33          | F60          | 106                                               | 37                                      | 2,050                                                            | APXA160ARA330MF60G |                    |
|             | 39          | F55          | 125                                               | 37                                      | 2,050                                                            | APXA160ARA390MF55G |                    |
|             | 39          | F60          | 125                                               | 37                                      | 2,050                                                            | APXA160ARA390MF60G |                    |
|             | 82          | H70          | 262                                               | 30                                      | 2,700                                                            | APXA160ARA820MH70G |                    |
|             | 150         | J80          | 480                                               | 26                                      | 3,430                                                            | APXA160ARA151MJ80G |                    |
|             | 180         | HC0          | 576                                               | 16                                      | 4,360                                                            | APXA160ARA181MHC0G |                    |
|             | 180         | J80          | 576                                               | 26                                      | 3,430                                                            | APXA160ARA181MJ80G |                    |
| 20          | 220         | JC0          | 704                                               | 14                                      | 5,050                                                            | APXA160ARA221MJC0G |                    |
|             | 330         | JC0          | 1,050                                             | 14                                      | 5,050                                                            | APXA160ARA331MJC0G |                    |
|             | 15          | F45          | 150                                               | 57                                      | 1,300                                                            | APXA200ARA150MF45G |                    |
|             | 22          | F55          | 88.0                                              | 50                                      | 1,650                                                            | APXA200ARA220MF55G |                    |
|             | 22          | F60          | 88.0                                              | 50                                      | 1,650                                                            | APXA200ARA220MF60G |                    |
|             | 39          | H70          | 156                                               | 45                                      | 2,000                                                            | APXA200ARA390MH70G |                    |
|             | 47          | H70          | 188                                               | 45                                      | 2,000                                                            | APXA200ARA470MH70G |                    |
|             | 82          | J80          | 328                                               | 40                                      | 2,500                                                            | APXA200ARA820MJ80G |                    |
|             | 150         | JC0          | 600                                               | 20                                      | 4,320                                                            | APXA200ARA151MJC0G |                    |
|             | 23          | 15           | F45                                               | 172                                     | 57                                                               | 1,300              | APXA230ARA150MF45G |
|             | 10          | F60          | 125                                               | 65                                      | 1,500                                                            | APXA250ARA100MF60G |                    |
|             | 25          | 22           | H70                                               | 275                                     | 50                                                               | 1,800              | APXA250ARA220MH70G |
|             | 39          | J80          | 488                                               | 45                                      | 2,100                                                            | APXA250ARA390MJ80G |                    |



## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Surface Mount

## NPCAP™-PXH Series

- Super low ESR, impedance and high heat resistance have been obtained by using conductive polymer as electrolyte.
- Suitable for DC-DC converters, voltage regulators and decoupling applications.
- Endurance : 125°C 1,000 hours
- Rated voltage range : 2.5 to 20V<sub>dc</sub>, Capacitance range : 22 to 1,000μF
- Case size range : φ6.3×5.7L to φ10×7.7L
- RoHS Compliant

PXH

Higher temperature  
PXA



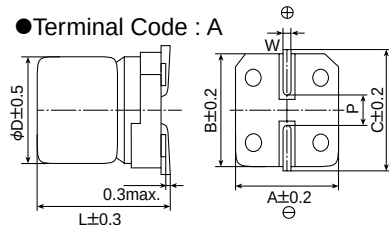
## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------|--------------------|----------------------------|-----------|--------------------------------------|-----|--------------------------------------|-----------------|------------------------------|
| Category                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Temperature Range                                      | -55 to +125°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Rated Voltage Range                                    | 2.5 to 20V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Surge Voltage                                          | Rated voltage×1.15 (at 125°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage Current                                        | Shall not exceed values shown in STANDARD RATINGS. (at 20°C after 2 minutes)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Dissipation Factor (tanδ)                              | 0.12 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Low Temperature Characteristics (Max. Impedance Ratio) | $Z(-25^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.15$<br>$Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$ (at 100kHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1,000 hours at 125°C. <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>DF (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                             | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤200% of the initial specified value | ESR | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Bias Humidity                                          | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to the DC rated voltage at 60°C, 90 to 95% RH for 1,000 hours. <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                     | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Surge Voltage                                          | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 125°C for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>DF (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | DF (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| DF (tanδ)                                              | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |
| Failure Rate                                           | 0.5% per 1,000 hours maximum (Confidence level 60% at 125°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |           |                                      |     |                                      |                 |                              |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.  
Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 125°C.

## ◆DIMENSIONS [mm]

- Terminal Code : A



| Size code | φD  | L   | A    | B    | C    | W          | P   |
|-----------|-----|-----|------|------|------|------------|-----|
| F60       | 6.3 | 5.7 | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| H70       | 8   | 6.7 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| J80       | 10  | 7.7 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆MARKING

EX) 20V22μF



## ◆PART NUMBERING SYSTEM

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18  
A P X H A R A M G

Supplement code  
Size code  
Capacitance tolerance code  
Capacitance code (ex. 22μF:220,100μF:101)  
Taping code  
Terminal code  
Voltage code (ex. 6.3V:6R3,10V:100)  
Series code  
Category

Please refer to "Product code guide (conductive polymer type)"



NPCAP™-PXX Series

## ◆STANDARD RATINGS

| WV(Vdc) | Cap(μF) | Size code | Leakage current<br>(μAmax/after 2min.) | ESR<br>(mΩmax/20°C, 100k to 300kHz) | Rated ripple current<br>(mA <sub>rms</sub> /100kHz) |                  | Part No.           |
|---------|---------|-----------|----------------------------------------|-------------------------------------|-----------------------------------------------------|------------------|--------------------|
|         |         |           |                                        |                                     | -55°C to +105°C                                     | +105°C to +125°C |                    |
| 2.5     | 220     | F60       | 110                                    | 35                                  | 2,500                                               | 770              | APXH2R5ARA221MF60G |
|         | 560     | H70       | 280                                    | 30                                  | 3,100                                               | 960              | APXH2R5ARA561MH70G |
|         | 1,000   | J80       | 500                                    | 25                                  | 3,700                                               | 1,100            | APXH2R5ARA102MJ80G |
| 4       | 150     | F60       | 120                                    | 35                                  | 2,450                                               | 770              | APXH4R0ARA151MF60G |
|         | 220     | H70       | 176                                    | 30                                  | 3,020                                               | 960              | APXH4R0ARA221MH70G |
|         | 680     | J80       | 544                                    | 25                                  | 3,700                                               | 1,100            | APXH4R0ARA681MJ80G |
| 6.3     | 82      | F60       | 103                                    | 40                                  | 2,400                                               | 720              | APXH6R3ARA820MF60G |
|         | 100     | F60       | 126                                    | 40                                  | 2,400                                               | 720              | APXH6R3ARA101MF60G |
|         | 150     | H70       | 189                                    | 30                                  | 3,020                                               | 960              | APXH6R3ARA151MH70G |
|         | 220     | H70       | 277                                    | 30                                  | 3,020                                               | 960              | APXH6R3ARA221MH70G |
|         | 470     | J80       | 592                                    | 25                                  | 3,700                                               | 1,100            | APXH6R3ARA471MJ80G |
| 10      | 56      | F60       | 112                                    | 45                                  | 2,250                                               | 680              | APXH100ARA560MF60G |
|         | 120     | H70       | 240                                    | 35                                  | 2,800                                               | 880              | APXH100ARA121MH70G |
|         | 150     | H70       | 300                                    | 35                                  | 2,800                                               | 880              | APXH100ARA151MH70G |
|         | 330     | J80       | 660                                    | 30                                  | 3,700                                               | 1,010            | APXH100ARA331MJ80G |
| 16      | 39      | F60       | 125                                    | 50                                  | 2,050                                               | 650              | APXH160ARA390MF60G |
|         | 82      | H70       | 262                                    | 40                                  | 2,700                                               | 830              | APXH160ARA820MH70G |
|         | 150     | J80       | 480                                    | 35                                  | 3,020                                               | 930              | APXH160ARA151MJ80G |
|         | 180     | J80       | 576                                    | 35                                  | 3,020                                               | 930              | APXH160ARA181MJ80G |
| 20      | 22      | F60       | 88.0                                   | 60                                  | 1,650                                               | 590              | APXH200ARA220MF60G |
|         | 47      | H70       | 188                                    | 45                                  | 2,000                                               | 780              | APXH200ARA470MH70G |
|         | 82      | J80       | 328                                    | 45                                  | 2,400                                               | 820              | APXH200ARA820MJ80G |



## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Radial Lead

New!

NPCAP™-PSK Series

- Super low ESR, high ripple current capability
- Downsized from PSE series (φ6.3×8L to φ5×8L)
- Longer life (5,000 hours at 105°C)
- ESR after endurance is specified within the initial spec
- RoHS Compliant
- Halogen Free

PSK

 ↑ Downsized  
PSE

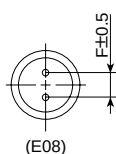
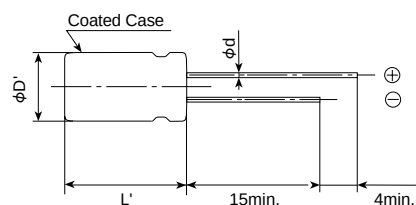

## ◆SPECIFICATIONS

| Items                                                 | Characteristics                                                                                                                                                                                                   |                              |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Category                                              | -55 to +105°C                                                                                                                                                                                                     |                              |
| Temperature Range                                     |                                                                                                                                                                                                                   |                              |
| Rated Voltage Range                                   | 2.5V <sub>dc</sub>                                                                                                                                                                                                |                              |
| Capacitance Tolerance                                 | ±20% (M)                                                                                                                                                                                                          | (at 20°C, 120Hz)             |
| Surge Voltage                                         | Rated voltage(V)×1.15                                                                                                                                                                                             | (at 105°C)                   |
| Leakage Current *Note                                 | 500μA max.                                                                                                                                                                                                        | (at 20°C after 2 minutes)    |
| Dissipation Factor (tanδ)                             | 0.10 max.                                                                                                                                                                                                         | (at 20°C, 120Hz)             |
| Low Temperature Characteristics (Max.Impedance Ratio) | $Z(-25^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.15$<br>$Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$                                                                                            |                              |
|                                                       | (at 100kHz)                                                                                                                                                                                                       |                              |
| Endurance                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 5,000 hours at 105°C.                                                             |                              |
|                                                       | Appearance                                                                                                                                                                                                        | No significant damage        |
|                                                       | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value   |
|                                                       | D.F. (tanδ)                                                                                                                                                                                                       | ≤The initial specified value |
|                                                       | ESR                                                                                                                                                                                                               | ≤The initial specified value |
|                                                       | Leakage current                                                                                                                                                                                                   | ≤The initial specified value |
| Bias Humidity Test                                    | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to DC voltage at 60°C, 90 to 95% RH for 1,000 hours.                                               |                              |
|                                                       | Appearance                                                                                                                                                                                                        | No significant damage        |
|                                                       | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value   |
|                                                       | D.F. (tanδ)                                                                                                                                                                                                       | ≤The initial specified value |
|                                                       | ESR                                                                                                                                                                                                               | ≤The initial specified value |
|                                                       | Leakage current                                                                                                                                                                                                   | ≤The initial specified value |
| Surge Voltage Test                                    | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. |                              |
|                                                       | Appearance                                                                                                                                                                                                        | No significant damage        |
|                                                       | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value   |
|                                                       | D.F. (tanδ)                                                                                                                                                                                                       | ≤The initial specified value |
|                                                       | ESR                                                                                                                                                                                                               | ≤The initial specified value |
|                                                       | Leakage current                                                                                                                                                                                                   | ≤The initial specified value |
| Failure Rate                                          | 0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)                                                                                                                                                      |                              |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.  
 Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C.

## ◆DIMENSIONS [mm]

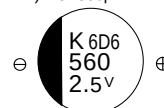
- Terminal Code : E



| Size code | E08        |
|-----------|------------|
| φD        | 5.0        |
| φd        | 0.45       |
| F         | 2.0        |
| φD'       | φD+0.5max. |
| L'        | L+1.0max.  |

## ◆MARKING

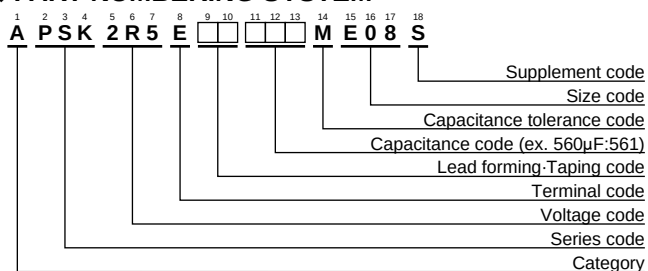
EX) 2.5V560μF





New!  
NPCAP™-PSK Series

### ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (conductive polymer type)"

### ◆STANDARD RATINGS

| WV(Vdc) | Cap(μF) | Case size<br>φDXL(mm) | ESR<br>(mΩ max./20°C, 100k to 300kHz) | Rated ripple current<br>(mA rms/105°C, 100kHz) | Part No.           |
|---------|---------|-----------------------|---------------------------------------|------------------------------------------------|--------------------|
| 2.5     | 220     | 5×8                   | 7                                     | 4,350                                          | APSK2R5E□□221ME08S |
|         | 330     | 5×8                   | 7                                     | 4,350                                          | APSK2R5E□□331ME08S |
|         | 470     | 5×8                   | 7                                     | 4,350                                          | APSK2R5E□□471ME08S |
|         | 560     | 5×8                   | 7                                     | 4,350                                          | APSK2R5E□□561ME08S |

□□ : Enter the appropriate lead forming or taping code.



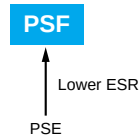
## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Radial Lead

Upgrade!

NPCAP™-PSF Series

- Super low ESR, high ripple current capability
- ESR 5mΩ max. (2 & 2.5Vdc)
- Longer life (5,000 hours at 105°C)
- ESR after endurance is specified within the initial spec (2 & 2.5Vdc)
- Rated voltage range : 2 to 16Vdc
- RoHS Compliant
- Halogen Free



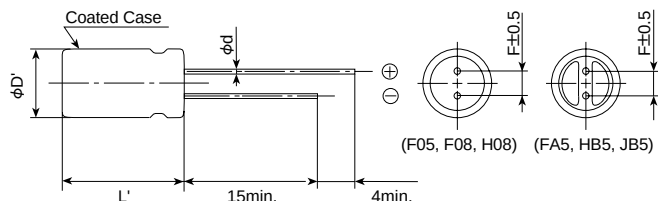
## ◆ SPECIFICATIONS

| Items                                                 | Characteristics                                                                                                                                                                                                   |                                                                                                                   |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Category                                              | -55 to +105°C                                                                                                                                                                                                     |                                                                                                                   |
| Temperature Range                                     |                                                                                                                                                                                                                   |                                                                                                                   |
| Rated Voltage Range                                   | 2 to 16V <sub>dc</sub>                                                                                                                                                                                            |                                                                                                                   |
| Capacitance Tolerance                                 | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                         |                                                                                                                   |
| Surge Voltage                                         | Rated voltage(V)×1.15 (at 105°C)                                                                                                                                                                                  |                                                                                                                   |
| Leakage Current                                       | I=0.2CV or 500μA, whichever is greater (at 20°C after 2 minutes)                                                                                                                                                  |                                                                                                                   |
| *Note                                                 | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                         |                                                                                                                   |
| Dissipation Factor (tanδ)                             | 0.10 max. (at 20°C, 120Hz)                                                                                                                                                                                        |                                                                                                                   |
| Low Temperature Characteristics (Max.Impedance Ratio) | Z(-25°C)/Z(+20°C)≤1.15<br>Z(-55°C)/Z(+20°C)≤1.25 (at 100kHz)                                                                                                                                                      |                                                                                                                   |
| Endurance                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 5,000 hours at 105°C.                                                             |                                                                                                                   |
|                                                       | Appearance                                                                                                                                                                                                        | No significant damage                                                                                             |
|                                                       | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value                                                                                        |
|                                                       | D.F. (tanδ)                                                                                                                                                                                                       | ≤The initial specified value                                                                                      |
|                                                       | ESR                                                                                                                                                                                                               | 2 & 2.5V <sub>dc</sub> : ≤The initial specified value<br>16V <sub>dc</sub> : ≤150% of the initial specified value |
|                                                       | Leakage current                                                                                                                                                                                                   | ≤The initial specified value                                                                                      |
| Bias Humidity Test                                    | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to DC voltage at 60°C, 90 to 95% RH for 1,000 hours.                                               |                                                                                                                   |
|                                                       | Appearance                                                                                                                                                                                                        | No significant damage                                                                                             |
|                                                       | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value                                                                                        |
|                                                       | D.F. (tanδ)                                                                                                                                                                                                       | ≤The initial specified value                                                                                      |
|                                                       | ESR                                                                                                                                                                                                               | 2 & 2.5V <sub>dc</sub> : ≤The initial specified value<br>16V <sub>dc</sub> : ≤150% of the initial specified value |
|                                                       | Leakage current                                                                                                                                                                                                   | ≤The initial specified value                                                                                      |
| Surge Voltage Test                                    | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. |                                                                                                                   |
|                                                       | Appearance                                                                                                                                                                                                        | No significant damage                                                                                             |
|                                                       | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value                                                                                        |
|                                                       | D.F. (tanδ)                                                                                                                                                                                                       | ≤The initial specified value                                                                                      |
|                                                       | ESR                                                                                                                                                                                                               | 2 & 2.5V <sub>dc</sub> : ≤The initial specified value<br>16V <sub>dc</sub> : ≤150% of the initial specified value |
|                                                       | Leakage current                                                                                                                                                                                                   | ≤The initial specified value                                                                                      |
| Failure Rate                                          | 0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)                                                                                                                                                      |                                                                                                                   |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.  
Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C.

## ◆ DIMENSIONS [mm]

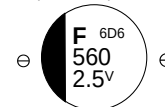
- Terminal Code : E



| Size code | F05        | F08       | FA5       | H08 | HB5       | JB5  |
|-----------|------------|-----------|-----------|-----|-----------|------|
| φD        |            | 6.3       |           | 8.0 |           | 10.0 |
| φd        | 0.45       | 0.6       | 0.5       |     | 0.6       |      |
| F         |            | 2.5       |           | 3.5 |           | 5.0  |
| φD'       | φD+0.5max. |           |           |     |           |      |
| L'        | L+1.0max.  | L+0.3max. | L+1.0max. |     | L+1.5max. |      |

## ◆ MARKING

EX) 2.5V560μF



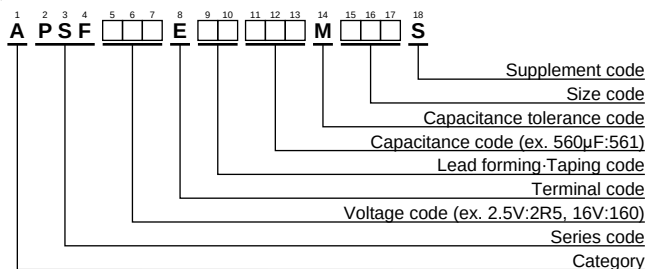


## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Radial Lead

Upgrade!  
NPCAP™-PSF Series

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (conductive polymer type)"

## ◆STANDARD RATINGS

| WV(Vdc) | Cap(μF) | Case size<br>φD×L(mm) | ESR<br>(mΩ max./20°C, 100k to 300kHz) | Rated ripple current<br>(mA rms/105°C, 100kHz) | Part No.           |
|---------|---------|-----------------------|---------------------------------------|------------------------------------------------|--------------------|
| 2       | 1,000   | 6.3×8                 | 5                                     | 5,900                                          | APSF2R0E□□102MF08S |
| 2.5     | 330     | 6.3×8                 | 5                                     | 5,900                                          | APSF2R5E□□331MF08S |
|         | 470     | 6.3×8                 | 5                                     | 5,900                                          | APSF2R5E□□471MF08S |
|         | 560     | 6.3×8                 | 5                                     | 5,900                                          | APSF2R5E□□561MF08S |
|         | 820     | 6.3×8                 | 5                                     | 5,900                                          | APSF2R5E□□821MF08S |
|         | 1,600   | 8×8                   | 5                                     | 6,100                                          | APSF2R5E□□162MH08S |
| 16      | 100     | 6.3×5                 | 24                                    | 2,490                                          | APSF160E□□101MF05S |
|         | 100     | 6.3×10.5              | 25                                    | 2,820                                          | APSF160E□□101MFA5S |
|         | 270     | 8×8                   | 10                                    | 5,000                                          | APSF160E□□271MH08S |
|         | 270     | 8×11.5                | 11                                    | 5,080                                          | APSF160E□□271MHB5S |
|         | 330     | 8×8                   | 13                                    | 4,700                                          | APSF160E□□331MH08S |
|         | 470     | 8×11.5                | 11                                    | 5,400                                          | APSF160E□□471MHB5S |
|         | 470     | 10×11.5               | 10                                    | 6,100                                          | APSF160E□□471MJB5S |

□□ : Enter the appropriate lead forming or taping code.



## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Radial Lead

## NPCAP™-PSE Series

- Super low ESR, high ripple current capability
- Downsized from PSC series ( $\phi 8 \times 8L$  to  $\phi 6.3 \times 8L$ )
- Endurance is longer life than PSC series (5,000 hours at 105°C)
- ESR after endurance is specified within the initial spec
- Rated voltage range : 2.5 to 6.3V<sub>dc</sub>
- RoHS Compliant
- Halogen Free

PSE

Longer life  
Downsized

PSC



## ◆ SPECIFICATIONS

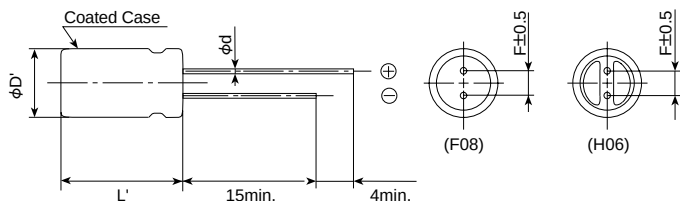
| Items                                                 | Characteristics                                                                                                                                                                                                   |                              |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Category                                              | Temperature Range                                                                                                                                                                                                 |                              |
|                                                       | -55 to +105°C                                                                                                                                                                                                     |                              |
| Rated Voltage Range                                   | 2.5 to 6.3V <sub>dc</sub>                                                                                                                                                                                         |                              |
| Capacitance Tolerance                                 | ±20% (M)                                                                                                                                                                                                          |                              |
|                                                       | (at 20°C, 120Hz)                                                                                                                                                                                                  |                              |
| Surge Voltage                                         | Rated voltage(V)×1.15                                                                                                                                                                                             |                              |
|                                                       | (at 105°C)                                                                                                                                                                                                        |                              |
| Leakage Current                                       | I=0.2CV or 500μA, whichever is greater                                                                                                                                                                            |                              |
| *Note                                                 | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                         |                              |
|                                                       | (at 20°C after 2 minutes)                                                                                                                                                                                         |                              |
| Dissipation Factor (tanδ)                             | 0.10 max.                                                                                                                                                                                                         |                              |
|                                                       | (at 20°C, 120Hz)                                                                                                                                                                                                  |                              |
| Low Temperature Characteristics (Max.Impedance Ratio) | $Z(-25^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.15$<br>$Z(-55^{\circ}\text{C})/Z(+20^{\circ}\text{C}) \leq 1.25$                                                                                            |                              |
|                                                       | (at 100kHz)                                                                                                                                                                                                       |                              |
| Endurance                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 5,000 hours at 105°C.                                                             |                              |
|                                                       | Appearance                                                                                                                                                                                                        | No significant damage        |
|                                                       | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value   |
|                                                       | D.F. (tanδ)                                                                                                                                                                                                       | ≤The initial specified value |
|                                                       | ESR                                                                                                                                                                                                               | ≤The initial specified value |
|                                                       | Leakage current                                                                                                                                                                                                   | ≤The initial specified value |
| Bias Humidity Test                                    | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to DC voltage at 60°C, 90 to 95% RH for 1,000 hours.                                               |                              |
|                                                       | Appearance                                                                                                                                                                                                        | No significant damage        |
|                                                       | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value   |
|                                                       | D.F. (tanδ)                                                                                                                                                                                                       | ≤The initial specified value |
|                                                       | ESR                                                                                                                                                                                                               | ≤The initial specified value |
|                                                       | Leakage current                                                                                                                                                                                                   | ≤The initial specified value |
| Surge Voltage Test                                    | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. |                              |
|                                                       | Appearance                                                                                                                                                                                                        | No significant damage        |
|                                                       | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value   |
|                                                       | D.F. (tanδ)                                                                                                                                                                                                       | ≤The initial specified value |
|                                                       | ESR                                                                                                                                                                                                               | ≤The initial specified value |
|                                                       | Leakage current                                                                                                                                                                                                   | ≤The initial specified value |
| Failure Rate                                          | 0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)                                                                                                                                                      |                              |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.

Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C.

## ◆ DIMENSIONS [mm]

● Terminal Code : E



| Size code | F08        | H06 |
|-----------|------------|-----|
| φD        | 6.3        | 8.0 |
| φd        | 0.6        |     |
| F         | 2.5        | 3.5 |
| φD'       | φD+0.5max. |     |
| L'        | L+1.5max.  |     |

## ◆ MARKING

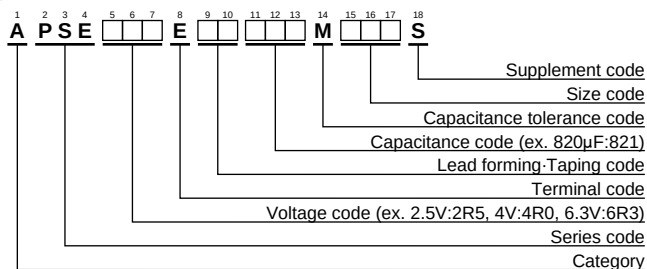
EX) 2.5V820μF





NPCAP™-PSE Series

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (conductive polymer type)"

## ◆STANDARD RATINGS

| WV(Vdc) | Cap(μF) | Case size<br>φDXL(mm) | ESR<br>(mΩ max./20°C, 100k to 300kHz) | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|---------|---------|-----------------------|---------------------------------------|------------------------------------------------------------|--------------------|
| 2.5     | 680     | 8×6                   | 8                                     | 4,900                                                      | APSE2R5E□□681MH06S |
|         | 820     | 6.3×8                 | 7                                     | 5,000                                                      | APSE2R5E□□821MF08S |
| 4       | 560     | 6.3×8                 | 7                                     | 5,000                                                      | APSE4R0E□□561MF08S |
| 6.3     | 470     | 6.3×8                 | 8                                     | 4,700                                                      | APSE6R3E□□471MF08S |
|         | 560     | 6.3×8                 | 8                                     | 4,700                                                      | APSE6R3E□□561MF08S |

□□ : Enter the appropriate lead forming or taping code.



## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Radial Lead

## NPCAP™-PSC Series

- Super low ESR, high ripple current capability
- Lower profile than PSA ( $\phi 8 \times 8L$  to  $\phi 10 \times 12.5L$ )
- Rated voltage range : 2.5 to 16V<sub>dc</sub>
- Nominal capacitance range : 270 to 2,700 $\mu$ F
- Endurance : 2,000 hours at 105°C
- Suitable for DC-DC converters, voltage regulators and decoupling applications for computer motherboards
- Added 2.5V 820 $\mu$ F (ESR 5m $\Omega$  max.)
- RoHS Compliant

PSC

Low profile  
Lower ESR

PSA



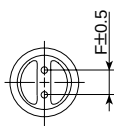
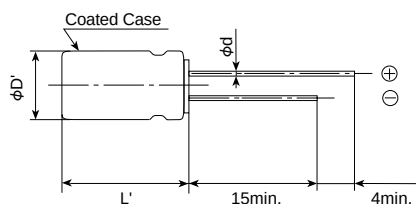
## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                             |                                             |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                           |                                             |
|                                                        | -55 to +105°C                                                                                                                                                                                                               |                                             |
| Rated Voltage Range                                    | 2.5 to 16V <sub>dc</sub>                                                                                                                                                                                                    |                                             |
| Capacitance Tolerance                                  | $\pm 20\%$ (M)                                                                                                                                                                                                              |                                             |
|                                                        | (at 20°C, 120Hz)                                                                                                                                                                                                            |                                             |
| Surge Voltage                                          | Rated voltage $\times 1.15$                                                                                                                                                                                                 |                                             |
|                                                        | (at 105°C)                                                                                                                                                                                                                  |                                             |
| Leakage Current                                        | $I = 0.2CV$ or 500 $\mu$ A, whichever is greater.                                                                                                                                                                           |                                             |
| *Note                                                  | Where, I : Max. leakage current ( $\mu$ A), C : Nominal capacitance ( $\mu$ F), V : Rated voltage (V <sub>dc</sub> )                                                                                                        |                                             |
|                                                        | (at 20°C after 2 minutes)                                                                                                                                                                                                   |                                             |
| Dissipation Factor (tan $\delta$ )                     | 0.10 max.                                                                                                                                                                                                                   |                                             |
|                                                        | (at 20°C, 120Hz)                                                                                                                                                                                                            |                                             |
| Low Temperature Characteristics (Max. Impedance Ratio) | $Z(-25^\circ\text{C})/Z(+20^\circ\text{C}) \leq 1.15$<br>$Z(-55^\circ\text{C})/Z(+20^\circ\text{C}) \leq 1.25$                                                                                                              |                                             |
|                                                        | (at 100kHz)                                                                                                                                                                                                                 |                                             |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C.                                                                       |                                             |
|                                                        | Appearance                                                                                                                                                                                                                  | No significant damage                       |
|                                                        | Capacitance change                                                                                                                                                                                                          | $\leq \pm 20\%$ of the initial value        |
|                                                        | D.F. (tan $\delta$ )                                                                                                                                                                                                        | $\leq 150\%$ of the initial specified value |
|                                                        | ESR                                                                                                                                                                                                                         | $\leq 150\%$ of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                             | $\leq$ The initial specified value          |
| Bias Humidity Test                                     | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to DC voltage at 60°C, 90 to 95% RH for 1,000 hours.                                                         |                                             |
|                                                        | Appearance                                                                                                                                                                                                                  | No significant damage                       |
|                                                        | Capacitance change                                                                                                                                                                                                          | $\leq \pm 20\%$ of the initial value        |
|                                                        | D.F. (tan $\delta$ )                                                                                                                                                                                                        | $\leq 150\%$ of the initial specified value |
|                                                        | ESR                                                                                                                                                                                                                         | $\leq 150\%$ of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                             | $\leq$ The initial specified value          |
| Surge Voltage Test                                     | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor (R=1k $\Omega$ ) and discharge for 5 minutes 30 seconds. |                                             |
|                                                        | Appearance                                                                                                                                                                                                                  | No significant damage                       |
|                                                        | Capacitance change                                                                                                                                                                                                          | $\leq \pm 20\%$ of the initial value        |
|                                                        | D.F. (tan $\delta$ )                                                                                                                                                                                                        | $\leq 150\%$ of the initial specified value |
|                                                        | ESR                                                                                                                                                                                                                         | $\leq 150\%$ of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                             | $\leq$ The initial specified value          |
| Failure Rate                                           | 0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)                                                                                                                                                                |                                             |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.  
Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C.

## ◆ DIMENSIONS [mm]

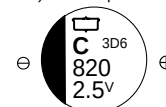
- Terminal Code : E



| Size code | H08                         | HB5         | JB5                    | JC5  |
|-----------|-----------------------------|-------------|------------------------|------|
| $\phi D$  | 8.0                         | 8.0         | 10.0                   | 10.0 |
| $\phi d$  | 0.6                         | 0.8 (Note1) | 0.8 (Note1)            | 0.6  |
| F         | 3.5                         | 3.5         | 5.0                    | 5.0  |
| $\phi D'$ | $\phi D + 0.5 \text{ max.}$ |             |                        |      |
| L'        | $L + 1.0 \text{ max.}$      |             | $L + 1.5 \text{ max.}$ |      |

Note1 : 0.6 for rated volt 16V.

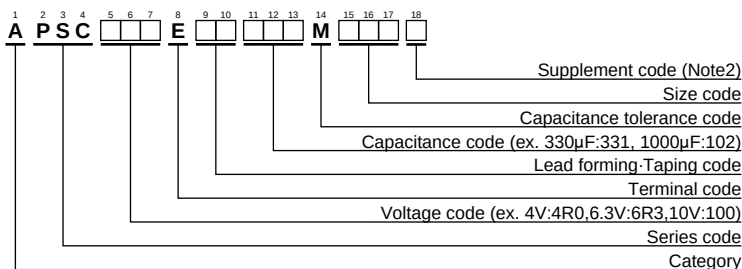
## ◆ MARKING

EX) 2.5V820 $\mu$ F



NPCAP™-PSC Series

### ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (conductive polymer type)"

(Note2) PSC series, 2.5V820µF(ESR 5mΩ max.) has supplement code "J".  
Can case, terminal and terminal plating are the same as all others in PSC series.

### ◆STANDARD RATINGS

| WV(V <sub>dc</sub> ) | Cap(µF) | Case size<br>φD×L(mm) | ESR<br>(mΩ max/20°C, 100k to 300kHz) | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|----------------------|---------|-----------------------|--------------------------------------|------------------------------------------------------------|--------------------|
| 2.5                  | 560     | 8×8                   | 7                                    | 6,100                                                      | APSC2R5E□□561MH08S |
|                      | 820     | 8×8                   | 5                                    | 6,100                                                      | APSC2R5E□□821MH08J |
|                      | 820     | 8×8                   | 7                                    | 6,100                                                      | APSC2R5E□□821MH08S |
|                      | 1,000   | 8×8                   | 7                                    | 6,100                                                      | APSC2R5E□□102MH08S |
|                      | 1,000   | 8×11.5                | 7                                    | 6,100                                                      | APSC2R5E□□102MHB5S |
|                      | 1,500   | 8×11.5                | 7                                    | 6,100                                                      | APSC2R5E□□152MHB5S |
|                      | 2,700   | 10×11.5               | 8                                    | 5,560                                                      | APSC2R5E□□272MJB5S |
| 4                    | 560     | 8×8                   | 7                                    | 6,100                                                      | APSC4R0E□□561MH08S |
|                      | 680     | 8×11.5                | 7                                    | 6,100                                                      | APSC4R0E□□681MHB5S |
|                      | 1,000   | 10×11.5               | 6                                    | 6,640                                                      | APSC4R0E□□102MJB5S |
| 6.3                  | 470     | 8×8                   | 8                                    | 5,700                                                      | APSC6R3E□□471MH08S |
|                      | 560     | 8×8                   | 8                                    | 5,700                                                      | APSC6R3E□□561MH08S |
|                      | 820     | 10×11.5               | 7                                    | 6,640                                                      | APSC6R3E□□821MJB5S |
|                      | 1,500   | 10×11.5               | 10                                   | 5,560                                                      | APSC6R3E□□152MJB5S |
| 10                   | 390     | 8×11.5                | 9                                    | 5,650                                                      | APSC100E□□391MHB5S |
|                      | 680     | 10×11.5               | 7                                    | 6,100                                                      | APSC100E□□681MJB5S |
| 16                   | 270     | 8×11.5                | 11                                   | 5,080                                                      | APSC160E□□271MHB5S |
|                      | 330     | 10×12.5               | 10                                   | 6,100                                                      | APSC160E□□331MJC5S |
|                      | 470     | 10×11.5               | 10                                   | 6,100                                                      | APSC160E□□471MJB5S |

□□ : Enter the appropriate lead forming or taping code.

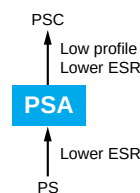


## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Radial Lead

## NPCAP™-PSA Series

- Super low ESR, high temperature resistance and high ripple current capability
- Rated voltage range : 2.5 to 16V<sub>dc</sub>
- Endurance : 2,000 hours at 105°C
- Suitable for DC-DC converters, voltage regulators and decoupling applications for computer motherboards
- RoHS Compliant



## ◆SPECIFICATIONS

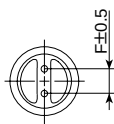
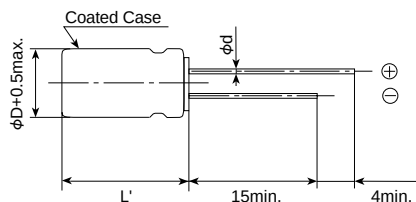
| Items                                                  | Characteristics                                                                                                                                                                                                   |                                      |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                 |                                      |
|                                                        | -55 to +105°C                                                                                                                                                                                                     |                                      |
| Rated Voltage Range                                    | 2.5 to 16V <sub>dc</sub>                                                                                                                                                                                          |                                      |
| Capacitance Tolerance                                  | ±20% (M)                                                                                                                                                                                                          |                                      |
|                                                        | (at 20°C, 120Hz)                                                                                                                                                                                                  |                                      |
| Surge Voltage                                          | Rated voltage×1.15                                                                                                                                                                                                |                                      |
|                                                        | (at 105°C)                                                                                                                                                                                                        |                                      |
| Leakage Current                                        | I=0.2CV                                                                                                                                                                                                           |                                      |
| *Note                                                  | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V <sub>dc</sub> )                                                                                                          |                                      |
|                                                        | (at 20°C after 2 minutes)                                                                                                                                                                                         |                                      |
| Dissipation Factor (tanδ)                              | 0.08 max. (FA5 size : 0.12max.)                                                                                                                                                                                   |                                      |
|                                                        | (at 20°C, 120Hz)                                                                                                                                                                                                  |                                      |
| Low Temperature Characteristics (Max. Impedance Ratio) | Z(-25°C)/Z(+20°C)≤1.15                                                                                                                                                                                            |                                      |
|                                                        | Z(-55°C)/Z(+20°C)≤1.25                                                                                                                                                                                            |                                      |
|                                                        | (at 100kHz)                                                                                                                                                                                                       |                                      |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C.                                                             |                                      |
|                                                        | Appearance                                                                                                                                                                                                        | No significant damage                |
|                                                        | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value           |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                       | ≤150% of the initial specified value |
|                                                        | ESR                                                                                                                                                                                                               | ≤150% of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                   | ≤The initial specified value         |
| Bias Humidity Test                                     | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to DC voltage at 60°C, 90 to 95% RH for 1,000 hours.                                               |                                      |
|                                                        | Appearance                                                                                                                                                                                                        | No significant damage                |
|                                                        | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value           |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                       | ≤150% of the initial specified value |
|                                                        | ESR                                                                                                                                                                                                               | ≤150% of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                   | ≤The initial specified value         |
| Surge Voltage Test                                     | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. |                                      |
|                                                        | Appearance                                                                                                                                                                                                        | No significant damage                |
|                                                        | Capacitance change                                                                                                                                                                                                | ≤±20% of the initial value           |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                       | ≤150% of the initial specified value |
|                                                        | ESR                                                                                                                                                                                                               | ≤150% of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                   | ≤The initial specified value         |
| Failure Rate                                           | 0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)                                                                                                                                                      |                                      |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.

Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C.

## ◆DIMENSIONS [mm]

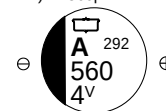
- Terminal Code : E



| φD  | 6.3       | 8        | 10  |
|-----|-----------|----------|-----|
| φd  | 0.5       | 0.8      |     |
| F   | 2.5       | 3.5      | 5.0 |
| φD' | φD+0.5max |          |     |
| L'  | L+0.3max  | L+1.5max |     |

## ◆MARKING

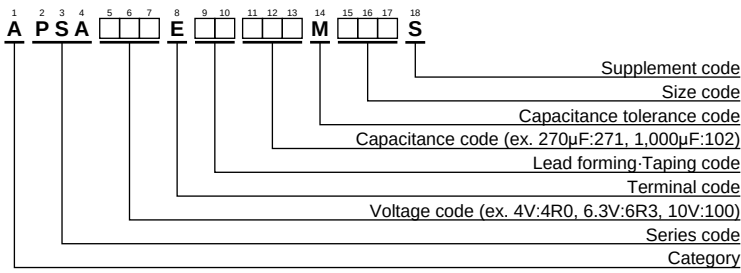
EX) 4V560μF





NPCAP™-PSA Series

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (conductive polymer type)"

## ◆STANDARD RATINGS

| WV(Vdc) | Cap( $\mu$ F) | Case size<br>$\phi$ DXL(mm) | ESR<br>(m $\Omega$ max/20°C, 100k to 300kHz) | Rated ripple current<br>(mArms/105°C, 100kHz) | Part No.           |
|---------|---------------|-----------------------------|----------------------------------------------|-----------------------------------------------|--------------------|
| 2.5     | 390           | 6.3×10.5                    | 20                                           | 3,160                                         | APSA2R5E□□391MFA5S |
|         | 680           | 8×11.5                      | 7                                            | 5,580                                         | APSA2R5E□□681MHB5S |
|         | 820           | 8×11.5                      | 7                                            | 5,580                                         | APSA2R5E□□821MHB5S |
|         | 1,000         | 10×11.5                     | 6                                            | 5,860                                         | APSA2R5E□□102MJB5S |
|         | 1,500         | 10×11.5                     | 7                                            | 5,860                                         | APSA2R5E□□152MJB5S |
| 4       | 270           | 6.3×10.5                    | 20                                           | 3,160                                         | APSA4R0E□□271MFA5S |
|         | 390           | 6.3×10.5                    | 24                                           | 3,300                                         | APSA4R0E□□391MFA5S |
|         | 560           | 8×11.5                      | 7                                            | 5,580                                         | APSA4R0E□□561MHB5S |
|         | 820           | 10×11.5                     | 6                                            | 5,860                                         | APSA4R0E□□821MJB5S |
|         |               |                             |                                              |                                               |                    |
| 6.3     | 220           | 6.3×10.5                    | 20                                           | 3,160                                         | APSA6R3E□□221MFA5S |
|         | 330           | 6.3×10.5                    | 28                                           | 3,190                                         | APSA6R3E□□331MFA5S |
|         | 390           | 8×11.5                      | 8                                            | 5,080                                         | APSA6R3E□□391MHB5S |
|         | 470           | 8×11.5                      | 7                                            | 5,700                                         | APSA6R3E□□471MHB5S |
|         | 680           | 10×11.5                     | 7                                            | 5,860                                         | APSA6R3E□□681MJB5S |
| 10      | 47            | 6.3×10.5                    | 25                                           | 2,820                                         | APSA100E□□470MFA5S |
|         | 68            | 6.3×10.5                    | 25                                           | 2,820                                         | APSA100E□□680MFA5S |
|         | 100           | 6.3×10.5                    | 25                                           | 2,820                                         | APSA100E□□101MFA5S |
|         | 150           | 6.3×10.5                    | 25                                           | 2,820                                         | APSA100E□□151MFA5S |
|         | 270           | 8×11.5                      | 9                                            | 4,710                                         | APSA100E□□271MHB5S |
|         | 470           | 10×11.5                     | 8                                            | 5,650                                         | APSA100E□□471MJB5S |
| 16      | 100           | 6.3×10.5                    | 25                                           | 2,820                                         | APSA160E□□101MFA5S |

□□ : Enter the appropriate lead forming or taping code.



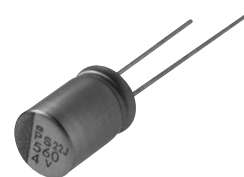
## CONDUCTIVE POLYMER ALUMINUM SOLID CAPACITORS

Radial Lead

## NPCAP™-PS Series

- Super low ESR, high temperature resistance
- Large capacitance & Improved high ripple current capability
- Rated voltage range : 2.5 to 35V<sub>dc</sub>
- Endurance : 2,000 hours at 105°C
- Suitable for DC-DC converters, voltage regulators and decoupling applications  
For computer motherboards
- RoHS Compliant

PSA  
Lower ESR  
PS



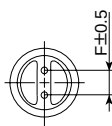
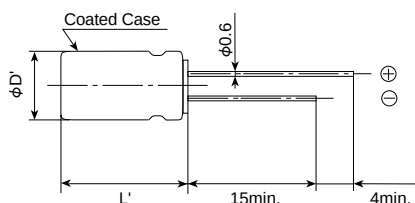
## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------|--------------------|----------------------------|-------------|--------------------------------------|-----|--------------------------------------|-----------------|------------------------------|
| Category                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Temperature Range                                      | -55 to +105°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Rated Voltage Range                                    | 2.5 to 35V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Surge Voltage                                          | Rated voltage×1.15 (at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Leakage Current                                        | I=0.2CV (Rated voltage 2.5 to 25V <sub>dc</sub> ) / I=0.5CV (Rated voltage 35V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| *Note                                                  | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V <sub>dc</sub> ) (at 20°C after 2 minutes)                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Dissipation Factor (tanδ)                              | 0.12 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Low Temperature Characteristics (Max. Impedance Ratio) | Z(-25°C)/Z(+20°C)≤1.15<br>Z(-55°C)/Z(+20°C)≤1.25 (at 100kHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C. <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                             | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| D.F. (tanδ)                                            | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Bias Humidity Test                                     | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjecting them to DC voltage at 60°C, 90 to 95% RH for 1,000 hours. <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                               | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| D.F. (tanδ)                                            | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Surge Voltage Test                                     | The capacitors shall be subjected to 1,000 cycles each consisting of charge with the surge voltage specified at 105°C for 30 seconds through a protective resistor(R=1kΩ) and discharge for 5 minutes 30 seconds. <table border="1"> <tr> <td>Appearance</td><td>No significant damage</td></tr> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>ESR</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Appearance | No significant damage | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤150% of the initial specified value | ESR | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Appearance                                             | No significant damage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Capacitance change                                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| D.F. (tanδ)                                            | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| ESR                                                    | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Leakage current                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |
| Failure Rate                                           | 0.5% per 1,000 hours maximum (Confidence level 60% at 105°C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |                       |                    |                            |             |                                      |     |                                      |                 |                              |

\*Note : If any doubt arises, measure the leakage current after the following voltage treatment.  
Voltage treatment : DC rated voltage is applied to the capacitors for 120 minutes at 105°C.

## ◆ DIMENSIONS [mm]

- Terminal Code : E



|     | 8          | 10  |
|-----|------------|-----|
| φD  | 8          | 10  |
| φd  | 0.6        |     |
| F   | 3.5        | 5.0 |
| φD' | φD+0.5max. |     |
| L'  | L+1.5max.  |     |

## ◆ MARKING

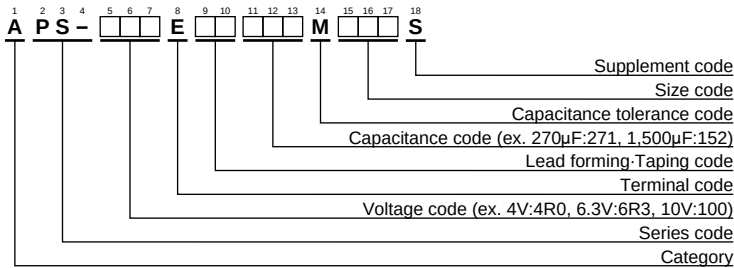
EX) 4V820μF





NPCAP™-PS Series

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (conductive polymer type)"

## ◆STANDARD RATINGS

| WV(Vdc) | Cap(μF) | Case size<br>φD×L(mm) | ESR<br>(mΩmax/20°C, 100k to 300kHz) | Rated ripple current<br>(mArms/105°C, 100kHz) | Part No.           |
|---------|---------|-----------------------|-------------------------------------|-----------------------------------------------|--------------------|
| 2.5     | 680     | 8 ×11.5               | 10                                  | 5,230                                         | APS-2R5E□□681MHB5S |
|         | 820     | 8 ×11.5               | 10                                  | 5,230                                         | APS-2R5E□□821MHB5S |
|         | 1500    | 10 ×12.5              | 8                                   | 5,500                                         | APS-2R5E□□152MJC5S |
| 4       | 560     | 8 ×11.5               | 10                                  | 5,230                                         | APS-4R0E□□561MHB5S |
|         | 820     | 10 ×12.5              | 8                                   | 5,500                                         | APS-4R0E□□821MJC5S |
|         | 1000    | 10 ×12.5              | 8                                   | 5,500                                         | APS-4R0E□□102MJC5S |
|         | 1200    | 10 ×12.5              | 8                                   | 5,500                                         | APS-4R0E□□122MJC5S |
| 6.3     | 390     | 8 ×11.5               | 12                                  | 4,770                                         | APS-6R3E□□391MHB5S |
|         | 470     | 8 ×11.5               | 12                                  | 4,770                                         | APS-6R3E□□471MHB5S |
|         | 680     | 10 ×12.5              | 10                                  | 5,500                                         | APS-6R3E□□681MJC5S |
|         | 820     | 10 ×12.5              | 10                                  | 5,500                                         | APS-6R3E□□821MJC5S |
|         | 1000    | 10 ×12.5              | 10                                  | 5,500                                         | APS-6R3E□□102MJC5S |
| 10      | 270     | 8 ×11.5               | 14                                  | 4,420                                         | APS-100E□□271MHB5S |
|         | 330     | 8 ×11.5               | 14                                  | 4,420                                         | APS-100E□□331MHB5S |
|         | 470     | 10 ×12.5              | 12                                  | 5,300                                         | APS-100E□□471MJC5S |
|         | 560     | 10 ×12.5              | 12                                  | 5,300                                         | APS-100E□□561MJC5S |
| 16      | 100     | 8 ×11.5               | 16                                  | 4,360                                         | APS-160E□□101MHB5S |
|         | 180     | 8 ×11.5               | 16                                  | 4,360                                         | APS-160E□□181MHB5S |
|         | 270     | 10 ×12.5              | 14                                  | 5,050                                         | APS-160E□□271MJC5S |
|         | 330     | 10 ×12.5              | 14                                  | 5,050                                         | APS-160E□□331MJC5S |
| 20      | 100     | 8 ×11.5               | 24                                  | 3,320                                         | APS-200E□□101MHB5S |
|         | 150     | 10 ×12.5              | 20                                  | 4,320                                         | APS-200E□□151MJC5S |
| 25      | 68      | 8 ×11.5               | 24                                  | 3,320                                         | APS-250E□□680MHB5S |
|         | 100     | 10 ×12.5              | 20                                  | 4,320                                         | APS-250E□□101MJC5S |
| 35      | 18      | 8 ×11.5               | 34                                  | 2,830                                         | APS-350E□□180MHB5S |
|         | 33      | 10 ×12.5              | 30                                  | 3,270                                         | APS-350E□□330MJC5S |

□□ : Enter the appropriate lead forming or taping code.



## Aluminum Electrolytic Capacitors



## PRECAUTIONS AND GUIDELINES

For conductive polymer aluminum electrolytic solid capacitors, please refer to PRECAUTIONS AND GUIDELINES (Conductive Polymer)

### Designing Device Circuits

**1 Select the capacitors to suit installation and operating conditions, and use the capacitors to meet the performance limits prescribed in this catalog or the product specifications.**

#### 2 Polarity

Aluminum Electrolytic Capacitors are polarized. Apply neither reverse voltage nor AC voltage to polarized capacitors. Using reversed polarity causes a short circuit or venting. Before use, refer to the catalog, product specifications or capacitor body to identify the polarity marking. (The shape of rubber seal does not represent the directional rule for polarity.) Use a bi-polar type of non-solid aluminum electrolytic capacitor for a circuit where the polarity is occasionally reversed. However, note that even a bi-polar aluminum electrolytic capacitor must not be used for AC voltage applications.

#### 3 Operating voltage

Do not apply a DC voltage which exceeds the full rated voltage. The peak voltage of a superimposed AC voltage (ripple voltage) on the DC voltage must not exceed the full rated voltage. A surge voltage value, which exceeds the full rated voltage, is prescribed in the catalogs, but it is a restricted condition, for especially short periods of time.

#### 4 Ripple current

Do not apply overcurrent which exceeds the full rated ripple current. The superimposition of a large ripple current increases the rate of heating within the capacitor. When excessive ripple current is imposed the internal temperature increases which may occur failure mode as follows.

- Shorten lifetime
- Open vent
- Short circuit

The rated ripple current has been specified at a certain ripple frequency. The rated ripple current at several frequencies must be calculated by multiplying the rated ripple current at the original frequency using the frequency multipliers for each product series. For more details, refer to the paragraph on Aluminum Electrolytic Capacitor Life.

#### 5 Category temperature

Do not apply over temperature which exceeds the maximum category temperature.

The use of a capacitor outside the maximum rated category temperature will considerably shorten the life or cause the capacitor to vent.

The relation between the lifetime of aluminum electrolytic capacitors and ambient temperature follows Arrhenius' rule that the lifetime is approximately halved with each 10°C rise in ambient temperature.

#### 6 Life expectancy

Select the capacitors to meet the service life of a device.

#### 7 Charge and discharge

Do not use capacitors in circuits where heavy charge and discharge cycles are frequently repeated. Frequent and sharp heavy discharging cycles will result in decreasing capacitance and damage to the capacitors due to generated heat. Specified capacitors can be designed to meet the requirements of charging-discharging cycles, frequency, operating temperature, etc.

#### 8 Failure mode of capacitors

Non-solid aluminum electrolytic capacitors, in general, have a

lifetime which ends in an open circuit, but depending on conditions of usage or products type, failure mode of capacitors will be venting.

Please contact a representative of Nippon Chemi-Con.

#### 9 Insulating

Electrically isolate the following parts of a capacitor from the negative terminal, the positive terminal and the circuit traces.

- The outer can case of a non-solid aluminum capacitor.
- The dummy terminal of a non-solid aluminum capacitor, which is designed for mounting stability.

#### 10 The outer sleeve

The outer sleeve of a capacitor is not assured as an insulator (Except for screw type).

#### 11 Condition

Do not use/expose capacitors to the following conditions.

- a) Oil, water, salty water storage in damp locations.
- b) Direct sunlight
- c) Toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine or its compounds, and ammonium
- d) Ozone, ultraviolet rays or radiation
- e) Severe vibration or mechanical shock conditions beyond the limits prescribed in the catalogs or the product specification.

#### 12 Mounting

- a) The paper separators and the electrolytic-conductive electrolytes in a non-solid aluminum electrolytic capacitor are flammable.

Leaking electrolyte on a printed circuit board can gradually erode the copper traces, possibly causing smoke or burning by short-circuiting the copper traces.

Verify the following points when designing a PC board.

- Provide the appropriate hole spacing on the PC board to match the terminal spacing of the capacitor.
- Make the following open space over the vent so that the vent can operate correctly.

| Case diameter | Clearance   |
|---------------|-------------|
| φ6.3 to φ16mm | 2mm minimum |
| φ18 to φ35mm  | 3mm minimum |
| φ40mm and up  | 5mm minimum |

- Do not place any wires or copper traces over the vent of the capacitor.
  - Installing a capacitor with the vent facing the PC board needs an appropriate ventilation hole in PC board.
  - Do not pass any copper traces beneath the seal side of a capacitor. The trace must pass 1 or 2mm to the side of the capacitor.
  - Avoid placing any heat-generating objects adjacent to a capacitor or even on the reverse side of the PC board.
  - Do not pass any via holes underneath a capacitor on double sided PC board.
  - In designing double-sided PC boards, do not locate any copper trace under the seal side of a capacitor.
- b) Do not mount the terminal side of a screw mount capacitor downwards. If a screw terminal capacitor is mounted on its side, make sure the positive terminal and vent are higher than the negative terminal.  
Do not tighten the screws of the terminals and the mounting clamps over the specified torque prescribed in the catalog or the production specification.
  - c) For a surface mount capacitor, design the copper pads of the PC board in accordance with the catalog or the product specifications.



## PRECAUTIONS AND GUIDELINES

### 13 Others

- a) Using capacitor for applications which always consider safety. Consult with our factory before use in applications which can affect human life.(space equipment, aerial equipment, nuclear equipment, medical equipment, vehicle control equipment, etc) Please note that the product, which is designed only for specific usage cannot be used in other usages.(ex. Photo flash type, etc.)
- b) The electrical characteristics of capacitors vary in respect to temperature, frequency and service life. Design the device circuits by taking these changes into account.
- c) Capacitors mounted in parallel need the current to flow equally through the individual capacitors.
- d) Capacitors mounted in series require resistors in parallel with the individual capacitors to balance the voltage.

### Installing Capacitors

#### 1 Installing

- a) Used capacitors are not reusable, except in the case that the capacitors are detached from a device for periodic inspection to measure their electrical characteristics.
  - b) If the capacitors have self charged, discharge in the capacitors through a resistor of approximately 1kΩ before use.
  - c) If capacitors are stored at a temperature of 35°C or more and more than 75%RH, the leakage current may increase. In this case, they can be reformed by applying the rated voltage through a resistor of approximately 1kΩ.
  - d) Verify the rated capacitance and voltages of the capacitors when installing.
  - e) Verify the polarity of the capacitors.
  - f) Do not use the capacitors if they have been dropped on the floor.
  - g) Do not deform the cases of capacitors.
  - h) Verify that the lead spacing of the capacitor fits the hole spacing in the PC board before installing the capacitors. Some standard pre-formed leads are available.
  - i) For radial or snap-in terminals, insert the terminals into PC board and press the capacitor downward until the bottom of the capacitor body reaches PC board surface.
  - j) Do not apply any mechanical force in excess of the limits prescribed in the catalogs or the product specifications of the capacitors.
- Also, note the capacitors may be damaged by mechanical shocks caused by the vacuum/insertion head, component checker or centering operation of an automatic mounting or insertion machine.

#### 2 Soldering and Solderability

- a) When soldering with a soldering iron
  - Soldering conditions (temperature and time) should be within the limits prescribed in the catalogs or the product specifications.
  - If the terminal spacing of a capacitor does not fit the terminal hole spacing of the PC board, reform the terminals in a manner to minimize a mechanical stress into the body of the capacitor.
  - Remove the capacitors from the PC board, after the solder is completely melted, reworking by using a soldering iron minimizes the mechanical stress to the capacitors.
  - Do not touch the capacitor body with the hot tip of the soldering iron.
- b) Flow soldering
  - Do not dip the body of a capacitor into the solder bath only dip the terminals in. The soldering must be done on the reverse side of PC board.
  - Soldering conditions (preheat, solder temperature and dipping time) should be within the limits prescribed in the catalogs or the product specifications.

- Do not apply flux to any part of capacitors other than their terminals.
- Make sure the capacitors do not come into contact with any other components while soldering.

#### c) Reflow soldering

- Soldering conditions (preheat, solder temperature and soldering time) should be within the limits prescribed in the catalogs or the product specifications.
- When setting the temperature infrared heaters, consider that the infrared absorption causes material to be discolored and change in appearance.
- Do not solder capacitors more than two times using reflow. If you need to do three times, be sure to consult with us.
- Make sure capacitors do not come into contact with copper traces.
- Vapor phase soldering (VPS) is not used.

#### d) Do not re-use surface mount capacitors which have already been soldered.

In addition, when installing a new capacitor onto the assembly board to rework, remove old residual flux from the surface of the PC board, and then use a soldering iron within the prescribed conditions.

#### e) Confirm before running into soldering that the capacitors are SMD for reflow soldering.

### 3 Handling after soldering

Do not apply any mechanical stress to the capacitor after soldering onto the PC board.

- a) Do not lean or twist the body of the capacitor after soldering the capacitors onto the PC board.
  - b) Do not use the capacitors for lifting or carrying the assembly board.
  - c) Do not hit or poke the capacitor after soldering to PC board.
- When stacking the assembly board, be careful that other components do not touch the aluminum electrolytic capacitors.
- d) Do not drop the assembly board.

### 4 Cleaning PC boards

- a) Do not wash capacitors by using the following cleaning agents.
  - Halogenated solvents; cause capacitors to fail due to corrosion.
  - Alkali system solvents; corrode (dissolve) an aluminum case.
  - Petroleum and terpene system solvents; cause the rubber seal material to deteriorate.
  - Xylene; causes the rubber seal material to deteriorate.
  - Acetone; erases the marking.

Solvent resistant capacitors are only suitable for washing using the cleaning conditions prescribed in the catalogs or the product specifications. In particular, ultrasonic cleaning will accelerate damaging capacitors.
- b) Verify the following points when washing capacitors.

- Monitor conductivity, pH, specific gravity, and the water content of cleaning agents. Contamination adversely affects these characteristics.
  - Be sure not to expose the capacitors under solvent rich conditions or keep capacitors inside a closed container. In addition, please dry the solvent sufficiently on the PC board and the capacitor with an air knife (temperature should be less than the maximum rated category temperature of the capacitor) over 10 minutes.
- Aluminum electrolytic capacitors can be characteristically and catastrophically damaged by halogen ions, particularly by chlorine ions, though the degree of the damage mainly depends upon the characteristics of the electrolyte and rubber seal material. When halogen ions come into contact with the capacitors, the foil corrodes when voltages applied. This corrosion causes ; extremely high leakage current, which causes in line with, venting, and an open circuit.



## PRECAUTIONS AND GUIDELINES

Global environmental warnings (Greenhouse effects and other environmental destruction by depletion of the ozone layer), new types of cleaning agents have been developed and commercialized as substitutes for CFC-113, 1,1,2-trichloroethylene and 1,1,1-trichloroethylene. The following are recommended as cleaning conditions for some of new cleaning agents.

### –Higher alcohol system cleaning agents

Recommended cleaning agents:

Pine Alpha ST-100S (Arakawa Chemical)

Clean Through 750H, 750K, 750L, and 710M (Kao)

Technocare FRW-14,15,16,17 (Momentive performance materials)

Cleaning conditions:

Using these cleaning agents capacitors are capable of withstanding immersion or ultrasonic cleaning for 10 minutes at a maximum liquid temperature of 60°C. Find optimum condition for washing, rinsing, and drying. Be sure not to rub the marking off the capacitor by contacting any other components or the PC board. Note that shower cleaning adversely affects the markings on the sleeve.

### –Non-Halogenated Solvent Cleaning

AK225AES (Asahi Glass)

Cleaning conditions:

Solvent resistant capacitors are capable of withstanding any one of immersion, ultrasonic or vapor cleaning for 5 minutes; exception is 2 minutes max. for KRE, and KRE-BP series capacitors and 3 minutes for SRM series capacitors. However, from a view of the global environmental problems, these types of solvent will be banned in near future. We would recommend not using them as much as possible.

### Isopropyl alcohol cleaning agents

IPA (Isopropyl Alcohol) is one of the most acceptable cleaning agents; it is necessary to maintain a flux content in the cleaning liquid at a maximum limit of 2 Wt.%.

## 5 Precautions for using adhesives and coating materials

- Do not use any adhesive and coating materials containing halogenated solvent.
- Verify the following before using adhesive and coating material.
  - Remove flux and dust leftover between the rubber seal and the PC board before applying adhesive or coating materials to the capacitor.
  - Dry and remove any residual cleaning agents before applying adhesive and coating materials to the capacitors. Do not cover over the whole surface of the rubber seal with the adhesive or coating materials.
  - For permissible heat conditions for curing adhesives or coating materials, follow the instructions in the catalogs or the product specifications of the capacitors.
  - Covering over the whole surface of the capacitor rubber seal with resin may result in a hazardous condition because the inside pressure cannot release completely. Also, a large amount of halogen ions in resins will cause the capacitors to fail because the halogen ions penetrate into the rubber seal and the inside of the capacitor.
- Some coating materials, it cannot be implemented to the capacitor. Please note that loose luster and whitening on the surface of the outer sleeve might be caused according to the kind of solvents used for mounting adhesives and coating agents.

## 6 Fumigation

In many cases when exporting or importing electronic devices, such as capacitors, wooden packaging is used. In order to control insects, many times, it becomes necessary to fumigate the shipments. Precautions during "Fumigation" using halogenated

chemical such as Methyl Bromide must be taken. Halogen gas can penetrate packaging materials used, such as, cardboard boxes and vinyl bags. Penetration of the halogenide gas can cause corrosion of Electrolytic capacitors.

## The Operation of Devices

- Do not touch terminals of capacitor directly with bare hands.
- Do not short-circuit the terminal of a capacitor by letting it come into contact with any conductive object.
  - Also, do not spill electric-conductive liquid such as acid or alkaline solution over the capacitor.
- Do not use capacitors in circumstance where they would be subject to exposure to the following materials exist or expose.
  - Oil, water, salty water or damp location.
  - Direct sunlight.
  - Toxic gases such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine or its compounds, and ammonium.
  - Ozone, ultraviolet rays or radiation.
  - Severe vibration or mechanical shock conditions beyond the limits prescribed in the catalogs or product specification.

## Maintenance Inspection

- Make periodic inspections of capacitors that have been used in industrial applications. Before inspection, turn off the power supply and carefully discharge the electricity in the capacitors. Verify the polarity when measuring the capacitors with a volt-ohm meter. Also, do not apply any mechanical stress to the terminals of the capacitors.
- The following items should be checked during the periodic inspections.
  - Significant damage in appearance : venting and electrolyte leakage.
  - Electrical characteristics: leakage current, capacitance,  $\tan\delta$  and other characteristics prescribed in the catalogs or product specifications.
 We recommend replacing the capacitors if the parts are out of specification.

## In Case of Venting

- If a non-solid aluminum electrolytic capacitor expels gas when venting, it will discharge odors or smoke, or burn in the case of a short-circuit failure. Immediately turn off or unplug the main power supply of the device.
- When venting, a non-solid aluminum electrolytic capacitor blows out gas with a temperature of over 100°C. (A solid aluminum electrolytic capacitor discharges decomposition gas or burning gas while the outer resin case is burning.) The gas which comes out from the pressure vent of a capacitor, it is not smoke by flammable. This is the vaporized electrolyte. Never expose the face close to a venting capacitor. If your eyes should inadvertently become exposed to the spouting gas or you inhale it, immediately flush the open eyes with large amounts of water and gargle with water respectively. If electrolyte is on the skin, wash the electrolyte away from the skin with soap and plenty of water. Do not lick the electrolyte of non-solid aluminum electrolytic capacitors.

## Storage

We recommend the following conditions for storage.

- Do not store capacitors at a high temperature or in high humidity. Store the capacitors indoors at a temperature of 5 to 35°C and a humidity of less than 75%RH.
- Keep capacitors in the original package.
- Store the capacitors in places free from water, oil or salt water.



## PRECAUTIONS AND GUIDELINES

- d) Store the capacitors in places free from toxic gasses (hydrogen sulfide, sulfurous acid, chlorine, ammonium, etc.)
- e) Store the capacitors in places free from acidic and alkaline solvents
- f) Store the capacitors in places free from ozone, ultraviolet rays or radiation.
- g) Store the capacitor in place free vibrations and mechanical shocks
- h) It is not applied to a regulation of JEDEC J-STD-020(Rev.C).

### Disposal

Please consult with a local industrial waste disposal specialist when disposing of aluminum electrolytic capacitors.

### Catalogs

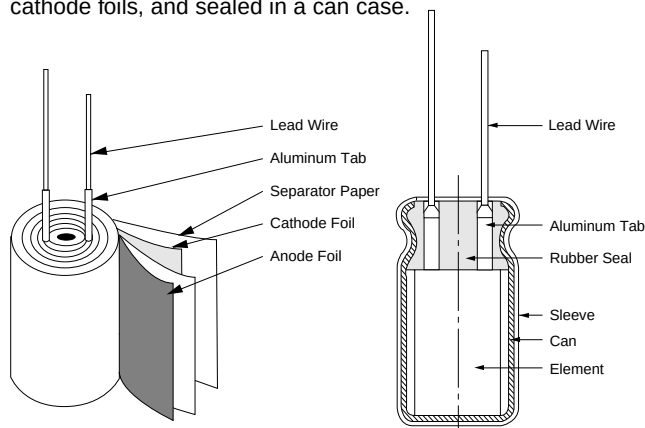
Specifications in catalogs may be subject to change without notice. Catalog data are typical. This value does not guarantee the performance. For more details of precautions and guidelines for aluminum electrolytic capacitors, please refer to Engineering Bulletin No. 634A.

### Regarding compliance for EU REACH Regulation

- a) According to the content of REACH handbook (Guidance on requirements for substances in articles which is published on May 2008), our electronic components are "articles without any intended release". Therefore they are not applicable for "Registration" for EU REACH Regulation Article 7 (1).  
Reference: Electrolytic Condenser Investigation Society  
"Study of REACH Regulation in EU about Electrolytic Capacitor"  
(published on 13 March 2008)
- b) DEHP (CAS No.117-81-7) is a high concern substance (SVHC) in the EU REACH rules. DEHP is contained as a plasticizer in PVC sleeve covering material etc.. Nippon Chemi-Con will abolish use of DEHP by June, 2011. Please consult with us about an alternate product.

### Structure of Aluminum Electrolytic Capacitors

The aluminum electrolytic capacitor contains an internal element of an anode foil, a cathode foil and paper separator rolled together, impregnated with an electrolyte, then attached to external terminals connecting the tabs with the anode or the cathode foils, and sealed in a can case.



Among various types of capacitors, an aluminum electrolytic capacitor offers large CV to volume and features low cost. The capacitance (C) of aluminum electrolytic capacitors, as well as other capacitors, is expressed by the following equation:

$$C = 8.854 \times 10^{-12} \times \frac{\epsilon S}{d} \text{ (F)}$$

Where :  $\epsilon$  = Dielectric constant  
 $S$  = Surface area of dielectric (m<sup>2</sup>)  
 $d$  = Thickness of dielectric (m)

This equation shows that the capacitance increases in proportion as the dielectric constant becomes high, its surface area becomes large and the thickness of dielectric becomes thin. In aluminum electrolytic capacitors the dielectric constant of an aluminum oxide (Al<sub>2</sub>O<sub>3</sub>) layer is 8 to 10, which is not as high as compared with the other types of capacitors. However, the dielectric layer of the aluminum oxide is extremely thin (about 15Å per volt) and the surface area is very large. An electrochemical formed electrode foil makes the dielectric on the etched surface of aluminum electrode foil. Electrochemical etching creates 20 to 100 times more surface area as plain foil. Therefore, an aluminum electrolytic capacitor can offer a large capacitance compared with other types.

### Primary of Composition Material

#### Anode aluminum foil:

First, the etching process is carried out electromechanically with a chloride solution which dissolves metal and increases the surface area of the foil; forming a dense network like innumerable microscopic channels. Secondly, the formation process is carried out with a solution such as ammonium borate which forms the aluminum oxide layer (Al<sub>2</sub>O<sub>3</sub>) as a dielectric at a thickness of about 1.1 to 1.5nm / volt. The process needs to charge more the rated voltage into the foil.

#### Cathode aluminum foil:

As in the first manufacturing process of the positive foil, the cathode foil requires etching process. Generally, it does not require the formation process; therefore, the natural oxide layer of Al<sub>2</sub>O<sub>3</sub>, which gives a characteristic dielectric voltage of 1.0 volts, is formed.

#### Electrolyte and separator:

In a non-solid aluminum electrolytic capacitor, the electrolyte, an electrically conductive liquid, functions as a true cathode by contacting the dielectric oxide layer. Accordingly, the "cathode foil" serves as an electrical connection between the electrolyte and terminal.

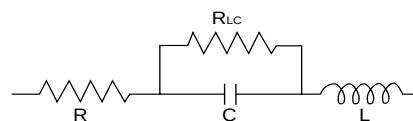
The separator functions to retain the electrolyte and prevent the anode and cathode foils from short-circuiting.

#### Can case and sealing materials:

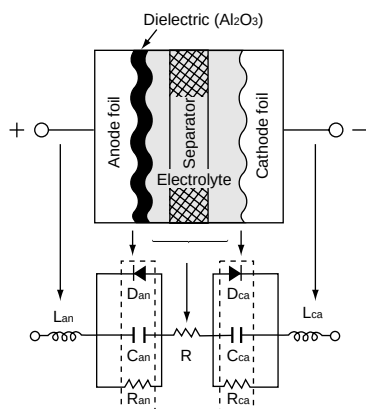
The foils and separator are wound into a cylinder to make an internal element, which is impregnated with the electrolyte, inserted into an aluminum can case and sealed. During the service life of a capacitor, electrolyte slowly and naturally vaporizes by electrochemical reaction on the boundary of the aluminum foils. The gas will increase the pressure inside the case and finally cause the pressure relief vent to open or the sealing materials to bulge. The sealing material functions not only to prevent electrolyte from drying out but also to allow the gas to escape out of the can case in a controlled manner.

### The Equivalent Circuit

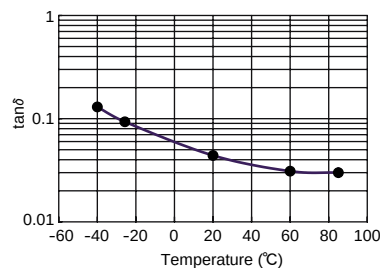
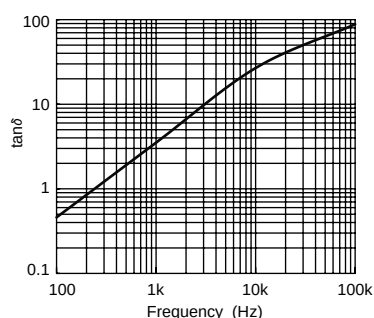
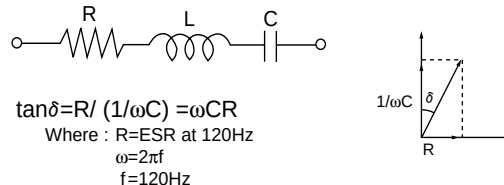
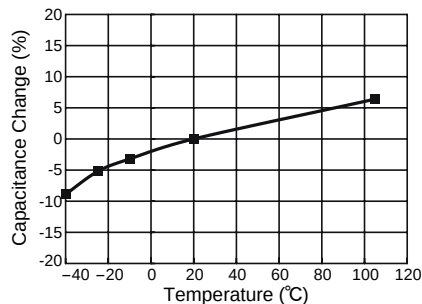
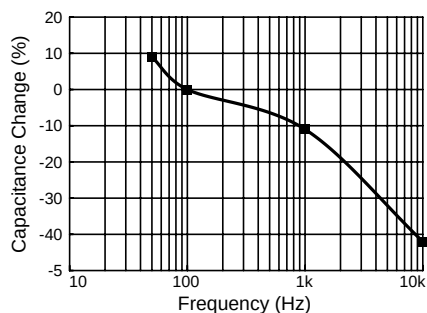
As the equivalent circuit of an aluminum electrolytic capacitor is shown below, it forms a capacitance, a series resistance, an inductance, and a parallel resistance.



R = Equivalent series resistance (ESR)  
 $R_{LC}$  = Resistance due to leakage current  
 $C$  = Capacitance  
 $L$  = Equivalent series inductance



$C_{an}$ ,  $C_{ca}$  = Capacitance due to anode and cathodes foils  
 $R$  = Resistance of electrolyte and separator  
 $R_{an}$ ,  $R_{ca}$  = Internal resistance of oxide layer on anode and cathode foils  
 $D_{an}$ ,  $D_{ca}$  = Diode effects due to oxide layer on anode and cathode foils  
 $L_{an}$ ,  $L_{ca}$  = Inductance due to anode and cathode terminals



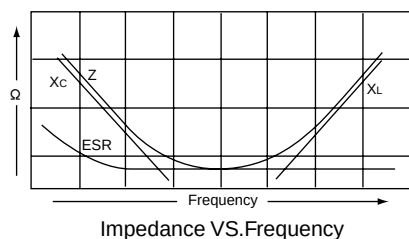
$$Z = \sqrt{R^2 + (X_L - X_C)^2}$$

Where :  $R = \text{ESR}$   
 $X_C = 1/\omega C = 1/2\pi fC$   
 $X_L = \omega L = 2\pi fL$

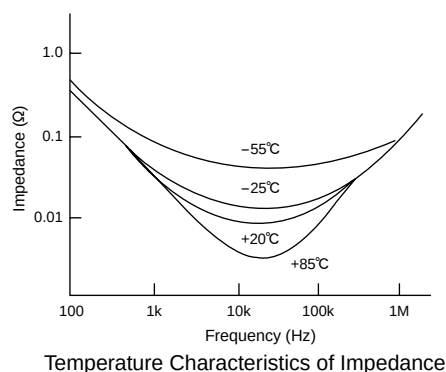


## PRECAUTIONS AND GUIDELINES

the impedance increases when increasing the measuring frequency.

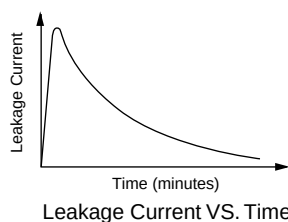


As shown at the next page, the impedance value varies with temperature because the resistance of the electrolyte is strongly affected by temperature.

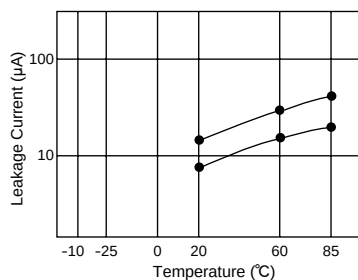


### Leakage current:

The dielectric of a capacitor has a very high resistance that does not allow DC current to flow. However, due to the characteristics of the aluminum oxide layer that functions as a dielectric in contact with electrolyte, a small amount of current, called leakage current, will flow to reform and repair the oxide layer when a voltage is being applied. As shown below, a high leakage current flows to charge voltage to the capacitor for the first seconds, and then the leakage current will decrease and reach an almost steady-state value with time.



Measuring temperature and voltage influences the leakage current. The leakage current shows higher values as the temperature and voltage increase.



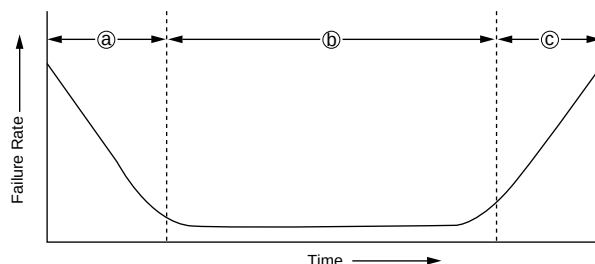
Typical Temperature Characteristics

In general, the leakage current is measured at 20°C by applying the rated voltage to capacitor through a resistor of 1000Ω in series. The leakage current is the value several minutes later after the capacitor has reached the rated voltage. The catalog prescribes the measuring temperature and time.

### Reliability

#### The bathtub curve:

Aluminum electrolytic capacitors feature failure rates shown by the following bathtub curve.



#### a) Infant failure period

This initial period accounts for the failures caused by deficiencies in design, structure, the manufacturing process or severe misapplications. In other words the initial failures occur as soon as the components are installed in a circuit. In the case of aluminum electrolytic capacitors, these failures do not occur at customers' field because aging process reforms an incomplete oxide layer, or eliminate the defective parts at the aging process and the sorting process. Misapplication of the capacitor such as inappropriate ambient conditions, over-voltage, reverse voltage, or excessive ripple current should be avoided for proper use of the capacitor in a circuit.

#### b) Useful life period

This random failure period exhibits an extremely low failure rate. These failures are not related to operating time but to application conditions. During this period, non-solid aluminum electrolytic capacitors lose a small amount of electrolyte. The electrolyte loss shows as a slow decrease in capacitance and a slow increase in  $\tan\delta$  and ESR. Non-solid aluminum electrolytic capacitors still exhibit lower catastrophic failures than semiconductors and solid tantalum capacitors.

#### c) Wear-out failure period

This period reflects a deterioration in the component properties of the capacitor; the failure rate increases with time. Non-solid aluminum electrolytic capacitors end their useful life during this period.

### Failure types:

The two types of failures are classified as catastrophic failures and wear-out failures as follows.

#### 1) Catastrophic failures

This is a failure mode that destroys the function of the capacitor like a short circuit or open circuit failure.

#### 2) Wear-out failures

This is a failure mode where gradually deteriorates; the electrical parameters of the capacitor. The criteria of judging the failures, vary with application and design factors. Capacitance decreases and  $\tan\delta$  increases are caused by the loss of electrolyte in the wear-out failure period. This is primary due to loss of electrolyte by diffusion (as vapor) through the sealing material. Gas molecules can diffuse out through the material of the end seal. High temperature increase the electrolyte vapor pressure within the capacitor and the diffusion rate is therefore increased. This increases internal pressure may cause the seal to bulge caused by elevated temperatures. This bulging may accelerate diffusion and mechanically degrade the seal. Factors that can increase the capacitor temperature, such as ambient temperature and ripple current, can accelerate the wear-out phase of a capacitor.

### Failure modes:

Aluminum electrolytic capacitors show various failure modes in different applications. (See Table 1.)

## PRECAUTIONS AND GUIDELINES

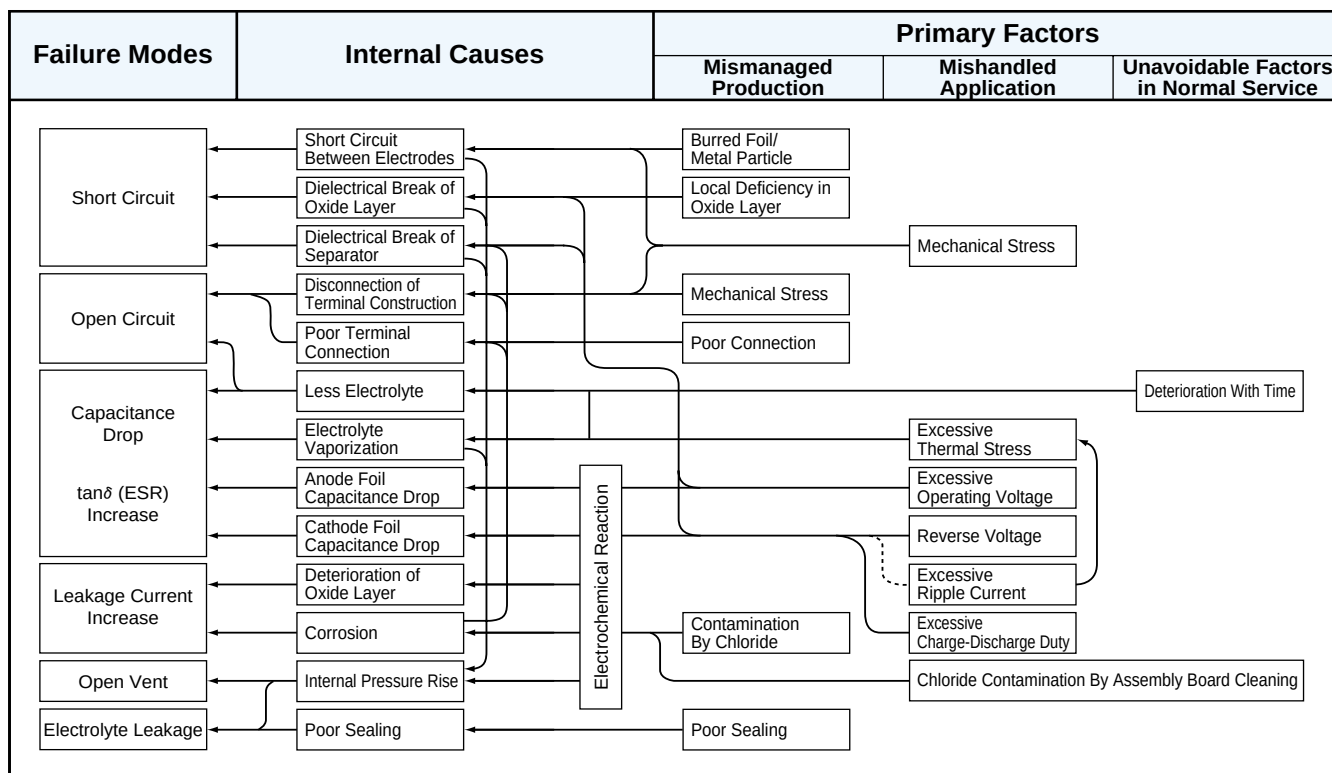


Table1

**Life of Aluminum Electrolytic Capacitors**

The life of aluminum electrolytic capacitors is largely dependent on environmental and electrical factors. Environmental factors include temperature, humidity, atmospheric pressure and vibration. Electrical factors include operating voltage, ripple current and charge-discharge duty cycles. The factor of temperature (ambient temperature and internal heating due to ripple current) is the most critical to the life of aluminum electrolytic capacitors.

**General formula to estimate lifetime:**

The lifetime of non-solid aluminum electrolytic capacitors is generally expressed by using three elements representing the effects of ambient temperature, applying voltage and ripple current, which is shown by the following equation:

$$L_x = L_0 \cdot K_{Temp} \cdot K_{Voltage} \cdot K_{Ripple}$$

Where :  $L_x$  = Lifetime of capacitor to be estimated  
 $L_0$  = Base lifetime of capacitor  
 $K_{Temp}$  = Ambient temperature acceleration term  
 $K_{Voltage}$  = Voltage acceleration term  
 $K_{Ripple}$  = Ripple current acceleration term

 **$K_{Temp}$  (Effects of ambient temperature on life):**

Because an aluminum electrolytic capacitor is essentially an electrochemical component, increased temperatures accelerate the chemical reaction producing gas within the capacitor which is diffused through the end seal, and consequently accelerates a gradual decrease in capacitance and a gradual increase in  $\tan\delta$  and ESR. The following equation has been experimentally found to express the relationship between the temperature acceleration factor and the deterioration of the capacitor.

$$L_x = L_0 \cdot K_{Temp} = L_0 \cdot B_T \cdot (T_0 - T_x) / 10$$

$$K_{Temp} = B_T \cdot (T_0 - T_x) / 10$$

Where :  $L_x$  = Lifetime (hour) of capacitor to be estimated  
 $L_0$  = Base lifetime (hour) of capacitor  
 $T_0$  = Maximum rated category temperature (°C) of capacitor shown in catalog  
 $T_x$  = Actual ambient temperature (°C) of capacitor  
 $B_T$  = Temperature acceleration factor ( $\approx 2$ )

Factor  $B_T$  will vary depending on range of ambient temperature or products type.

This equation is similar to Arrhenius' equation that expresses a relationship between chemical reaction rates and temperature, and called Arrhenius' rule of aluminum electrolytic capacitors. The temperature acceleration factor ( $B_T$ ) is approximately 2 over an ambient temperature range ( $T_x$ ) from 40°C to the maximum rated category temperature of each capacitor. It means that the lifetime is approximately halved with every 10°C rise in ambient temperature and can be extended by using the capacitors at low temperatures. For an ambient temperature range ( $T_x$ ) of 20°C to 40°C, the factor  $B_T$  will be close to 2, and the lifetime will actually be extended. However, operating and surrounding conditions, especially the operating conditions influence ambient temperatures mutually. The ambient temperature in this range will be very changeable; therefore, lifetime estimation under 40°C should use 40 as  $T_x$ .

 **$K_{Voltage}$  (Effects of applying voltage to life):**

350V and higher screw-mount terminal types of capacitors for customer-use power electronics applications allow the life time to extend by applying low voltage, relating to the characteristics of their aluminum oxide layer. For  $K_{Voltage}$  values of these products, please contact a representative of Nippon Chemi-Con.

 **$K_{Ripple}$  (Effects of ripple current to life):**

Aluminum electrolytic capacitors have higher  $\tan\delta$  than any other types of capacitors; therefore, the ripple current gives aluminum electrolytic capacitors higher internal heat. Be sure to check the rated ripple current which is specified in the catalog for assuring the life.

The ripple current through the capacitor produces heat by dissipating power from the capacitor. This leads to temperature increase. Internal heating produced by ripple currents can be expressed by:

$$W = I_R^2 \cdot R + V \cdot I_L$$

Where :  $W$  = Internal power loss  
 $I_R$  = R.M.S. ripple current  
 $R$  = Internal resistance (ESR) at ripple frequency  
 $V$  = Applied voltage  
 $I_L$  = Leakage current



## PRECAUTIONS AND GUIDELINES

Leakage current may be 5 to 10 times higher than the values measured at 20°C, but compared with  $I_R$ , the leakage current value is very small and negligible.

Thus, the above equation can be simplified:

$$W = I_R^2 \cdot R$$

The following equation gives the internal heat rise; it is heat rise to stable condition. (It is necessary to input several factors.):

$$I_R^2 \cdot R = \beta \cdot A \cdot \Delta T$$

Where :  $\beta$  =Heat transfer constant

A =Surface area of can case

$$A = (\pi/4) \cdot D \cdot (D + 4L)$$

Where : D=Can diameter

L=Can length

$\Delta T$ =An increase in core temperature by internal heating due to ripple current

( $\Delta T$ =Core temperature–Ambient temperature)

From the above equation, internal temperature rise ( $\Delta T$ ) produced by ripple current is given by:

$$\Delta T = I_R^2 \cdot R / (\beta \cdot A)$$

When the ripple frequency is 120Hz, R at 120Hz is expressed by

$$R = \tan \delta / (\omega \cdot C)$$

$$\Delta T = I_R^2 \cdot \tan \delta / (\beta \cdot A \cdot \omega \cdot C)$$

Where :  $\tan \delta$ =120Hz value

$$\omega = 2\pi \cdot f = 2\pi \cdot 120\text{Hz}$$

C =120Hz capacitance value

As above equation,  $\Delta T$  varies with frequency of ripple, frequency and temperature dependent ESR, and application dependent (even ripple current is constant). We really recommend that customers measure  $\Delta T$  with a thermocouple at the actual operating conditions of the application in lieu of using the above equation. (Another approximation of  $\Delta T$  will be stated later.)

As mentioned in the paragraph of  $K_{Temp}$ , aluminum electrolytic capacitors will slowly increase in  $\tan \delta$  and ESR during their service life. The application without ripple current has no influence on the life of the capacitor even though the ESR will increase during life. In other words, the application with ripple current makes  $\Delta T$  increase; furthermore, a  $\Delta T$  increase results in ESR increase. The ESR increase then makes  $\Delta T$  increase. It is a chain reaction. Theoretically, the ripple current acceleration term ( $K_{Ripple}$ ) cannot be simply expressed like the ambient temperature acceleration term ( $K_{Temp}$ ). Practically, the ripple current acceleration term ( $K_{Ripple}$ ) can be approximately expressed by an equation using a  $\Delta T$  initially measured. The following table shows the ripple current acceleration term ( $K_{Ripple}$ ) for each capacitor design group.

| K <sub>Ripple</sub>             | Products                                       |                                          |                                           |                                        |
|---------------------------------|------------------------------------------------|------------------------------------------|-------------------------------------------|----------------------------------------|
|                                 | Type                                           | Series                                   |                                           |                                        |
| $2^{(-\Delta T/5)}$             | Surface Mount                                  | MVS<br>MVK<br>MZF<br>MLF<br>MVJ<br>MV-BP | MVA<br>MZJ<br>MZE<br>MLE<br>MVH<br>MVK-BP | MV<br>MZA<br>MKZ<br>MLK<br>MHB<br>MKB  |
|                                 | Radial                                         | SRM<br>KMA<br>SMG                        | SRE<br>SRG<br>SME-BP                      | KRE<br>KRG<br>KME-BP                   |
| $2^{(\Delta T_0 - \Delta T)/5}$ | Radial                                         | KMQ<br>KZE<br>LXY<br>SMH<br>KLG<br>GXL   | KMG<br>KY<br>LXV<br>KMH<br>FL<br>GXH      | KZM<br>LZA<br>KXJ<br>PAG<br>GPA<br>LBG |
|                                 | Snap-in                                        | SMQ<br>KMT<br>SMH<br>LXM<br>CHA          | KMW<br>SMM<br>KMH<br>LXS<br>LXH           | KMR<br>KMS<br>SLM<br>LXQ<br>LXG        |
|                                 | Screw-Mount<br>(Less than 350V <sub>dc</sub> ) | SME                                      | KMH                                       | LXA                                    |
| $2^{(-2+(25-\Delta T)/b)}$      | Screw-Mount<br>(350V <sub>dc</sub> and higher) | RWG<br>RWY                               | RWF<br>RWL                                | RWQ<br>LXA<br>RWE<br>LXR               |

Note :  $\Delta T$  = An increase (deg) in core temperature produced by internal heating due to actual operating ripple current. The  $\Delta T$  is the difference between the core temperature and ambient temperature measured at the actual operating conditions.

$\Delta T_0$  = An increase (deg) in core temperature by internal heating due to rated ripple current.

b = Factor b varies from 5 to 10 by the conditions of ripple frequency and  $\Delta T$ . Please contact a representative of Nippon Chemi-Con for the details

Note that a  $\Delta T$  over a certain maximum limit may over-heat the capacitors, though the lifetime estimation will not give you practical lifetime. For instance, the following shows a guide limit of  $\Delta T$  at each ambient temperature for 105°C maximum rated products.

| Ambient temperature Tx (°C)         | 85  | 105 |
|-------------------------------------|-----|-----|
| Guide limit of $\Delta T$ (deg)     | 15  | 5   |
| Core temperature (=Tx+ $\Delta T$ ) | 100 | 110 |

### Approximation of $\Delta T$

You can roughly estimate a  $\Delta T$  by using the following equation without need to measure.

$$\Delta T = \Delta T_0 \cdot (I_x / I_0)^2$$

Where :  $\Delta T_0$ =Please contact a representative of Nippon Chemi-Con for details.

$I_0$  =Rated ripple current ( $I_{RMS}$ ) : if its frequency is different from operating ripple current  $I_x$ , it needs converting by using a frequency multiplier prescribed in the catalog.

$I_x$  =Operating ripple current ( $I_{RMS}$ ) actually flowing into a capacitor

Like switching power supplies, if the operating ripple current consists of commercial frequency element and switching frequency element(s), an internal power loss is expressed by the following equation.

$$W = I_{f1}^2 \cdot R_{f1} + I_{f2}^2 \cdot R_{f2} + \dots + I_{fn}^2 \cdot R_{fn}$$

Where : W =Internal power loss

$I_{f1} \dots I_{fn}$  =Ripple currents at every frequencies  $f1 \dots fn$

$R_{f1} \dots R_{fn}$ =ESR's at every frequencies  $f1 \dots fn$



## PRECAUTIONS AND GUIDELINES

The above equation can be transformed into another equation to get a ripple current value in accordance with the frequency of the rated ripple current, each of  $R_{f1}, \dots, R_{fn}$  is approximately equal to  $R_{f0}$  divided by square value of the frequency multiplier ( $F_{f1} \dots F_{fn}$ ). Here  $R_{f0}$  is the value at the frequency of the rated ripple current and  $F_{f1} \dots F_{fn}$  is a conversion coefficient from one frequency to another in accordance with the frequency  $f_1 \dots f_n$ .

$$\begin{aligned} R_{f1} &= R_{f0} / F_{f1} \\ &\vdots \\ R_{fn} &= R_{f0} / F_{fn} \end{aligned}$$

Relationship of  $W = I_R^2 \cdot R$  leads  $I_{f0}$  as follows:

$$I_{f0} = \sqrt{W/R_{f0}}$$

The above is rewritten in the following equation:

$$I_{f0} = \sqrt{(I_{f1}/F_{f1})^2 + (I_{f2}/F_{f2})^2 + \dots + (I_{fn}/F_{fn})^2}$$

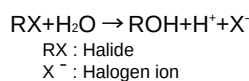
Where :  $I_x$  = Ripple current in accordance with the frequency of the rated ripple current  
 $I_1, \dots, I_n$  = Operating ripple currents at every frequency  $f_1 \dots f_n$   
 $F_{f1}, \dots, F_{fn}$  = Frequency multipliers for every frequency  $f_1 \dots f_n$  prescribed in the catalog, based on the fact that the internal resistance of a capacitor varies with frequency.

The result calculated by the estimated life expectancy formula, it is not guaranteed lifetime.

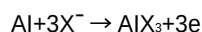
When designer calculate the lifetime of apparatus, please include an extra margin in consideration of the estimated lifetime of a capacitor. When the result calculated by the estimated life expectancy formula exceeds 15 years, please consider 15 years to be a maximum.

### Cleaning Agents

- Cleaning agents penetrate into a capacitor.  
Solvent contacts the rubber seal of a capacitor. Some percentage of solvent does not penetrate but a percentage succeeds in entering and defusing inside the capacitor.
- Cleaning agents decompose and release halogen ions.  
In the electrolyte of the inside element, the halides in the cleaning agents become hydrolyzed and release halogen ions as follows,



- Corrosion  
The halogen ions attack the aluminum foil by the following anodic half-cell reaction:



The  $AlX_3$  further becomes hydrolyzed and release the halogen ion again:



The halogen ions release by this hydrolysis reaction further attacks the aluminum according to the previous reaction formula, and these reactions are repeated and accelerated when voltage and temperature is applied. Also, the hydrogen ions increase the local acidity which causes the oxide dielectric to dissolve. Thus, localized corrosion accelerates to corrode both the aluminum metal and the dielectric. In addition, a terpene

or petroleum system cleaning solvent will be absorbed into the rubber seal of the capacitor. The rubber seal finally weakens. An alkaline saponification detergent will damage the aluminum metal and marking. In summary, recommended cleaning agents are halogen free. Terpene, petroleum, alkali detergent and any solvent making the rubber seal material deteriorate are not recommended.

### Compatible cleaning agents:

In line with recent global environmental warnings (Greenhouse effect and other environmental destruction by depletion of the ozone layer), new types of cleaning agents have been commercialized and substituted as CFC-113, 1,1,2-trichloroethylene and 1,1,1-trichloroethylene. The following are recommended cleaning conditions for some of new cleaning agents.

#### Higher alcohol system cleaning agents

Recommended cleaning agents:

Pine Alpha ST-100S (Arakawa Chemical)  
 Clean Through 750H, 750K, 750L, and 710M (Kao)  
 Technocare FRW-14 through 17 (GE Toshiba Silicones)

Cleaning conditions:

- Capacitors are capable of withstanding immersion or ultrasonic cleaning for 10 minutes at a maximum liquid temperature of 60°C using the above cleaning agents. Find the optimum conditions for washing, rinsing, and drying. Be sure not to rub the marking off the capacitor by contact with any other components on the PC board. Note that shower cleaning adversely affects the marking.
- To rinse by water, control the conditions such as temperature and water pressure to avoid sleeve shrinking or swelling.
- Clean Through 750H and similar are weak-alkaline solvents. Do not leave the alkaline on the capacitor after cleaning process.

### CFCs substitute solvents (HCFC system)

Asahi Glass AK225AES solvent is usable only with solvent resistant type capacitors, which are designed with reinforced seal constructions and modified electrolyte. This product does not penetrate the capacitor and deactivate halogen ions. However, AK225AES is one of the solvents which will have a restricted usage in future from the environmental point of view.

### Non-Halogenated Solvent Cleaning

#### HCFC solvents: AK225AES (Asahi Glass)

Cleaning conditions:

Solvent resistant type capacitors are capable of withstanding immersion, ultrasonic or vapor cleaning for 5 minutes; exception is 2 minutes max. for KRE and KRE-BP series capacitors for 3 minutes and SRM series capacitors.

Applicable series (only for solvent resistant products):

Surface mount : PXX, PXS, PXF, PXE, PXA, PXH, MVS, MVA(4 to 63V<sub>dc</sub>), MV, MVE(6.3 to 63V<sub>dc</sub>), MVK, MZJ, MZA, MVY(6.3 to 63V<sub>dc</sub>), MZF, MZE, MZK, MLA, MLF, MLE, MLK, MVL, MVJ, MVH(10 to 50V<sub>dc</sub>), MHB, MV-BP, MVK-BP

Radial lead : PSK, PSF, PSE, PSC, PSA, PS, SRM, KRE, KMA, SRG, KRG, KMQ(6.3 to 100V<sub>dc</sub>), SMG(6.3 to 250V<sub>dc</sub>), KMG(6.3 to 250V<sub>dc</sub>), SME-BP, KME-BP, LXZ, LXY, LXV, FL, GPA, GXE(10 to 50V<sub>dc</sub>), GXL, GXH, LBG, LLA

### Isopropyl alcohol cleaning agents

IPA (Isopropyl Alcohol) is one of the most acceptable cleaning agents; it is necessary to maintain a flux content in the



## PRECAUTIONS AND GUIDELINES

cleaning liquid at a maximum limit of 2 Wt. %, because chlorides in flux dissolves in the cleaning liquid during the cleaning process.

Xylene-additive IPA may make the rubber seal deteriorate.

### Non-clean flux

Both ionic halogen and non-ionic halogens damage the capacitor when they penetrate in through the rubber seal. Note that some of the fluxes called non-halogenated flux contains less ionic halogen activator but actually a large amount of non-ionic halogen.

Per our analysis, AHQ3100K(Asahi) and POZ6(Senju) minimize ionic and non-ionic halogens.

### Other Precautions to wash capacitors

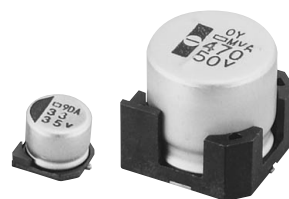
- a) Monitor conductivity, pH, specific gravity and water content of cleaning agents. Contamination adversely affects the characteristics.
- b) The solvent may stay between the end seal and the PC board if the capacitor is mounted directly onto the PCB without a small gap. The residual solvent can cause defects. Also, washing for more than the specified time causes solvent residual. Therefore, wash the assembly board for at least 10 minutes at the recommended temperature. Be sure not to expose the capacitors under solvent rich conditions or keep capacitors inside a closed container.
- c) Reforming the leads of the capacitor to fit lead spacing on the PC board causes cleaning agents to get into the inside capacitor. This may result in corrosion to the foil. Therefore, use the capacitors, which fit the hole spacing on the PC board or reform the lead wires in a manner which will not cause mechanical stress to the capacitor body.

### Recovery Voltage

After discharged aluminum electrolytic capacitor, the voltage will be increasing again. This phenomenon is called by "Recovery Voltage". It happens very often and commonly for all aluminum electrolytic capacitors. In this case, discharge through a 1k $\Omega$  resistance before use at your process, because you may have trouble on sensitive devices and frighten a person working with the capacitor.



## Surface Mount Aluminum Electrolytic Capacitors





## PART NUMBERING SYSTEM

## Product code guide (Surface mount type)

(Example : MVA series, 25V-47 $\mu$ F,  $\phi$ 6.3X5.2L)

Please refer to the following table

|   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| E | M | V | A | 2 | 5 | 0 | A | D | A  | 4  | 7  | 0  | M  | F  | 5  | 5  | G  |

Supplement code⑨

Size code⑧

Capacitance tolerance⑦

Capacitance code⑥

Taping /Tray code⑤

Terminal code④

Voltage code③

Series code②

Category①

## ①Category

| Contents | Code |
|----------|------|
| Polar    | E    |
| Bi-polar | B    |

## ②Series code

| Series name    | Code |     |     |
|----------------|------|-----|-----|
|                | 2nd  | 3rd | 4th |
| MVA            | M    | V   | A   |
| MV             | M    | V   | —   |
| No series name | C    | S   | T   |

## ③Voltage code

| Voltage (V) | Code |     |     |
|-------------|------|-----|-----|
|             | 5th  | 6th | 7th |
| 4           | 4    | R   | 0   |
| 6.3         | 6    | R   | 3   |
| 10          | 1    | 0   | 0   |
| 16          | 1    | 6   | 0   |
| 25          | 2    | 5   | 0   |
| 35          | 3    | 5   | 0   |
| 50          | 5    | 0   | 0   |
| 63          | 6    | 3   | 0   |
| 80          | 8    | 0   | 0   |
| 100         | 1    | 0   | 1   |
| 160         | 1    | 6   | 1   |
| 200         | 2    | 0   | 1   |
| 250         | 2    | 5   | 1   |
| 400         | 4    | 0   | 1   |
| 450         | 4    | 5   | 1   |

## ④Terminal code

| Type                | Code |
|---------------------|------|
|                     | 8th  |
| No dummy terminal   | A    |
| With dummy terminal | G    |

## ⑤Taping / Tray code

| Taping type      | Reel dia. $\phi$ (mm) | Code |      | Application size $\phi$ D (mm)       |
|------------------|-----------------------|------|------|--------------------------------------|
|                  |                       | 9th  | 10th |                                      |
| Reel (Cardboard) | 380                   | D    | A    | $\phi$ D=4 to 18 (not $\phi$ D=12.5) |
| Reel (Cardboard) | 330                   | D    | B    | $\phi$ D=4 to 18                     |
| Reel (Plastic)   | 380                   | P    | A    | $\phi$ D=4 to 10                     |
| Reel for reuse   | 380                   | R    | A    | $\phi$ D=4 to 12.5                   |

| Package | Code |      | Application size $\phi$ D(mm) |
|---------|------|------|-------------------------------|
|         | 9th  | 10th |                               |
| Tray    | T    | R    | $\phi$ D=12.5 to 18           |

Refer to product guide for taping and tray specifications.

## ⑥Capacitance code

| Cap. ( $\mu$ F) | Code |      |      |
|-----------------|------|------|------|
|                 | 11th | 12th | 13th |
| 1.0             | 1    | R    | 0    |
| 1.5             | 1    | R    | 5    |
| 2.2             | 2    | R    | 2    |
| 3.3             | 3    | R    | 3    |
| 4.7             | 4    | R    | 7    |
| 6.8             | 6    | R    | 8    |
| 10              | 1    | 0    | 0    |
| 15              | 1    | 5    | 0    |
| 22              | 2    | 2    | 0    |
| 33              | 3    | 3    | 0    |
| 47              | 4    | 7    | 0    |
| 56              | 5    | 6    | 0    |
| 68              | 6    | 8    | 0    |
| 100             | 1    | 0    | 1    |
| 150             | 1    | 5    | 1    |
| 180             | 1    | 8    | 1    |
| 220             | 2    | 2    | 1    |
| 330             | 3    | 3    | 1    |
| 470             | 4    | 7    | 1    |
| 680             | 6    | 8    | 1    |
| 820             | 8    | 2    | 1    |
| 1,000           | 1    | 0    | 2    |
| 1,500           | 1    | 5    | 2    |
| 2,200           | 2    | 2    | 2    |
| 3,300           | 3    | 3    | 2    |
| 4,700           | 4    | 7    | 2    |
| 6,800           | 6    | 8    | 2    |
| 8,200           | 8    | 2    | 2    |
| 10,000          | 1    | 0    | 3    |

## ⑦Capacitance tolerance

| Tol. (%) | Code |
|----------|------|
|          | 14th |
| $\pm 20$ | M    |

## ⑧Size code (Vertical)

| $\phi$ D (mm) | Code |
|---------------|------|
|               | 15th |
| 4             | D    |
| 5             | E    |
| 6.3           | F    |
| 8             | H    |
| 10            | J    |
| 12.5          | K    |
| 16            | L    |
| 18            | M    |

| L (mm) | Code |      |
|--------|------|------|
|        | 16th | 17th |
| 4.5    | 4    | 6    |
| 5.2    | 5    | 5    |
| 5.7    | 6    | 0    |
| 5.8    | 6    | 1    |
| 6.3    | 6    | 3    |
| 7.0    | 7    | 3    |
| 7.7    | 8    | 0    |
| 8.7    | 9    | 0    |
| 10     | A    | 0    |
| 13.5   | E    | 0    |
| 16     | G    | 5    |
| 16.5   | H    | 0    |
| 21.5   | N    | 0    |

## ⑨Supplement code

| Terminal plating material | Code |
|---------------------------|------|
|                           | 18th |
| Sn-Bi                     | G    |
| Sn                        | S    |

\* Refer to the appendix (Part number) for codes not listed here.

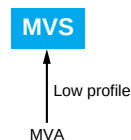


## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

4.5mm height, 85°C

## Alchip™-MVS Series

- 4.5mm height
- Endurance : 2,000 hours at 85°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

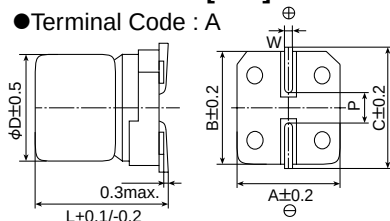


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                        |                                      |      |      |      |      |      |                                      |                  |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|--------------------------------------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                      |                                      |      |      |      |      |      |                                      |                  |
| Rated Voltage Range                                    | 4 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                                 |                                      |      |      |      |      |      |                                      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                              |                                      |      |      |      |      |      |                                      |                  |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                          |                                      |      |      |      |      |      |                                      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V                                  | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                            | 0.50                                 | 0.30 | 0.24 | 0.19 | 0.16 | 0.14 | 0.14                                 |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V                                  | (at 120Hz)       |
|                                                        | Z(−25°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | 7                                    | 4    | 3    | 2    | 2    | 2    | 2                                    |                  |
|                                                        | Z(−40°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | 15                                   | 8    | 8    | 4    | 4    | 3    | 3                                    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 85°C.                                                                                                                                   |                                      |      |      |      |      |      |                                      |                  |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                          | 4 & 6.3V <sub>dc</sub>               |      |      |      |      |      | 10 to 50V <sub>dc</sub>              |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±30% of the initial value           |      |      |      |      |      | ≤±25% of the initial value           |                  |
|                                                        | DF (tanδ)                                                                                                                                                                                                                                                                              | ≤300% of the initial specified value |      |      |      |      |      | ≤300% of the initial specified value |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |      |      |      |      |      | ≤The initial specified value         |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |                                      |                  |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                          | 4 & 6.3V <sub>dc</sub>               |      |      |      |      |      | 10 to 50V <sub>dc</sub>              |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±30% of the initial value           |      |      |      |      |      | ≤±25% of the initial value           |                  |
|                                                        | DF (tanδ)                                                                                                                                                                                                                                                                              | ≤300% of the initial specified value |      |      |      |      |      | ≤300% of the initial specified value |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |      |      |      |      |      | ≤The initial specified value         |                  |

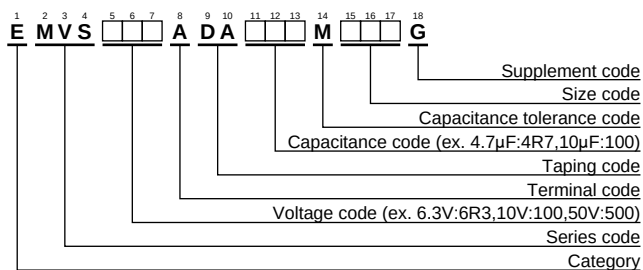
## ◆ DIMENSIONS [mm]

● Terminal Code : A



| Size code | D   | L   | A   | B   | C   | W          | P   |
|-----------|-----|-----|-----|-----|-----|------------|-----|
| D46       | 4   | 4.5 | 4.3 | 4.3 | 5.1 | 0.5 to 0.8 | 1.0 |
| E46       | 5   | 4.5 | 5.3 | 5.3 | 5.9 | 0.5 to 0.8 | 1.4 |
| F46       | 6.3 | 4.5 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆ MARKING

EX) 16V47μF



## ◆ STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | tanδ | Rated ripple current (mA <sub>rms</sub> /85°C, 120Hz) | Part No.           |
|-----------------------|----------|-----------|------|-------------------------------------------------------|--------------------|
| 4                     | 33       | D46       | 0.50 | 28                                                    | EMVS4R0ADA330MD46G |
|                       | 47       | D46       | 0.50 | 33                                                    | EMVS4R0ADA470MD46G |
|                       | 100      | E46       | 0.50 | 56                                                    | EMVS4R0ADA101ME46G |
|                       | 220      | F46       | 0.50 | 96                                                    | EMVS4R0ADA221MF46G |
| 6.3                   | 22       | D46       | 0.30 | 28                                                    | EMVS6R3ADA220MD46G |
|                       | 47       | E46       | 0.30 | 45                                                    | EMVS6R3ADA470ME46G |
|                       | 100      | F46       | 0.30 | 70                                                    | EMVS6R3ADA101MF46G |
| 10                    | 33       | E46       | 0.24 | 41                                                    | EMVS100ADA330ME46G |
| 16                    | 10       | D46       | 0.19 | 23                                                    | EMVS160ADA100MD46G |
|                       | 22       | E46       | 0.19 | 37                                                    | EMVS160ADA220ME46G |
|                       | 47       | F46       | 0.19 | 58                                                    | EMVS160ADA470MF46G |

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | tanδ | Rated ripple current (mA <sub>rms</sub> /85°C, 120Hz) | Part No.           |
|-----------------------|----------|-----------|------|-------------------------------------------------------|--------------------|
| 25                    | 33       | F46       | 0.16 | 52                                                    | EMVS250ADA330MF46G |
| 35                    | 4.7      | D46       | 0.14 | 18                                                    | EMVS350ADA4R7MD46G |
|                       | 10       | E46       | 0.14 | 29                                                    | EMVS350ADA100ME46G |
|                       | 22       | F46       | 0.14 | 46                                                    | EMVS350ADA220MF46G |
| 50                    | 1.0      | D46       | 0.14 | 8.4                                                   | EMVS500ADA1R0MD46G |
|                       | 2.2      | D46       | 0.14 | 13                                                    | EMVS500ADA2R2MD46G |
|                       | 3.3      | D46       | 0.14 | 17                                                    | EMVS500ADA3R3MD46G |
|                       | 4.7      | E46       | 0.14 | 20                                                    | EMVS500ADA4R7ME46G |
|                       | 10       | F46       | 0.14 | 33                                                    | EMVS500ADA100MF46G |

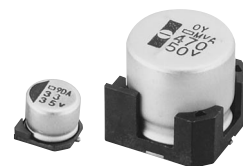


## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85°C

## Alchip™-MVA Series

- φ4 through φ18 case sizes are fully lined up
- Endurance : 2,000 hours at 85°C
- Suitable to fit for downsized equipment
- Solvent resistant type except 100 to 450V<sub>dc</sub> (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

MVA → MVE  
105°C

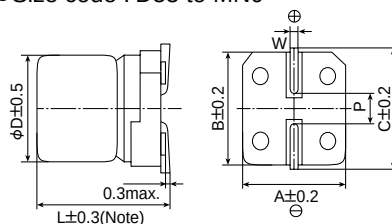
## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                        |                                                         |      |      |      |                                      |      |                                     |             |      |             |            |               |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|------|------|------|--------------------------------------|------|-------------------------------------|-------------|------|-------------|------------|---------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                      |                                                         |      |      |      |                                      |      |                                     |             |      |             |            |               |
| Rated Voltage Range                                    | 4 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                |                                                         |      |      |      |                                      |      |                                     |             |      |             |            |               |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                              |                                                         |      |      |      |                                      |      |                                     |             |      |             |            |               |
| Leakage Current                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 4 to 100V                                               |      |      |      |                                      |      | 160 to 450V                         |             |      |             |            |               |
|                                                        | D55 to JA0                                                                                                                                                                                                                                                                             | I=0.01CV or 3μA, whichever is greater.(after 2 minutes) |      |      |      |                                      |      | —                                   |             |      |             |            |               |
|                                                        | KE0 to MN0                                                                                                                                                                                                                                                                             | I=0.03CV or 4μA, whichever is greater.(after 1 minute)  |      |      |      |                                      |      | I=0.04CV+100μA max.(after 1 minute) |             |      |             |            |               |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C)                                                                                                                                                                                    |                                                         |      |      |      |                                      |      |                                     |             |      |             |            |               |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 4V                                                      | 6.3V | 10V  | 16V  | 25V                                  | 35V  | 50V                                 | 63V         | 100V | 160 to 250V | 400 & 450V |               |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                            | D55 to JA0                                              | 0.42 | 0.35 | 0.30 | 0.26                                 | 0.16 | 0.14                                | 0.12        | 0.12 | 0.12        | —          | —             |
|                                                        |                                                                                                                                                                                                                                                                                        | KE0 to MN0                                              | —    | 0.38 | 0.34 | 0.30                                 | 0.26 | 0.22                                | 0.18        | 0.14 | 0.10        | 0.20       | 0.25          |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                      |                                                         |      |      |      |                                      |      |                                     |             |      |             |            |               |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 4V                                                      | 6.3V | 10V  | 16V  | 25V                                  | 35V  | 50V                                 | 63V         | 100V | 160 to 250V | 400 & 450V |               |
|                                                        | D55 to JA0                                                                                                                                                                                                                                                                             | Z(−25°C)/Z(+20°C)                                       | 7    | 4    | 3    | 2                                    | 2    | 2                                   | 2           | 3    | —           | —          |               |
|                                                        |                                                                                                                                                                                                                                                                                        | Z(−40°C)/Z(+20°C)                                       | 17   | 10   | 8    | 6                                    | 4    | 3                                   | 3           | 4    | —           | —          |               |
|                                                        | KE0 to MN0                                                                                                                                                                                                                                                                             | Z(−25°C)/Z(+20°C)                                       | —    | 5    | 4    | 3                                    | 2    | 2                                   | 2           | 2    | 3           | 6          |               |
|                                                        |                                                                                                                                                                                                                                                                                        | Z(−40°C)/Z(+20°C)                                       | —    | 12   | 10   | 8                                    | 5    | 4                                   | 3           | 3    | 3           | 6          | 10 (at 120Hz) |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 85°C.                                                                                                                                   |                                                         |      |      |      |                                      |      |                                     |             |      |             |            |               |
|                                                        | Size code                                                                                                                                                                                                                                                                              | D55 to JA0                                              |      |      |      | D55 to JA0                           |      |                                     | KE0 to MN0  |      |             |            |               |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 4V & 6.3V                                               |      |      |      | 10 to 100V                           |      |                                     | 6.3 to 450V |      |             |            |               |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±30% of the initial value                              |      |      |      | ≤±20% of the initial value           |      |                                     |             |      |             |            |               |
|                                                        | DF (tanδ)                                                                                                                                                                                                                                                                              | ≤200% of the initial specified value                    |      |      |      | ≤200% of the initial specified value |      |                                     |             |      |             |            |               |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value                            |      |      |      | ≤The initial specified value         |      |                                     |             |      |             |            |               |
|                                                        |                                                                                                                                                                                                                                                                                        |                                                         |      |      |      |                                      |      |                                     |             |      |             |            |               |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                         |      |      |      |                                      |      |                                     |             |      |             |            |               |
|                                                        | Size code                                                                                                                                                                                                                                                                              | D55 to JA0                                              |      |      |      | D55 to JA0                           |      |                                     | KE0 to MN0  |      |             |            |               |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                          | 4V & 6.3V                                               |      |      |      | 10 to 100V                           |      |                                     | 6.3 to 450V |      |             |            |               |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±30% of the initial value                              |      |      |      | ≤±20% of the initial value           |      |                                     |             |      |             |            |               |
|                                                        | DF (tanδ)                                                                                                                                                                                                                                                                              | ≤200% of the initial specified value                    |      |      |      | ≤200% of the initial specified value |      |                                     |             |      |             |            |               |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value                            |      |      |      | ≤The initial specified value         |      |                                     |             |      |             |            |               |
|                                                        |                                                                                                                                                                                                                                                                                        |                                                         |      |      |      |                                      |      |                                     |             |      |             |            |               |
|                                                        |                                                                                                                                                                                                                                                                                        |                                                         |      |      |      |                                      |      |                                     |             |      |             |            |               |

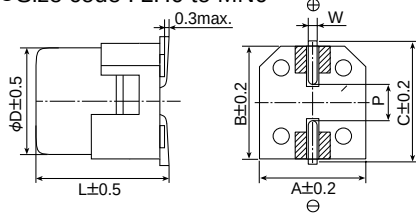
## ◆DIMENSIONS [mm]

- Terminal Code : A
- Size code : D55 to MN0

- Terminal Code : G
- Size code : LH0 to MN0



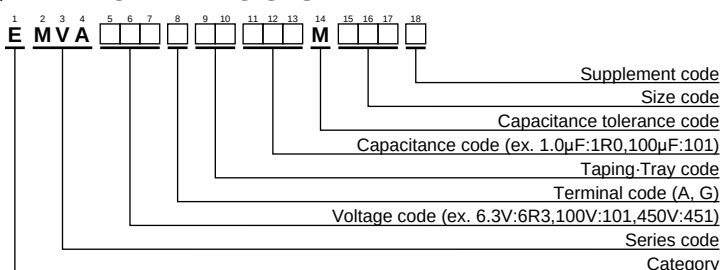
Note : L±0.5 for HA0 to MN0



⊠ : Dummy terminals

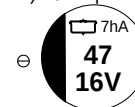
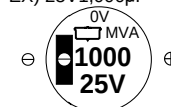
| Size code | D    | L    | A    | B    | C    | W          | P   |
|-----------|------|------|------|------|------|------------|-----|
| D55       | 4    | 5.2  | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E55       | 5    | 5.2  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F55       | 6.3  | 5.2  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F80       | 6.3  | 7.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8    | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10   | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |
| KE0       | 12.5 | 13.5 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 |
| KG5       | 12.5 | 16.0 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 |
| LH0       | 16   | 16.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 |
| LN0       | 16   | 21.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 |
| MH0       | 18   | 16.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 |
| MN0       | 18   | 21.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆MARKING

D55 to JA0  
EX) 16V47μFKE0 to MN0  
EX) 25V1,000μF



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85°C

Alchip™-MVA Series

## ◆STANDARD RATINGS

□ is not solvent resistant.

| WV (Vdc) | Cap (μF) | Size code | tanδ | Rated ripple current (mA rms/85°C, 120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Size code | tanδ | Rated ripple current (mA rms/85°C, 120Hz) | Part No.           |
|----------|----------|-----------|------|-------------------------------------------|--------------------|----------|----------|-----------|------|-------------------------------------------|--------------------|
| 4        | 33       | D55       | 0.42 | 25                                        | EMVA4R0ADA330MD55G | 35       | 33       | F55       | 0.14 | 54                                        | EMVA350ADA330MF55G |
|          | 47       | D55       | 0.42 | 30                                        | EMVA4R0ADA470MD55G |          | 100      | F80       | 0.14 | 120                                       | EMVA350ADA101MF80G |
|          | 100      | E55       | 0.42 | 50                                        | EMVA4R0ADA101ME55G |          | 150      | HA0       | 0.14 | 210                                       | EMVA350ADA151MHA0G |
|          | 220      | F55       | 0.42 | 80                                        | EMVA4R0ADA221MF55G |          | 220      | HA0       | 0.14 | 260                                       | EMVA350ADA221MHA0G |
|          | 330      | F80       | 0.42 | 135                                       | EMVA4R0ADA331MF80G |          | 330      | JA0       | 0.14 | 360                                       | EMVA350ADA331MJA0G |
|          | 470      | F80       | 0.42 | 150                                       | EMVA4R0ADA471MF80G |          | 470      | KE0       | 0.22 | 600                                       | EMVA350ARA471MKE0S |
| 6.3      | 1,000    | HA0       | 0.42 | 320                                       | EMVA4R0ADA102MHA0G | 50       | 1,000    | LH0       | 0.22 | 1,100                                     | EMVA350□DA102MLH0S |
|          | 33       | D55       | 0.35 | 30                                        | EMVA6R3ADA330MD55G |          | 2,200    | MN0       | 0.24 | 1,700                                     | EMVA350□DA222MMN0S |
|          | 47       | D55       | 0.35 | 33                                        | EMVA6R3ADA470MD55G |          | 3.3      | D55       | 0.12 | 15                                        | EMVA500ADA3R3MD55G |
|          | 100      | E55       | 0.35 | 55                                        | EMVA6R3ADA101ME55G |          | 4.7      | D55       | 0.12 | 18                                        | EMVA500ADA4R7MD55G |
|          | 220      | E55       | 0.35 | 88                                        | EMVA6R3ADA221MF55G |          | 10       | E55       | 0.12 | 30                                        | EMVA500ADA100ME55G |
|          | 330      | F80       | 0.35 | 135                                       | EMVA6R3ADA331MF80G |          | 22       | F55       | 0.12 | 47                                        | EMVA500ADA220MF55G |
|          | 470      | HA0       | 0.35 | 280                                       | EMVA6R3ADA471MHA0G |          | 33       | F80       | 0.12 | 70                                        | EMVA500ADA330MF80G |
|          | 680      | HA0       | 0.35 | 290                                       | EMVA6R3ADA681MHA0G |          | 47       | F80       | 0.12 | 85                                        | EMVA500ADA470MF80G |
|          | 820      | HA0       | 0.35 | 320                                       | EMVA6R3ADA821MHA0G |          | 100      | HA0       | 0.12 | 190                                       | EMVA500ADA101MHA0G |
|          | 1,000    | JA0       | 0.35 | 430                                       | EMVA6R3ADA102MJA0G |          | 220      | JA0       | 0.12 | 320                                       | EMVA500ADA221MJA0G |
|          | 1,500    | JA0       | 0.35 | 480                                       | EMVA6R3ADA152MJA0G |          | 330      | KE0       | 0.18 | 600                                       | EMVA500ARA331MKE0S |
|          | 2,200    | KE0       | 0.40 | 890                                       | EMVA6R3ARA222MKE0S |          | 470      | KG5       | 0.18 | 740                                       | EMVA500ARA471MKG5S |
|          | 3,300    | KG5       | 0.42 | 1,000                                     | EMVA6R3ARA332MKG5S |          | 470      | LH0       | 0.18 | 850                                       | EMVA500□DA471MLH0S |
|          | 3,300    | LH0       | 0.42 | 1,200                                     | EMVA6R3□DA332MLH0S |          | 1,000    | LH0       | 0.18 | 1,300                                     | EMVA500□DA102MLN0S |
| 10       | 4,700    | LH0       | 0.44 | 1,400                                     | EMVA6R3□DA472MLH0S | 63       | 1,000    | MN0       | 0.18 | 1,400                                     | EMVA500□DA102MMN0S |
|          | 6,800    | LN0       | 0.48 | 1,750                                     | EMVA6R3□DA682MLN0S |          | 1.0      | D55       | 0.12 | 8.0                                       | EMVA630ADA1R0MD55G |
|          | 6,800    | MH0       | 0.48 | 1,700                                     | EMVA6R3□DA682MMH0S |          | 2.2      | D55       | 0.12 | 12                                        | EMVA630ADA2R2MD55G |
|          | 10,000   | MN0       | 0.56 | 2,000                                     | EMVA6R3□DA103MMN0S |          | 3.3      | E55       | 0.12 | 17                                        | EMVA630ADA3R3ME55G |
|          | 22       | D55       | 0.30 | 26                                        | EMVA100ADA220MD55G |          | 4.7      | E55       | 0.12 | 20                                        | EMVA630ADA4R7ME55G |
|          | 33       | D55       | 0.30 | 30                                        | EMVA100ADA330MD55G |          | 10       | F55       | 0.12 | 32                                        | EMVA630ADA100MF55G |
|          | 47       | E55       | 0.30 | 44                                        | EMVA100ADA470ME55G |          | 22       | F80       | 0.12 | 60                                        | EMVA630ADA220MF80G |
|          | 100      | F55       | 0.30 | 70                                        | EMVA100ADA101MF55G |          | 33       | HA0       | 0.12 | 110                                       | EMVA630ADA330MHA0G |
|          | 150      | F55       | 0.30 | 79                                        | EMVA100ADA151MF55G |          | 47       | HA0       | 0.12 | 130                                       | EMVA630ADA470MHA0G |
|          | 220      | F80       | 0.30 | 130                                       | EMVA100ADA221MF80G |          | 56       | JA0       | 0.12 | 160                                       | EMVA630ADA560MJA0G |
| 16       | 330      | HA0       | 0.30 | 270                                       | EMVA100ADA331MHA0G | 100      | 68       | JA0       | 0.12 | 170                                       | EMVA630ADA680MJA0G |
|          | 470      | HA0       | 0.30 | 280                                       | EMVA100ADA471MHA0G |          | 100      | KE0       | 0.14 | 380                                       | EMVA630ARA101MKE0S |
|          | 1,000    | JA0       | 0.30 | 430                                       | EMVA100ADA102MJA0G |          | 220      | KE0       | 0.14 | 580                                       | EMVA630ARA221MKE0S |
|          | 2,200    | KE0       | 0.36 | 960                                       | EMVA100ARA222MKE0S |          | 330      | KG5       | 0.14 | 720                                       | EMVA630ARA331MKG5S |
|          | 3,300    | LH0       | 0.38 | 1,300                                     | EMVA100□DA332MLH0S |          | 330      | LH0       | 0.14 | 820                                       | EMVA630□DA331MLH0S |
|          | 4,700    | LN0       | 0.40 | 1,550                                     | EMVA100□DA472MLN0S |          | 470      | LH0       | 0.14 | 950                                       | EMVA630□DA471MLH0S |
|          | 4,700    | MH0       | 0.40 | 1,600                                     | EMVA100□DA472MMH0S |          | 470      | MH0       | 0.14 | 1,000                                     | EMVA630□DA471MMH0S |
|          | 6,800    | MN0       | 0.44 | 1,850                                     | EMVA100□DA682MMN0S | 160      | 22       | HA0       | 0.12 | 90                                        | EMVA101ADA220MHA0G |
|          | 22       | D55       | 0.26 | 26                                        | EMVA160ADA220MD55G |          | 33       | JA0       | 0.12 | 120                                       | EMVA101ADA330MJA0G |
|          | 33       | E55       | 0.26 | 37                                        | EMVA160ADA330ME55G |          | 68       | KE0       | 0.10 | 380                                       | EMVA101ARA680MKE0S |
|          | 47       | E55       | 0.26 | 44                                        | EMVA160ADA470ME55G |          | 100      | KE0       | 0.10 | 440                                       | EMVA101ARA101MKE0S |
|          | 100      | F55       | 0.26 | 70                                        | EMVA160ADA101MF55G |          | 220      | LN0       | 0.10 | 850                                       | EMVA101□DA221MLN0S |
|          | 150      | F80       | 0.26 | 110                                       | EMVA160ADA151MF80G |          | 220      | MH0       | 0.10 | 800                                       | EMVA101□DA221MMH0S |
| 25       | 220      | F80       | 0.26 | 130                                       | EMVA160ADA221MF80G | 200      | 330      | MN0       | 0.10 | 1,000                                     | EMVA101□DA331MMN0S |
|          | 330      | HA0       | 0.26 | 270                                       | EMVA160ADA331MHA0G |          | 47       | KG5       | 0.20 | 370                                       | EMVA161ARA470MKG5S |
|          | 470      | HA0       | 0.26 | 280                                       | EMVA160ADA471MHA0G |          | 68       | LH0       | 0.20 | 500                                       | EMVA161□DA680MLH0S |
|          | 680      | JA0       | 0.26 | 380                                       | EMVA160ADA681MJA0G |          | 100      | LN0       | 0.20 | 590                                       | EMVA161□DA101MLN0S |
|          | 1,000    | KE0       | 0.30 | 710                                       | EMVA160ARA102MKE0S |          | 100      | MH0       | 0.20 | 590                                       | EMVA161□DA101MMH0S |
|          | 2,200    | LH0       | 0.32 | 1,150                                     | EMVA160□DA222MLH0S | 250      | 22       | KE0       | 0.20 | 240                                       | EMVA201ARA220MKE0S |
|          | 3,300    | LN0       | 0.34 | 1,450                                     | EMVA160□DA332MLN0S |          | 33       | KG5       | 0.20 | 310                                       | EMVA201ARA330MKG5S |
|          | 3,300    | MH0       | 0.34 | 1,450                                     | EMVA160□DA332MMH0S |          | 47       | LH0       | 0.20 | 420                                       | EMVA201□DA470MLH0S |
|          | 4,700    | MN0       | 0.36 | 1,750                                     | EMVA160□DA472MMN0S |          | 68       | LN0       | 0.20 | 510                                       | EMVA201□DA680MLN0S |
|          | 10       | D55       | 0.16 | 24                                        | EMVA250ADA100MD55G |          | 68       | MH0       | 0.20 | 510                                       | EMVA201□DA680MMH0S |
|          | 22       | E55       | 0.16 | 41                                        | EMVA250ADA220ME55G | 400      | 100      | MN0       | 0.20 | 590                                       | EMVA201□DA101MMN0S |
|          | 33       | E55       | 0.16 | 47                                        | EMVA250ADA330ME55G |          | 10       | KE0       | 0.20 | 150                                       | EMVA251ARA100MKE0S |
|          | 47       | F55       | 0.16 | 60                                        | EMVA250ADA470MF55G |          | 22       | KG5       | 0.20 | 240                                       | EMVA251ARA220MKG5S |
|          | 56       | F55       | 0.16 | 66                                        | EMVA250ADA560MF55G |          | 33       | LH0       | 0.20 | 340                                       | EMVA251□DA330MLH0S |
|          | 100      | F80       | 0.16 | 120                                       | EMVA250ADA101MF80G |          | 47       | LN0       | 0.20 | 420                                       | EMVA251□DA470MLN0S |
|          | 150      | HA0       | 0.16 | 210                                       | EMVA250ADA151MHA0G |          | 47       | MH0       | 0.20 | 420                                       | EMVA251□DA470MMH0S |
| 35       | 220      | HA0       | 0.16 | 260                                       | EMVA250ADA221MHA0G | 450      | 68       | MN0       | 0.20 | 490                                       | EMVA251□DA680MMN0S |
|          | 330      | HA0       | 0.16 | 300                                       | EMVA250ADA331MHA0G |          | 4.7      | KE0       | 0.25 | 120                                       | EMVA401ARA47MKE0S  |
|          | 470      | JA0       | 0.16 | 400                                       | EMVA250ADA471MJA0G |          | 10       | LH0       | 0.25 | 140                                       | EMVA401□DA100MLH0S |
|          | 1,000    | KE0       | 0.26 | 820                                       | EMVA250ARA102MKE0S |          | 22       | LN0       | 0.25 | 280                                       | EMVA401□DA220MLN0S |
|          | 2,200    | LN0       | 0.28 | 1,450                                     | EMVA250□DA222MLN0S |          | 22       | MH0       | 0.25 | 280                                       | EMVA401□DA220MMH0S |
|          | 2,200    | MH0       | 0.28 | 1,400                                     | EMVA250□DA222MMH0S | 450      | 33       | MN0       | 0.25 | 350                                       | EMVA401□DA330MMN0S |
| 35       | 3,300    | MN0       | 0.30 | 1,800                                     | EMVA250□DA332MMN0S |          | 4.7      | KE0       | 0.25 | 120                                       | EMVA451ARA47MKE0S  |
|          | 4.7      | D55       | 0.14 | 18                                        | EMVA350ADA4R7MD55G |          | 10       | LH0       | 0.25 | 140                                       | EMVA451□DA100MLH0S |
|          | 10       | D55       | 0.14 | 24                                        | EMVA350ADA100MD55G |          | 22       | LN0       | 0.25 | 280                                       | EMVA451□DA220MLN0S |
|          | 22       | E55       | 0.14 | 41                                        | EMVA350ADA220ME55G |          | 33       | MN0       | 0.25 | 350                                       | EMVA451□DA330MMN0S |

□ : Enter the appropriate terminal code.

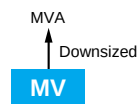


## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Standard, 85°C

## Alchip™-MV Series

- Height 5.2 to 10.0mm
- Suitable to fit for downsized equipment
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant
- MV series will be discontinued, strongly recommended MVA series

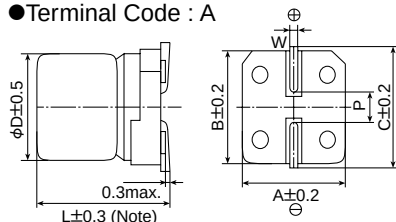


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                    |            |                                      |      |      |      |      |      |      |      |                |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------|------|------|------|------|------|------|------|----------------|
| Category Temperature Range                             | -40 to +85℃                                                                                                                                                                                                                                                                        |            |                                      |      |      |      |      |      |      |      |                |
| Rated Voltage Range                                    | 4 to 63V <sub>dc</sub>                                                                                                                                                                                                                                                             |            |                                      |      |      |      |      |      |      |      |                |
| Capacitance Tolerance                                  | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                           |            |                                      |      |      |      |      |      |      |      |                |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)                                                                                                                       |            |                                      |      |      |      |      |      |      |      |                |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                   |            | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  | (at 20℃,120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                        | D55 to F60 | 0.42                                 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.12 |                |
|                                                        |                                                                                                                                                                                                                                                                                    | H63 to JA0 | —                                    | 0.40 | 0.30 | 0.26 | 0.16 | 0.14 | 0.12 | 0.12 |                |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                   |            | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  | (at 120Hz)     |
|                                                        | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                    |            | 7                                    | 4    | 3    | 2    | 2    | 2    | 2    | 2    |                |
|                                                        | Z(-40℃)/Z(+20℃)                                                                                                                                                                                                                                                                    | D55 to F60 | 15                                   | 10   | 8    | 6    | 4    | 3    | 3    | 3    |                |
|                                                        |                                                                                                                                                                                                                                                                                    | H63 to JA0 | —                                    | 10   | 8    | 6    | 4    | 3    | 3    | 3    |                |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 2,000 hours at 85℃.                                                                                                                                 |            |                                      |      |      |      |      |      |      |      |                |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                 |            | ≤±20% of the initial value           |      |      |      |      |      |      |      |                |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                        |            | ≤200% of the initial specified value |      |      |      |      |      |      |      |                |
|                                                        | Leakage current                                                                                                                                                                                                                                                                    |            | ≤The initial specified value         |      |      |      |      |      |      |      |                |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 500 hours at 85℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |            |                                      |      |      |      |      |      |      |      |                |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                 |            | ≤±15% of the initial value           |      |      |      |      |      |      |      |                |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                        |            | ≤150% of the initial specified value |      |      |      |      |      |      |      |                |
|                                                        | Leakage current                                                                                                                                                                                                                                                                    |            | ≤The initial specified value         |      |      |      |      |      |      |      |                |

## ◆DIMENSIONS [mm]

- Terminal Code : A



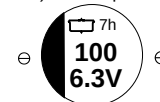
Note : L±0.5 for H63 to JA0

| Size code | D   | L    | A    | B    | C    | W          | P   |
|-----------|-----|------|------|------|------|------------|-----|
| D55 & D60 | 4   | *5.2 | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E55 & E60 | 5   | *5.2 | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F55       | 6.3 | 5.2  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| H63       | 8   | 6.3  | 8.3  | 8.3  | 9.0  | 0.5 to 0.8 | 2.3 |
| HA0       | 8   | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10  | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

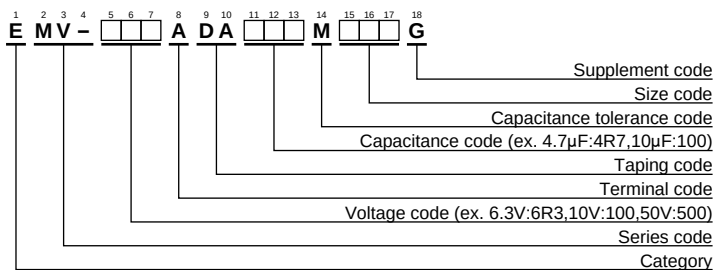
\* : L=5.7 for D60, E60 and F60.

## ◆MARKING

EX)6.3V100μF



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Standard, 85°C

Alchip™-MV Series

## ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Size code | tanδ | Rated ripple current (mA <sub>rms</sub> /85°C,120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Size code | tanδ | Rated ripple current (mA <sub>rms</sub> /85°C,120Hz) | Part No.           |
|----------|----------|-----------|------|------------------------------------------------------|--------------------|----------|----------|-----------|------|------------------------------------------------------|--------------------|
| 4        | 33       | D55       | 0.42 | 23                                                   | EMV-4R0ADA330MD55G | 35       | 4.7      | D55       | 0.12 | 15                                                   | EMV-350ADA4R7MD55G |
|          | 47       | D55       | 0.42 | 27                                                   | EMV-4R0ADA470MD55G |          | 10       | E55       | 0.12 | 25                                                   | EMV-350ADA100ME55G |
|          | 100      | E55       | 0.42 | 46                                                   | EMV-4R0ADA101ME55G |          | 22       | F55       | 0.12 | 40                                                   | EMV-350ADA220MF55G |
|          | 220      | F55       | 0.42 | 74                                                   | EMV-4R0ADA221MF55G |          | 47       | H63       | 0.14 | 105                                                  | EMV-350ADA470MH63G |
| 6.3      | 22       | D55       | 0.24 | 23                                                   | EMV-6R3ADA220MD55G |          | 100      | HA0       | 0.14 | 175                                                  | EMV-350ADA101MHA0G |
|          | 47       | E55       | 0.24 | 38                                                   | EMV-6R3ADA470ME55G |          | 220      | JA0       | 0.14 | 265                                                  | EMV-350ADA221MJA0G |
|          | 100      | F55       | 0.24 | 60                                                   | EMV-6R3ADA101MF55G | 50       | 1.0      | D55       | 0.10 | 6.2                                                  | EMV-500ADA1R0MD55G |
|          | 330      | H63       | 0.40 | 190                                                  | EMV-6R3ADA331MH63G |          | 2.2      | D55       | 0.10 | 10                                                   | EMV-500ADA2R2MD55G |
|          | 470      | HA0       | 0.40 | 265                                                  | EMV-6R3ADA471MHA0G |          | 3.3      | D55       | 0.10 | 14                                                   | EMV-500ADA3R3MD55G |
| 10       | 1,000    | JA0       | 0.40 | 400                                                  | EMV-6R3ADA102MJA0G |          | 4.7      | E55       | 0.10 | 19                                                   | EMV-500ADA4R7ME55G |
|          | 33       | E55       | 0.20 | 35                                                   | EMV-100ADA330ME55G |          | 10       | F55       | 0.10 | 29                                                   | EMV-500ADA100MF55G |
|          | 220      | H63       | 0.30 | 175                                                  | EMV-100ADA221MH63G |          | 33       | H63       | 0.12 | 95                                                   | EMV-500ADA330MH63G |
| 16       | 10       | D55       | 0.16 | 17                                                   | EMV-160ADA100MD55G |          | 47       | HA0       | 0.12 | 140                                                  | EMV-500ADA470MHA0G |
|          | 22       | E55       | 0.16 | 32                                                   | EMV-160ADA220ME55G |          | 100      | JA0       | 0.12 | 195                                                  | EMV-500ADA101MJA0G |
|          | 47       | F55       | 0.16 | 50                                                   | EMV-160ADA470MF55G | 63       | 1.0      | D60       | 0.12 | 7.0                                                  | EMV-630ADA1R0MD60G |
|          | 220      | HA0       | 0.26 | 215                                                  | EMV-160ADA221MHA0G |          | 2.2      | D60       | 0.12 | 10                                                   | EMV-630ADA2R2MD60G |
|          | 330      | HA0       | 0.26 | 270                                                  | EMV-160ADA331MHA0G |          | 3.3      | E60       | 0.12 | 13                                                   | EMV-630ADA3R3ME60G |
|          | 470      | JA0       | 0.26 | 330                                                  | EMV-160ADA471MJA0G |          | 10       | HA0       | 0.12 | 46                                                   | EMV-630ADA100MHA0G |
| 25       | 33       | F55       | 0.14 | 45                                                   | EMV-250ADA330MF55G |          | 22       | HA0       | 0.12 | 69                                                   | EMV-630ADA220MHA0G |
|          | 100      | H63       | 0.16 | 145                                                  | EMV-250ADA101MH63G |          | 33       | HA0       | 0.12 | 85                                                   | EMV-630ADA330MHA0G |
|          | 330      | JA0       | 0.16 | 305                                                  | EMV-250ADA331MJA0G |          | 47       | HA0       | 0.12 | 101                                                  | EMV-630ADA470MHA0G |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 105°C

## Alchip™-MVE Series

- Rated voltage range : 6.3 to 450V, capacitance range : 1.0 to 6,800 $\mu$ F
- Endurance : 1,000 to 2,000 hours at 105°C
- Case size range :  $\phi$ 4×5.2L to  $\phi$ 18×21.5L
- Solvent resistant type except 100 to 450V<sub>dc</sub> (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

MVE → MVL  
Longer life MVJ



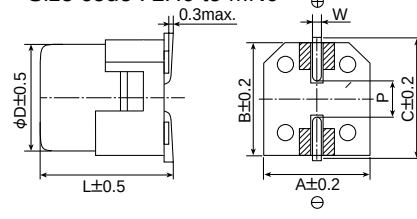
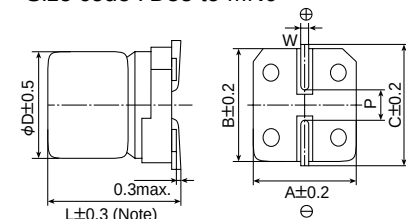
## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                         |     |     |     |     |                                      |                          |      |             |             |         |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|--------------------------------------|--------------------------|------|-------------|-------------|---------|
| Category                                               | Temperature Range                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         |     |     |     |     |                                      |                          |      |             |             |         |
| Temperature Range                                      | -40 to +105°C                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                         |     |     |     |     |                                      |                          |      |             |             |         |
| Rated Voltage Range                                    | 6.3 to 450V <sub>dc</sub>                                                                                                                                              |                                                                                                                                                                                                                                                                                                                         |     |     |     |     |                                      |                          |      |             |             |         |
| Capacitance Tolerance                                  | ±20%(M) (20°C, 120Hz)                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                         |     |     |     |     |                                      |                          |      |             |             |         |
| Leakage Current                                        | Rated voltage(V <sub>dc</sub> )                                                                                                                                        | 6.3 to 100V                                                                                                                                                                                                                                                                                                             |     |     |     |     |                                      | 160 to 450V              |      |             |             | (20°C)  |
|                                                        | D55 to JA0                                                                                                                                                             | I=0.01CV or 3μA, whichever is greater (2 minutes)                                                                                                                                                                                                                                                                       |     |     |     |     |                                      | —                        |      |             |             |         |
|                                                        | KE0 to MN0                                                                                                                                                             | I=0.03CV or 4μA, whichever is greater (1 minute)                                                                                                                                                                                                                                                                        |     |     |     |     |                                      | I=0.04CV+100μA (1minute) |      |             |             |         |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                              |                                                                                                                                                                                                                                                                                                                         |     |     |     |     |                                      |                          |      |             |             |         |
| Dissipation Factor (tanδ)                              | See STANDARD RATINGS (20°C, 120Hz)                                                                                                                                     |                                                                                                                                                                                                                                                                                                                         |     |     |     |     |                                      |                          |      |             |             |         |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                       | 6.3V                                                                                                                                                                                                                                                                                                                    | 10V | 16V | 25V | 35V | 50V                                  | 63V                      | 100V | 160 to 250V | 400 to 450V | (120Hz) |
|                                                        | D55 to JA0                                                                                                                                                             | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                       | 4   | 3   | 2   | 2   | 2                                    | 2                        | 3    | —           | —           |         |
|                                                        |                                                                                                                                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                       | 12  | 8   | 6   | 4   | 3                                    | 3                        | 4    | —           | —           |         |
|                                                        | KE0 to MN0                                                                                                                                                             | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                       | 5   | 4   | 3   | 2   | 2                                    | 2                        | 2    | 3           | 6           |         |
|                                                        |                                                                                                                                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                       | 10  | 8   | 6   | 4   | 3                                    | 3                        | 3    | 6           | 10          |         |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for the specified period of time at 105°C. |                                                                                                                                                                                                                                                                                                                         |     |     |     |     |                                      |                          |      |             |             |         |
|                                                        | Size code                                                                                                                                                              | D55 to F80                                                                                                                                                                                                                                                                                                              |     |     |     |     | HA0 to MN0                           |                          |      |             |             |         |
|                                                        | Time                                                                                                                                                                   | 1,000 hours                                                                                                                                                                                                                                                                                                             |     |     |     |     | 2,000 hours                          |                          |      |             |             |         |
|                                                        | Capacitance change                                                                                                                                                     | ≤±30% of the initial value                                                                                                                                                                                                                                                                                              |     |     |     |     | ≤±20% of the initial value           |                          |      |             |             |         |
|                                                        | D.F. (tanδ)                                                                                                                                                            | ≤300% of the initial specified value                                                                                                                                                                                                                                                                                    |     |     |     |     | ≤200% of the initial specified value |                          |      |             |             |         |
|                                                        | Leakage current                                                                                                                                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                            |     |     |     |     | ≤The initial specified value         |                          |      |             |             |         |
|                                                        | Shelf Life                                                                                                                                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours (500 hours for B55 to F80 size) at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |     |     |     |     |                                      |                          |      |             |             |         |
| Size code                                              |                                                                                                                                                                        | D55 to F80                                                                                                                                                                                                                                                                                                              |     |     |     |     | HA0 to MN0                           |                          |      |             |             |         |
| Capacitance change                                     |                                                                                                                                                                        | ≤±25% of the initial value                                                                                                                                                                                                                                                                                              |     |     |     |     | ≤±20% of the initial value           |                          |      |             |             |         |
| D.F. (tanδ)                                            |                                                                                                                                                                        | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                    |     |     |     |     | ≤200% of the initial specified value |                          |      |             |             |         |
| Leakage current                                        |                                                                                                                                                                        | ≤The initial specified value                                                                                                                                                                                                                                                                                            |     |     |     |     | ≤The initial specified value         |                          |      |             |             |         |
|                                                        |                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                         |     |     |     |     |                                      |                          |      |             |             |         |

## ◆DIMENSIONS [mm]

- Terminal Code : A
- Size code : D55 to MN0

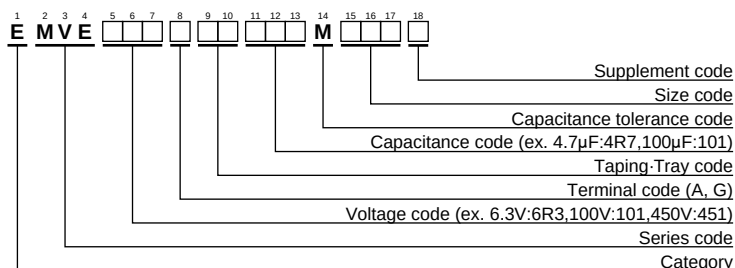
- Terminal Code : G
- Size code : LH0 to MN0

Note : L $\pm$ 0.5 for HA0 to MN0

▨ : Dummy terminals

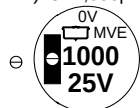
| Size code | D    | L    | A    | B    | C    | W          | P   |
|-----------|------|------|------|------|------|------------|-----|
| D55       | 4    | 5.2  | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E55       | 5    | 5.2  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F55       | 6.3  | 5.2  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F80       | 6.3  | 7.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8    | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10   | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |
| KE0       | 12.5 | 13.5 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 |
| KG5       | 12.5 | 16.0 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 |
| LH0       | 16   | 16.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 |
| LN0       | 16   | 21.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 |
| MH0       | 18   | 16.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 |
| MN0       | 18   | 21.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆MARKING

D55 to JA0  
Ex)16V22 $\mu$ FKE0 to MN0  
Ex)25V1,000 $\mu$ F



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 105°C

Alchip™-MVE Series

## ◆STANDARD RATINGS

□ is not solvent resistant.

| WV (Vdc) | Cap (μF) | Size code | tanδ | Rated ripple current (mA rms/105°C, 120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Size code | tanδ | Rated ripple current (mA rms/105°C, 120Hz) | Part No.            |
|----------|----------|-----------|------|--------------------------------------------|--------------------|----------|----------|-----------|------|--------------------------------------------|---------------------|
| 6.3      | 22       | D55       | 0.30 | 22                                         | EMVE6R3ADA220MD55G | 35       | 330      | JA0       | 0.16 | 450                                        | EMVE350ADA331MJA0G  |
|          | 33       | E55       | 0.30 | 34                                         | EMVE6R3ADA330ME55G |          | 470      | KE0       | 0.22 | 520                                        | EMVE350ARA471MKE0S  |
|          | 47       | E55       | 0.30 | 38                                         | EMVE6R3ADA470ME55G |          | 470      | LH0       | 0.22 | 650                                        | EMVE350□DA471MLH0S  |
|          | 100      | F55       | 0.30 | 69                                         | EMVE6R3ADA101MF55G |          | 1,000    | LH0       | 0.22 | 750                                        | EMVE350□DA102MLH0S  |
|          | 220      | F80       | 0.45 | 120                                        | EMVE6R3ADA221MF80G |          | 1,000    | MH0       | 0.22 | 1,000                                      | EMVE350□DA102MMH0S  |
|          | 330      | HA0       | 0.40 | 290                                        | EMVE6R3ADA331MHA0G |          | 2,200    | MN0       | 0.24 | 1,450                                      | EMVE350□DA222MMN0S  |
|          | 470      | HA0       | 0.45 | 320                                        | EMVE6R3ADA471MHA0G | 50       | 1.0      | D55       | 0.12 | 8.0                                        | EMVE500ADA1R0MD55G  |
|          | 680      | HA0       | 0.45 | 340                                        | EMVE6R3ADA681MHA0G |          | 2.2      | D55       | 0.12 | 12                                         | EMVE500ADA2R2MD55G  |
|          | 1,000    | JA0       | 0.40 | 410                                        | EMVE6R3ADA102MJA0G |          | 3.3      | D55       | 0.12 | 15                                         | EMVE500ADA3R3MD55G  |
|          | 1,500    | JA0       | 0.45 | 550                                        | EMVE6R3ADA152MJA0G |          | 4.7      | E55       | 0.12 | 20                                         | EMVE500ADA4R7ME55G  |
|          | 2,200    | KE0       | 0.40 | 680                                        | EMVE6R3ADA222MKE0S |          | 10       | F55       | 0.12 | 32                                         | EMVE500ADA100MF55G  |
|          | 2,200    | LH0       | 0.40 | 840                                        | EMVE6R3□DA222MLH0S |          | 33       | F80       | 0.14 | 65                                         | EMVE500ADA330MF80G  |
|          | 3,300    | KG5       | 0.42 | 850                                        | EMVE6R3ARA332MKG5S |          | 47       | F80       | 0.14 | 80                                         | EMVE500ADA470MF80G  |
|          | 3,300    | MH0       | 0.42 | 1,000                                      | EMVE6R3□DA332MMH0S |          | 100      | HA0       | 0.14 | 230                                        | EMVE500ADA101MHA0G  |
|          | 4,700    | LN0       | 0.44 | 1,200                                      | EMVE6R3□DA472MLN0S |          | 220      | JA0       | 0.14 | 375                                        | EMVE500ADA221MJA0G  |
|          | 4,700    | MH0       | 0.44 | 1,200                                      | EMVE6R3□DA472MMH0S |          | 330      | KE0       | 0.18 | 500                                        | EMVE500ARA331MKE0S  |
|          | 6,800    | LN0       | 0.48 | 1,200                                      | EMVE6R3□DA682MLN0S |          | 330      | LH0       | 0.18 | 600                                        | EMVE500□DA331MLH0S  |
|          | 6,800    | MN0       | 0.48 | 1,350                                      | EMVE6R3□DA682MMN0S |          | 470      | LH0       | 0.18 | 700                                        | EMVE500□DA471MLH0S  |
|          |          |           |      |                                            |                    |          | 470      | MH0       | 0.18 | 750                                        | EMVE500□DA471MMH0S  |
|          |          |           |      |                                            |                    |          | 1,000    | MN0       | 0.18 | 1,200                                      | EMVE500□DA102MMN0S  |
| 10       | 22       | E55       | 0.24 | 30                                         | EMVE100ADA220ME55G | 63       | 1.0      | D55       | 0.12 | 8.0                                        | EMVE630ADA1R0MD55G  |
|          | 33       | E55       | 0.24 | 34                                         | EMVE100ADA330ME55G |          | 2.2      | D55       | 0.12 | 12                                         | EMVE630ADA2R2MD55G  |
|          | 47       | F55       | 0.24 | 48                                         | EMVE100ADA470MF55G |          | 3.3      | E55       | 0.12 | 17                                         | EMVE630ADA3R3ME55G  |
|          | 100      | F55       | 0.30 | 69                                         | EMVE100ADA101MF55G |          | 4.7      | F55       | 0.12 | 22                                         | EMVE630ADA4R7MF55G  |
|          | 150      | F80       | 0.35 | 100                                        | EMVE100ADA151MF80G |          | 10       | F55       | 0.12 | 32                                         | EMVE630ADA100MF55G  |
|          | 220      | F80       | 0.35 | 120                                        | EMVE100ADA221MF80G |          | 22       | F80       | 0.12 | 58                                         | EMVE630ADA220MF80G  |
|          | 330      | HA0       | 0.35 | 290                                        | EMVE100ADA331MHA0G |          | 33       | HA0       | 0.12 | 140                                        | EMVE630ADA330MHA0G  |
|          | 470      | HA0       | 0.35 | 320                                        | EMVE100ADA471MHA0G |          | 47       | HA0       | 0.12 | 170                                        | EMVE630ADA470MHA0G  |
|          | 1,000    | JA0       | 0.35 | 410                                        | EMVE100ADA102MJA0G |          | 100      | JA0       | 0.12 | 310                                        | EMVE630ADA101MJA0G  |
|          | 2,200    | KG5       | 0.36 | 750                                        | EMVE100ARA222MKG5S |          | 220      | KE0       | 0.14 | 470                                        | EMVE630ARA221MKE0S  |
|          | 2,200    | LH0       | 0.36 | 850                                        | EMVE100□DA222MLH0S |          | 220      | LH0       | 0.14 | 560                                        | EMVE630□DA221MLH0S  |
|          | 3,300    | LH0       | 0.38 | 1,000                                      | EMVE100□DA332MLH0S |          | 330      | LH0       | 0.14 | 700                                        | EMVE630□DA331MLH0S  |
|          | 3,300    | MH0       | 0.38 | 1,100                                      | EMVE100□DA332MMH0S |          | 330      | MH0       | 0.14 | 750                                        | EMVE630□DA331MMH0S  |
|          | 4,700    | LN0       | 0.40 | 1,300                                      | EMVE100□DA472MLN0S |          | 470      | LN0       | 0.14 | 900                                        | EMVE630□DA471MLN0S  |
|          | 4,700    | MN0       | 0.40 | 1,350                                      | EMVE100□DA472MMN0S |          | 470      | MH0       | 0.14 | 900                                        | EMVE630□DA471MMH0S  |
| 16       | 10       | D55       | 0.20 | 17                                         | EMVE160ADA100MD55G | 100      | 22       | HA0       | 0.12 | 100                                        | EMVE101ADA220MHA0G  |
|          | 22       | E55       | 0.20 | 30                                         | EMVE160ADA220ME55G |          | 33       | JA0       | 0.12 | 150                                        | EMVE101ADA330MJA0G  |
|          | 33       | F55       | 0.20 | 45                                         | EMVE160ADA330MF55G |          | 47       | KE0       | 0.10 | 250                                        | EMVE101ARA470MKE0S  |
|          | 47       | F55       | 0.20 | 48                                         | EMVE160ADA470MF55G |          | 68       | KE0       | 0.10 | 300                                        | EMVE101ARA680MKE0S  |
|          | 100      | F55       | 0.26 | 69                                         | EMVE160ADA101MF55G |          | 100      | KE0       | 0.10 | 380                                        | EMVE101ARA101MKE0S  |
|          | 150      | F80       | 0.28 | 100                                        | EMVE160ADA151MF80G |          | 100      | LH0       | 0.10 | 450                                        | EMVE101□DA101MLH0S  |
|          | 220      | F80       | 0.28 | 120                                        | EMVE160ADA221MF80G |          | 220      | LN0       | 0.10 | 750                                        | EMVE101□DA221MLN0S  |
|          | 330      | HA0       | 0.28 | 290                                        | EMVE160ADA331MHA0G |          | 220      | MH0       | 0.10 | 750                                        | EMVE101□DA221MMH0S  |
|          | 470      | HA0       | 0.28 | 320                                        | EMVE160ADA471MHA0G |          | 330      | MN0       | 0.10 | 980                                        | EMVE101□DA331MMN0S  |
|          | 680      | JA0       | 0.28 | 470                                        | EMVE160ADA681MJA0G |          | 33       | KE0       | 0.15 | 95                                         | EMVE161ARA330MKE0S  |
|          | 1,000    | KE0       | 0.30 | 550                                        | EMVE160ARA102MKE0S |          | 47       | LH0       | 0.15 | 260                                        | EMVE161□DA470MLH0S  |
|          | 1,000    | LH0       | 0.30 | 650                                        | EMVE160□DA102MLH0S |          | 68       | LN0       | 0.15 | 320                                        | EMVE161□DA680MLN0S  |
|          | 2,200    | LH0       | 0.32 | 950                                        | EMVE160□DA222MLH0S |          | 68       | MH0       | 0.15 | 320                                        | EMVE161□DA680MMH0S  |
|          | 2,200    | MH0       | 0.32 | 1,000                                      | EMVE160□DA222MMH0S |          | 100      | LN0       | 0.15 | 380                                        | EMVE161□DA101MLN0S  |
|          | 3,300    | LN0       | 0.34 | 1,200                                      | EMVE160□DA332MLN0S | 200      | 10       | KE0       | 0.15 | 80                                         | EMVE201ARA100MKE0S  |
|          | 3,300    | MH0       | 0.34 | 1,200                                      | EMVE160□DA332MMH0S |          | 22       | KG5       | 0.15 | 110                                        | EMVE201ARA220MKG5S  |
| 25       | 10       | E55       | 0.16 | 27                                         | EMVE250ADA100ME55G |          | 33       | LH0       | 0.15 | 220                                        | EMVE201□DA330MLH0S  |
|          | 22       | F55       | 0.16 | 44                                         | EMVE250ADA220MF55G |          | 47       | LN0       | 0.15 | 270                                        | EMVE201□DA470MLN0S  |
|          | 33       | F55       | 0.16 | 50                                         | EMVE250ADA330MF55G |          | 47       | MH0       | 0.15 | 270                                        | EMVE201□DA470MMH0S  |
|          | 47       | F55       | 0.16 | 60                                         | EMVE250ADA470MF55G |          | 68       | MN0       | 0.15 | 330                                        | EMVE201□DA680MMN0S  |
|          | 100      | F80       | 0.18 | 100                                        | EMVE250ADA101MF80G |          | 4.7      | KE0       | 0.15 | 65                                         | EMVE251ARA47R7MKE0S |
|          | 150      | HA0       | 0.18 | 240                                        | EMVE250ADA151MHA0G |          | 10       | KG5       | 0.15 | 105                                        | EMVE251ARA100MKG5S  |
|          | 220      | HA0       | 0.18 | 320                                        | EMVE250ADA221MHA0G |          | 22       | LH0       | 0.15 | 180                                        | EMVE251□DA220MLH0S  |
|          | 330      | JA0       | 0.16 | 450                                        | EMVE250ADA331MJA0G |          | 33       | LN0       | 0.15 | 230                                        | EMVE251□DA330MLN0S  |
|          | 470      | JA0       | 0.18 | 490                                        | EMVE250ADA471MJA0G |          | 33       | MH0       | 0.15 | 230                                        | EMVE251□DA330MMH0S  |
|          | 1,000    | LH0       | 0.26 | 820                                        | EMVE250□DA102MLH0S |          | 47       | MN0       | 0.15 | 280                                        | EMVE251□DA470MMN0S  |
|          | 1,000    | MH0       | 0.26 | 880                                        | EMVE250□DA102MMH0S | 400      | 4.7      | KG5       | 0.20 | 50                                         | EMVE401ARA47R7MKG5S |
|          | 2,200    | LN0       | 0.28 | 1,250                                      | EMVE250□DA222MLN0S |          | 10       | LH0       | 0.20 | 85                                         | EMVE401□DA100MLH0S  |
|          | 2,200    | MN0       | 0.28 | 1,300                                      | EMVE250□DA222MMN0S |          | 22       | MN0       | 0.20 | 130                                        | EMVE401□DA220MMN0S  |
| 35       | 4.7      | D55       | 0.14 | 16                                         | EMVE350ADA4R7MD55G |          | 3.3      | KE0       | 0.20 | 40                                         | EMVE451ARA3R3MKE0S  |
|          | 10       | E55       | 0.14 | 27                                         | EMVE350ADA100ME55G |          | 4.7      | KG5       | 0.20 | 50                                         | EMVE451ARA47R7MKG5S |
|          | 22       | F55       | 0.14 | 44                                         | EMVE350ADA220MF55G |          | 10       | LH0       | 0.20 | 85                                         | EMVE451□DA100MLH0S  |
|          | 47       | F80       | 0.16 | 80                                         | EMVE350ADA470MF80G |          | 22       | MN0       | 0.20 | 130                                        | EMVE451□DA220MMN0S  |
|          | 100      | F80       | 0.16 | 100                                        | EMVE350ADA101MF80G |          |          |           |      |                                            |                     |
|          | 150      | HA0       | 0.16 | 260                                        | EMVE350ADA151MHA0G |          |          |           |      |                                            |                     |
|          | 220      | JA0       | 0.16 | 375                                        | EMVE350ADA221MJA0G |          |          |           |      |                                            |                     |

□ : Enter the appropriate terminal code.

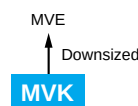


## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Standard, 105°C

## Alchip™-MVK Series

- Endurance : 1,000 to 2,000 hours at 105°C
- Suitable to fit for downsized equipment
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant
- MVK series will be discontinued, strongly recommended MVE series

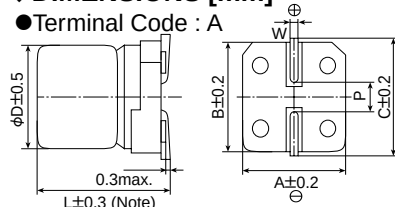


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                        |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|--------------------------------------|------------|------|-----------------|------|
| Category                                               | Temperature Range                                                                                                                                                      |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
| Rated Voltage Range                                    | -40 to +105°C                                                                                                                                                          |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
| Capacitance Tolerance                                  | 6.3 to 50V <sub>dc</sub>                                                                                                                                               |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
| Leakage Current                                        | ±20% (M) (at 20°C, 120Hz)                                                                                                                                              |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
| Dissipation Factor (tanδ)                              | I=0.01CV or 3μA, whichever is greater.                                                                                                                                 |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                    |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                       | 6.3V                                                                                                                                                                                                                                                                                           | 10V        | 16V  | 25V                                  | 35V        | 50V  | (at 20°C,120Hz) |      |
|                                                        | tanδ (Max.)                                                                                                                                                            | D55 to F55                                                                                                                                                                                                                                                                                     | 0.30       | 0.24 | 0.20                                 | 0.16       | 0.14 |                 | 0.12 |
| Low Temperature Characteristics (Max. Impedance Ratio) | H63 to JA0                                                                                                                                                             |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|                                                        | 0.40 0.30 0.26 0.16 0.14 0.12                                                                                                                                          |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|                                                        | 0.26 0.16 0.14 0.12                                                                                                                                                    |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|                                                        | 0.16 0.14 0.12                                                                                                                                                         |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
| Endurance                                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                       |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|                                                        | 6.3V 10V 16V 25V 35V 50V                                                                                                                                               |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                      |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|                                                        | 4 3 2 2 2 2                                                                                                                                                            |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
| Shelf Life                                             | Z(-40°C)/Z(+20°C)                                                                                                                                                      |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|                                                        | 10 8 6 4 3 3                                                                                                                                                           |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|                                                        | (at 120Hz)                                                                                                                                                             |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
|                                                        | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for the specified period of time at 105°C. |                                                                                                                                                                                                                                                                                                |            |      |                                      |            |      |                 |      |
| Endurance                                              | Case code                                                                                                                                                              | D55 to F55                                                                                                                                                                                                                                                                                     |            |      | H63 to JA0                           |            |      |                 |      |
|                                                        | Time                                                                                                                                                                   | 1,000hours                                                                                                                                                                                                                                                                                     |            |      | 2,000hours                           |            |      |                 |      |
|                                                        | Capacitance change                                                                                                                                                     | ≤±30% of the initial value                                                                                                                                                                                                                                                                     |            |      | ≤±20% of the initial value           |            |      |                 |      |
|                                                        | D.F. (tanδ)                                                                                                                                                            | ≤300% of the initial specified value                                                                                                                                                                                                                                                           |            |      | ≤200% of the initial specified value |            |      |                 |      |
|                                                        | Leakage current                                                                                                                                                        | ≤The initial specified value                                                                                                                                                                                                                                                                   |            |      | ≤The initial specified value         |            |      |                 |      |
|                                                        | Shelf Life                                                                                                                                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for the specified time at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |            |      |                                      |            |      |                 |      |
|                                                        |                                                                                                                                                                        | Case code                                                                                                                                                                                                                                                                                      | D55 to F55 |      |                                      | H63 to JA0 |      |                 |      |
| Time                                                   |                                                                                                                                                                        | 500hours                                                                                                                                                                                                                                                                                       |            |      | 1,000hours                           |            |      |                 |      |
| Capacitance change                                     |                                                                                                                                                                        | ≤±25% of the initial value                                                                                                                                                                                                                                                                     |            |      | ≤±20% of the initial value           |            |      |                 |      |
| D.F. (tanδ)                                            |                                                                                                                                                                        | ≤200% of the initial specified value                                                                                                                                                                                                                                                           |            |      | ≤200% of the initial specified value |            |      |                 |      |
| Leakage current                                        |                                                                                                                                                                        | ≤The initial specified value                                                                                                                                                                                                                                                                   |            |      | ≤The initial specified value         |            |      |                 |      |

## ◆DIMENSIONS [mm]

●Terminal Code : A

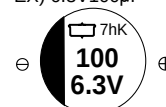


Note : L±0.5 for H63 to JA0

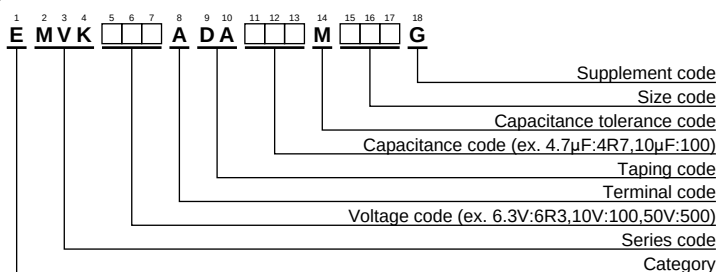
| Size code | D   | L    | A    | B    | C    | W          | P   |
|-----------|-----|------|------|------|------|------------|-----|
| D55       | 4   | 5.2  | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E55       | 5   | 5.2  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F55       | 6.3 | 5.2  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| H63       | 8   | 6.3  | 8.3  | 8.3  | 9.0  | 0.5 to 0.8 | 2.3 |
| HA0       | 8   | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10  | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆MARKING

EX) 6.3V100μF



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Standard, 105°C

Alchip™-MVK Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case code | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case code | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           |
|-------------|-------------|-----------|------|-------------------------------------------------------------|--------------------|-------------|-------------|-----------|------|-------------------------------------------------------------|--------------------|
| 6.3         | 22          | D55       | 0.30 | 21                                                          | EMVK6R3ADA220MD55G | 35          | 4.7         | D55       | 0.14 | 15                                                          | EMVK350ADA4R7MD55G |
|             | 47          | E55       | 0.30 | 36                                                          | EMVK6R3ADA470ME55G |             | 10          | E55       | 0.14 | 25                                                          | EMVK350ADA100ME55G |
|             | 100         | F55       | 0.30 | 56                                                          | EMVK6R3ADA101MF55G |             | 22          | F55       | 0.14 | 40                                                          | EMVK350ADA220MF55G |
|             | 330         | HA0       | 0.40 | 290                                                         | EMVK6R3ADA331MHA0G |             | 33          | H63       | 0.14 | 80                                                          | EMVK350ADA330MH63G |
|             | 1,000       | JA0       | 0.40 | 410                                                         | EMVK6R3ADA102MJA0G |             | 220         | JA0       | 0.14 | 375                                                         | EMVK350ADA221MJA0G |
| 10          | 33          | E55       | 0.24 | 34                                                          | EMVK100ADA330ME55G | 50          | 1.0         | D55       | 0.12 | 5.6                                                         | EMVK500ADA1R0MD55G |
|             | 100         | H63       | 0.30 | 90                                                          | EMVK100ADA101MH63G |             | 2.2         | D55       | 0.12 | 10                                                          | EMVK500ADA2R2MD55G |
|             | 220         | HA0       | 0.30 | 180                                                         | EMVK100ADA221MHA0G |             | 3.3         | D55       | 0.12 | 14                                                          | EMVK500ADA3R3MD55G |
| 16          | 10          | D55       | 0.20 | 16                                                          | EMVK160ADA100MD55G |             | 4.7         | E55       | 0.12 | 19                                                          | EMVK500ADA4R7ME55G |
|             | 22          | E55       | 0.20 | 30                                                          | EMVK160ADA220ME55G |             | 10          | F55       | 0.12 | 29                                                          | EMVK500ADA100MF55G |
|             | 47          | F55       | 0.20 | 48                                                          | EMVK160ADA470MF55G |             | 22          | H63       | 0.12 | 70                                                          | EMVK500ADA220MH63G |
|             | 470         | JA0       | 0.26 | 460                                                         | EMVK160ADA471MJA0G |             | 33          | HA0       | 0.12 | 140                                                         | EMVK500ADA330MHA0G |
| 25          | 33          | F55       | 0.16 | 45                                                          | EMVK250ADA330MF55G |             | 47          | HA0       | 0.12 | 170                                                         | EMVK500ADA470MHA0G |
|             | 47          | H63       | 0.16 | 80                                                          | EMVK250ADA470MH63G |             | 100         | JA0       | 0.12 | 310                                                         | EMVK500ADA101MJA0G |
|             | 100         | HA0       | 0.16 | 180                                                         | EMVK250ADA101MHA0G |             |             |           |      |                                                             |                    |
|             | 330         | JA0       | 0.16 | 450                                                         | EMVK250ADA331MJA0G |             |             |           |      |                                                             |                    |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Lower ESR, 105°C

New!

## Alchip™-MZJ Series

- Lower ESR, 2,000 hours at 105°C
- Rated voltage range : 6.3 to 35V
- Nominal capacitance range : 10 to 1,800  $\mu\text{F}$
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

MZJ

↑ Lower ESR  
MZA

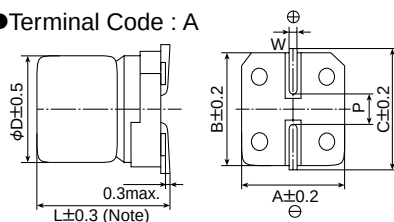


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |                  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------------------|
| Category Temperature Range                             | -55 to +105°C                                                                                                                                                                                                                                                                           |                                      |      |      |      |      |                  |
| Rated Voltage Range                                    | 6.3 to 35V <sub>dc</sub>                                                                                                                                                                                                                                                                |                                      |      |      |      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |      |      |      |      |                  |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                           |                                      |      |      |      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.26                                 | 0.19 | 0.16 | 0.14 | 0.12 |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | (at 120Hz)       |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 2                                    | 2    | 2    | 2    | 2    |                  |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 3                                    | 3    | 3    | 3    | 3    |                  |
|                                                        | Z(-55°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 4    | 4    | 3    | 3    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C.                                                                                                                                   |                                      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value           |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |      |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value           |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |      |      |                  |
| Surge Voltage Test                                     | The capacitors shall be subjected to 1,000 cycles each consisting of charging with the specified surge voltage for 30±5 seconds through a protective resistor (as required for RC=0.1±0.05sec) and open-circuiting for 5.5 minutes at a room temperature of 15 to 35°C.                 |                                      |      |      |      |      |                  |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 6.3V                                 | 10V  | 16V  | 25V  | 35V  |                  |
|                                                        | Surge voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 7.2V                                 | 12V  | 18V  | 29V  | 40V  |                  |
|                                                        |                                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |                  |
|                                                        | Appearance                                                                                                                                                                                                                                                                              | No significant damage                |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |      |      |                  |
|                                                        | (Caution)                                                                                                                                                                                                                                                                               |                                      |      |      |      |      |                  |
|                                                        | Surge Voltage Test intends to evaluate capacitors in durability of an exceptional excessive voltage under specific conditions. It does not imply long-term use at all.                                                                                                                  |                                      |      |      |      |      |                  |

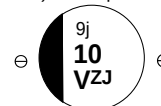
## ◆ DIMENSIONS [mm]

● Terminal Code : A

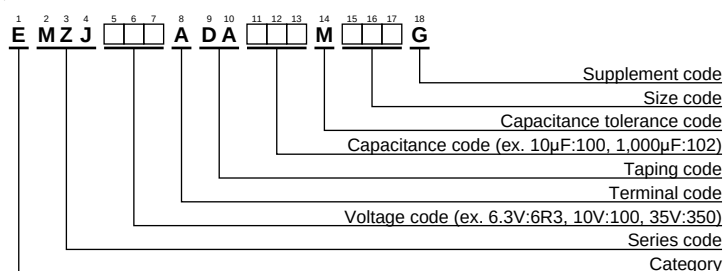
Note : L $\pm 0.5$  for HA0 and JA0

| Size code | D   | L    | A    | B    | C    | W          | P   |
|-----------|-----|------|------|------|------|------------|-----|
| D61       | 4   | 5.8  | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E61       | 5   | 5.8  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F61       | 6.3 | 5.8  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F80       | 6.3 | 7.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8   | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10  | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆ MARKING

EX) 35V10 $\mu\text{F}$ 

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ● Rated voltage symbol

| Rated voltage (V <sub>dc</sub> ) | Symbol |
|----------------------------------|--------|
| 6.3                              | j      |
| 10                               | A      |
| 16                               | C      |
| 25                               | E      |
| 35                               | V      |

Applying voltage over the rated voltages causes the capacitors to have short lifetime.  
Besides, applying voltage over the specified surge voltages may cause to have short circuit failure. A protection circuit should be used if applied voltage will exceed the rated voltages.



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Lower ESR, 105°C

New!  
Alchip™-MZJ Series

## ◆STANDARD RATINGS

| WV(Vdc) | Cap(μF) | Size code | tanδ | ESR<br>(Ω <sub>max</sub> /20°C, 100kHz) | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|---------|---------|-----------|------|-----------------------------------------|------------------------------------------------------------|--------------------|
| 6.3     | 47      | D61       | 0.26 | 0.85                                    | 160                                                        | EMZJ6R3ADA470MD61G |
|         | 100     | E61       | 0.26 | 0.36                                    | 240                                                        | EMZJ6R3ADA101ME61G |
|         | 220     | F61       | 0.26 | 0.26                                    | 300                                                        | EMZJ6R3ADA221MF61G |
|         | 330     | F80       | 0.26 | 0.16                                    | 600                                                        | EMZJ6R3ADA331MF80G |
|         | 1,000   | HA0       | 0.26 | 0.08                                    | 850                                                        | EMZJ6R3ADA102MHA0G |
|         | 1,500   | JA0       | 0.26 | 0.06                                    | 1,190                                                      | EMZJ6R3ADA152MJA0G |
|         | 1,800   | JA0       | 0.26 | 0.06                                    | 1,190                                                      | EMZJ6R3ADA182MJA0G |
| 10      | 33      | D61       | 0.19 | 0.85                                    | 160                                                        | EMZJ100ADA330MD61G |
|         | 150     | F61       | 0.19 | 0.26                                    | 300                                                        | EMZJ100ADA151MF61G |
|         | 680     | HA0       | 0.19 | 0.08                                    | 850                                                        | EMZJ100ADA681MHA0G |
|         | 1,000   | JA0       | 0.19 | 0.06                                    | 1,190                                                      | EMZJ100ADA102MJA0G |
|         | 1,200   | JA0       | 0.19 | 0.06                                    | 1,190                                                      | EMZJ100ADA122MJA0G |
| 16      | 22      | D61       | 0.16 | 0.85                                    | 160                                                        | EMZJ160ADA220MD61G |
|         | 47      | E61       | 0.16 | 0.36                                    | 240                                                        | EMZJ160ADA470ME61G |
|         | 100     | F61       | 0.16 | 0.26                                    | 300                                                        | EMZJ160ADA101MF61G |
|         | 150     | F80       | 0.16 | 0.16                                    | 600                                                        | EMZJ160ADA151MF80G |
|         | 220     | F80       | 0.16 | 0.16                                    | 600                                                        | EMZJ160ADA221MF80G |
|         | 470     | HA0       | 0.16 | 0.08                                    | 850                                                        | EMZJ160ADA471MHA0G |
|         | 680     | JA0       | 0.16 | 0.06                                    | 1,190                                                      | EMZJ160ADA681MJA0G |
|         | 820     | JA0       | 0.16 | 0.06                                    | 1,190                                                      | EMZJ160ADA821MJA0G |
| 25      | 10      | D61       | 0.14 | 0.85                                    | 160                                                        | EMZJ250ADA100MD61G |
|         | 22      | E61       | 0.14 | 0.36                                    | 240                                                        | EMZJ250ADA220ME61G |
|         | 33      | E61       | 0.14 | 0.36                                    | 240                                                        | EMZJ250ADA330ME61G |
|         | 33      | F61       | 0.14 | 0.26                                    | 300                                                        | EMZJ250ADA330MF61G |
|         | 47      | F61       | 0.14 | 0.26                                    | 300                                                        | EMZJ250ADA470MF61G |
|         | 68      | F61       | 0.14 | 0.26                                    | 300                                                        | EMZJ250ADA680MF61G |
|         | 100     | F80       | 0.14 | 0.16                                    | 600                                                        | EMZJ250ADA101MF80G |
|         | 330     | HA0       | 0.14 | 0.08                                    | 850                                                        | EMZJ250ADA331MHA0G |
|         | 470     | JA0       | 0.14 | 0.06                                    | 1,190                                                      | EMZJ250ADA471MJA0G |
|         | 560     | JA0       | 0.14 | 0.06                                    | 1,190                                                      | EMZJ250ADA561MJA0G |
| 35      | 10      | D61       | 0.12 | 0.85                                    | 160                                                        | EMZJ350ADA100MD61G |
|         | 22      | E61       | 0.12 | 0.36                                    | 240                                                        | EMZJ350ADA220ME61G |
|         | 33      | F61       | 0.12 | 0.26                                    | 300                                                        | EMZJ350ADA330MF61G |
|         | 47      | F61       | 0.12 | 0.26                                    | 300                                                        | EMZJ350ADA470MF61G |
|         | 68      | F61       | 0.12 | 0.26                                    | 300                                                        | EMZJ350ADA680MF61G |
|         | 100     | F80       | 0.12 | 0.16                                    | 600                                                        | EMZJ350ADA101MF80G |
|         | 100     | HA0       | 0.12 | 0.08                                    | 850                                                        | EMZJ350ADA101MHA0G |
|         | 150     | HA0       | 0.12 | 0.08                                    | 850                                                        | EMZJ350ADA151MHA0G |
|         | 220     | HA0       | 0.12 | 0.08                                    | 850                                                        | EMZJ350ADA221MHA0G |
|         | 330     | JA0       | 0.12 | 0.06                                    | 1,190                                                      | EMZJ350ADA331MJA0G |
|         | 390     | JA0       | 0.12 | 0.06                                    | 1,190                                                      | EMZJ350ADA391MJA0G |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Lower impedance, 105°C

## Alchip™-MZA Series

- Lowest impedance, 2,000 hours at 105°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

MZA

↑ Lower Z  
MVY

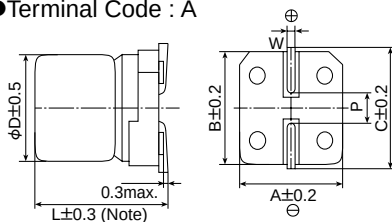


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                              |                                      |      |      |      |      |      |      |      |               |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|------|------|---------------|
| Category                                               | -55 to +105°C                                                                                                                                                |                                      |      |      |      |      |      |      |      |               |
| Temperature Range                                      |                                                                                                                                                              |                                      |      |      |      |      |      |      |      |               |
| Rated Voltage Range                                    | 6.3 to 80V <sub>dc</sub>                                                                                                                                     |                                      |      |      |      |      |      |      |      |               |
| Capacitance Tolerance                                  | ±20%(M) (20°C, 120Hz)                                                                                                                                        |                                      |      |      |      |      |      |      |      |               |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes) |                                      |      |      |      |      |      |      |      |               |
| Dissipation Factor (tanδ)                              | Rated voltage(V <sub>dc</sub> )                                                                                                                              | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  | 80V  |               |
|                                                        | tanδ (Max.)                                                                                                                                                  | 0.26                                 | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.08 | (20°C, 120Hz) |
| Low Temperature Characteristics (Max. impedance Ratio) | Rated voltage(V <sub>dc</sub> )                                                                                                                              | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  | 80V  |               |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                            | 2                                    | 2    | 2    | 2    | 2    | 2    | 2    | 2    |               |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                            | 3                                    | 3    | 3    | 3    | 3    | 3    | 3    | 3    |               |
|                                                        | Z(-55°C)/Z(+20°C)                                                                                                                                            | 4                                    | 4    | 4    | 4    | 3    | 3    | 3    | 3    | (120Hz)       |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C.        |                                      |      |      |      |      |      |      |      |               |
|                                                        | Capacitance change                                                                                                                                           | ≤±30% of the initial value           |      |      |      |      |      |      |      |               |
|                                                        | D.F. (tanδ)                                                                                                                                                  | ≤200% of the initial specified value |      |      |      |      |      |      |      |               |
|                                                        | Leakage current                                                                                                                                              | ≤The initial specified value         |      |      |      |      |      |      |      |               |

## ◆ DIMENSIONS [mm]

- Terminal Code : A



Note : L±0.5 for HA0 and JA0

| Size code | D   | L    | A    | B    | C    | W          | P   |
|-----------|-----|------|------|------|------|------------|-----|
| D61       | 4   | 5.8  | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E61       | 5   | 5.8  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F61       | 6.3 | 5.8  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F80       | 6.3 | 7.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8   | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10  | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆ MARKING

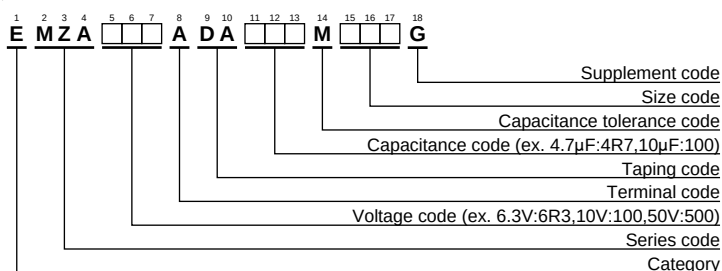
EX) 16V220μF



- Rated voltage symbol

| Rated voltage (V <sub>dc</sub> ) | Symbol |
|----------------------------------|--------|
| 6.3                              | j      |
| 10                               | A      |
| 16                               | C      |
| 25                               | E      |
| 35                               | V      |
| 50                               | H      |
| 63                               | J      |
| 80                               | K      |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Lower impedance, 105°C

Alchip™-MZA Series

## ◆STANDARD RATINGS

| WV(Vdc) | Cap(μF) | Size code | tanδ | Impedance<br>(Q <sub>max</sub> /20°C, 100kHz) | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|---------|---------|-----------|------|-----------------------------------------------|------------------------------------------------------------|--------------------|
| 6.3     | 22      | D61       | 0.26 | 1.35                                          | 90                                                         | EMZA6R3ADA220MD61G |
|         | 47      | D61       | 0.26 | 1.35                                          | 90                                                         | EMZA6R3ADA470MD61G |
|         | 47      | E61       | 0.26 | 0.70                                          | 160                                                        | EMZA6R3ADA470ME61G |
|         | 100     | E61       | 0.26 | 0.70                                          | 160                                                        | EMZA6R3ADA101ME61G |
|         | 100     | F61       | 0.26 | 0.36                                          | 240                                                        | EMZA6R3ADA101MF61G |
|         | 220     | F61       | 0.26 | 0.36                                          | 240                                                        | EMZA6R3ADA221MF61G |
|         | 330     | F80       | 0.26 | 0.34                                          | 280                                                        | EMZA6R3ADA331MF80G |
|         | 470     | HA0       | 0.26 | 0.16                                          | 600                                                        | EMZA6R3ADA471MHA0G |
|         | 1,000   | HA0       | 0.26 | 0.16                                          | 600                                                        | EMZA6R3ADA102MHA0G |
| 10      | 1,500   | JA0       | 0.26 | 0.08                                          | 850                                                        | EMZA6R3ADA152MJA0G |
|         | 22      | D61       | 0.19 | 1.35                                          | 90                                                         | EMZA100ADA220MD61G |
|         | 33      | D61       | 0.19 | 1.35                                          | 90                                                         | EMZA100ADA330MD61G |
|         | 33      | E61       | 0.19 | 0.70                                          | 160                                                        | EMZA100ADA330ME61G |
|         | 220     | F80       | 0.19 | 0.34                                          | 280                                                        | EMZA100ADA221MF80G |
|         | 330     | HA0       | 0.19 | 0.16                                          | 600                                                        | EMZA100ADA331MHA0G |
|         | 470     | HA0       | 0.19 | 0.16                                          | 600                                                        | EMZA100ADA471MHA0G |
|         | 680     | HA0       | 0.19 | 0.16                                          | 600                                                        | EMZA100ADA681MHA0G |
|         | 1,000   | JA0       | 0.19 | 0.08                                          | 850                                                        | EMZA100ADA102MJA0G |
| 16      | 10      | D61       | 0.16 | 1.35                                          | 90                                                         | EMZA160ADA100MD61G |
|         | 22      | D61       | 0.16 | 1.35                                          | 90                                                         | EMZA160ADA220MD61G |
|         | 22      | E61       | 0.16 | 0.70                                          | 160                                                        | EMZA160ADA220ME61G |
|         | 47      | E61       | 0.16 | 0.70                                          | 160                                                        | EMZA160ADA470ME61G |
|         | 47      | F61       | 0.16 | 0.36                                          | 240                                                        | EMZA160ADA470MF61G |
|         | 100     | F61       | 0.16 | 0.36                                          | 240                                                        | EMZA160ADA101MF61G |
|         | 220     | F80       | 0.16 | 0.34                                          | 280                                                        | EMZA160ADA221MF80G |
|         | 330     | HA0       | 0.16 | 0.16                                          | 600                                                        | EMZA160ADA331MHA0G |
|         | 470     | HA0       | 0.16 | 0.16                                          | 600                                                        | EMZA160ADA471MHA0G |
| 25      | 680     | JA0       | 0.16 | 0.08                                          | 850                                                        | EMZA160ADA681MJA0G |
|         | 10      | D61       | 0.14 | 1.35                                          | 90                                                         | EMZA250ADA100MD61G |
|         | 22      | E61       | 0.14 | 0.70                                          | 160                                                        | EMZA250ADA220ME61G |
|         | 33      | E61       | 0.14 | 0.70                                          | 160                                                        | EMZA250ADA330ME61G |
|         | 33      | F61       | 0.14 | 0.36                                          | 240                                                        | EMZA250ADA330MF61G |
|         | 47      | F61       | 0.14 | 0.36                                          | 240                                                        | EMZA250ADA470MF61G |
|         | 100     | F80       | 0.14 | 0.34                                          | 280                                                        | EMZA250ADA101MF80G |
|         | 220     | HA0       | 0.14 | 0.16                                          | 600                                                        | EMZA250ADA221MHA0G |
|         | 330     | HA0       | 0.14 | 0.16                                          | 600                                                        | EMZA250ADA331MHA0G |
| 35      | 470     | JA0       | 0.14 | 0.08                                          | 850                                                        | EMZA250ADA471MJA0G |
|         | 4.7     | D61       | 0.12 | 1.35                                          | 90                                                         | EMZA350ADA4R7MD61G |
|         | 10      | D61       | 0.12 | 1.35                                          | 90                                                         | EMZA350ADA100MD61G |
|         | 10      | E61       | 0.12 | 0.70                                          | 160                                                        | EMZA350ADA100ME61G |
|         | 22      | E61       | 0.12 | 0.70                                          | 160                                                        | EMZA350ADA220ME61G |
|         | 33      | F61       | 0.12 | 0.36                                          | 240                                                        | EMZA350ADA330MF61G |
|         | 47      | F61       | 0.12 | 0.36                                          | 240                                                        | EMZA350ADA470MF61G |
|         | 100     | F80       | 0.12 | 0.34                                          | 280                                                        | EMZA350ADA101MF80G |
|         | 100     | HA0       | 0.12 | 0.16                                          | 600                                                        | EMZA350ADA101MHA0G |
| 50      | 220     | HA0       | 0.12 | 0.16                                          | 600                                                        | EMZA350ADA221MHA0G |
|         | 330     | JA0       | 0.12 | 0.08                                          | 850                                                        | EMZA350ADA331MJA0G |
|         | 4.7     | D61       | 0.10 | 2.90                                          | 60                                                         | EMZA500ADA4R7MD61G |
|         | 10      | E61       | 0.10 | 1.52                                          | 85                                                         | EMZA500ADA100ME61G |
|         | 10      | F61       | 0.10 | 0.88                                          | 165                                                        | EMZA500ADA100MF61G |
|         | 22      | F61       | 0.10 | 0.88                                          | 165                                                        | EMZA500ADA220MF61G |
|         | 33      | F80       | 0.10 | 0.68                                          | 195                                                        | EMZA500ADA330MF80G |
|         | 47      | F80       | 0.10 | 0.68                                          | 195                                                        | EMZA500ADA470MF80G |
|         | 100     | HA0       | 0.10 | 0.34                                          | 350                                                        | EMZA500ADA101MHA0G |
| 63      | 220     | JA0       | 0.10 | 0.18                                          | 670                                                        | EMZA500ADA221MJA0G |
|         | 4.7     | E61       | 0.08 | 4.8                                           | 50                                                         | EMZA630ADA4R7ME61G |
|         | 10      | F61       | 0.08 | 2.2                                           | 80                                                         | EMZA630ADA100MF61G |
|         | 22      | F80       | 0.08 | 2.1                                           | 120                                                        | EMZA630ADA220MF80G |
|         | 33      | HA0       | 0.08 | 0.70                                          | 250                                                        | EMZA630ADA330MHA0G |
|         | 47      | HA0       | 0.08 | 0.70                                          | 250                                                        | EMZA630ADA470MHA0G |
|         | 68      | HA0       | 0.08 | 0.70                                          | 250                                                        | EMZA630ADA680MHA0G |
| 80      | 100     | JA0       | 0.08 | 0.45                                          | 400                                                        | EMZA630ADA101MJA0G |
|         | 3.3     | E61       | 0.08 | 5.0                                           | 25                                                         | EMZA800ADA3R3ME61G |
|         | 4.7     | F61       | 0.08 | 3.0                                           | 40                                                         | EMZA800ADA4R7MF61G |
|         | 10      | F80       | 0.08 | 2.4                                           | 60                                                         | EMZA800ADA100MF80G |
|         | 22      | HA0       | 0.08 | 1.3                                           | 130                                                        | EMZA800ADA220MHA0G |
|         | 33      | HA0       | 0.08 | 1.3                                           | 130                                                        | EMZA800ADA330MHA0G |
|         | 47      | JA0       | 0.08 | 0.70                                          | 200                                                        | EMZA800ADA470MJA0G |

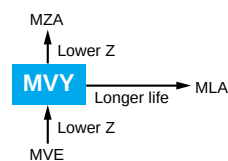


## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

## Alchip™-MVY Series

- Endurance : 1,000 to 5,000 hours at 105°C
- Low impedance
- For digital equipment, especially DC-DC converters
- Solvent resistant type except 80 & 100V<sub>dc</sub> (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant



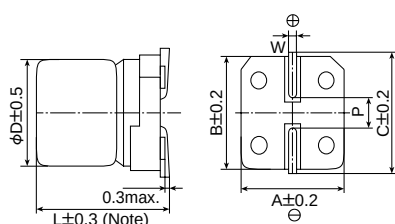
## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                                                                 |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|------|------|------|------|--------------------------------------|------|------|------|------|---------------------------------------------------------------------------------------------------------------------|
| Category                                               |                                                                                                                                                                                                                                                                                       |                                                                                 |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |
| Temperature Range                                      | -55 to +105℃ (6.3 to 63V <sub>dc</sub> )    -40 to +105℃ (80 & 100V <sub>dc</sub> )                                                                                                                                                                                                   |                                                                                 |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |
| Rated Voltage Range                                    | 6.3 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                             |                                                                                 |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |
| Capacitance Tolerance                                  | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                              |                                                                                 |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)                                                                                                                          |                                                                                 |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      |                                                                                 | 6.3V | 10V  | 16V  | 25V  | 35V                                  | 50V  | 63V  | 80V  | 100V | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase.<br>(at 20℃, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | D55 to F80                                                                      | 0.24 | 0.20 | 0.16 | 0.14 | 0.12                                 | 0.12 | —    | —    | —    |                                                                                                                     |
|                                                        |                                                                                                                                                                                                                                                                                       | HA0 & JA0                                                                       | 0.28 | 0.24 | 0.20 | 0.16 | 0.14                                 | 0.12 | —    | —    | —    |                                                                                                                     |
|                                                        |                                                                                                                                                                                                                                                                                       | KE0 to MN0                                                                      | 0.26 | 0.22 | 0.18 | 0.16 | 0.14                                 | 0.12 | 0.14 | 0.10 | 0.10 |                                                                                                                     |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      |                                                                                 | 6.3V | 10V  | 16V  | 25V  | 35V                                  | 50V  | 63V  | 80V  | 100V | (at 120Hz)                                                                                                          |
|                                                        | Z(-40℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | D55 to JA0                                                                      | 3    | 2    | 2    | 2    | 2                                    | 2    | —    | —    | —    |                                                                                                                     |
|                                                        |                                                                                                                                                                                                                                                                                       | KE0 to MN0                                                                      | 10   | 8    | 6    | 4    | 3                                    | 3    | 3    | 3    | 3    |                                                                                                                     |
|                                                        |                                                                                                                                                                                                                                                                                       |                                                                                 |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for specified time at 105℃.                                                                                                                                |                                                                                 |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |
|                                                        | Time                                                                                                                                                                                                                                                                                  | D55 to F80 : 1,000 hours<br>HA0 & JA0 : 2,000 hours<br>KE0 to MN0 : 5,000 hours |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                         | 6.3V <sub>dc</sub> (D55 to JA0)                                                 |      |      |      |      | 6.3 to 100V <sub>dc</sub>            |      |      |      |      |                                                                                                                     |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value                                                      |      |      |      |      | ≤±20% of the initial value           |      |      |      |      |                                                                                                                     |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value                                            |      |      |      |      | ≤200% of the initial specified value |      |      |      |      |                                                                                                                     |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value                                                    |      |      |      |      | ≤The initial specified value         |      |      |      |      |                                                                                                                     |
|                                                        |                                                                                                                                                                                                                                                                                       |                                                                                 |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                                                 |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                         | 6.3V <sub>dc</sub> (D55 to JA0)                                                 |      |      |      |      | 6.3 to 100V <sub>dc</sub>            |      |      |      |      |                                                                                                                     |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value                                                      |      |      |      |      | ≤±20% of the initial value           |      |      |      |      |                                                                                                                     |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value                                            |      |      |      |      | ≤200% of the initial specified value |      |      |      |      |                                                                                                                     |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value                                                    |      |      |      |      | ≤The initial specified value         |      |      |      |      |                                                                                                                     |
|                                                        |                                                                                                                                                                                                                                                                                       |                                                                                 |      |      |      |      |                                      |      |      |      |      |                                                                                                                     |

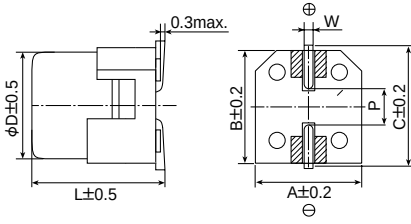
## ◆DIMENSIONS [mm]

- Terminal Code : A
- Size code : D55 to MN0

- Terminal Code : G
- Size code : LH0 to MN0



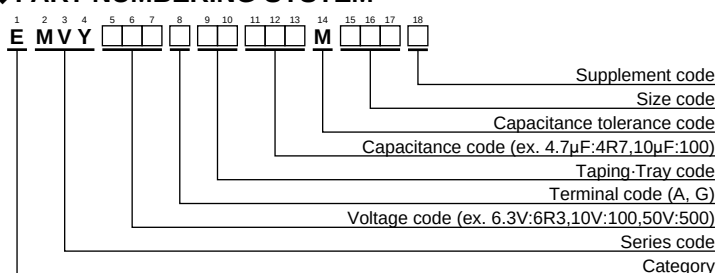
Note : L±0.5 for HA0 to MN0



: Dummy terminals

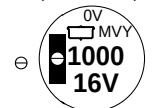
| Size code | φD   | L    | A    | B    | C    | W          | P   |
|-----------|------|------|------|------|------|------------|-----|
| D55       | 4    | 5.2  | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E55       | 5    | 5.2  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F55       | 6.3  | 5.2  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F61       | 6.3  | 5.8  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F80       | 6.3  | 7.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8    | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10   | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |
| KE0       | 12.5 | 13.5 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 |
| KG5       | 12.5 | 16.0 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 |
| LH0       | 16   | 16.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 |
| LN0       | 16   | 21.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 |
| MH0       | 18   | 16.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 |
| MN0       | 18   | 21.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆MARKING

D55 to JA0  
EX) 6.3V100μFKE0 to MN0  
EX) 16V1,000μF



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

Alchip™-MVY Series

## ◆STANDARD RATINGS

□ is not solvent resistant (80/100V<sub>dc</sub>).

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | Impedance (Ω <sub>max</sub> /20°C, 100kHz) | Rated ripple current (mA <sub>rms</sub> /105°C, 100kHz) | Part No.           | WV (V <sub>dc</sub> ) | Cap (μF) | Size code | Impedance (Ω <sub>max</sub> /20°C, 100kHz) | Rated ripple current (mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|-----------------------|----------|-----------|--------------------------------------------|---------------------------------------------------------|--------------------|-----------------------|----------|-----------|--------------------------------------------|---------------------------------------------------------|--------------------|
| 6.3                   | 22       | D55       | 3.0                                        | 60                                                      | EMVY6R3ADA220MD55G | 25                    | 330      | HA0       | 0.30                                       | 450                                                     | EMVY250ADA331MHA0G |
|                       | 33       | E55       | 1.8                                        | 95                                                      | EMVY6R3ADA330ME55G |                       | 470      | JA0       | 0.15                                       | 670                                                     | EMVY250ADA471MJA0G |
|                       | 47       | E55       | 1.8                                        | 95                                                      | EMVY6R3ADA470ME55G |                       | 1,000    | LH0       | 0.054                                      | 1,260                                                   | EMVY250□DA102MLH0S |
|                       | 100      | F55       | 1.0                                        | 140                                                     | EMVY6R3ADA101MF55G |                       | 1,000    | MH0       | 0.054                                      | 1,350                                                   | EMVY250□DA102MMH0S |
|                       | 220      | F55       | 1.0                                        | 140                                                     | EMVY6R3ADA221MF55G |                       | 2,200    | LN0       | 0.038                                      | 1,630                                                   | EMVY250□DA222MLN0S |
|                       | 330      | F80       | 0.34                                       | 280                                                     | EMVY6R3ADA331MF80G |                       | 2,200    | MN0       | 0.038                                      | 1,750                                                   | EMVY250□DA222MMN0S |
|                       | 470      | HA0       | 0.30                                       | 450                                                     | EMVY6R3ADA471MHA0G |                       | 3,300    | MN0       | 0.038                                      | 1,750                                                   | EMVY250□DA332MMN0S |
|                       | 680      | HA0       | 0.30                                       | 450                                                     | EMVY6R3ADA681MHA0G | 35                    | 4.7      | D55       | 3.0                                        | 60                                                      | EMVY350ADA4R7MD55G |
|                       | 1,000    | HA0       | 0.30                                       | 450                                                     | EMVY6R3ADA102MJA0G |                       | 10       | E55       | 1.8                                        | 95                                                      | EMVY350ADA100ME55G |
|                       | 1,500    | JA0       | 0.15                                       | 670                                                     | EMVY6R3ADA152MJA0G |                       | 22       | F55       | 1.0                                        | 140                                                     | EMVY350ADA220MF55G |
|                       | 2,200    | KE0       | 0.070                                      | 820                                                     | EMVY6R3ARA222MKE0S |                       | 33       | F55       | 1.0                                        | 140                                                     | EMVY350ADA330MF55G |
|                       | 2,200    | LH0       | 0.054                                      | 1,260                                                   | EMVY6R3□DA222MLH0S |                       | 47       | F55       | 1.0                                        | 140                                                     | EMVY350ADA470MF55G |
|                       | 3,300    | KG5       | 0.060                                      | 950                                                     | EMVY6R3ARA332MKG5S |                       | 47       | F61       | 1.0                                        | 140                                                     | EMVY350ADA470MF61G |
|                       | 3,300    | MH0       | 0.054                                      | 1,350                                                   | EMVY6R3□DA332MMH0S |                       | 68       | F80       | 0.34                                       | 280                                                     | EMVY350ADA680MF80G |
|                       | 4,700    | LN0       | 0.038                                      | 1,630                                                   | EMVY6R3□DA472MLN0S |                       | 100      | HA0       | 0.30                                       | 450                                                     | EMVY350ADA101MHA0G |
|                       | 4,700    | MH0       | 0.054                                      | 1,350                                                   | EMVY6R3□DA472MMH0S |                       | 220      | HA0       | 0.30                                       | 450                                                     | EMVY350ADA221MHA0G |
|                       | 6,800    | LN0       | 0.038                                      | 1,630                                                   | EMVY6R3□DA682MLN0S |                       | 330      | JA0       | 0.15                                       | 670                                                     | EMVY350ADA331MJA0G |
|                       | 6,800    | MN0       | 0.038                                      | 1,750                                                   | EMVY6R3□DA682MMN0S |                       | 470      | KE0       | 0.070                                      | 820                                                     | EMVY350ARA471MKE0S |
|                       | 8,200    | MN0       | 0.038                                      | 1,750                                                   | EMVY6R3□DA822MMN0S |                       | 470      | LH0       | 0.054                                      | 1,260                                                   | EMVY350□DA471MLH0S |
| 10                    | 22       | E55       | 1.8                                        | 95                                                      | EMVY100ADA220ME55G |                       | 1,000    | LH0       | 0.054                                      | 1,260                                                   | EMVY350□DA102MLH0S |
|                       | 33       | E55       | 1.8                                        | 95                                                      | EMVY100ADA330ME55G |                       | 1,000    | MH0       | 0.054                                      | 1,350                                                   | EMVY350□DA102MMH0S |
|                       | 47       | F55       | 1.0                                        | 140                                                     | EMVY100ADA470MF55G | 50                    | 2,200    | MN0       | 0.038                                      | 1,750                                                   | EMVY350□DA222MMN0S |
|                       | 100      | F55       | 1.0                                        | 140                                                     | EMVY100ADA101MF55G |                       | 1.0      | D55       | 5.0                                        | 30                                                      | EMVY500ADA1R0MD55G |
|                       | 220      | F80       | 0.34                                       | 280                                                     | EMVY100ADA221MF80G |                       | 2.2      | D55       | 5.0                                        | 30                                                      | EMVY500ADA2R2MD55G |
|                       | 330      | HA0       | 0.30                                       | 450                                                     | EMVY100ADA331MHA0G |                       | 3.3      | D55       | 5.0                                        | 30                                                      | EMVY500ADA3R3MD55G |
|                       | 470      | HA0       | 0.30                                       | 450                                                     | EMVY100ADA471MHA0G |                       | 4.7      | E55       | 3.0                                        | 50                                                      | EMVY500ADA4R7ME55G |
|                       | 680      | JA0       | 0.15                                       | 670                                                     | EMVY100ADA681MJA0G |                       | 10       | F55       | 2.0                                        | 70                                                      | EMVY500ADA100MF55G |
|                       | 1,000    | JA0       | 0.15                                       | 670                                                     | EMVY100ADA102MJA0G |                       | 22       | F55       | 2.0                                        | 70                                                      | EMVY500ADA220MF55G |
|                       | 2,200    | KG5       | 0.060                                      | 950                                                     | EMVY100ARA222MKG5S |                       | 33       | F80       | 0.60                                       | 170                                                     | EMVY500ADA330MF80G |
|                       | 2,200    | LH0       | 0.054                                      | 1,260                                                   | EMVY100□DA222MLH0S |                       | 47       | F80       | 0.60                                       | 170                                                     | EMVY500ADA470MF80G |
|                       | 3,300    | LH0       | 0.054                                      | 1,260                                                   | EMVY100□DA332MLH0S |                       | 68       | HA0       | 0.60                                       | 300                                                     | EMVY500ADA680MHA0G |
|                       | 3,300    | MH0       | 0.054                                      | 1,350                                                   | EMVY100□DA332MMH0S |                       | 100      | HA0       | 0.60                                       | 300                                                     | EMVY500ADA101MHA0G |
|                       | 4,700    | LN0       | 0.038                                      | 1,630                                                   | EMVY100□DA472MLN0S |                       | 220      | JA0       | 0.30                                       | 500                                                     | EMVY500ADA221MJA0G |
|                       | 4,700    | MN0       | 0.038                                      | 1,750                                                   | EMVY100□DA472MMN0S |                       | 330      | KE0       | 0.11                                       | 650                                                     | EMVY500ARA331MKE0S |
|                       | 6,800    | MN0       | 0.038                                      | 1,750                                                   | EMVY100□DA682MMN0S |                       | 330      | LH0       | 0.087                                      | 900                                                     | EMVY500□DA331MLH0S |
| 16                    | 10       | D55       | 3.0                                        | 60                                                      | EMVY160ADA100MD55G |                       | 470      | LH0       | 0.087                                      | 900                                                     | EMVY500□DA471MLH0S |
|                       | 22       | E55       | 1.8                                        | 95                                                      | EMVY160ADA220ME55G | 63                    | 470      | MH0       | 0.087                                      | 1,060                                                   | EMVY500□DA471MMH0S |
|                       | 33       | F55       | 1.0                                        | 140                                                     | EMVY160ADA330MF55G |                       | 1,000    | MN0       | 0.050                                      | 1,520                                                   | EMVY500□DA102MMN0S |
|                       | 47       | F55       | 1.0                                        | 140                                                     | EMVY160ADA470MF55G |                       | 68       | KE0       | 0.19                                       | 500                                                     | EMVY630ARA680MKE0S |
|                       | 100      | F55       | 1.0                                        | 140                                                     | EMVY160ADA101MF55G |                       | 100      | KE0       | 0.19                                       | 500                                                     | EMVY630ARA101MKE0S |
|                       | 220      | F80       | 0.34                                       | 280                                                     | EMVY160ADA221MF80G |                       | 220      | KE0       | 0.19                                       | 500                                                     | EMVY630ARA221MKE0S |
|                       | 330      | HA0       | 0.30                                       | 450                                                     | EMVY160ADA331MHA0G |                       | 220      | LH0       | 0.12                                       | 845                                                     | EMVY630□DA221MLH0S |
|                       | 470      | HA0       | 0.30                                       | 450                                                     | EMVY160ADA471MHA0G |                       | 330      | LH0       | 0.12                                       | 845                                                     | EMVY630□DA331MLH0S |
|                       | 680      | JA0       | 0.15                                       | 670                                                     | EMVY160ADA681MJA0G |                       | 330      | MH0       | 0.12                                       | 905                                                     | EMVY630□DA331MMH0S |
|                       | 1,000    | KE0       | 0.070                                      | 820                                                     | EMVY160ARA102MKE0S |                       | 470      | LN0       | 0.085                                      | 1,100                                                   | EMVY630□DA471MLN0S |
|                       | 1,000    | LH0       | 0.054                                      | 1,260                                                   | EMVY160□DA102MLH0S |                       | 470      | MH0       | 0.12                                       | 905                                                     | EMVY630□DA471MMH0S |
|                       | 2,200    | LH0       | 0.054                                      | 1,260                                                   | EMVY160□DA222MLH0S | 80                    | 100      | KE0       | 0.33                                       | 450                                                     | EMVY800ARA101MKE0S |
|                       | 2,200    | MH0       | 0.054                                      | 1,350                                                   | EMVY160□DA222MMH0S |                       | 220      | KG5       | 0.26                                       | 550                                                     | EMVY800ARA221MKG5S |
|                       | 3,300    | LN0       | 0.038                                      | 1,630                                                   | EMVY160□DA332MLN0S |                       | 330      | LN0       | 0.16                                       | 900                                                     | EMVY800□DA331MLN0S |
|                       | 3,300    | MH0       | 0.054                                      | 1,350                                                   | EMVY160□DA332MMH0S |                       | 330      | MH0       | 0.24                                       | 700                                                     | EMVY800□DA331MMH0S |
|                       | 4,700    | MN0       | 0.038                                      | 1,750                                                   | EMVY160□DA472MMN0S |                       | 470      | MN0       | 0.16                                       | 950                                                     | EMVY800□DA471MMN0S |
| 25                    | 10       | E55       | 1.8                                        | 95                                                      | EMVY250ADA100ME55G |                       | 47       | KE0       | 0.33                                       | 450                                                     | EMVY101ARA470MKE0S |
|                       | 22       | F55       | 1.0                                        | 140                                                     | EMVY250ADA220MF55G | 100                   | 68       | KE0       | 0.33                                       | 450                                                     | EMVY101ARA680MKE0S |
|                       | 33       | F55       | 1.0                                        | 140                                                     | EMVY250ADA330MF55G |                       | 100      | KE0       | 0.33                                       | 450                                                     | EMVY101ARA101MKE0S |
|                       | 47       | F55       | 1.0                                        | 140                                                     | EMVY250ADA470MF55G |                       | 100      | LH0       | 0.24                                       | 650                                                     | EMVY101□DA101MLH0S |
|                       | 100      | F80       | 0.34                                       | 280                                                     | EMVY250ADA101MF80G |                       | 220      | LN0       | 0.16                                       | 900                                                     | EMVY101□DA221MLN0S |
|                       | 220      | HA0       | 0.30                                       | 450                                                     | EMVY250ADA221MHA0G |                       | 220      | MH0       | 0.24                                       | 700                                                     | EMVY101□DA221MMH0S |
|                       |          |           |                                            |                                                         |                    |                       | 330      | MN0       | 0.16                                       | 950                                                     | EMVY101□DA331MMN0S |

□ : Enter the appropriate terminal code.



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

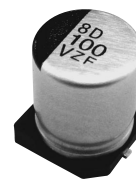
Low impedance, 10000-hours-life, 105°C

New!

## Alchip™-MZF Series

- Endurance : 10,000 hours at 105°C
- Low impedance
- Rated voltage range : 6.3 to 50V
- Nominal capacitance range : 10 to 470μF
- Suitable for high reliability products
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

MLA  $\xrightarrow{\text{Longer life}}$  MZE  $\xrightarrow{\text{Longer life}}$  **MZF**

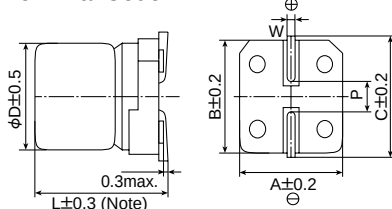


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |                     |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|---------------------|
| Category                                               | -25 to +105℃                                                                                                                                                                                                                                                                          |                                      |      |      |      |      |                     |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |                     |
| Rated Voltage Range                                    | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                      |      |      |      |      |                     |
| Capacitance Tolerance                                  | ±20%(M) (at 20℃,120Hz)                                                                                                                                                                                                                                                                |                                      |      |      |      |      |                     |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃, after 2 minutes)                                                                                                                          |                                      |      |      |      |      |                     |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V                 |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.32                                 | 0.28 | 0.26 | 0.16 | 0.14 | 0.14 (at 20℃,120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V                 |
|                                                        | Z(-10℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 4                                    | 3    | 2    | 2    | 2    | 2 (at 120Hz)        |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 10,000 hours at 105℃.                                                                                                                                  |                                      |      |      |      |      |                     |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value           |      |      |      |      |                     |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value |      |      |      |      |                     |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |                     |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |                     |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value           |      |      |      |      |                     |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value |      |      |      |      |                     |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |                     |

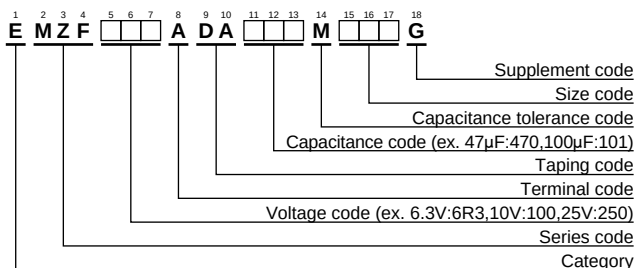
## ◆DIMENSIONS [mm]

- Terminal Code : A



Note : L±0.5 for HA0 and JA0

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

| Size code | D   | L    | A    | B    | C    | W          | P   |
|-----------|-----|------|------|------|------|------------|-----|
| E73       | 5   | 7.0  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F73       | 6.3 | 7.0  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F90       | 6.3 | 8.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8   | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10  | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆MARKING

EX) 16V47μF



- Rated voltage symbol

| Rated voltage (V <sub>dc</sub> ) | 6.3 | 10 | 16 | 25 | 35 | 50 |
|----------------------------------|-----|----|----|----|----|----|
| Symbol                           | j   | A  | C  | E  | V  | H  |

## ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | Impedance (Ω <sub>max</sub> /20°C, 100kHz) | Rated ripple current (mA <sub>RMS</sub> /105°C, 100kHz) | Part No.           | WV (V <sub>dc</sub> ) | Cap (μF) | Size code | Impedance (Ω <sub>max</sub> /20°C, 100kHz) | Rated ripple current (mA <sub>RMS</sub> /105°C, 100kHz) | Part No.           |
|-----------------------|----------|-----------|--------------------------------------------|---------------------------------------------------------|--------------------|-----------------------|----------|-----------|--------------------------------------------|---------------------------------------------------------|--------------------|
| 6.3                   | 47       | E73       | 2.2                                        | 95                                                      | EMZF6R3ADA470ME73G | 25                    | 33       | F73       | 1.1                                        | 140                                                     | EMZF250ADA330MF73G |
|                       | 100      | F73       | 1.1                                        | 140                                                     | EMZF6R3ADA101MF73G |                       | 47       | F73       | 1.1                                        | 140                                                     | EMZF250ADA470MF73G |
|                       | 220      | F90       | 1.0                                        | 230                                                     | EMZF6R3ADA221MF90G |                       | 100      | F90       | 1.0                                        | 230                                                     | EMZF250ADA101MF90G |
|                       | 330      | F90       | 1.0                                        | 230                                                     | EMZF6R3ADA331MF90G |                       | 220      | HA0       | 0.22                                       | 600                                                     | EMZF250ADA221MHA0G |
|                       | 470      | HA0       | 0.22                                       | 600                                                     | EMZF6R3ADA471MHA0G |                       | 330      | JA0       | 0.16                                       | 850                                                     | EMZF250ADA331MJA0G |
| 10                    | 33       | E73       | 2.2                                        | 95                                                      | EMZF100ADA330ME73G | 35                    | 10       | E73       | 2.2                                        | 95                                                      | EMZF350ADA100ME73G |
|                       | 150      | F73       | 1.1                                        | 140                                                     | EMZF100ADA151MF73G |                       | 10       | F73       | 1.1                                        | 140                                                     | EMZF350ADA100MF73G |
| 16                    | 22       | E73       | 2.2                                        | 95                                                      | EMZF160ADA220ME73G |                       | 22       | E73       | 2.2                                        | 95                                                      | EMZF350ADA220ME73G |
|                       | 47       | F73       | 1.1                                        | 140                                                     | EMZF160ADA470MF73G |                       | 22       | F73       | 1.1                                        | 140                                                     | EMZF350ADA220MF73G |
|                       | 100      | F73       | 1.1                                        | 140                                                     | EMZF160ADA101MF73G |                       | 33       | F90       | 1.0                                        | 230                                                     | EMZF350ADA330MF90G |
|                       | 150      | F90       | 1.0                                        | 230                                                     | EMZF160ADA151MF90G |                       | 47       | F90       | 1.0                                        | 230                                                     | EMZF350ADA470MF90G |
|                       | 220      | F90       | 1.0                                        | 230                                                     | EMZF160ADA221MF90G |                       | 100      | HA0       | 0.22                                       | 600                                                     | EMZF350ADA101MHA0G |
|                       | 330      | HA0       | 0.22                                       | 600                                                     | EMZF160ADA331MHA0G |                       | 220      | JA0       | 0.16                                       | 850                                                     | EMZF350ADA221MJA0G |
| 25                    | 470      | JA0       | 0.16                                       | 850                                                     | EMZF160ADA471MJA0G | 50                    | 47       | HA0       | 0.53                                       | 350                                                     | EMZF500ADA470MHA0G |
|                       | 22       | E73       | 2.2                                        | 95                                                      | EMZF250ADA220ME73G |                       | 100      | JA0       | 0.35                                       | 670                                                     | EMZF500ADA101MJA0G |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 7000 to 8000-hours-life, 105°C

# Alchip™-MZE Series

- Endurance : 7,000 to 8,000 hours at 105°C
- Low impedance
- Rated voltage range : 6.3 to 50V
- Nominal capacitance range : 10 to 470μF
- Suitable for high reliability products
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

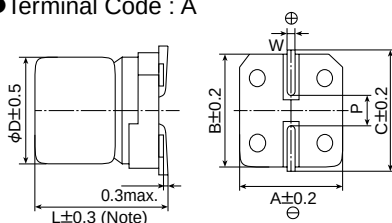
## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                               |                                                     |      |      |      |      |      |                 |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|------|------|------|------|------|-----------------|
| Category                                               | Temperature Range                                                                                                                                             |                                                     |      |      |      |      |      |                 |
| Rated Voltage Range                                    | -25 to +105°C                                                                                                                                                 |                                                     |      |      |      |      |      |                 |
| Capacitance Tolerance                                  | 6.3 to 50V <sub>dc</sub>                                                                                                                                      |                                                     |      |      |      |      |      |                 |
| Leakage Current                                        | ±20%(M) (at 20°C,120Hz)                                                                                                                                       |                                                     |      |      |      |      |      |                 |
| Dissipation Factor (tanδ)                              | I=0.01CV or 3μA, whichever is greater<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C, after 2 minutes) |                                                     |      |      |      |      |      |                 |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                              | 6.3V                                                | 10V  | 16V  | 25V  | 35V  | 50V  | (at 20°C,120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                   | 0.32                                                | 0.28 | 0.26 | 0.16 | 0.14 | 0.14 |                 |
| Endurance                                              | Rated voltage(V <sub>dc</sub> )                                                                                                                               | 6.3V                                                | 10V  | 16V  | 25V  | 35V  | 50V  | (at 120Hz)      |
|                                                        | Z(-10°C)/Z(+20°C)                                                                                                                                             | 4                                                   | 3    | 2    | 2    | 2    | 2    |                 |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for specified time at 105°C.      |                                                     |      |      |      |      |      |                 |
|                                                        | Time                                                                                                                                                          | E73 & F73 : 7,000 hours<br>F90 to JA0 : 8,000 hours |      |      |      |      |      |                 |
|                                                        | Capacitance change                                                                                                                                            | ≤±30% of the initial value                          |      |      |      |      |      |                 |
|                                                        | D.F. (tanδ)                                                                                                                                                   | ≤300% of the initial specified value                |      |      |      |      |      |                 |
|                                                        | Leakage current                                                                                                                                               | ≤The initial specified value                        |      |      |      |      |      |                 |



### ◆ DIMENSIONS [mm]

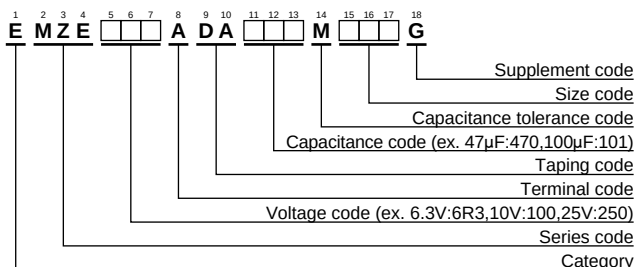
- Terminal Code : A



Note :  $L \pm 0.5$  for HA0 and JA0

| Size code | D   | L    | A    | B    | C    | W          | P   |
|-----------|-----|------|------|------|------|------------|-----|
| E73       | 5   | 7.0  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F73       | 6.3 | 7.0  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F90       | 6.3 | 8.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8   | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10  | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

**◆ MARKING**

EX) 16V47 $\mu$ F



- Rated voltage symbol

|                                  |     |    |    |    |    |    |
|----------------------------------|-----|----|----|----|----|----|
| Rated voltage (V <sub>dc</sub> ) | 6.3 | 10 | 16 | 25 | 35 | 50 |
| Symbol                           | i   | A  | C  | E  | V  | H  |

## ◆ STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Size code | Impedance<br>(Ωmax/20℃,<br>100kHz) | Rated ripple<br>current<br>(mA rms/105℃,<br>100kHz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Size code | Impedance<br>(Ωmax/20℃,<br>100kHz) | Rated ripple<br>current<br>(mA rms/105℃,<br>100kHz) | Part No.           |
|-------------|-------------|-----------|------------------------------------|-----------------------------------------------------|--------------------|-------------|-------------|-----------|------------------------------------|-----------------------------------------------------|--------------------|
| 6.3         | 47          | E73       | 2.2                                | 95                                                  | EMZE6R3ADA470ME73G | 25          | 33          | F73       | 1.1                                | 140                                                 | EMZE250ADA330MF73G |
|             | 100         | F73       | 1.1                                | 140                                                 | EMZE6R3ADA101MF73G |             | 47          | F73       | 1.1                                | 140                                                 | EMZE250ADA470MF73G |
|             | 220         | F90       | 1.0                                | 230                                                 | EMZE6R3ADA221MF90G |             | 100         | F90       | 1.0                                | 230                                                 | EMZE250ADA101MF90G |
|             | 330         | F90       | 1.0                                | 230                                                 | EMZE6R3ADA331MF90G |             | 220         | HA0       | 0.22                               | 600                                                 | EMZE250ADA221MHA0G |
|             | 470         | HA0       | 0.22                               | 600                                                 | EMZE6R3ADA471MHA0G |             | 330         | JA0       | 0.16                               | 850                                                 | EMZE250ADA331MJA0G |
| 10          | 33          | E73       | 2.2                                | 95                                                  | EMZE100ADA330ME73G | 35          | 10          | E73       | 2.2                                | 95                                                  | EMZE350ADA100ME73G |
|             | 150         | F73       | 1.1                                | 140                                                 | EMZE100ADA151MF73G |             | 10          | F73       | 1.1                                | 140                                                 | EMZE350ADA100MF73G |
| 16          | 22          | E73       | 2.2                                | 95                                                  | EMZE160ADA220ME73G |             | 22          | E73       | 2.2                                | 95                                                  | EMZE350ADA220ME73G |
|             | 47          | F73       | 1.1                                | 140                                                 | EMZE160ADA470MF73G |             | 22          | F73       | 1.1                                | 140                                                 | EMZE350ADA220MF73G |
|             | 100         | F73       | 1.1                                | 140                                                 | EMZE160ADA101MF73G |             | 33          | F90       | 1.0                                | 230                                                 | EMZE350ADA330MF90G |
|             | 150         | F90       | 1.0                                | 230                                                 | EMZE160ADA151MF90G |             | 47          | F90       | 1.0                                | 230                                                 | EMZE350ADA470MF90G |
|             | 220         | F90       | 1.0                                | 230                                                 | EMZE160ADA221MF90G |             | 100         | HA0       | 0.22                               | 600                                                 | EMZE350ADA101MHA0G |
|             | 330         | HA0       | 0.22                               | 600                                                 | EMZE160ADA331MHA0G |             | 220         | JA0       | 0.16                               | 850                                                 | EMZE350ADA221MJA0G |
|             | 470         | JA0       | 0.16                               | 850                                                 | EMZE160ADA471MJA0G |             | 50          | 47        | HA0                                | 0.53                                                | 350                |
| 25          | 22          | E73       | 2.2                                | 95                                                  | EMZE250ADA220ME73G |             |             | 100       | JA0                                | 0.35                                                | 670                |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 5000-hours-life, 105°C

New!

## Alchip™-MZK Series

- Endurance : 5,000 hours at 105°C
- Low impedance
- Rated voltage range : 6.3 to 35V
- Nominal capacitance range : 10 to 150μF
- Suitable for high reliability products
- Solvent resistant type
- RoHS Compliant

MVY → Longer life

MZK

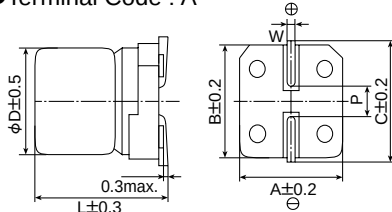


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |      |      |                     |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|---------------------|
| Category                                               |                                                                                                                                                                                                                                                                                       |                                      |      |      |      |                     |
| Temperature Range                                      | -25 to +105℃                                                                                                                                                                                                                                                                          |                                      |      |      |      |                     |
| Rated Voltage Range                                    | 6.3 to 35V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                      |      |      |      |                     |
| Capacitance Tolerance                                  | ±20%(M) (at 20℃,120Hz)                                                                                                                                                                                                                                                                |                                      |      |      |      |                     |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃, after 2 minutes)                                                                                                                          |                                      |      |      |      |                     |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V                 |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.32                                 | 0.28 | 0.26 | 0.16 | 0.14 (at 20℃,120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 6.3V                                 | 10V  | 16V  | 25V  | 35V                 |
|                                                        | Z(-10℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 4                                    | 3    | 2    | 2    | 2 (at 120Hz)        |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 5,000 hours at 105℃.                                                                                                                                   |                                      |      |      |      |                     |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value           |      |      |      |                     |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value |      |      |      |                     |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |                     |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |                     |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value           |      |      |      |                     |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value |      |      |      |                     |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |                     |

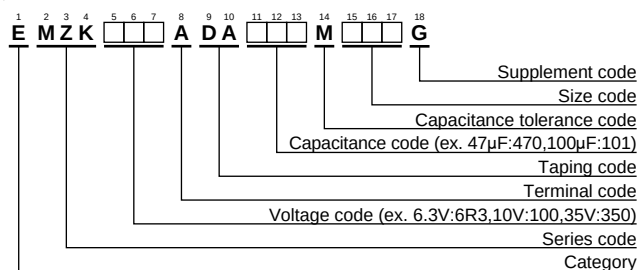
## ◆DIMENSIONS [mm]

●Terminal Code : A



| Size code | D   | L   | A   | B   | C   | W          | P   |
|-----------|-----|-----|-----|-----|-----|------------|-----|
| E61       | 5   | 5.8 | 5.3 | 5.3 | 5.9 | 0.5 to 0.8 | 1.4 |
| F61       | 6.3 | 5.8 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆MARKING

EX) 35V47μF



●Rated voltage symbol

| Rated voltage (V <sub>dc</sub> ) | 6.3 | 10 | 16 | 25 | 35 |
|----------------------------------|-----|----|----|----|----|
| Symbol                           | j   | A  | C  | E  | V  |

## ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | Impedance (Ω <sub>max</sub> /20°C, 100kHz) | Rated ripple current (mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|-----------------------|----------|-----------|--------------------------------------------|---------------------------------------------------------|--------------------|
| 6.3                   | 100      | E61       | 2.2                                        | 95                                                      | EMZK6R3ADA101ME61G |
| 10                    | 150      | F61       | 1.1                                        | 140                                                     | EMZK100ADA151MF61G |
| 16                    | 33       | E61       | 2.2                                        | 95                                                      | EMZK160ADA330ME61G |
|                       | 47       | E61       | 2.2                                        | 95                                                      | EMZK160ADA470ME61G |
|                       | 100      | F61       | 1.1                                        | 140                                                     | EMZK160ADA101MF61G |
| 25                    | 68       | F61       | 1.1                                        | 140                                                     | EMZK250ADA680MF61G |
| 35                    | 10       | E61       | 2.2                                        | 95                                                      | EMZK350ADA100ME61G |
|                       | 10       | F61       | 1.1                                        | 140                                                     | EMZK350ADA100MF61G |
|                       | 22       | E61       | 2.2                                        | 95                                                      | EMZK350ADA220ME61G |
|                       | 22       | F61       | 1.1                                        | 140                                                     | EMZK350ADA220MF61G |
|                       | 33       | F61       | 1.1                                        | 140                                                     | EMZK350ADA330MF61G |
|                       | 47       | F61       | 1.1                                        | 140                                                     | EMZK350ADA470MF61G |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

## Alchip™-MLA Series

- Low impedance, long life
- Rated voltage 6.3 to 50V, Capacitance 10 to 1,000μF
- Case size φ5×5.8L to φ10×10L
- Suitable for applications requiring long life and low impedance such as equipment in continuous operation, industrial applications, etc.
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

MVY → Longer life

MLA

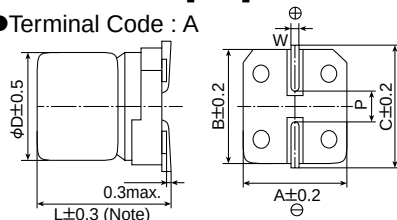


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                              |      |      |      |      |      |      |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|
| Category                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |      |      |      |      |      |
| Temperature Range                                      | -40 to +105°C                                                                                                                                                                                                                                                                                                                                                                                                                                |      |      |      |      |      |      |
| Rated Voltage Range                                    | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                     |      |      |      |      |      |      |
| Capacitance Tolerance                                  | ±20%(M) (20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                        |      |      |      |      |      |      |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                                                                                                                                                                                 |      |      |      |      |      |      |
| Dissipation Factor (tanδ)                              | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                                                                                                                              | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V  |
|                                                        | E61 to F61                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.28 | 0.24 | 0.22 | 0.16 | 0.13 | 0.12 |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                                                                                                                                                                                  | F80  | 0.32 | 0.27 | 0.24 | 0.16 | 0.13 |
|                                                        | HA0 to JA0                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.28 | 0.24 | 0.22 | 0.16 | 0.13 | 0.12 |
| Low Temperature Characteristics (Max. impedance Ratio) | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                                                                                                                              | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V  |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                                                                                                                                            | 4    | 3    | 2    | 2    | 2    | 2    |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                                                                                                                                            | 10   | 7    | 5    | 3    | 3    | 3    |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 3,000 hours at 105°C.<br>Capacitance change ≤±30% of the initial value<br>D.F. (tanδ) ≤300% of the initial specified value<br>Leakage current ≤The initial specified value                                                                                                                                   |      |      |      |      |      |      |
| Shelf life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.<br>Capacitance change ≤±30% of the initial value<br>D.F. (tanδ) ≤300% of the initial specified value<br>Leakage current ≤The initial specified value |      |      |      |      |      |      |

## ◆ DIMENSIONS [mm]

- Terminal Code : A



Note : L±0.5 for HA0 and JA0

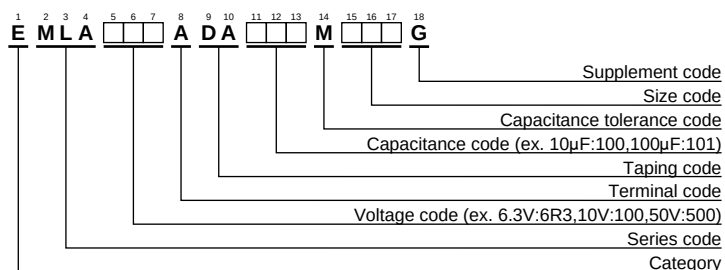
| Size code | D   | L    | A    | B    | C    | W          | P   |
|-----------|-----|------|------|------|------|------------|-----|
| E61       | 5   | 5.8  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F61       | 6.3 | 5.8  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F80       | 6.3 | 7.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8   | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10  | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆ MARKING

EX) 16V100μF



## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

- Rated voltage symbol

| Rated voltage (V <sub>dc</sub> ) | Symbol |
|----------------------------------|--------|
| 6.3                              | j      |
| 10                               | A      |
| 16                               | C      |
| 25                               | E      |
| 35                               | V      |
| 50                               | H      |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

Alchip™-MLA Series

## ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Size code | tanδ | Impedance (Ω <sub>max</sub> /20°C, 100kHz) | Rated ripple current (mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|----------|----------|-----------|------|--------------------------------------------|---------------------------------------------------------|--------------------|
| 6.3      | 47       | E61       | 0.28 | 1.30                                       | 95                                                      | EMLA6R3ADA470ME61G |
|          | 100      | F61       | 0.28 | 0.70                                       | 140                                                     | EMLA6R3ADA101MF61G |
|          | 150      | F61       | 0.28 | 0.70                                       | 140                                                     | EMLA6R3ADA151MF61G |
|          | 220      | F80       | 0.32 | 0.70                                       | 230                                                     | EMLA6R3ADA221MF80G |
|          | 330      | F80       | 0.32 | 0.70                                       | 230                                                     | EMLA6R3ADA331MF80G |
|          | 330      | HA0       | 0.28 | 0.16                                       | 600                                                     | EMLA6R3ADA331MHA0G |
|          | 470      | HA0       | 0.28 | 0.16                                       | 600                                                     | EMLA6R3ADA471MHA0G |
| 10       | 1,000    | JA0       | 0.28 | 0.08                                       | 850                                                     | EMLA6R3ADA102MJA0G |
|          | 33       | E61       | 0.24 | 1.30                                       | 95                                                      | EMLA100ADA330ME61G |
|          | 47       | F61       | 0.24 | 0.70                                       | 140                                                     | EMLA100ADA470MF61G |
|          | 100      | F61       | 0.24 | 0.70                                       | 140                                                     | EMLA100ADA101MF61G |
|          | 150      | F61       | 0.24 | 0.70                                       | 140                                                     | EMLA100ADA151MF61G |
|          | 220      | F80       | 0.27 | 0.70                                       | 230                                                     | EMLA100ADA221MF80G |
|          | 220      | HA0       | 0.24 | 0.16                                       | 600                                                     | EMLA100ADA221MHA0G |
| 16       | 330      | HA0       | 0.24 | 0.16                                       | 600                                                     | EMLA100ADA331MHA0G |
|          | 470      | HA0       | 0.24 | 0.16                                       | 600                                                     | EMLA100ADA471MHA0G |
|          | 22       | E61       | 0.22 | 1.30                                       | 95                                                      | EMLA160ADA220ME61G |
|          | 33       | F61       | 0.22 | 0.70                                       | 140                                                     | EMLA160ADA330MF61G |
|          | 47       | F61       | 0.22 | 0.70                                       | 140                                                     | EMLA160ADA470MF61G |
|          | 100      | F61       | 0.22 | 0.70                                       | 140                                                     | EMLA160ADA101MF61G |
|          | 100      | F80       | 0.24 | 0.70                                       | 230                                                     | EMLA160ADA101MF80G |
| 25       | 150      | F80       | 0.24 | 0.70                                       | 230                                                     | EMLA160ADA151MF80G |
|          | 220      | F80       | 0.24 | 0.70                                       | 230                                                     | EMLA160ADA221MF80G |
|          | 220      | HA0       | 0.22 | 0.16                                       | 600                                                     | EMLA160ADA221MHA0G |
|          | 330      | HA0       | 0.22 | 0.16                                       | 600                                                     | EMLA160ADA331MHA0G |
|          | 470      | HA0       | 0.22 | 0.16                                       | 600                                                     | EMLA160ADA471MHA0G |
|          | 470      | JA0       | 0.22 | 0.08                                       | 850                                                     | EMLA160ADA471MJA0G |
|          | 10       | E61       | 0.16 | 1.30                                       | 95                                                      | EMLA250ADA100ME61G |
| 25       | 22       | E61       | 0.16 | 1.30                                       | 95                                                      | EMLA250ADA220ME61G |
|          | 22       | F61       | 0.16 | 0.70                                       | 140                                                     | EMLA250ADA220MF61G |
|          | 22       | F61       | 0.16 | 0.70                                       | 140                                                     | EMLA250ADA220MF61G |
| 25       | 33       | F61       | 0.16 | 0.70                                       | 140                                                     | EMLA250ADA330MF61G |
|          | 47       | F61       | 0.16 | 0.70                                       | 140                                                     | EMLA250ADA470MF61G |
|          | 47       | F80       | 0.16 | 0.70                                       | 230                                                     | EMLA250ADA470MF80G |
|          | 100      | F80       | 0.16 | 0.70                                       | 230                                                     | EMLA250ADA101MF80G |
|          | 100      | HA0       | 0.16 | 0.16                                       | 600                                                     | EMLA250ADA101MHA0G |
|          | 150      | HA0       | 0.16 | 0.16                                       | 600                                                     | EMLA250ADA151MHA0G |
|          | 220      | HA0       | 0.16 | 0.16                                       | 600                                                     | EMLA250ADA221MHA0G |
|          | 330      | HA0       | 0.16 | 0.16                                       | 600                                                     | EMLA250ADA331MHA0G |
|          | 330      | JA0       | 0.16 | 0.08                                       | 850                                                     | EMLA250ADA331MJA0G |
|          | 470      | JA0       | 0.16 | 0.08                                       | 850                                                     | EMLA250ADA471MJA0G |
|          | 10       | E61       | 0.13 | 1.30                                       | 95                                                      | EMLA350ADA100ME61G |
|          | 22       | F61       | 0.13 | 0.70                                       | 140                                                     | EMLA350ADA220MF61G |
|          | 33       | F61       | 0.13 | 0.70                                       | 140                                                     | EMLA350ADA330MF61G |
|          | 33       | F80       | 0.13 | 0.70                                       | 230                                                     | EMLA350ADA330MF80G |
| 35       | 47       | F80       | 0.13 | 0.70                                       | 230                                                     | EMLA350ADA470MF80G |
|          | 100      | F80       | 0.13 | 0.70                                       | 230                                                     | EMLA350ADA101MF80G |
|          | 100      | HA0       | 0.13 | 0.16                                       | 600                                                     | EMLA350ADA101MHA0G |
|          | 150      | HA0       | 0.13 | 0.16                                       | 600                                                     | EMLA350ADA151MHA0G |
|          | 220      | HA0       | 0.13 | 0.16                                       | 600                                                     | EMLA350ADA221MHA0G |
|          | 220      | JA0       | 0.13 | 0.08                                       | 850                                                     | EMLA350ADA221MJA0G |
|          | 330      | JA0       | 0.13 | 0.08                                       | 850                                                     | EMLA350ADA331MJA0G |
|          | 10       | F61       | 0.12 | 2.00                                       | 70                                                      | EMLA500ADA100MF61G |
|          | 22       | F61       | 0.12 | 2.00                                       | 70                                                      | EMLA500ADA220MF61G |
|          | 33       | F80       | 0.12 | 1.60                                       | 100                                                     | EMLA500ADA330MF80G |
|          | 47       | F80       | 0.12 | 1.60                                       | 100                                                     | EMLA500ADA470MF80G |
|          | 47       | HA0       | 0.12 | 0.34                                       | 350                                                     | EMLA500ADA470MHA0G |
|          | 100      | HA0       | 0.12 | 0.34                                       | 350                                                     | EMLA500ADA101MHA0G |
|          | 100      | JA0       | 0.12 | 0.18                                       | 670                                                     | EMLA500ADA101MJA0G |
| 50       | 150      | JA0       | 0.12 | 0.18                                       | 670                                                     | EMLA500ADA151MJA0G |
|          | 220      | JA0       | 0.12 | 0.18                                       | 670                                                     | EMLA500ADA221MJA0G |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

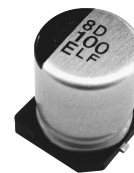
10000-hours-life, 105°C

New!

## Alchip™-MLF Series

- Endurance : 10,000 hours at 105°C
- Rated voltage range : 6.3 to 50V
- Nominal capacitance range : 1.0 to 1,000μF
- Suitable for high reliability products
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

MVL → Longer life → MLE → Longer life → MLF

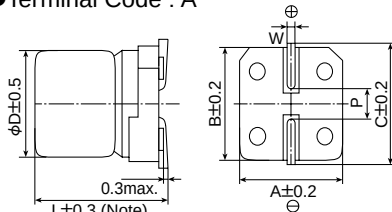


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |      |                |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|----------------|
| Category Temperature Range                             | -25 to +105℃                                                                                                                                                                                                                                                                          |                                      |      |      |      |      |      |                |
| Rated Voltage Range                                    | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                      |      |      |      |      |      |                |
| Capacitance Tolerance                                  | ±20%(M) (at 20℃,120Hz)                                                                                                                                                                                                                                                                |                                      |      |      |      |      |      |                |
| Leakage Current                                        | I=0.03CV or 4μA, whichever is greater<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃, after 2 minutes)                                                                                                                          |                                      |      |      |      |      |      |                |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | (at 20℃,120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.32                                 | 0.28 | 0.26 | 0.16 | 0.14 | 0.14 |                |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | (at 120Hz)     |
|                                                        | Z(-10℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 4                                    | 3    | 2    | 2    | 2    | 2    |                |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 10,000 hours at 105℃.                                                                                                                                  |                                      |      |      |      |      |      |                |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value           |      |      |      |      |      |                |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value |      |      |      |      |      |                |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |      |                |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |                |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value           |      |      |      |      |      |                |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value |      |      |      |      |      |                |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |      |                |

## ◆DIMENSIONS [mm]

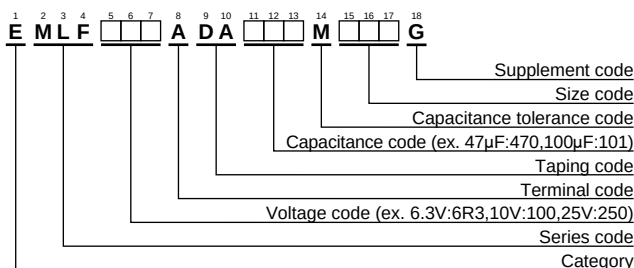
- Terminal Code : A



Note : L±0.5 for HA0 and JA0

| Size code | D   | L    | A    | B    | C    | W          | P   |
|-----------|-----|------|------|------|------|------------|-----|
| D73       | 4   | 7.0  | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E73       | 5   | 7.0  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F73       | 6.3 | 7.0  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F90       | 6.3 | 8.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8   | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10  | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

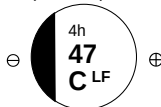
## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆MARKING

EX) 16V47μF



- Rated voltage symbol

| Rated voltage (V <sub>dc</sub> ) | 6.3 | 10 | 16 | 25 | 35 | 50 |
|----------------------------------|-----|----|----|----|----|----|
| Symbol                           | j   | A  | C  | E  | V  | H  |

## ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | Rated ripple current (mA <sub>rms</sub> /105°C, 120Hz) | Part No.           |
|-----------------------|----------|-----------|--------------------------------------------------------|--------------------|
| 6.3                   | 22       | D73       | 22                                                     | EMLF6R3ADA220MD73G |
|                       | 47       | E73       | 36                                                     | EMLF6R3ADA470ME73G |
|                       | 100      | F73       | 60                                                     | EMLF6R3ADA101MF73G |
|                       | 220      | F90       | 101                                                    | EMLF6R3ADA221MF90G |
|                       | 330      | HA0       | 160                                                    | EMLF6R3ADA331MHA0G |
|                       | 1,000    | JA0       | 313                                                    | EMLF6R3ADA102MJA0G |
| 10                    | 33       | E73       | 35                                                     | EMLF100ADA330ME73G |
|                       | 220      | HA0       | 141                                                    | EMLF100ADA221MHA0G |
|                       | 10       | D73       | 18                                                     | EMLF160ADA100MD73G |
| 16                    | 22       | E73       | 30                                                     | EMLF160ADA220ME73G |
|                       | 47       | F73       | 50                                                     | EMLF160ADA470MF73G |
|                       | 100      | F90       | 81                                                     | EMLF160ADA101MF90G |
|                       | 470      | JA0       | 254                                                    | EMLF160ADA471MJA0G |
| 25                    | 33       | F73       | 48                                                     | EMLF250ADA330MF73G |
|                       | 47       | F90       | 63                                                     | EMLF250ADA470MF90G |
|                       | 100      | HA0       | 116                                                    | EMLF250ADA101MHA0G |

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | Rated ripple current (mA <sub>rms</sub> /105°C, 120Hz) | Part No.           |
|-----------------------|----------|-----------|--------------------------------------------------------|--------------------|
| 35                    | 1.0      | D73       | 6.2                                                    | EMLF350ADA1R0MD73G |
|                       | 2.2      | D73       | 11                                                     | EMLF350ADA2R2MD73G |
|                       | 3.3      | D73       | 14                                                     | EMLF350ADA3R3MD73G |
|                       | 4.7      | D73       | 15                                                     | EMLF350ADA4R7MD73G |
|                       | 4.7      | E73       | 19                                                     | EMLF350ADA4R7ME73G |
|                       | 10       | E73       | 25                                                     | EMLF350ADA100ME73G |
|                       | 10       | F73       | 30                                                     | EMLF350ADA100MF73G |
|                       | 22       | F73       | 42                                                     | EMLF350ADA220MF73G |
|                       | 22       | F90       | 49                                                     | EMLF350ADA220MF90G |
|                       | 33       | F90       | 57                                                     | EMLF350ADA330MF90G |
| 50                    | 220      | JA0       | 216                                                    | EMLF350ADA221MJA0G |
|                       | 33       | HA0       | 77                                                     | EMLF500ADA330MHA0G |
|                       | 47       | HA0       | 92                                                     | EMLF500ADA470MHA0G |
|                       | 100      | JA0       | 151                                                    | EMLF500ADA101MJA0G |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

7000 to 8000-hours-life, 105°C

## Alchip™-MLE Series

- Endurance : 7,000 to 8,000 hours at 105°C
- Rated voltage range : 6.3 to 50V
- Nominal capacitance range : 1.0 to 1,000μF
- Suitable for high reliability products
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

MVJ  $\xrightarrow{\text{Longer life}}$  MVL  $\xrightarrow{\text{Longer life}}$  **MLE**

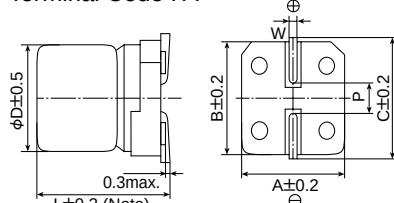


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                                      |      |      |      |      |                      |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|------|------|------|------|----------------------|
| Category                                               |                                                                                                                                                                                                                                                                                         |                                                      |      |      |      |      |                      |
| Temperature Range                                      | -25 to +105°C                                                                                                                                                                                                                                                                           |                                                      |      |      |      |      |                      |
| Rated Voltage Range                                    | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                                |                                                      |      |      |      |      |                      |
| Capacitance Tolerance                                  | ±20%(M) (at 20°C,120Hz)                                                                                                                                                                                                                                                                 |                                                      |      |      |      |      |                      |
| Leakage Current                                        | I=0.03CV or 4μA, whichever is greater<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C, after 2 minutes)                                                                                                                           |                                                      |      |      |      |      |                      |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 6.3V                                                 | 10V  | 16V  | 25V  | 35V  | 50V                  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.32                                                 | 0.28 | 0.26 | 0.16 | 0.14 | 0.14 (at 20°C,120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                         | 6.3V                                                 | 10V  | 16V  | 25V  | 35V  | 50V                  |
|                                                        | Z(-10°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                                    | 3    | 2    | 2    | 2    | 2 (at 120Hz)         |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for specified time at 105°C.                                                                                                                                |                                                      |      |      |      |      |                      |
|                                                        | Time                                                                                                                                                                                                                                                                                    | D73 to F73 : 7,000 hours<br>F90 to JA0 : 8,000 hours |      |      |      |      |                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value                           |      |      |      |      |                      |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value                 |      |      |      |      |                      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                         |      |      |      |      |                      |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                      |      |      |      |      |                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value                           |      |      |      |      |                      |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value                 |      |      |      |      |                      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                         |      |      |      |      |                      |

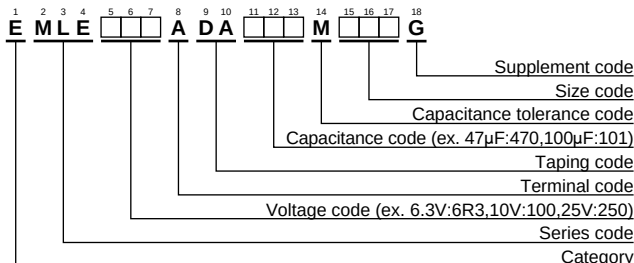
## ◆DIMENSIONS [mm]

- Terminal Code : A



Note : L±0.5 for HA0 and JA0

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

| Size code | D   | L    | A    | B    | C    | W          | P   |
|-----------|-----|------|------|------|------|------------|-----|
| D73       | 4   | 7.0  | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E73       | 5   | 7.0  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F73       | 6.3 | 7.0  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F90       | 6.3 | 8.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8   | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10  | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆MARKING

EX) 16V47μF



- Rated voltage symbol

| Rated voltage (V <sub>dc</sub> ) | 6.3 | 10 | 16 | 25 | 35 | 50 |
|----------------------------------|-----|----|----|----|----|----|
| Symbol                           | j   | A  | C  | E  | V  | H  |

## ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | Rated ripple current (mArms/105°C, 120Hz) | Part No.           |
|-----------------------|----------|-----------|-------------------------------------------|--------------------|
| 6.3                   | 22       | D73       | 22                                        | EMLE6R3ADA220MD73G |
|                       | 47       | E73       | 36                                        | EMLE6R3ADA470ME73G |
|                       | 100      | F73       | 60                                        | EMLE6R3ADA101MF73G |
|                       | 220      | F90       | 101                                       | EMLE6R3ADA221MF90G |
|                       | 330      | HA0       | 160                                       | EMLE6R3ADA331MHA0G |
|                       | 1,000    | JA0       | 313                                       | EMLE6R3ADA102MJA0G |
| 10                    | 33       | E73       | 35                                        | EMLE100ADA330ME73G |
|                       | 220      | HA0       | 141                                       | EMLE100ADA221MHA0G |
| 16                    | 10       | D73       | 18                                        | EMLE160ADA100MD73G |
|                       | 22       | E73       | 30                                        | EMLE160ADA220ME73G |
|                       | 47       | F73       | 50                                        | EMLE160ADA470MF73G |
|                       | 100      | F90       | 81                                        | EMLE160ADA101MF90G |
|                       | 470      | JA0       | 254                                       | EMLE160ADA471MJA0G |
| 25                    | 33       | F73       | 48                                        | EMLE250ADA330MF73G |
|                       | 47       | F90       | 63                                        | EMLE250ADA470MF90G |
|                       | 100      | HA0       | 116                                       | EMLE250ADA101MHA0G |
| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | Rated ripple current (mArms/105°C, 120Hz) | Part No.           |
| 35                    | 1.0      | D73       | 6.2                                       | EMLE350ADA1R0MD73G |
|                       | 2.2      | D73       | 11                                        | EMLE350ADA2R2MD73G |
|                       | 3.3      | D73       | 14                                        | EMLE350ADA3R3MD73G |
|                       | 4.7      | D73       | 15                                        | EMLE350ADA4R7MD73G |
|                       | 4.7      | E73       | 19                                        | EMLE350ADA4R7ME73G |
|                       | 10       | E73       | 25                                        | EMLE350ADA100ME73G |
|                       | 10       | F73       | 30                                        | EMLE350ADA100MF73G |
|                       | 22       | F73       | 42                                        | EMLE350ADA220MF73G |
|                       | 22       | F90       | 49                                        | EMLE350ADA220MF90G |
| 50                    | 33       | F90       | 57                                        | EMLE350ADA330MF90G |
|                       | 220      | JA0       | 216                                       | EMLE350ADA221MJA0G |
|                       | 33       | HA0       | 77                                        | EMLE500ADA330MHA0G |
|                       | 47       | HA0       | 92                                        | EMLE500ADA470MHA0G |
|                       | 100      | JA0       | 151                                       | EMLE500ADA101MJA0G |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

5000-hours-life, 105°C

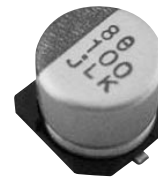
New!

## Alchip™-MLK Series

- 6.1mm height
- Endurance : 5,000 hours at 105°C
- Rated voltage range : 6.3 to 35V
- Nominal capacitance range : 4.7 to 100μF
- Suitable to fit for downsized equipment
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

MVL → Longer life →

MLK

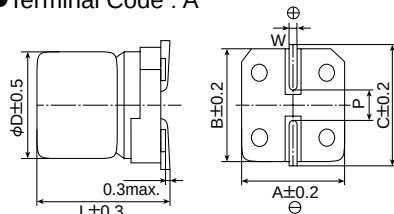


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |                |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|----------------|
| Category                                               | -25 to +105℃                                                                                                                                                                                                                                                                          |                                      |      |      |      |      |                |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |                |
| Rated Voltage Range                                    | 6.3 to 35V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                      |      |      |      |      |                |
| Capacitance Tolerance                                  | ±20%(M) (at 20℃,120Hz)                                                                                                                                                                                                                                                                |                                      |      |      |      |      |                |
| Leakage Current                                        | I=0.03CV or 4μA, whichever is greater<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃, after 2 minutes)                                                                                                                          |                                      |      |      |      |      |                |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  |                |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.32                                 | 0.28 | 0.26 | 0.16 | 0.14 | (at 20℃,120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 6.3V                                 | 10V  | 16V  | 25V  | 35V  |                |
|                                                        | Z(-10℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 4                                    | 3    | 2    | 2    | 2    | (at 120Hz)     |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 5,000 hours at 105℃.                                                                                                                                   |                                      |      |      |      |      |                |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value           |      |      |      |      |                |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value |      |      |      |      |                |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |                |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |                |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value           |      |      |      |      |                |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value |      |      |      |      |                |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |                |

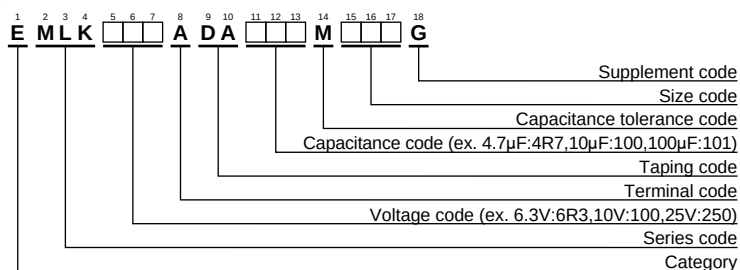
## ◆ DIMENSIONS [mm]

- Terminal Code : A



| Size code | D   | L   | A   | B   | C   | W          | P   |
|-----------|-----|-----|-----|-----|-----|------------|-----|
| E61       | 5   | 5.8 | 5.3 | 5.3 | 5.9 | 0.5 to 0.8 | 1.4 |
| F61       | 6.3 | 5.8 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |

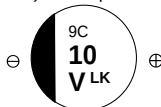
## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆ MARKING

EX) 35V10μF



- Rated voltage symbol

| Rated voltage (V <sub>dc</sub> ) | 6.3 | 10 | 16 | 25 | 35 |
|----------------------------------|-----|----|----|----|----|
| Symbol                           | j   | A  | C  | E  | V  |

## ◆ STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | tanδ | Rated ripple current (mA rms/105°C, 120Hz) | Part No.           |
|-----------------------|----------|-----------|------|--------------------------------------------|--------------------|
| 6.3                   | 47       | E61       | 0.32 | 36                                         | EMLK6R3ADA470ME61G |
|                       | 100      | F61       | 0.32 | 60                                         | EMLK6R3ADA101MF61G |
| 10                    | 33       | E61       | 0.28 | 35                                         | EMLK100ADA330ME61G |
| 16                    | 22       | E61       | 0.26 | 30                                         | EMLK160ADA220ME61G |
|                       | 47       | F61       | 0.26 | 50                                         | EMLK160ADA470MF61G |
| 25                    | 33       | F61       | 0.16 | 48                                         | EMLK250ADA330MF61G |
| 35                    | 4.7      | E61       | 0.14 | 19                                         | EMLK350ADA4R7ME61G |
|                       | 10       | E61       | 0.14 | 25                                         | EMLK350ADA100ME61G |
|                       | 10       | F61       | 0.14 | 30                                         | EMLK350ADA100MF61G |
|                       | 22       | F61       | 0.14 | 42                                         | EMLK350ADA220MF61G |

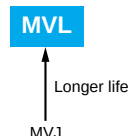


## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

3000 to 5000-hours-life, 105°C

## Alchip™-MVL Series

- Endurance : 3,000 to 5,000 hours at 105°C
- Suitable for applications requiring long life such as continuously operating equipment, industrial applications, etc
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

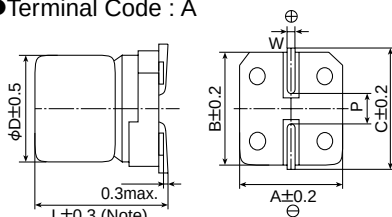


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |      |  |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|--|
| Category                                               |                                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |      |  |
| Temperature Range                                      | -40 to +105℃                                                                                                                                                                                                                                                                          |                                      |      |      |      |      |      |  |
| Rated Voltage Range                                    | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                      |      |      |      |      |      |  |
| Capacitance Tolerance                                  | ±20%(M) (at 20℃,120Hz)                                                                                                                                                                                                                                                                |                                      |      |      |      |      |      |  |
| Leakage Current                                        | I=0.03CV or 4μA, whichever is greater<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃, after 2 minutes)                                                                                                                          |                                      |      |      |      |      |      |  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  |  |
|                                                        | Max. tanδ                                                                                                                                                                                                                                                                             | 0.28                                 | 0.24 | 0.20 | 0.16 | 0.13 | 0.12 |  |
| Low Temperature Characteristics (Max. impedance Ratio) | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  |  |
|                                                        | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 4                                    | 3    | 2    | 2    | 2    | 2    |  |
|                                                        | Z(-40℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 10                                   | 7    | 5    | 3    | 3    | 3    |  |
| Endurance                                              | After the capacitors are subjected to the rated DC voltage for 3,000 hours (HA0 & JA0 sizes 5,000 hours) at 105℃, the following specifications shall be satisfied when the capacitors are restored to 20℃.                                                                            |                                      |      |      |      |      |      |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value           |      |      |      |      |      |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value |      |      |      |      |      |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |      |  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value           |      |      |      |      |      |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value |      |      |      |      |      |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |      |  |

## ◆DIMENSIONS [mm]

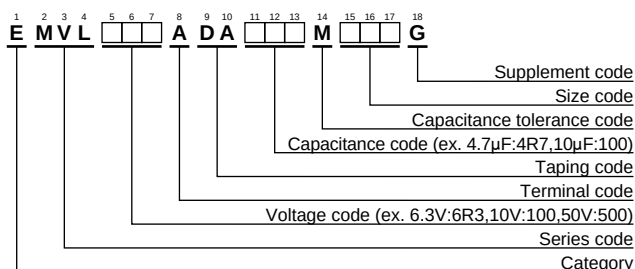
- Terminal Code : A



Note : L±0.5 for HA0 and JA0

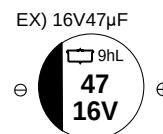
| Size code | D   | L    | A    | B    | C    | W          | P   |
|-----------|-----|------|------|------|------|------------|-----|
| D60       | 4   | 5.7  | 4.3  | 4.3  | 5.1  | 0.5 to 0.8 | 1.0 |
| E60       | 5   | 5.7  | 5.3  | 5.3  | 5.9  | 0.5 to 0.8 | 1.4 |
| F60       | 6.3 | 5.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F80       | 6.3 | 7.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| HA0       | 8   | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10  | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆MARKING



## ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | tanδ | Rated ripple current (mA <sub>rms</sub> /105°C,120Hz) | Part No.           |
|-----------------------|----------|-----------|------|-------------------------------------------------------|--------------------|
| 6.3                   | 22       | D60       | 0.28 | 22                                                    | EMVL6R3ADA220MD60G |
|                       | 47       | E60       | 0.28 | 36                                                    | EMVL6R3ADA470ME60G |
|                       | 100      | F60       | 0.28 | 60                                                    | EMVL6R3ADA101MF60G |
|                       | 220      | F80       | 0.28 | 101                                                   | EMVL6R3ADA221MF80G |
|                       | 330      | HA0       | 0.28 | 160                                                   | EMVL6R3ADA331MHA0G |
|                       | 1,000    | JA0       | 0.28 | 313                                                   | EMVL6R3ADA102MJA0G |
| 10                    | 33       | E60       | 0.24 | 35                                                    | EMVL100ADA330ME60G |
|                       | 220      | HA0       | 0.24 | 141                                                   | EMVL100ADA221MHA0G |
| 16                    | 10       | D60       | 0.20 | 18                                                    | EMVL160ADA100MD60G |
|                       | 22       | E60       | 0.20 | 30                                                    | EMVL160ADA220ME60G |
|                       | 47       | F60       | 0.20 | 50                                                    | EMVL160ADA470MF60G |
|                       | 100      | F80       | 0.20 | 81                                                    | EMVL160ADA101MF80G |
|                       | 470      | JA0       | 0.20 | 254                                                   | EMVL160ADA471MJA0G |
| 25                    | 33       | F60       | 0.16 | 48                                                    | EMVL250ADA330MF60G |
|                       | 47       | F80       | 0.16 | 63                                                    | EMVL250ADA470MF80G |
|                       | 100      | HA0       | 0.16 | 116                                                   | EMVL250ADA101MHA0G |
|                       | 330      | JA0       | 0.16 | 238                                                   | EMVL250ADA331MJA0G |
| 35                    | 4.7      | D60       | 0.13 | 15                                                    | EMVL350ADA4R7MD60G |
|                       | 10       | E60       | 0.13 | 25                                                    | EMVL350ADA100ME60G |
|                       | 22       | F60       | 0.13 | 42                                                    | EMVL350ADA220MF60G |
|                       | 33       | F80       | 0.13 | 57                                                    | EMVL350ADA330MF80G |
|                       | 220      | JA0       | 0.13 | 216                                                   | EMVL350ADA221MJA0G |
| 50                    | 1.0      | D60       | 0.12 | 6.2                                                   | EMVL500ADA1R0MD60G |
|                       | 2.2      | D60       | 0.12 | 11                                                    | EMVL500ADA2R2MD60G |
|                       | 3.3      | D60       | 0.12 | 14                                                    | EMVL500ADA3R3MD60G |
|                       | 4.7      | E60       | 0.12 | 19                                                    | EMVL500ADA4R7ME60G |
|                       | 10       | F60       | 0.12 | 30                                                    | EMVL500ADA100MF60G |
|                       | 22       | F80       | 0.12 | 49                                                    | EMVL500ADA220MF80G |
|                       | 33       | HA0       | 0.12 | 77                                                    | EMVL500ADA330MHA0G |
|                       | 47       | HA0       | 0.12 | 92                                                    | EMVL500ADA470MHA0G |
|                       | 100      | JA0       | 0.12 | 151                                                   | EMVL500ADA101MJA0G |

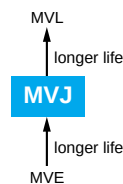


## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

2000-hours-life, 105°C

## Alchip™-MVJ Series

- Endurance : 2,000 hours at 105°C
- Solvent resistant type
- RoHS Compliant

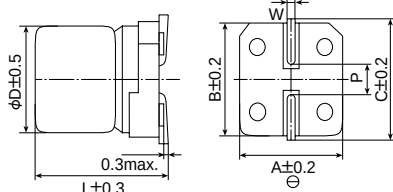


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |                                      |                  |                                      |  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|--------------------------------------|------------------|--------------------------------------|--|
| Category                                               |                                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |                                      |                  |                                      |  |
| Temperature Range                                      | -40 to +105°C                                                                                                                                                                                                                                                                           |                                      |      |      |      |      |                                      |                  |                                      |  |
| Rated Voltage Range                                    | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                                |                                      |      |      |      |      |                                      |                  |                                      |  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |      |      |      |      |                                      |                  |                                      |  |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                           |                                      |      |      |      |      |                                      |                  |                                      |  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V                                  | (at 20°C, 120Hz) |                                      |  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.30                                 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12                                 |                  |                                      |  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V                                  | (at 120Hz)       |                                      |  |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 3    | 2    | 2    | 2    | 2                                    |                  |                                      |  |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 12                                   | 8    | 6    | 4    | 3    | 3                                    |                  |                                      |  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 105°C.                                                                                                                                   |                                      |      |      |      |      |                                      |                  |                                      |  |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                           | 6.3V <sub>dc</sub>                   |      |      |      |      | 10 & 16V <sub>dc</sub>               |                  | 25 to 50V <sub>dc</sub>              |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value           |      |      |      |      | ≤±25% of the initial value           |                  | ≤±20% of the initial value           |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value |      |      |      |      | ≤300% of the initial specified value |                  | ≤200% of the initial specified value |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | The initial specified value          |      |      |      |      | ≤The initial specified value         |                  | ≤The initial specified value         |  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |                                      |                  |                                      |  |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                           | 6.3V <sub>dc</sub>                   |      |      |      |      | 10 & 16V <sub>dc</sub>               |                  | 25 to 50V <sub>dc</sub>              |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value           |      |      |      |      | ≤±25% of the initial value           |                  | ≤±20% of the initial value           |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value |      |      |      |      | ≤300% of the initial specified value |                  | ≤200% of the initial specified value |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |      |      | ≤The initial specified value         |                  | ≤The initial specified value         |  |
|                                                        |                                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |                                      |                  |                                      |  |

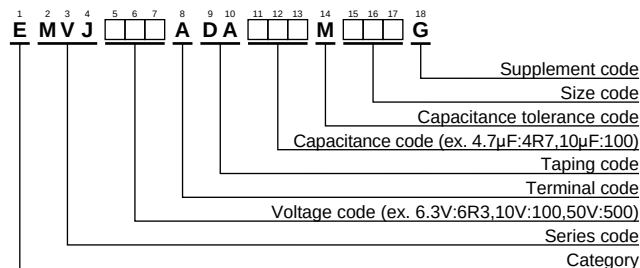
## ◆DIMENSIONS [mm]

- Terminal Code : A



| Size code | D   | L   | A   | B   | C   | W          | P   |
|-----------|-----|-----|-----|-----|-----|------------|-----|
| D60       | 4   | 5.7 | 4.3 | 4.3 | 5.1 | 0.5 to 0.8 | 1.0 |
| E60       | 5   | 5.7 | 5.3 | 5.3 | 5.9 | 0.5 to 0.8 | 1.4 |
| F60       | 6.3 | 5.7 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |

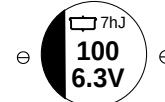
## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆MARKING

EX) 6.3V100μF



## ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | tanδ | Rated ripple current (mA <sub>rms</sub> /105°C,120Hz) | Part No.           |
|-----------------------|----------|-----------|------|-------------------------------------------------------|--------------------|
| 6.3                   | 22       | D60       | 0.30 | 21                                                    | EMVJ6R3ADA220MD60G |
|                       | 47       | E60       | 0.30 | 36                                                    | EMVJ6R3ADA470ME60G |
|                       | 100      | F60       | 0.30 | 56                                                    | EMVJ6R3ADA101MF60G |
| 10                    | 33       | E60       | 0.24 | 34                                                    | EMVJ100ADA330ME60G |
|                       | 10       | D60       | 0.20 | 16                                                    | EMVJ160ADA100MD60G |
|                       | 22       | E60       | 0.20 | 30                                                    | EMVJ160ADA220ME60G |
| 16                    | 47       | F60       | 0.20 | 48                                                    | EMVJ160ADA470MF60G |
|                       | 33       | F60       | 0.16 | 45                                                    | EMVJ250ADA330MF60G |
| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | tanδ | Rated ripple current (mA <sub>rms</sub> /105°C,120Hz) | Part No.           |
| 35                    | 4.7      | D60       | 0.14 | 15                                                    | EMVJ350ADA4R7MD60G |
|                       | 10       | E60       | 0.14 | 25                                                    | EMVJ350ADA100ME60G |
|                       | 22       | F60       | 0.14 | 40                                                    | EMVJ350ADA220MF60G |
| 50                    | 1.0      | D60       | 0.12 | 5.6                                                   | EMVJ500ADA1R0MD60G |
|                       | 2.2      | D60       | 0.12 | 10                                                    | EMVJ500ADA2R2MD60G |
|                       | 3.3      | D60       | 0.12 | 14                                                    | EMVJ500ADA3R3MD60G |
|                       | 4.7      | E60       | 0.12 | 19                                                    | EMVJ500ADA4R7ME60G |
|                       | 10       | F60       | 0.12 | 29                                                    | EMVJ500ADA100MF60G |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

High heat resistance, 125°C

## Alchip™-MVH Series

- Lower ESR, Higher ripple current
- Endurance : 1,000 to 5,000 hours at 125°C
- Suitable to fit for automotive equipment
- Solvent resistant type (10 to 50V)
- RoHS Compliant

MVH

↑ 125°C  
MVE

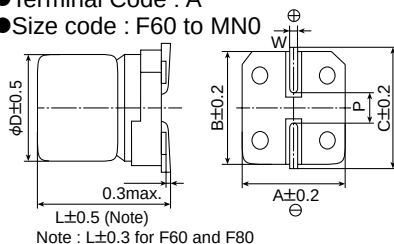


## ◆SPECIFICATIONS

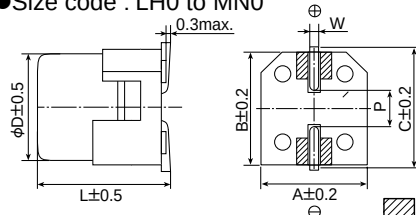
| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                           |      |      |      |      |                                      |      |      |             |            |    |      |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|--------------------------------------|------|------|-------------|------------|----|------|
| Category                                               |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                           |      |      |      |      |                                      |      |      |             |            |    |      |
| Temperature Range                                      | -40 to +125°C                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                           |      |      |      |      |                                      |      |      |             |            |    |      |
| Rated Voltage Range                                    | 10 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                           |      |      |      |      |                                      |      |      |             |            |    |      |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                           |      |      |      |      |                                      |      |      |             |            |    |      |
| Leakage Current                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                   | 10 to 100V <sub>dc</sub>                                                                                                                                                                                                  |      |      |      |      | 160 to 450V <sub>dc</sub>            |      |      |             |            |    |      |
|                                                        | F60 to JA0                                                                                                                                                                                                                                                                                                                         | I=0.01CV or 3μA, whichever is greater.                                                                                                                                                                                    |      |      |      |      | I=0.04CV+100                         |      |      |             |            |    |      |
|                                                        | KE0 to MN0                                                                                                                                                                                                                                                                                                                         | I=0.03CV or 4μA, whichever is greater.                                                                                                                                                                                    |      |      |      |      |                                      |      |      |             |            |    |      |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                                                                                                                |                                                                                                                                                                                                                           |      |      |      |      |                                      |      |      |             |            |    |      |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                   | 10V                                                                                                                                                                                                                       | 16V  | 25V  | 35V  | 50V  | 63V                                  | 80V  | 100V | 160 to 250V | 400 & 450V |    |      |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                                                                        | F60 to JA0                                                                                                                                                                                                                | 0.24 | 0.20 | 0.16 | 0.14 | 0.14                                 | 0.12 | 0.12 | 0.10        | —          |    | —    |
|                                                        |                                                                                                                                                                                                                                                                                                                                    | KE0 to MN0                                                                                                                                                                                                                | 0.22 | 0.18 | 0.16 | 0.14 | 0.12                                 | 0.14 | —    | 0.10        | 0.20       |    | 0.24 |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                                                                  |                                                                                                                                                                                                                           |      |      |      |      |                                      |      |      |             |            |    |      |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                   | 10V                                                                                                                                                                                                                       | 16V  | 25V  | 35V  | 50V  | 63V                                  | 80V  | 100V | 160 to 250V | 400 & 450V |    |      |
|                                                        | F60 to JA0                                                                                                                                                                                                                                                                                                                         | Z(−25°C)/Z(+20°C)                                                                                                                                                                                                         | 3    | 2    | 2    | 2    | 2                                    | 2    | 2    | —           | —          |    |      |
|                                                        |                                                                                                                                                                                                                                                                                                                                    | Z(−40°C)/Z(+20°C)                                                                                                                                                                                                         | 6    | 4    | 4    | 3    | 3                                    | 3    | 3    | —           | —          |    |      |
|                                                        | KE0 to MN0                                                                                                                                                                                                                                                                                                                         | Z(−25°C)/Z(+20°C)                                                                                                                                                                                                         | 4    | 3    | 2    | 2    | 2                                    | 2    | —    | 2           | 3          |    | 6    |
|                                                        |                                                                                                                                                                                                                                                                                                                                    | Z(−40°C)/Z(+20°C)                                                                                                                                                                                                         | 8    | 6    | 4    | 3    | 3                                    | 3    | —    | 3           | 6          | 10 |      |
| (at 120Hz)                                             |                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                           |      |      |      |      |                                      |      |      |             |            |    |      |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for the specified time at 125°C.                                                                                                                                                                       |                                                                                                                                                                                                                           |      |      |      |      |                                      |      |      |             |            |    |      |
|                                                        | Time                                                                                                                                                                                                                                                                                                                               | F60 to H63 (10 to 100V <sub>dc</sub> ) : 1,000hours<br>HA0 to JA0 (10 to 100V <sub>dc</sub> ) : 2,000hours<br>KE0 to MN0 (10 to 100V <sub>dc</sub> ) : 5,000hours<br>KE0 to MN0 (160 to 450V <sub>dc</sub> ) : 2,000hours |      |      |      |      |                                      |      |      |             |            |    |      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                                                                 | ≤±30% of the initial value                                                                                                                                                                                                |      |      |      |      |                                      |      |      |             |            |    |      |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                                                                        | ≤300% of the initial specified value                                                                                                                                                                                      |      |      |      |      |                                      |      |      |             |            |    |      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                                                                    | ≤The initial specified value                                                                                                                                                                                              |      |      |      |      |                                      |      |      |             |            |    |      |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours (500 hours for 400 to 450V <sub>dc</sub> ) at 125°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                                                                                                                                                                                           |      |      |      |      |                                      |      |      |             |            |    |      |
|                                                        | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                    | 10 to 50V <sub>dc</sub>                                                                                                                                                                                                   |      |      |      |      | 63 to 450V <sub>dc</sub>             |      |      |             |            |    |      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                                                                 | ≤±30% of the initial value                                                                                                                                                                                                |      |      |      |      | ≤±30% of the initial value           |      |      |             |            |    |      |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                                                                        | ≤300% of the initial specified value                                                                                                                                                                                      |      |      |      |      | ≤300% of the initial specified value |      |      |             |            |    |      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                                                                    | ≤The initial specified value                                                                                                                                                                                              |      |      |      |      | ≤500% of the initial specified value |      |      |             |            |    |      |

## ◆DIMENSIONS [mm]

- Terminal Code : A
- Size code : F60 to MN0



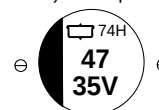
- Terminal Code : G
- Size code : LH0 to MN0



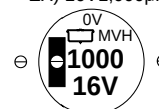
| Size code | D    | L    | A    | B    | C    | W          | P   |
|-----------|------|------|------|------|------|------------|-----|
| F60       | 6.3  | 5.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| F80       | 6.3  | 7.7  | 6.6  | 6.6  | 7.2  | 0.5 to 0.8 | 1.9 |
| H63       | 8    | 6.3  | 8.3  | 8.3  | 9.0  | 0.5 to 0.8 | 2.3 |
| HA0       | 8    | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10   | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |
| KE0       | 12.5 | 13.5 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 |
| KG5       | 12.5 | 16.0 | 13.0 | 13.0 | 13.7 | 1.0 to 1.3 | 4.2 |
| LH0       | 16   | 16.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 |
| LN0       | 16   | 21.5 | 17.0 | 17.0 | 18.0 | 1.0 to 1.3 | 6.5 |
| MH0       | 18   | 16.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 |
| MN0       | 18   | 21.5 | 19.0 | 19.0 | 20.0 | 1.0 to 1.3 | 6.5 |

## ◆MARKING

F60 to JA0  
EX) 35V47μF



KE0 to MN0  
EX) 16V1,000μF



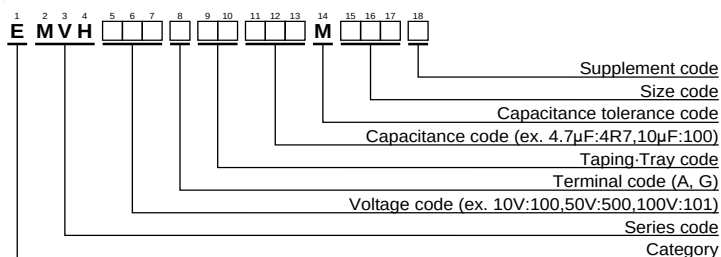


## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

High heat resistance, 125°C

Alchip™-MVH Series

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆STANDARD RATINGS

□ is not solvent resistant (63 to 450V<sub>dc</sub>).

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Size<br>code | ESR<br>(Ω <sub>max</sub> /<br>100kHz) |       | Rated ripple<br>current<br>(mA <sub>rms</sub> /125°C) |       | Part No.           |
|--------------------------|-------------|--------------|---------------------------------------|-------|-------------------------------------------------------|-------|--------------------|
|                          |             |              | 20°C                                  | -40°C | 100kHz                                                | 120Hz |                    |
| 10                       | 100         | F80          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH100ADA101MF80G |
|                          | 100         | H63          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH100ADA101MH63G |
|                          | 220         | F80          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH100ADA221MF80G |
|                          | 220         | H63          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH100ADA221MH63G |
|                          | 220         | HA0          | 0.40                                  | 6.0   | 220                                                   | —     | EMVH100ADA221MHA0G |
|                          | 330         | HA0          | 0.40                                  | 6.0   | 220                                                   | —     | EMVH100ADA331MHA0G |
|                          | 330         | JA0          | 0.30                                  | 4.5   | 296                                                   | —     | EMVH100ADA331MJA0G |
|                          | 470         | JA0          | 0.30                                  | 4.5   | 296                                                   | —     | EMVH100ADA471MJA0G |
|                          | 1,000       | KE0          | 0.14                                  | 2.1   | 750                                                   | —     | EMVH100ARA102MKE0S |
|                          | 2,200       | LH0          | 0.10                                  | 1.5   | 1,000                                                 | —     | EMVH100□DA222MLH0S |
|                          | 2,200       | MH0          | 0.10                                  | 1.5   | 1,200                                                 | —     | EMVH100□DA222MMH0S |
|                          | 3,300       | MH0          | 0.10                                  | 1.5   | 1,200                                                 | —     | EMVH100□DA332MMH0S |
|                          | 4,700       | MN0          | 0.058                                 | 0.87  | 1,550                                                 | —     | EMVH100□DA472MMN0S |
|                          | 47          | F60          | 1.6                                   | 24.0  | 69                                                    | —     | EMVH160ADA470MF60G |
| 16                       | 100         | HA0          | 0.40                                  | 6.0   | 220                                                   | —     | EMVH160ADA101MHA0G |
|                          | 220         | HA0          | 0.40                                  | 6.0   | 220                                                   | —     | EMVH160ADA221MHA0G |
|                          | 220         | JA0          | 0.30                                  | 4.5   | 296                                                   | —     | EMVH160ADA221MJA0G |
|                          | 330         | JA0          | 0.30                                  | 4.5   | 296                                                   | —     | EMVH160ADA331MJA0G |
|                          | 470         | KE0          | 0.14                                  | 2.1   | 750                                                   | —     | EMVH160ARA471MKE0S |
|                          | 680         | KE0          | 0.14                                  | 2.1   | 750                                                   | —     | EMVH160ARA681MKE0S |
|                          | 680         | LH0          | 0.10                                  | 1.5   | 1,000                                                 | —     | EMVH160□DA681MLH0S |
|                          | 1,000       | MH0          | 0.10                                  | 1.5   | 1,200                                                 | —     | EMVH160□DA102MMH0S |
|                          | 2,200       | MH0          | 0.10                                  | 1.5   | 1,200                                                 | —     | EMVH160□DA222MMH0S |
|                          | 47          | F80          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH250ADA330MF80G |
| 25                       | 47          | H63          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH250ADA470MH63G |
|                          | 100         | F80          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH250ADA101MF80G |
|                          | 100         | H63          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH250ADA101MH63G |
|                          | 100         | HA0          | 0.40                                  | 6.0   | 220                                                   | —     | EMVH250ADA101MHA0G |
|                          | 220         | HA0          | 0.40                                  | 6.0   | 220                                                   | —     | EMVH250ADA221MHA0G |
|                          | 220         | JA0          | 0.30                                  | 4.5   | 296                                                   | —     | EMVH250ADA221MJA0G |
|                          | 330         | JA0          | 0.30                                  | 4.5   | 296                                                   | —     | EMVH250ADA331MJA0G |
|                          | 330         | KE0          | 0.14                                  | 2.1   | 750                                                   | —     | EMVH250ARA331MKE0S |
|                          | 470         | KE0          | 0.14                                  | 2.1   | 750                                                   | —     | EMVH250ARA471MKE0S |
|                          | 470         | LH0          | 0.10                                  | 1.5   | 1,000                                                 | —     | EMVH250□DA471MLH0S |
|                          | 680         | LH0          | 0.10                                  | 1.5   | 1,000                                                 | —     | EMVH250□DA681MLH0S |
|                          | 680         | MH0          | 0.10                                  | 1.5   | 1,200                                                 | —     | EMVH250□DA681MMH0S |
|                          | 1,000       | MN0          | 0.058                                 | 0.87  | 1,550                                                 | —     | EMVH250□DA102MMN0S |
|                          | 10          | F60          | 1.6                                   | 24.0  | 69                                                    | —     | EMVH350ADA100MF60G |
| 35                       | 22          | F60          | 1.6                                   | 24.0  | 69                                                    | —     | EMVH350ADA220MF60G |
|                          | 33          | F80          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH350ADA330MF80G |
|                          | 33          | H63          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH350ADA330MH63G |
|                          | 47          | F80          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH350ADA470MF80G |
|                          | 47          | H63          | 0.90                                  | 14.0  | 110                                                   | —     | EMVH350ADA470MH63G |
|                          | 47          | HA0          | 0.40                                  | 6.0   | 220                                                   | —     | EMVH350ADA470MHA0G |
|                          | 100         | HA0          | 0.40                                  | 6.0   | 220                                                   | —     | EMVH350ADA101MHA0G |
|                          | 100         | JA0          | 0.30                                  | 4.5   | 296                                                   | —     | EMVH350ADA101MJA0G |
|                          | 220         | JA0          | 0.30                                  | 4.5   | 296                                                   | —     | EMVH350ADA221MJA0G |
|                          | 330         | KE0          | 0.14                                  | 2.1   | 750                                                   | —     | EMVH350ARA331MKE0S |
|                          | 330         | LH0          | 0.10                                  | 1.5   | 1,000                                                 | —     | EMVH350□DA331MLH0S |
|                          | 470         | KG5          | 0.11                                  | 1.5   | 900                                                   | —     | EMVH350ARA471MKG5S |
|                          | 470         | LH0          | 0.10                                  | 1.5   | 1,000                                                 | —     | EMVH350□DA471MLH0S |
|                          | 680         | MH0          | 0.10                                  | 1.5   | 1,200                                                 | —     | EMVH350□DA681MMH0S |
| 50                       | 10          | F60          | 2.8                                   | 42.0  | 51                                                    | —     | EMVH500ADA100MF60G |
|                          | 10          | H63          | 1.6                                   | 30.0  | 83                                                    | —     | EMVH500ADA100MH63G |
|                          | 22          | F80          | 2.0                                   | 30.0  | 83                                                    | —     | EMVH500ADA220MF80G |
|                          | 22          | H63          | 1.6                                   | 30.0  | 83                                                    | —     | EMVH500ADA220MH63G |
|                          | 22          | H63          | 1.6                                   | 30.0  | 83                                                    | —     | EMVH500ADA220MH63G |

□ : Enter the appropriate terminal code.



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

High heat resistance, 125°C

Upgrade!

## Alchip™-MHB Series

- ESR : Less than MVH
- Endurance : 2,000 hours at 125°C
- Rated Voltage Range : 10 to 35V
- Nominal capacitance range : 47 to 470μF
- Solvent resistant type
- RoHS Compliant

MHB

Lower ESR  
MVH

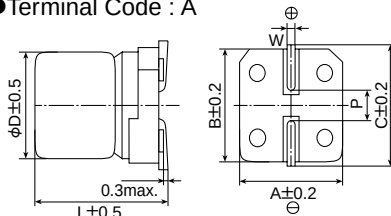


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |      |      |     |               |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|-----|---------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                       |                                      |      |      |     |               |
| Rated Voltage Range                                    | -40 to +125°C                                                                                                                                                                                                                                                                           |                                      |      |      |     |               |
| Capacitance Tolerance                                  | 10 to 35V <sub>dc</sub>                                                                                                                                                                                                                                                                 |                                      |      |      |     |               |
| Leakage Current                                        | ±20%(M) (20°C, 120Hz)                                                                                                                                                                                                                                                                   |                                      |      |      |     |               |
| Dissipation Factor (tanδ)                              | I=0.01CV                                                                                                                                                                                                                                                                                |                                      |      |      |     |               |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                                                                     |                                      |      |      |     |               |
|                                                        | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                         | 10V                                  | 16V  | 25V  | 35V | (20°C, 120Hz) |
| tanδ (Max.)                                            | 0.24                                                                                                                                                                                                                                                                                    | 0.20                                 | 0.16 | 0.14 |     |               |
| Low Temperature Characteristics (Max. impedance Ratio) | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                         | 10V                                  | 16V  | 25V  | 35V |               |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 3                                    | 2    | 2    | 2   | (120Hz)       |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 3    | 3    | 3   |               |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 125°C.                                                                                                                                   |                                      |      |      |     |               |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value           |      |      |     |               |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value |      |      |     |               |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |     |               |
|                                                        | ESR(-40°C, 400kHz)                                                                                                                                                                                                                                                                      | HA0 : ≤6Ω<br>JA0 : ≤4.5Ω             |      |      |     |               |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 125°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |     |               |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value           |      |      |     |               |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value |      |      |     |               |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |     |               |

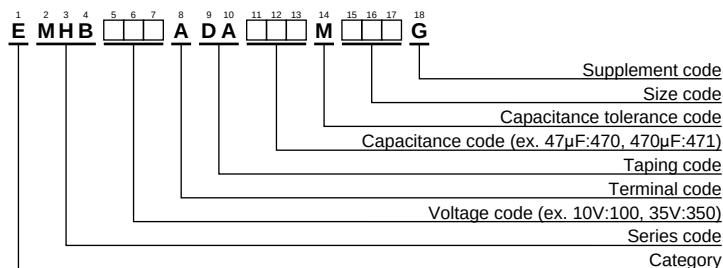
## ◆ DIMENSIONS [mm]

- Terminal Code : A



| Size code | D  | L    | A    | B    | C    | W          | P   |
|-----------|----|------|------|------|------|------------|-----|
| HA0       | 8  | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10 | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆ MARKING

EX) 16V220μF



- Rated voltage symbol

| Rated voltage (V <sub>dc</sub> ) | Symbol |
|----------------------------------|--------|
| 10                               | A      |
| 16                               | C      |
| 25                               | E      |
| 35                               | V      |

## ◆ STANDARD RATINGS

| WV(V <sub>dc</sub> ) | Cap(μF) | Size code | ESR (Ωmax/100k to 400kHz) |       | Rated ripple current (mA rms/125°C, 100k to 400kHz) | Part No.           |
|----------------------|---------|-----------|---------------------------|-------|-----------------------------------------------------|--------------------|
|                      |         |           | 20°C                      | -40°C |                                                     |                    |
| 10                   | 330     | HA0       | 0.3                       | 3.0   | 240                                                 | EMHB100ADA331MHA0G |
|                      | 470     | JA0       | 0.2                       | 2.0   | 330                                                 | EMHB100ADA471MJA0G |
| 16                   | 100     | HA0       | 0.3                       | 3.0   | 240                                                 | EMHB160ADA101MHA0G |
|                      | 220     | HA0       | 0.3                       | 3.0   | 240                                                 | EMHB160ADA221MHA0G |
| 25                   | 100     | HA0       | 0.3                       | 3.0   | 240                                                 | EMHB250ADA101MHA0G |
|                      | 220     | HA0       | 0.3                       | 3.0   | 240                                                 | EMHB250ADA221MHA0G |
|                      | 330     | JA0       | 0.2                       | 2.0   | 330                                                 | EMHB250ADA331MJA0G |
| 35                   | 47      | HA0       | 0.3                       | 3.0   | 240                                                 | EMHB350ADA470MHA0G |
|                      | 100     | HA0       | 0.3                       | 3.0   | 240                                                 | EMHB350ADA101MHA0G |
|                      | 100     | JA0       | 0.2                       | 2.0   | 330                                                 | EMHB350ADA101MJA0G |
|                      | 220     | JA0       | 0.2                       | 2.0   | 330                                                 | EMHB350ADA221MJA0G |

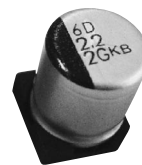


## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Low ESR, 105°C

## Alchip™-MKB Series

- Low ESR
- Endurance : 3,000 hours at 105°C
- Rated voltage 400V, Capacitance 2.2 to 4.7μF
- RoHS Compliant

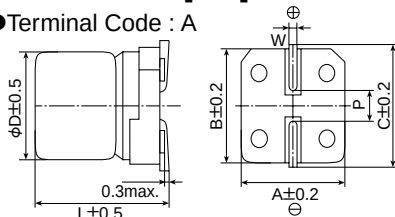


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Category                                               | -40 to +105°C                                                                                                                                                                                                                                                                         |                                      |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                       |                                      |
| Rated Voltage Range                                    | 400V <sub>dc</sub>                                                                                                                                                                                                                                                                    |                                      |
| Capacitance Tolerance                                  | ±20%(M)                                                                                                                                                                                                                                                                               | (20°C, 120Hz)                        |
| Leakage Current                                        | I=0.04CV+100(max.)<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)<br>(at 20°C after 1 minute)                                                                                                                                           |                                      |
| Dissipation Factor (tanδ)                              | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 400V                                 |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.25<br>(20°C, 120Hz)                |
| Low Temperature Characteristics (Max. impedance Ratio) | Rated voltage(V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 400V                                 |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 6                                    |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 10<br>(120Hz)                        |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 3,000 hours at 105°C.                                                                                                                                 |                                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |
| Shelf life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |

## ◆ DIMENSIONS [mm]

- Terminal Code : A



| Size code | D  | L    | A    | B    | C    | W          | P   |
|-----------|----|------|------|------|------|------------|-----|
| HA0       | 8  | 10.0 | 8.3  | 8.3  | 9.0  | 0.7 to 1.1 | 3.1 |
| JA0       | 10 | 10.0 | 10.3 | 10.3 | 11.0 | 0.7 to 1.1 | 4.5 |

## ◆ MARKING

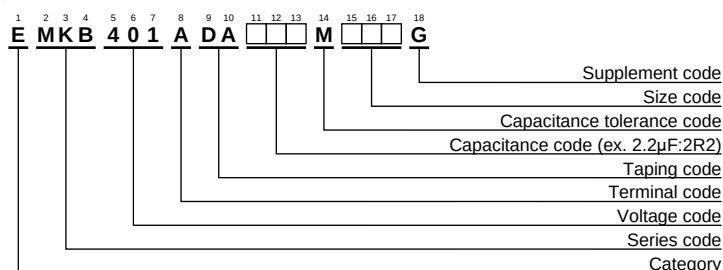
EX) 400V3.9μF



- Rated voltage symbol

| Rated voltage (V <sub>dc</sub> ) | Symbol |
|----------------------------------|--------|
| 400                              | 2G     |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆ STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | ESR (Ω <sub>max</sub> /120Hz) |       | Rated ripple current (mA <sub>rms</sub> /105°C, 120Hz) | Part No.           |
|-----------------------|----------|-----------|-------------------------------|-------|--------------------------------------------------------|--------------------|
|                       |          |           | 20°C                          | -40°C |                                                        |                    |
| 400                   | 2.2      | HA0       | 20                            | 1,000 | 26                                                     | EMKB401ADA2R2MHA0G |
|                       | 3.3      | JA0       | 10                            | 500   | 37                                                     | EMKB401ADA3R3MJA0G |
|                       | 3.9      | JA0       | 10                            | 500   | 38                                                     | EMKB401ADA3R9MJA0G |
|                       | 4.7      | JA0       | 10                            | 500   | 39                                                     | EMKB401ADA4R7MJA0G |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Bi-polar, 85°C

## Alchip™-MV-BP Series

- Bi-polar chip type for the circuit, of which polarity is frequently reversed
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

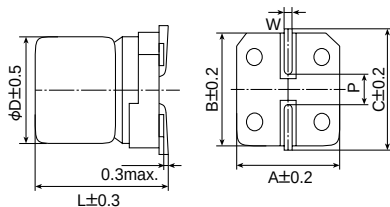


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                      |                                      |      |      |      |      |      |                  |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                    |                                      |      |      |      |      |      |                  |
| Temperature Range                                      | -40 to +85°C                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |      |                  |
| Rated Voltage Range                                    | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                             |                                      |      |      |      |      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                            |                                      |      |      |      |      |      |                  |
| Leakage Current                                        | I=0.05CV or 10μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                       |                                      |      |      |      |      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                     | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                          | 0.32                                 | 0.26 | 0.24 | 0.22 | 0.20 | 0.20 |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                     | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | (at 120Hz)       |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                    | 4                                    | 3    | 2    | 2    | 2    | 2    |                  |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                    | 10                                   | 8    | 6    | 4    | 3    | 3    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 85°C, however the polarization shall be reversed every 250 hours.                                                                     |                                      |      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤±20% of the initial value           |      |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                          | ≤200% of the initial specified value |      |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤The initial specified value         |      |      |      |      |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤±15% of the initial value           |      |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                          | ≤150% of the initial specified value |      |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤The initial specified value         |      |      |      |      |      |                  |

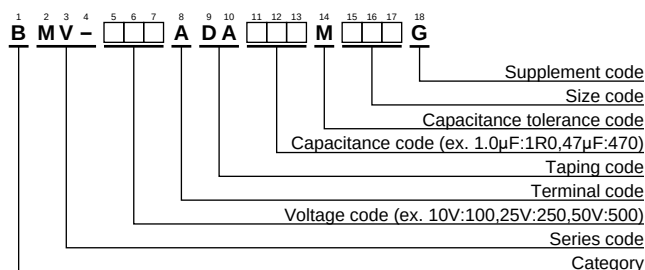
## ◆DIMENSIONS [mm]

- Terminal Code : A



| Size code | D   | L   | A   | B   | C   | W          | P   |
|-----------|-----|-----|-----|-----|-----|------------|-----|
| D55       | 4   | 5.2 | 4.3 | 4.3 | 5.1 | 0.5 to 0.8 | 1.0 |
| E55       | 5   | 5.2 | 5.3 | 5.3 | 5.9 | 0.5 to 0.8 | 1.4 |
| F55       | 6.3 | 5.2 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |

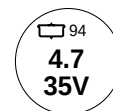
## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆MARKING

EX) 35V4.7μF



## ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | tanδ | Rated ripple current (mA <sub>rms</sub> /85°C,120Hz) | Part No.           |
|-----------------------|----------|-----------|------|------------------------------------------------------|--------------------|
| 6.3                   | 10       | D55       | 0.32 | 13                                                   | BMV-6R3ADA100MD55G |
|                       | 22       | E55       | 0.32 | 23                                                   | BMV-6R3ADA220ME55G |
|                       | 47       | F55       | 0.32 | 36                                                   | BMV-6R3ADA470MF55G |
| 10                    | 33       | F55       | 0.26 | 33                                                   | BMV-100ADA330MF55G |
|                       | 4.7      | D55       | 0.24 | 11                                                   | BMV-160ADA4R7MD55G |
| 16                    | 10       | E55       | 0.24 | 18                                                   | BMV-160ADA100ME55G |
|                       | 22       | F55       | 0.24 | 28                                                   | BMV-160ADA220MF55G |
| 25                    | 3.3      | D55       | 0.22 | 9.0                                                  | BMV-250ADA3R3MD55G |
|                       | 2.2      | D55       | 0.20 | 8.0                                                  | BMV-350ADA2R2MD55G |
| 35                    | 4.7      | E55       | 0.20 | 13                                                   | BMV-350ADA4R7ME55G |
|                       | 10       | F55       | 0.20 | 21                                                   | BMV-350ADA100MF55G |
| 50                    | 1.0      | D55       | 0.20 | 5.5                                                  | BMV-500ADA1R0MD55G |
|                       | 2.2      | E55       | 0.20 | 9.0                                                  | BMV-500ADA2R2ME55G |
|                       | 3.3      | E55       | 0.20 | 11                                                   | BMV-500ADA3R3ME55G |
|                       | 4.7      | F55       | 0.20 | 14                                                   | BMV-500ADA4R7MF55G |



## SURFACE MOUNT ALUMINUM ELECTROLYTIC CAPACITORS

Bi-polar, 105°C

## Alchip™-MVK-BP Series

- Bi-polar chip type for the circuit, of which polarity is frequently reversed
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

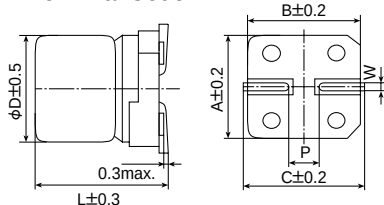


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |      |                  |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                     |                                      |      |      |      |      |      |                  |
| Rated Voltage Range                                    | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                      |      |      |      |      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                             |                                      |      |      |      |      |      |                  |
| Leakage Current                                        | I=0.05CV or 10μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                        |                                      |      |      |      |      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.35                                 | 0.26 | 0.24 | 0.20 | 0.18 | 0.18 |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | (at 120Hz)       |
|                                                        | Z(−25°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 4                                    | 3    | 2    | 2    | 2    | 2    |                  |
|                                                        | Z(−40°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 10                                   | 8    | 6    | 4    | 3    | 3    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1,000 hours at 105°C, however the polarization shall be reversed every 250 hours.                                                                     |                                      |      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±30% of the initial value           |      |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤300% of the initial specified value |      |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value           |      |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |      |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |      |                  |

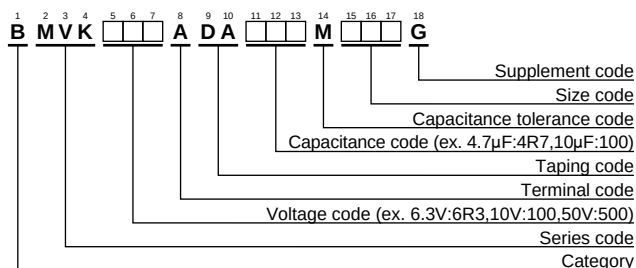
## ◆DIMENSIONS [mm]

- Terminal Code : A



| Size code | D   | L   | A   | B   | C   | W          | P   |
|-----------|-----|-----|-----|-----|-----|------------|-----|
| D60       | 4   | 5.7 | 4.3 | 4.3 | 5.1 | 0.5 to 0.8 | 1.0 |
| E60       | 5   | 5.7 | 5.3 | 5.3 | 5.9 | 0.5 to 0.8 | 1.4 |
| F60       | 6.3 | 5.7 | 6.6 | 6.6 | 7.2 | 0.5 to 0.8 | 1.9 |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (surface mount type)"

## ◆MARKING

EX) 35V4.7μF

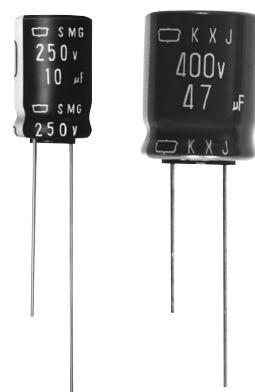


## ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Size code | tanδ | Rated ripple current (mA <sub>rms</sub> /105°C,120Hz) | Part No.           |
|-----------------------|----------|-----------|------|-------------------------------------------------------|--------------------|
| 6.3                   | 10       | D60       | 0.35 | 14                                                    | BMVK6R3ADA100MD60G |
|                       | 22       | E60       | 0.35 | 25                                                    | BMVK6R3ADA220ME60G |
|                       | 47       | F60       | 0.35 | 39                                                    | BMVK6R3ADA470MF60G |
| 10                    | 33       | F60       | 0.26 | 35                                                    | BMVK100ADA330MF60G |
|                       | 4.7      | D60       | 0.24 | 12                                                    | BMVK160ADA4R7MD60G |
|                       | 10       | E60       | 0.24 | 20                                                    | BMVK160ADA100ME60G |
| 16                    | 22       | F60       | 0.24 | 32                                                    | BMVK160ADA220MF60G |
|                       | 3.3      | D60       | 0.20 | 10                                                    | BMVK250ADA3R3MD60G |
|                       | 2.2      | D60       | 0.18 | 8.8                                                   | BMVK350ADA2R2ME60G |
| 35                    | 4.7      | E60       | 0.18 | 15                                                    | BMVK350ADA4R7ME60G |
|                       | 10       | F60       | 0.18 | 23                                                    | BMVK350ADA100MF60G |
| 50                    | 1.0      | D60       | 0.18 | 5.5                                                   | BMVK500ADA1R0MD60G |
|                       | 2.2      | E60       | 0.18 | 10                                                    | BMVK500ADA2R2ME60G |
|                       | 3.3      | E60       | 0.18 | 13                                                    | BMVK500ADA3R3ME60G |
|                       | 4.7      | F60       | 0.18 | 16                                                    | BMVK500ADA4R7MF60G |



## Miniature Aluminum Electrolytic Capacitors



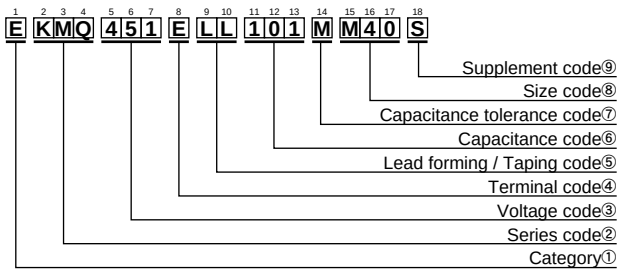


## PART NUMBERING SYSTEM

## Product code guide (Radial lead type)

(Example : KMQ series, 450V-100 $\mu$ F,  $\phi$ 18 $\times$ 40L, Straight lead with bulk)

Please refer to the following table



## ①Category

| Type     | Code |
|----------|------|
| Polar    | E    |
| Bi-polar | B    |

## ②Series code

| Series name    | Code |     |     |
|----------------|------|-----|-----|
|                | 2th  | 3th | 4th |
| KMQ            | K    | M   | Q   |
| FL             | F    | L   | —   |
| No series name | C    | S   | T   |

## ③Voltage code

| Voltage (V) | Code |     |     |
|-------------|------|-----|-----|
|             | 5th  | 6th | 7th |
| 4           | 4    | R   | 0   |
| 6.3         | 6    | R   | 3   |
| 10          | 1    | 0   | 0   |
| 16          | 1    | 6   | 0   |
| 25          | 2    | 5   | 0   |
| 35          | 3    | 5   | 0   |
| 50          | 5    | 0   | 0   |
| 63          | 6    | 3   | 0   |
| 80          | 8    | 0   | 0   |
| 100         | 1    | 0   | 1   |
| 160         | 1    | 6   | 1   |
| 200         | 2    | 0   | 1   |
| 250         | 2    | 5   | 1   |
| 315         | 3    | B   | 1   |
| 350         | 3    | 5   | 1   |
| 400         | 4    | 0   | 1   |
| 420         | 4    | 2   | 1   |
| 450         | 4    | 5   | 1   |
| 500         | 5    | 0   | 1   |

## ④Terminal code

| Type        | Code |
|-------------|------|
| Radial lead | E    |

## ⑤Lead forming / Taping code

| Type                              | Contents               | Code |      |
|-----------------------------------|------------------------|------|------|
|                                   |                        | 9th  | 10th |
| Lead forming (Radial lead / Bulk) | Straight               | L    | L    |
|                                   | CC(3.5mm)              | C    | 3    |
|                                   | CC(5.0mm)              | C    | 5    |
|                                   | FC                     | F    | C    |
|                                   | FM                     | F    | M    |
|                                   | MC                     | M    | C    |
|                                   | BC                     | B    | C    |
|                                   | RC                     | R    | C    |
| Taping (Radial lead)              | Straight               | T    | D    |
|                                   | Sloping clinch         | T    | D    |
|                                   | Straight (Skip a hole) | T    | E    |
|                                   | Clinch (F=2.5mm)       | T    | A    |
|                                   | Clinch (F=3.5mm)       | T    | B    |
|                                   | Clinch (F=5.0mm)       | T    | C    |

Refer to product guide for lead forming and taping specifications.

## ⑥Capacitance code

| Cap. ( $\mu$ F) | Code |      |      |
|-----------------|------|------|------|
|                 | 11th | 12th | 13th |
| 1.0             | 1    | R    | 0    |
| 2.2             | 2    | R    | 2    |
| 3.3             | 3    | R    | 3    |
| 4.7             | 4    | R    | 7    |
| 6.8             | 6    | R    | 8    |
| 10              | 1    | 0    | 0    |
| 22              | 2    | 2    | 0    |
| 33              | 3    | 3    | 0    |
| 47              | 4    | 7    | 0    |
| 68              | 6    | 8    | 0    |
| 100             | 1    | 0    | 1    |
| 220             | 2    | 2    | 1    |
| 330             | 3    | 3    | 1    |
| 470             | 4    | 7    | 1    |
| 680             | 6    | 8    | 1    |
| 1,000           | 1    | 0    | 2    |
| 2,200           | 2    | 2    | 2    |
| 3,300           | 3    | 3    | 2    |
| 4,700           | 4    | 7    | 2    |
| 6,800           | 6    | 8    | 2    |
| 10,000          | 1    | 0    | 3    |
| 22,000          | 2    | 2    | 3    |
| 33,000          | 3    | 3    | 3    |
| 47,000          | 4    | 7    | 3    |
| 68,000          | 6    | 8    | 3    |

## ⑦Capacitance tolerance

| Tol. (%)   | Code |
|------------|------|
| $\pm 20$   | M    |
| $\pm 10$   | K    |
| -10 to +30 | Q    |
| -10 to +50 | T    |

## ⑧Size code

| $\phi$ D | Code |
|----------|------|
| 4        | D    |
| 5        | E    |
| 6.3      | F    |
| 8        | H    |
| 10       | J    |
| 12.5     | K    |
| 14.5     | U    |
| 16       | L    |
| 18       | M    |
| 20       | N    |
| 22       | P    |

| L    | Code |      |
|------|------|------|
|      | 16th | 17th |
| 5    | 0    | 5    |
| 7    | 0    | 7    |
| 9    | 0    | 9    |
| 11   | 1    | 1    |
| 11.5 | B    | 5    |
| 12.0 | 1    | 2    |
| 12.5 | C    | 5    |
| 13   | 1    | 3    |
| 15   | 1    | 5    |
| 16   | 1    | 6    |
| 20   | 2    | 0    |
| 25   | 2    | 5    |
| 30   | 3    | 0    |
| 31.5 | N    | 3    |
| 35   | 3    | 5    |
| 35.5 | P    | 1    |
| 40   | 4    | 0    |
| 45   | 4    | 5    |
| 50   | 5    | 0    |
| 55   | 5    | 5    |
| 60   | 6    | 0    |

## ⑨Supplement code

| Sleeve material           | Terminal plating material | Code |
|---------------------------|---------------------------|------|
| PET                       | Sn-Bi                     | D    |
|                           | Sn                        | S    |
| Sleeveless (Coating case) | Sn-Bi                     | G    |
|                           | Sn                        | H    |

\* Refer to the appendix (Part number) for codes not listed here.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 5mm height, 85°C

## SRM Series

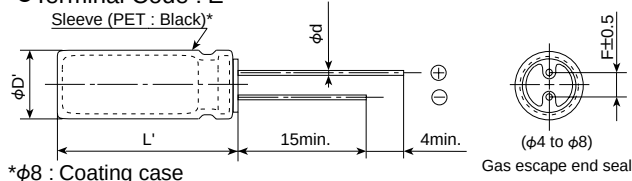
- Downsized from current standard SRE series
- 5mm height
- Endurance : 1,000 hours at 85°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                      |                                      |      |      |      |      |      |      |                 |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|------|-----------------|
| Category                                               | -40 to +85℃                                                                                                                                                                                                                                                                          |                                      |      |      |      |      |      |      |                 |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                      |                                      |      |      |      |      |      |      |                 |
| Rated Voltage Range                                    | 4 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                      |      |      |      |      |      |      |                 |
| Capacitance Tolerance                                  | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                             |                                      |      |      |      |      |      |      |                 |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 2 minutes)                                                                                                                         |                                      |      |      |      |      |      |      |                 |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                     | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V  | (at 20℃, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                          | 0.40                                 | 0.38 | 0.30 | 0.23 | 0.17 | 0.15 | 0.13 |                 |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                     | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V  | (at 120Hz)      |
|                                                        | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                      | 7                                    | 4    | 3    | 2    | 2    | 2    | 2    |                 |
|                                                        | Z(-40℃)/Z(+20℃)                                                                                                                                                                                                                                                                      | 15                                   | 8    | 8    | 6    | 4    | 3    | 3    |                 |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 1,000 hours at 85℃.                                                                                                                                   |                                      |      |      |      |      |      |      |                 |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤±20% of the initial value           |      |      |      |      |      |      |                 |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                          | ≤200% of the initial specified value |      |      |      |      |      |      |                 |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤The initial specified value         |      |      |      |      |      |      |                 |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |      |                 |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤±20% of the initial value           |      |      |      |      |      |      |                 |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                          | ≤200% of the initial specified value |      |      |      |      |      |      |                 |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤The initial specified value         |      |      |      |      |      |      |                 |

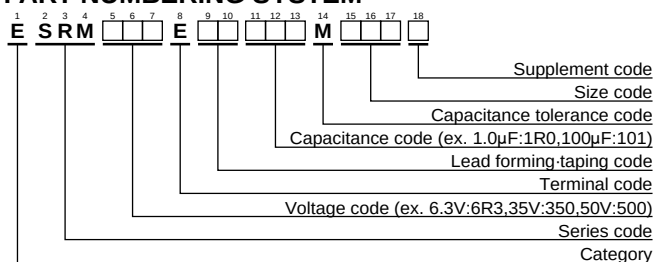
## ◆ DIMENSIONS [mm]

## ● Terminal Code : E



| φD  | 4          | 5    | 6.3  | 8    |
|-----|------------|------|------|------|
| φd  | 0.45       | 0.45 | 0.45 | 0.45 |
| F   | 1.5        | 2.0  | 2.5  | 2.5  |
| φD' | φD+0.5max. |      |      |      |
| L'  | L+1.0max.  |      |      |      |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

## ◆ STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (mA <sub>rms</sub> /85°C,120Hz) | Part No.           |
|-----------------------|----------|--------------------|------|------------------------------------------------------|--------------------|
| 4                     | 100      | 5×5                | 0.40 | 55                                                   | ESRM4R0E□□101ME05D |
|                       | 220      | 6.3×5              | 0.40 | 88                                                   | ESRM4R0E□□221MF05D |
| 6.3                   | 22       | 4×5                | 0.38 | 22                                                   | ESRM6R3E□□220MD05D |
|                       | 47       | 4×5                | 0.38 | 40                                                   | ESRM6R3E□□470MD05D |
|                       | 330      | 8×5                | 0.38 | 141                                                  | ESRM6R3E□□331MH05G |
| 10                    | 33       | 4×5                | 0.30 | 36                                                   | ESRM100E□□330MD05D |
|                       | 100      | 6.3×5              | 0.30 | 78                                                   | ESRM100E□□101MF05D |
|                       | 220      | 8×5                | 0.30 | 148                                                  | ESRM100E□□221MH05G |
| 16                    | 10       | 4×5                | 0.23 | 18                                                   | ESRM160E□□100MD05D |
|                       | 22       | 4×5                | 0.23 | 33                                                   | ESRM160E□□220MD05D |
|                       | 33       | 5×5                | 0.23 | 47                                                   | ESRM160E□□330ME05D |
|                       | 47       | 5×5                | 0.23 | 55                                                   | ESRM160E□□470ME05D |
| 25                    | 4.7      | 4×5                | 0.17 | 13                                                   | ESRM250E□□4R7MD05D |
|                       | 10       | 4×5                | 0.17 | 25                                                   | ESRM250E□□100MD05D |

□□ : Enter the appropriate lead forming or taping code.

Note : □□ unified to φ4×5.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

5mm height, 85°C

# SRE Series

- 5mm height
- Endurance : 1,000 hours at 85°C
- Non solvent resistant type
- RoHS Compliant

SRM

Downsized

SRE

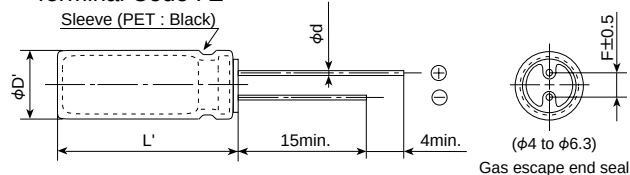


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                        |                                      |      |      |      |      |      |      |                  |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                      |                                      |      |      |      |      |      |      |                  |
| Rated Voltage Range                                    | 4 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                                 |                                      |      |      |      |      |      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                              |                                      |      |      |      |      |      |      |                  |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                          |                                      |      |      |      |      |      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V  | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                            | 0.35                                 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V  | (at 120Hz)       |
|                                                        | Z(−25°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | 7                                    | 4    | 3    | 2    | 2    | 2    | 2    |                  |
|                                                        | Z(−40°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | 15                                   | 10   | 8    | 6    | 4    | 3    | 3    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1,000 hours at 85°C.                                                                                                                                   |                                      |      |      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±20% of the initial value           |      |      |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤200% of the initial specified value |      |      |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |      |      |      |      |      |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±20% of the initial value           |      |      |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤200% of the initial specified value |      |      |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |      |      |      |      |      |      |                  |

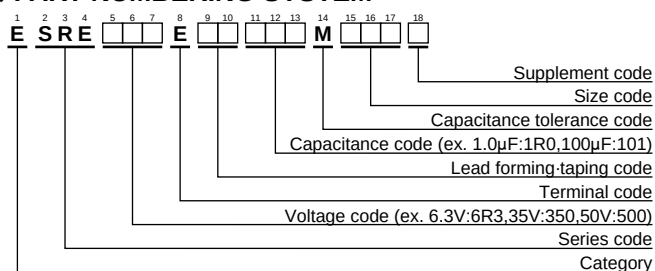
## ◆ DIMENSIONS [mm]

- Terminal Code : E



| φD  | 4          | 5    | 6.3  |
|-----|------------|------|------|
| φd  | 0.45       | 0.45 | 0.45 |
| F   | 1.5        | 2.0  | 2.5  |
| φD* | φD+0.5max. |      |      |
| L'  | L+1.0max.  |      |      |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

## ◆ STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA <sub>rms</sub> /85°C,120Hz) | Part No.           |
|-----------------------|----------|--------------------|------|------------------------------------------------------|--------------------|
| 4                     | 33       | 4X5                | 0.35 | 23                                                   | ESRE4R0E□□330MD05D |
| 6.3                   | 10       | 4X5                | 0.24 | 12                                                   | ESRE6R3E□□100MD05D |
|                       | 22       | 4X5                | 0.24 | 23                                                   | ESRE6R3E□□220MD05D |
|                       | 47       | 5X5                | 0.24 | 38                                                   | ESRE6R3E□□470ME05D |
|                       | 100      | 6.3X5              | 0.24 | 60                                                   | ESRE6R3E□□101MF05D |
| 10                    | 33       | 5X5                | 0.20 | 35                                                   | ESRE100E□□330ME05D |
| 16                    | 4.7      | 4X5                | 0.16 | 10                                                   | ESRE160E□□4R7MD05D |
|                       | 10       | 4X5                | 0.16 | 17                                                   | ESRE160E□□100MD05D |
|                       | 22       | 5X5                | 0.16 | 32                                                   | ESRE160E□□220ME05D |
|                       | 47       | 6.3X5              | 0.16 | 50                                                   | ESRE160E□□470MF05D |
| 25                    | 3.3      | 4X5                | 0.14 | 9.3                                                  | ESRE250E□□3R3MD05D |
|                       | 4.7      | 4X5                | 0.14 | 12                                                   | ESRE250E□□4R7MD05D |
|                       | 33       | 6.3X5              | 0.14 | 45                                                   | ESRE250E□□330MF05D |

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA <sub>rms</sub> /85°C,120Hz) | Part No.           |
|-----------------------|----------|--------------------|------|------------------------------------------------------|--------------------|
| 35                    | 2.2      | 4X5                | 0.12 | 8.3                                                  | ESRE350E□□2R2MD05D |
|                       | 3.3      | 4X5                | 0.12 | 11                                                   | ESRE350E□□3R3MD05D |
|                       | 4.7      | 4X5                | 0.12 | 15                                                   | ESRE350E□□4R7MD05D |
|                       | 10       | 5X5                | 0.12 | 25                                                   | ESRE350E□□100ME05D |
|                       | 22       | 6.3X5              | 0.12 | 40                                                   | ESRE350E□□220MF05D |
| 50                    | 1.0      | 4X5                | 0.10 | 6.2                                                  | ESRE500E□□1R0MD05D |
|                       | 2.2      | 4X5                | 0.10 | 10                                                   | ESRE500E□□2R2MD05D |
|                       | 3.3      | 4X5                | 0.10 | 14                                                   | ESRE500E□□3R3MD05D |
|                       | 4.7      | 5X5                | 0.10 | 19                                                   | ESRE500E□□4R7ME05D |
|                       | 10       | 6.3X5              | 0.10 | 29                                                   | ESRE500E□□100MF05D |

□□ : Enter the appropriate lead forming or taping code.

Note : □ unified to φ4X5.



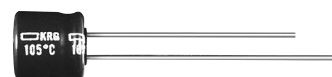
## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

5mm height, 105°C

# KRE Series

- 5mm height
- Endurance : 1,000 hours at 105°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

KRE  
105°C  
SRE

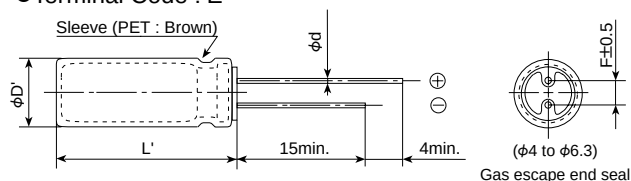


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |      |                  |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                     |                                      |      |      |      |      |      |                  |
| Rated Voltage Range                                    | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                      |      |      |      |      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                             |                                      |      |      |      |      |      |                  |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                         |                                      |      |      |      |      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.27                                 | 0.23 | 0.19 | 0.15 | 0.13 | 0.11 |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | (at 120Hz)       |
|                                                        | Z(−25°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 3                                    | 3    | 2    | 2    | 2    | 2    |                  |
|                                                        | Z(−40°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 9                                    | 7    | 5    | 3    | 3    | 3    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1,000 hours at 105°C.                                                                                                                                 |                                      |      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |      |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |      |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |      |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |      |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |      |                  |

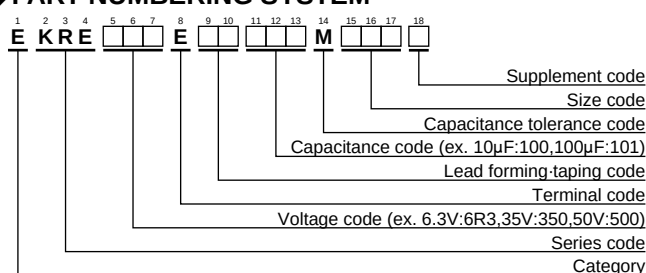
## ◆ DIMENSIONS [mm]

- Terminal Code : E



| φD  | 4          | 5    | 6.3  |
|-----|------------|------|------|
| φd  | 0.45       | 0.45 | 0.45 |
| F   | 1.5        | 2.0  | 2.5  |
| φD' | φD+0.5max. |      |      |
| L'  | L+1.0max.  |      |      |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

## ◆ STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA rms/105°C, 120Hz) | Part No.           |
|-----------------------|----------|--------------------|------|--------------------------------------------|--------------------|
| 6.3                   | 10       | 4×5                | 0.27 | 12                                         | EKRE6R3E□□100MD05D |
|                       | 22       | 4×5                | 0.27 | 21                                         | EKRE6R3E□□220MD05D |
|                       | 47       | 5×5                | 0.27 | 36                                         | EKRE6R3E□□470ME05D |
|                       | 100      | 6.3×5              | 0.27 | 56                                         | EKRE6R3E□□101MF05D |
| 10                    | 33       | 5×5                | 0.23 | 34                                         | EKRE100E□□330ME05D |
| 16                    | 4.7      | 4×5                | 0.19 | 9.4                                        | EKRE160E□□47MD05D  |
|                       | 10       | 4×5                | 0.19 | 16                                         | EKRE160E□□100MD05D |
|                       | 22       | 5×5                | 0.19 | 30                                         | EKRE160E□□220ME05D |
|                       | 47       | 6.3×5              | 0.19 | 48                                         | EKRE160E□□470MF05D |
| 25                    | 3.3      | 4×5                | 0.15 | 8.8                                        | EKRE250E□□33MD05D  |
|                       | 4.7      | 4×5                | 0.15 | 12                                         | EKRE250E□□47MD05D  |
|                       | 33       | 6.3×5              | 0.15 | 45                                         | EKRE250E□□330MF05D |

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA rms/105°C, 120Hz) | Part No.           |
|-----------------------|----------|--------------------|------|--------------------------------------------|--------------------|
| 35                    | 2.2      | 4×5                | 0.13 | 7.7                                        | EKRE350E□□2R2MD05D |
|                       | 3.3      | 4×5                | 0.13 | 11                                         | EKRE350E□□3R3MD05D |
|                       | 4.7      | 4×5                | 0.13 | 15                                         | EKRE350E□□4R7MD05D |
|                       | 10       | 5×5                | 0.13 | 25                                         | EKRE350E□□100ME05D |
|                       | 22       | 6.3×5              | 0.13 | 40                                         | EKRE350E□□220MF05D |
| 50                    | 1.0      | 4×5                | 0.11 | 5.6                                        | EKRE500E□□1R0MD05D |
|                       | 2.2      | 4×5                | 0.11 | 10                                         | EKRE500E□□2R2MD05D |
|                       | 3.3      | 4×5                | 0.11 | 14                                         | EKRE500E□□3R3MD05D |
|                       | 4.7      | 5×5                | 0.11 | 19                                         | EKRE500E□□4R7ME05D |
|                       | 10       | 6.3×5              | 0.11 | 29                                         | EKRE500E□□100MF05D |

□□ : Enter the appropriate lead forming or taping code.

Note : □ unified to φ4×5.



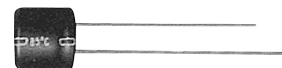
## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

7mm height, 85°C

# SRA Series

- 7mm height
- Endurance : 1,000 hours at 85°C
- Non solvent resistant type
- RoHS Compliant

SRG  
Downsized  
**SRA**

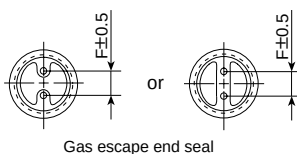
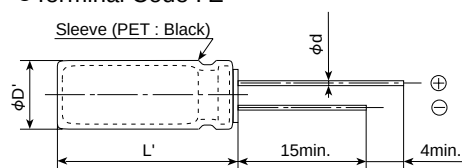


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                      |                                      |      |      |      |      |      |      |      |                  |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|------|------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                    |                                      |      |      |      |      |      |      |      |                  |
| Temperature Range                                      | -40 to +85°C                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |      |      |      |                  |
| Rated Voltage Range                                    | 4 to 63V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                      |      |      |      |      |      |      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                            |                                      |      |      |      |      |      |      |      |                  |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                        |                                      |      |      |      |      |      |      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                     | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                          | 0.35                                 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                     | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  | (at 120Hz)       |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                    | 4                                    | 4    | 3    | 2    | 2    | 2    | 2    | 2    |                  |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                    | 10                                   | 10   | 8    | 6    | 4    | 3    | 3    | 3    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1,000 hours at 85°C.                                                                                                                                 |                                      |      |      |      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤±20% of the initial value           |      |      |      |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                          | ≤200% of the initial specified value |      |      |      |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤The initial specified value         |      |      |      |      |      |      |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤±20% of the initial value           |      |      |      |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                          | ≤200% of the initial specified value |      |      |      |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤The initial specified value         |      |      |      |      |      |      |      |                  |

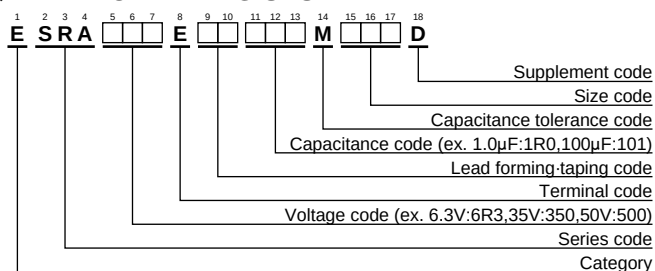
## ◆ DIMENSIONS [mm]

- Terminal Code : E



| φD  | 4          | 5    | 6.3  | 8    |
|-----|------------|------|------|------|
| φd  | 0.45       | 0.45 | 0.45 | 0.45 |
| F   | 1.5        | 2.0  | 2.5  | 3.5  |
| φD' | φD+0.5max. |      |      |      |
| L'  | L+1.0max.  |      |      |      |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

## ◆ STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA <sub>rms</sub> /85°C, 120Hz) | Part No.           | WV (V <sub>dc</sub> ) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA <sub>rms</sub> /85°C, 120Hz) | Part No.           |
|-----------------------|----------|--------------------|------|-------------------------------------------------------|--------------------|-----------------------|----------|--------------------|------|-------------------------------------------------------|--------------------|
| 4                     | 33       | 4×7                | 0.35 | 26                                                    | ESRA4R0E□□330MD07D | 35                    | 4.7      | 4×7                | 0.12 | 20                                                    | ESRA350E□□4R7MD07D |
|                       | 47       | 4×7                | 0.35 | 34                                                    | ESRA4R0E□□470MD07D |                       | 10       | 5×7                | 0.12 | 30                                                    | ESRA350E□□100ME07D |
|                       | 100      | 5×7                | 0.35 | 61                                                    | ESRA4R0E□□101ME07D |                       | 22       | 6.3×7              | 0.12 | 47                                                    | ESRA350E□□220MF07D |
|                       | 220      | 6.3×7              | 0.35 | 95                                                    | ESRA4R0E□□221MF07D |                       | 33       | 6.3×7              | 0.12 | 64                                                    | ESRA350E□□330MF07D |
|                       | 470      | 8×7                | 0.35 | 154                                                   | ESRA4R0E□□471MH07D |                       | 47       | 8×7                | 0.12 | 83                                                    | ESRA350E□□470MH07D |
| 6.3                   | 22       | 4×7                | 0.24 | 31                                                    | ESRA6R3E□□220MD07D | 50                    | 1.0      | 4×7                | 0.10 | 10                                                    | ESRA500E□□1R0MD07D |
|                       | 47       | 5×7                | 0.24 | 47                                                    | ESRA6R3E□□470ME07D |                       | 2.2      | 4×7                | 0.10 | 15                                                    | ESRA500E□□2R2MD07D |
|                       | 330      | 8×7                | 0.24 | 156                                                   | ESRA6R3E□□331MH07D |                       | 3.3      | 4×7                | 0.10 | 18                                                    | ESRA500E□□3R3MD07D |
| 10                    | 33       | 5×7                | 0.20 | 43                                                    | ESRA100E□□330ME07D |                       | 4.7      | 5×7                | 0.10 | 23                                                    | ESRA500E□□4R7ME07D |
|                       | 100      | 6.3×7              | 0.20 | 80                                                    | ESRA100E□□101MF07D |                       | 10       | 6.3×7              | 0.10 | 34                                                    | ESRA500E□□100MF07D |
|                       | 220      | 8×7                | 0.20 | 140                                                   | ESRA100E□□221MH07D |                       | 22       | 6.3×7              | 0.10 | 57                                                    | ESRA500E□□220MF07D |
| 16                    | 10       | 4×7                | 0.16 | 25                                                    | ESRA160E□□100MD07D | 63                    | 33       | 8×7                | 0.10 | 76                                                    | ESRA500E□□330MH07D |
|                       | 22       | 5×7                | 0.16 | 39                                                    | ESRA160E□□220ME07D |                       | 1.0      | 4×7                | 0.08 | 11                                                    | ESRA630E□□1R0MD07D |
|                       | 47       | 6.3×7              | 0.16 | 59                                                    | ESRA160E□□470MF07D |                       | 2.2      | 4×7                | 0.08 | 17                                                    | ESRA630E□□2R2MD07D |
| 25                    | 100      | 6.3×7              | 0.16 | 97                                                    | ESRA160E□□101MF07D |                       | 3.3      | 5×7                | 0.08 | 21                                                    | ESRA630E□□3R3ME07D |
|                       | 33       | 6.3×7              | 0.14 | 53                                                    | ESRA250E□□330MF07D |                       | 4.7      | 6.3×7              | 0.08 | 26                                                    | ESRA630E□□4R7MF07D |
|                       | 47       | 6.3×7              | 0.14 | 71                                                    | ESRA250E□□470MF07D |                       | 10       | 6.3×7              | 0.08 | 47                                                    | ESRA630E□□100MF07D |

□ : Enter the appropriate lead forming or taping code.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

7mm height, 105°C

# KMA Series

- 7mm height
- Endurance : 1,000 hours at 105°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

KMA

105°C  
SRA

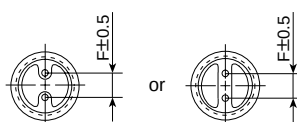
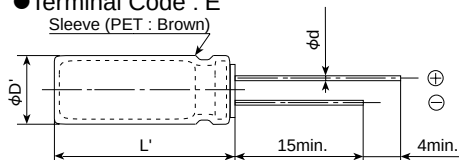
## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |                            |      |      |                  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|----------------------------|------|------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |                            |      |      |                  |
| Rated Voltage Range                                    | 4 to 63V <sub>dc</sub>                                                                                                                                                                                                                                                                  |                                      |      |      |      |      |                            |      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |      |      |      |      |                            |      |      |                  |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                           |                                      |      |      |      |      |                            |      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V                        | 50V  | 63V  | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.35                                 | 0.22 | 0.19 | 0.16 | 0.14 | 0.12                       | 0.10 | 0.08 |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V                        | 50V  | 63V  | (at 120Hz)       |
|                                                        | Z(−25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 3    | 2    | 2    | 2    | 2                          | 2    | 2    |                  |
|                                                        | Z(−40°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 10                                   | 6    | 5    | 3    | 3    | 3                          | 3    | 3    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1,000 hours at 105°C.                                                                                                                                   |                                      |      |      |      |      |                            |      |      |                  |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                           | 4 to 16V <sub>dc</sub>               |      |      |      |      | 25 to 63V <sub>dc</sub>    |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±25% of the initial value           |      |      |      |      | ≤±20% of the initial value |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |      |      |      |      |                            |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |      |      |                            |      |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |                            |      |      |                  |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                           | 4 to 16V <sub>dc</sub>               |      |      |      |      | 25 to 63V <sub>dc</sub>    |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±25% of the initial value           |      |      |      |      | ≤±20% of the initial value |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |      |      |      |      |                            |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |      |      |                            |      |      |                  |

## ◆ DIMENSIONS [mm]

## ● Terminal Code : E

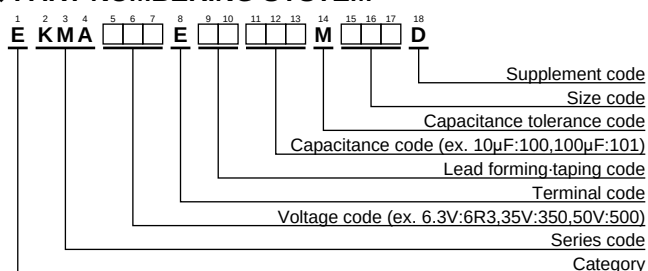
Sleeve (PET : Brown)



Gas escape end seal

| φD  | 4          | 5    | 6.3  |
|-----|------------|------|------|
| φd  | 0.45       | 0.45 | 0.45 |
| F   | 1.5        | 2.0  | 2.5  |
| φD' | φD+0.5max. |      |      |
| L'  | L+1.0max.  |      |      |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

7mm height, 105°C

KMA Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|-------------------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|-------------------------------------------------------------|--------------------|
| 4           | 33          | 4X7                   | 0.35 | 26                                                          | EKMA4R0E□□330MD07D | 35          | 4.7         | 4X7                   | 0.12 | 20                                                          | EKMA350E□□4R7MD07D |
|             | 47          | 4X7                   | 0.35 | 34                                                          | EKMA4R0E□□470MD07D |             | 10          | 5X7                   | 0.12 | 30                                                          | EKMA350E□□100ME07D |
|             | 100         | 5X7                   | 0.35 | 61                                                          | EKMA4R0E□□101ME07D |             | 22          | 6.3X7                 | 0.12 | 47                                                          | EKMA350E□□220MF07D |
|             | 220         | 6.3X7                 | 0.35 | 95                                                          | EKMA4R0E□□221MF07D |             | 33          | 6.3X7                 | 0.12 | 64                                                          | EKMA350E□□330MF07D |
| 6.3         | 22          | 4X7                   | 0.22 | 31                                                          | EKMA6R3E□□220MD07D | 50          | 1.0         | 4X7                   | 0.10 | 10                                                          | EKMA500E□□1R0MD07D |
|             | 47          | 5X7                   | 0.22 | 47                                                          | EKMA6R3E□□470ME07D |             | 2.2         | 4X7                   | 0.10 | 15                                                          | EKMA500E□□2R2MD07D |
| 10          | 33          | 5X7                   | 0.19 | 43                                                          | EKMA100E□□330ME07D |             | 3.3         | 4X7                   | 0.10 | 18                                                          | EKMA500E□□3R3MD07D |
|             | 100         | 6.3X7                 | 0.19 | 80                                                          | EKMA100E□□101MF07D |             | 4.7         | 5X7                   | 0.10 | 23                                                          | EKMA500E□□4R7ME07D |
| 16          | 10          | 4X7                   | 0.16 | 25                                                          | EKMA160E□□100MD07D |             | 10          | 6.3X7                 | 0.10 | 34                                                          | EKMA500E□□100MF07D |
|             | 22          | 5X7                   | 0.16 | 39                                                          | EKMA160E□□220ME07D |             | 22          | 6.3X7                 | 0.10 | 57                                                          | EKMA500E□□220MF07D |
|             | 47          | 6.3X7                 | 0.16 | 59                                                          | EKMA160E□□470MF07D | 63          | 1.0         | 4X7                   | 0.08 | 11                                                          | EKMA630E□□1R0MD07D |
|             | 100         | 6.3X7                 | 0.16 | 97                                                          | EKMA160E□□101MF07D |             | 2.2         | 4X7                   | 0.08 | 17                                                          | EKMA630E□□2R2MD07D |
| 25          | 33          | 6.3X7                 | 0.14 | 53                                                          | EKMA250E□□330MF07D |             | 3.3         | 5X7                   | 0.08 | 21                                                          | EKMA630E□□3R3ME07D |
|             | 47          | 6.3X7                 | 0.14 | 71                                                          | EKMA250E□□470MF07D |             | 4.7         | 6.3X7                 | 0.08 | 26                                                          | EKMA630E□□4R7MF07D |
|             |             |                       |      |                                                             |                    |             | 10          | 6.3X7                 | 0.08 | 43                                                          | EKMA630E□□100MF07D |

□□ : Enter the appropriate lead forming or taping code.

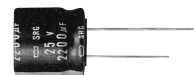
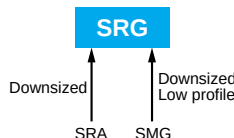


## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low profile, 85°C

## SRG Series

- Low profile :  $\phi 4 \times 7\text{mm}$  to  $\phi 18 \times 25\text{mm}$
- Endurance : 1,000 to 2,000 hours at 85°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

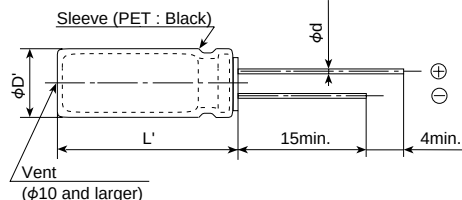


## ◆ SPECIFICATIONS

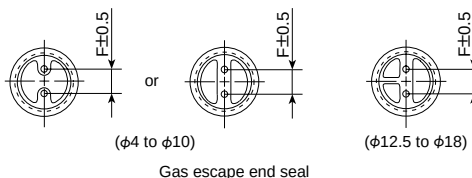
| Items                                                  | Characteristics                                                                                                                                                                                                                                                                        |                                      |      |      |      |      |      |              |  |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|--------------|--|
| Category                                               | –40 to +85°C                                                                                                                                                                                                                                                                           |                                      |      |      |      |      |      |              |  |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                        |                                      |      |      |      |      |      |              |  |
| Rated Voltage Range                                    | 4 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                                 |                                      |      |      |      |      |      |              |  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                              |                                      |      |      |      |      |      |              |  |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                          |                                      |      |      |      |      |      |              |  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V          |  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                            | 0.38                                 | 0.28 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12         |  |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.03 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                      |                                      |      |      |      |      |      |              |  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 4V                                   | 6.3V | 10V  | 16V  | 25V  | 35V  | 50V          |  |
|                                                        | Z(–25°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | 6                                    | 5    | 4    | 3    | 2    | 2    | 2            |  |
|                                                        | Z(–40°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | 12                                   | 12   | 10   | 8    | 5    | 4    | 3 (at 120Hz) |  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours (1,000 hours for φ8 and smaller) at 85°C.                                                                                                  |                                      |      |      |      |      |      |              |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±20% of the initial value           |      |      |      |      |      |              |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤200% of the initial specified value |      |      |      |      |      |              |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |      |      |      |      |      |              |  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |              |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±20% of the initial value           |      |      |      |      |      |              |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤200% of the initial specified value |      |      |      |      |      |              |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |      |      |      |      |      |              |  |

## ◆ DIMENSIONS [mm]

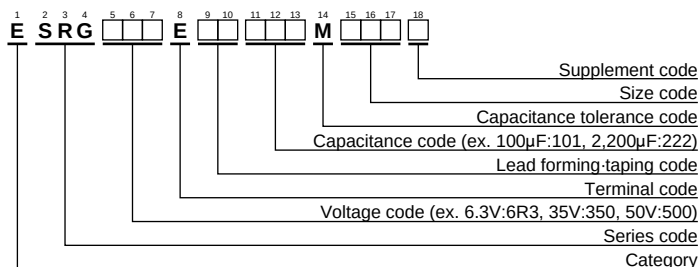
- Terminal Code : E



| $\phi D$  | 4                              | 5    | 6.3  | 8    | 10 & 12.5 | 16 & 18 |
|-----------|--------------------------------|------|------|------|-----------|---------|
| $\phi d$  | 7L                             | 0.45 | 0.45 | 0.45 | —         | —       |
|           | $\geq 9L$                      | —    | 0.5  | 0.5  | 0.6       | 0.6     |
| F         | 1.5                            | 2.0  | 2.5  | 3.5  | 5.0       | 7.5     |
| $\phi D'$ | $\phi D + 0.5\text{max.}$      |      |      |      |           |         |
| L'        | L + 1.5max. (7L : L + 1.0max.) |      |      |      |           |         |



## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"


**SRG** Series

**◆STANDARD RATINGS**

| WV (Vdc) | Cap (μF) | Case code<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /85°C,120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case code<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /85°C,120Hz) | Part No.           |
|----------|----------|-----------------------|------|------------------------------------------------------------|--------------------|----------|----------|-----------------------|------|------------------------------------------------------------|--------------------|
| 4        | 470      | 8×7                   | 0.38 | 154                                                        | ESRG4R0E□□471MH07D | 25       | 470      | 10×12.5               | 0.16 | 525                                                        | ESRG250E□□471MJC5S |
| 6.3      | 47       | 4×7                   | 0.28 | 50                                                         | ESRG6R3E□□470MD07D |          | 1,000    | 12.5×15               | 0.16 | 830                                                        | ESRG250E□□102MK15S |
|          | 100      | 5×7                   | 0.28 | 87                                                         | ESRG6R3E□□101ME07D |          | 2,200    | 18×15                 | 0.19 | 1,360                                                      | ESRG250E□□222MM15S |
|          | 220      | 6.3×7                 | 0.28 | 133                                                        | ESRG6R3E□□221MF07D |          | 3,300    | 18×20                 | 0.22 | 1,720                                                      | ESRG250E□□332MM20S |
|          | 330      | 6.3×9                 | 0.28 | 247                                                        | ESRG6R3E□□331MF09D |          | 4,700    | 18×25                 | 0.25 | 2,070                                                      | ESRG250E□□472MM25S |
|          | 330      | 8×7                   | 0.28 | 191                                                        | ESRG6R3E□□331MH07D | 35       | 10       | 4×7                   | 0.14 | 32                                                         | ESRG350E□□100MD07D |
|          | 1,000    | 10×9                  | 0.28 | 505                                                        | ESRG6R3E□□102MJ09S |          | 22       | 5×7                   | 0.14 | 57                                                         | ESRG350E□□220ME07D |
|          | 4,700    | 16×15                 | 0.37 | 1,410                                                      | ESRG6R3E□□472ML15S |          | 33       | 5×9                   | 0.14 | 94                                                         | ESRG350E□□330ME09D |
|          | 6,800    | 18×15                 | 0.43 | 1,660                                                      | ESRG6R3E□□682MM15S |          | 33       | 6.3×7                 | 0.14 | 73                                                         | ESRG350E□□330MF07D |
|          | 10,000   | 18×20                 | 0.55 | 2,020                                                      | ESRG6R3E□□103MM20S |          | 47       | 8×7                   | 0.14 | 101                                                        | ESRG350E□□470MH07D |
| 10       | 33       | 4×7                   | 0.24 | 46                                                         | ESRG100E□□330MD07D |          | 100      | 8×9                   | 0.14 | 220                                                        | ESRG350E□□101MH09D |
|          | 100      | 5×9                   | 0.24 | 132                                                        | ESRG100E□□101ME09D |          | 220      | 10×9                  | 0.14 | 335                                                        | ESRG350E□□221MJ09S |
|          | 220      | 6.3×9                 | 0.24 | 218                                                        | ESRG100E□□221MF09D |          | 330      | 10×12.5               | 0.14 | 475                                                        | ESRG350E□□331MJC5S |
|          | 220      | 8×7                   | 0.24 | 171                                                        | ESRG100E□□221MH07D |          | 470      | 12.5×13               | 0.14 | 585                                                        | ESRG350E□□471MK13S |
|          | 470      | 8×9                   | 0.24 | 385                                                        | ESRG100E□□471MH09D |          | 1,000    | 16×15                 | 0.14 | 1,010                                                      | ESRG350E□□102ML15S |
|          | 1,000    | 10×12.5               | 0.24 | 625                                                        | ESRG100E□□102MJC5S |          | 2,200    | 18×20                 | 0.17 | 1,560                                                      | ESRG350E□□222MM20S |
|          | 2,200    | 12.5×15               | 0.27 | 970                                                        | ESRG100E□□222MK15S | 50       | 1.0      | 4×7                   | 0.12 | 10                                                         | ESRG500E□□1R0MD07D |
|          | 3,300    | 16×15                 | 0.30 | 1,310                                                      | ESRG100E□□332ML15S |          | 1.0      | 5×9                   | 0.12 | 13                                                         | ESRG500E□□1R0ME09D |
|          | 4,700    | 18×15                 | 0.33 | 1,560                                                      | ESRG100E□□472MM15S |          | 2.2      | 4×7                   | 0.12 | 15                                                         | ESRG500E□□2R2MD07D |
|          | 6,800    | 18×20                 | 0.39 | 1,870                                                      | ESRG100E□□682MM20S |          | 2.2      | 5×9                   | 0.12 | 26                                                         | ESRG500E□□2R2ME09D |
|          | 10,000   | 18×25                 | 0.51 | 2,370                                                      | ESRG100E□□103MM25S |          | 3.3      | 4×7                   | 0.12 | 19                                                         | ESRG500E□□3R3MD07D |
| 16       | 22       | 4×7                   | 0.20 | 42                                                         | ESRG160E□□220MD07D |          | 3.3      | 5×9                   | 0.12 | 32                                                         | ESRG500E□□3R3ME09D |
|          | 47       | 5×7                   | 0.20 | 73                                                         | ESRG160E□□470ME07D |          | 4.7      | 4×7                   | 0.12 | 24                                                         | ESRG500E□□4R7MD07D |
|          | 100      | 6.3×7                 | 0.20 | 110                                                        | ESRG160E□□101MF07D |          | 4.7      | 5×9                   | 0.12 | 38                                                         | ESRG500E□□4R7ME09D |
|          | 220      | 8×9                   | 0.20 | 290                                                        | ESRG160E□□221MH09D |          | 10       | 5×7                   | 0.12 | 42                                                         | ESRG500E□□100ME07D |
|          | 330      | 8×9                   | 0.20 | 355                                                        | ESRG160E□□331MH09D |          | 10       | 5×9                   | 0.12 | 64                                                         | ESRG500E□□100ME09D |
|          | 470      | 10×9                  | 0.20 | 410                                                        | ESRG160E□□471MJ09S |          | 22       | 5×9                   | 0.12 | 86                                                         | ESRG500E□□220ME09D |
|          | 1,000    | 12.5×13               | 0.20 | 715                                                        | ESRG160E□□102MK13S |          | 22       | 6.3×7                 | 0.12 | 64                                                         | ESRG500E□□220MF07D |
|          | 2,200    | 16×15                 | 0.23 | 1,160                                                      | ESRG160E□□222ML15S |          | 33       | 6.3×9                 | 0.12 | 113                                                        | ESRG500E□□330MF09D |
|          | 3,300    | 18×15                 | 0.26 | 1,460                                                      | ESRG160E□□332MM15S |          | 33       | 8×7                   | 0.12 | 93                                                         | ESRG500E□□330MH07D |
|          | 4,700    | 18×20                 | 0.29 | 1,770                                                      | ESRG160E□□472MM20S |          | 47       | 6.3×9                 | 0.12 | 135                                                        | ESRG500E□□470MF09D |
| 25       | 6,800    | 18×25                 | 0.35 | 2,170                                                      | ESRG160E□□682MM25S |          | 100      | 10×9                  | 0.12 | 240                                                        | ESRG500E□□101MJ09S |
|          | 33       | 5×7                   | 0.16 | 66                                                         | ESRG250E□□330ME07D |          | 220      | 10×12.5               | 0.12 | 415                                                        | ESRG500E□□221MJC5S |
|          | 47       | 5×9                   | 0.16 | 105                                                        | ESRG250E□□470ME09D |          | 330      | 12.5×13               | 0.12 | 525                                                        | ESRG500E□□331MK13S |
|          | 47       | 6.3×7                 | 0.16 | 80                                                         | ESRG250E□□470MF07D |          | 470      | 16×15                 | 0.12 | 745                                                        | ESRG500E□□471ML15S |
|          | 100      | 6.3×9                 | 0.16 | 172                                                        | ESRG250E□□101MF09D |          | 1,000    | 18×20                 | 0.12 | 1,160                                                      | ESRG500E□□102MM20S |
|          | 330      | 10×9                  | 0.16 | 380                                                        | ESRG250E□□331MJ09S |          |          |                       |      |                                                            |                    |

□□ : Enter the appropriate lead forming or taping code.

**◆RATED RIPPLE CURRENT MULTIPLIERS**
**●Frequency Multipliers**

| Capacitance (μF) | 50   | 120  | 300  | 1k   | 10k  | 100k |
|------------------|------|------|------|------|------|------|
| to 4.7           | 0.65 | 1.00 | 1.35 | 1.75 | 2.30 | 2.50 |
| 10 to 47         | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 |
| 100 to 1,000     | 0.80 | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 |
| 2,200 to         | 0.85 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |

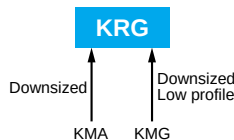


## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low profile, 105°C

## KRG Series

- Low profile :  $\phi 4 \times 7\text{mm}$  to  $\phi 18 \times 25\text{mm}$
- Endurance : 1,000 hours at 105°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

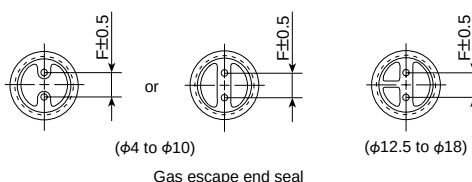
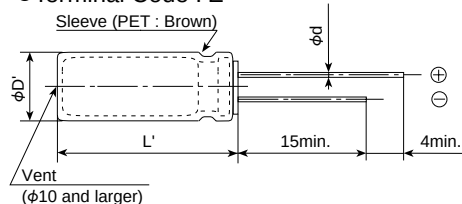


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |                                      |            |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|--------------------------------------|------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                     |                                      |      |      |      |      |                                      |            |
| Rated Voltage Range                                    | -55 to +105°C                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |                                      |            |
| Capacitance Tolerance                                  | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                      |      |      |      |      |                                      |            |
| Leakage Current                                        | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                             |                                      |      |      |      |      |                                      |            |
| Dissipation Factor (tanδ)                              | I=0.01CV or 3μA, whichever is greater.                                                                                                                                                                                                                                                |                                      |      |      |      |      |                                      |            |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                                                                   |                                      |      |      |      |      |                                      |            |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V                                  |            |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.28                                 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12                                 |            |
| Low Temperature Characteristics (Max. Impedance Ratio) | When nominal capacitance exceeds 1,000μF, add 0.03 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                     |                                      |      |      |      |      |                                      |            |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V                                  |            |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 5                                    | 4    | 3    | 2    | 2    | 2                                    |            |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 10                                   | 8    | 6    | 4    | 3    | 3                                    | (at 120Hz) |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1,000 hours at 105°C.                                                                                                                                 |                                      |      |      |      |      |                                      |            |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                         | 6.3 to 16V <sub>dc</sub>             |      |      |      |      | 25 to 50V <sub>dc</sub>              |            |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value           |      |      |      |      | ≤±20% of the initial value           |            |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |      |      |      |      | ≤200% of the initial specified value |            |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      | ≤The initial specified value         |            |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |                                      |            |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                         | 6.3 to 16V <sub>dc</sub>             |      |      |      |      | 25 to 50V <sub>dc</sub>              |            |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value           |      |      |      |      | ≤±20% of the initial value           |            |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |      |      |      |      | ≤200% of the initial specified value |            |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      | ≤The initial specified value         |            |

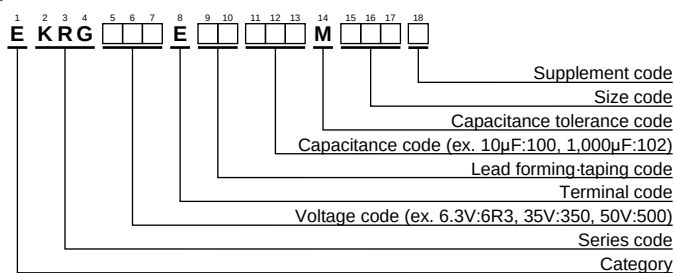
## ◆ DIMENSIONS [mm]

## ● Terminal Code : E



| φD  | 4                          | 5    | 6.3  | 8   | 10 & 12.5 | 16 & 18 |
|-----|----------------------------|------|------|-----|-----------|---------|
| 7L  | 0.45                       | 0.45 | 0.45 | —   | —         | —       |
| ≥9L | —                          | 0.5  | 0.5  | 0.6 | 0.6       | 0.8     |
| F   | 1.5                        | 2.0  | 2.5  | 3.5 | 5.0       | 7.5     |
| φD' | φD+0.5max.                 |      |      |     |           |         |
| L'  | L+1.5max. (7L : L+1.0max.) |      |      |     |           |         |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"


**KRG** Series

### ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA rms/105°C, 120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA rms/105°C, 120Hz) | Part No.           |
|----------|----------|--------------------|------|--------------------------------------------|--------------------|----------|----------|--------------------|------|--------------------------------------------|--------------------|
| 6.3      | 47       | 5×7                | 0.28 | 50                                         | EKRG6R3E□□470ME07D | 25       | 470      | 10×12.5            | 0.16 | 370                                        | EKRG250E□□471MJC5S |
|          | 330      | 6.3×9              | 0.28 | 175                                        | EKRG6R3E□□331MF09D |          | 1,000    | 12.5×15            | 0.16 | 590                                        | EKRG250E□□102MK15S |
|          | 1,000    | 10×9               | 0.28 | 365                                        | EKRG6R3E□□102MJ09S |          | 2,200    | 18×15              | 0.19 | 970                                        | EKRG250E□□222MM15S |
|          | 4,700    | 16×15              | 0.37 | 1,010                                      | EKRG6R3E□□472ML15S |          | 3,300    | 18×20              | 0.22 | 1,220                                      | EKRG250E□□332MM20S |
|          | 6,800    | 18×15              | 0.43 | 1,190                                      | EKRG6R3E□□682MM15S |          | 4,700    | 18×25              | 0.25 | 1,470                                      | EKRG250E□□472MM25S |
|          | 10,000   | 18×20              | 0.55 | 1,440                                      | EKRG6R3E□□103MM20S | 35       | 10       | 5×7                | 0.14 | 36                                         | EKRG350E□□100ME07D |
| 10       | 22       | 4×7                | 0.24 | 35                                         | EKRG100E□□220MD07D |          | 22       | 6.3×7              | 0.14 | 57                                         | EKRG350E□□220MF07D |
|          | 100      | 5×9                | 0.24 | 93                                         | EKRG100E□□101ME09D |          | 33       | 5×9                | 0.14 | 67                                         | EKRG350E□□330ME09D |
|          | 100      | 6.3×7              | 0.24 | 80                                         | EKRG100E□□101MF07D |          | 33       | 6.3×7              | 0.14 | 64                                         | EKRG350E□□330MF07D |
|          | 220      | 6.3×9              | 0.24 | 154                                        | EKRG100E□□221MF09D |          | 100      | 8×9                | 0.14 | 155                                        | EKRG350E□□101MH09D |
|          | 470      | 8×9                | 0.24 | 272                                        | EKRG100E□□471MH09D |          | 220      | 10×9               | 0.14 | 235                                        | EKRG350E□□221MJ09S |
|          | 1,000    | 10×12.5            | 0.24 | 445                                        | EKRG100E□□102MJC5S |          | 330      | 10×12.5            | 0.14 | 340                                        | EKRG350E□□331MJC5S |
|          | 2,200    | 12.5×15            | 0.27 | 690                                        | EKRG100E□□222MK15S |          | 470      | 12.5×13            | 0.14 | 415                                        | EKRG350E□□471MK13S |
|          | 3,300    | 16×15              | 0.30 | 940                                        | EKRG100E□□332ML15S |          | 1,000    | 16×15              | 0.14 | 720                                        | EKRG350E□□102ML15S |
|          | 4,700    | 18×15              | 0.33 | 1,120                                      | EKRG100E□□472MM15S |          | 2,200    | 18×20              | 0.17 | 1,110                                      | EKRG350E□□222MM20S |
|          | 6,800    | 18×20              | 0.39 | 1,330                                      | EKRG100E□□682MM20S | 50       | 1.0      | 4×7                | 0.12 | 10                                         | EKRG500E□□1R0MD07D |
| 16       | 10,000   | 18×25              | 0.51 | 1,700                                      | EKRG100E□□103MM25S |          | 1.0      | 5×9                | 0.12 | 12                                         | EKRG500E□□1R0ME09D |
|          | 33       | 5×7                | 0.20 | 53                                         | EKRG160E□□330ME07D |          | 2.2      | 4×7                | 0.12 | 15                                         | EKRG500E□□2R2MD07D |
|          | 47       | 6.3×7              | 0.20 | 68                                         | EKRG160E□□470MF07D |          | 2.2      | 5×9                | 0.12 | 18                                         | EKRG500E□□2R2ME09D |
|          | 100      | 6.3×7              | 0.20 | 97                                         | EKRG160E□□101MF07D |          | 3.3      | 4×7                | 0.12 | 18                                         | EKRG500E□□3R3MD07D |
|          | 220      | 8×9                | 0.20 | 205                                        | EKRG160E□□221MH09D |          | 3.3      | 5×9                | 0.12 | 22                                         | EKRG500E□□3R3ME09D |
|          | 330      | 8×9                | 0.20 | 251                                        | EKRG160E□□331MH09D |          | 4.7      | 4×7                | 0.12 | 25                                         | EKRG500E□□4R7MD07D |
|          | 470      | 10×9               | 0.20 | 290                                        | EKRG160E□□471MJ09S |          | 4.7      | 5×9                | 0.12 | 27                                         | EKRG500E□□4R7ME09D |
|          | 1,000    | 12.5×13            | 0.20 | 515                                        | EKRG160E□□102MK13S |          | 10       | 5×9                | 0.12 | 46                                         | EKRG500E□□100ME09D |
|          | 2,200    | 16×15              | 0.23 | 830                                        | EKRG160E□□222ML15S |          | 10       | 6.3×7              | 0.12 | 44                                         | EKRG500E□□100MF07D |
|          | 3,300    | 18×15              | 0.26 | 1,050                                      | EKRG160E□□332MM15S |          | 22       | 5×9                | 0.12 | 61                                         | EKRG500E□□220ME09D |
| 25       | 4,700    | 18×20              | 0.29 | 1,260                                      | EKRG160E□□472MM20S |          | 22       | 6.3×7              | 0.12 | 57                                         | EKRG500E□□220MF07D |
|          | 6,800    | 18×25              | 0.35 | 1,560                                      | EKRG160E□□682MM25S |          | 33       | 6.3×9              | 0.12 | 80                                         | EKRG500E□□330MF09D |
|          | 10       | 4×7                | 0.16 | 30                                         | EKRG250E□□100MD07D |          | 47       | 6.3×9              | 0.12 | 95                                         | EKRG500E□□470MF09D |
|          | 22       | 5×7                | 0.16 | 46                                         | EKRG250E□□220ME07D |          | 100      | 10×9               | 0.12 | 170                                        | EKRG500E□□101MJ09S |
|          | 33       | 6.3×7              | 0.16 | 63                                         | EKRG250E□□330MF07D |          | 220      | 10×12.5            | 0.12 | 290                                        | EKRG500E□□221MJC5S |
|          | 47       | 5×9                | 0.16 | 75                                         | EKRG250E□□470ME09D |          | 330      | 12.5×13            | 0.12 | 370                                        | EKRG500E□□331MK13S |
| 25       | 47       | 6.3×7              | 0.16 | 71                                         | EKRG250E□□470MF07D |          | 470      | 16×15              | 0.12 | 535                                        | EKRG500E□□471ML15S |
|          | 100      | 6.3×9              | 0.16 | 121                                        | EKRG250E□□101MF09D |          | 1,000    | 18×20              | 0.12 | 830                                        | EKRG500E□□102MM20S |
|          | 330      | 10×9               | 0.16 | 270                                        | EKRG250E□□331MJ09S |          |          |                    |      |                                            |                    |
|          |          |                    |      |                                            |                    |          |          |                    |      |                                            |                    |

□□ : Enter the appropriate lead forming or taping code.

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Capacitance (μF) | 50   | 120  | 300  | 1k   | 10k  | 100k |
|------------------|------|------|------|------|------|------|
| to 4.7           | 0.65 | 1.00 | 1.35 | 1.75 | 2.30 | 2.50 |
| 10 to 47         | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 |
| 100 to 1,000     | 0.80 | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 |
| 2,200 to         | 0.85 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85°C

## SMQ Series

- Downsized from current standard SMG series
- Endurance : 2,000 hours at 85°C
- Non solvent resistant type
- RoHS Compliant

SMQ

↑ Downsized  
SMG

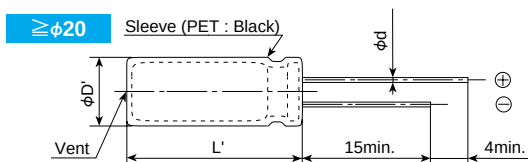
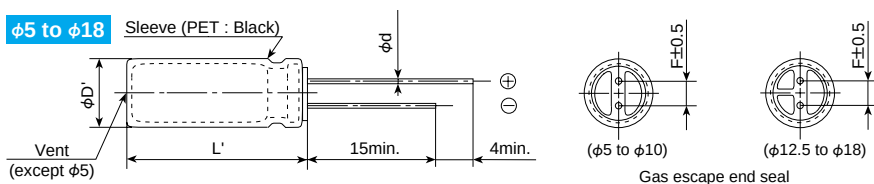


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                        |                                        |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------|------|------|------|------|--------------------------------------|------|-------------|-------------|------|------|------|--------------|
| Category                                               |                                                                                                                                                                                                                                                                                        |                                        |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
| Temperature Range                                      | -40 to +85°C(6.3 to 400V <sub>dc</sub> )    -25 to +85°C(450V <sub>dc</sub> )                                                                                                                                                                                                          |                                        |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
| Rated Voltage Range                                    | 6.3 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                        |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                              |                                        |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
| Leakage Current                                        |                                                                                                                                                                                                                                                                                        | 6.3 to 100V <sub>dc</sub>              |      |      |      |      |      | 160 to 450V <sub>dc</sub>            |      |             |             |      |      |      |              |
|                                                        | ≤φ18                                                                                                                                                                                                                                                                                   | I=0.03CV or 4μA, whichever is greater. |      |      |      |      |      | CV Time After 1minute                |      |             |             |      |      |      |              |
|                                                        |                                                                                                                                                                                                                                                                                        |                                        |      |      |      |      |      | CV≤1,000 I=0.1CV+40 max.             |      |             |             |      |      |      |              |
|                                                        |                                                                                                                                                                                                                                                                                        |                                        |      |      |      |      |      | CV>1,000 I=0.04CV+100 max.           |      |             |             |      |      |      |              |
|                                                        |                                                                                                                                                                                                                                                                                        | (at 20C after 1 minute)                |      |      |      |      |      | (at 20°C)                            |      |             |             |      |      |      |              |
|                                                        | ≥φ20                                                                                                                                                                                                                                                                                   | I=0.03CV                               |      |      |      |      |      | (at 20°C after 3 minutes)            |      |             |             |      |      |      |              |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                                                                                              |                                        |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 6.3V                                   | 10V  | 16V  | 25V  | 35V  | 50V  | 63V                                  | 100V | 160 to 250V | 315 to 400V | 450V |      |      |              |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                            | 0.28                                   | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.09                                 | 0.08 | 0.20        | 0.24        | 0.24 |      |      |              |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                      |                                        |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 6.3V                                   | 10V  | 16V  | 25V  | 35V  | 50V  | 63V                                  | 100V | 160 to 200V | 250V        | 350V | 400V | 450V |              |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | ≤φ8                                    | 5    | 4    | 3    | 2    | 2    | 2                                    | 2    | 2           | 3           | 3    | 4    | 4    | 6            |
|                                                        |                                                                                                                                                                                                                                                                                        | ≥φ10                                   | 5    | 4    | 3    | 2    | 2    | 2                                    | 2    | 2           | 3           | 3    | 4    | 4    | 6            |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | ≤φ8                                    | 12   | 10   | 8    | 5    | 4    | 3                                    | 3    | 3           | 8           | 10   | 8    | 8    | —            |
|                                                        |                                                                                                                                                                                                                                                                                        | ≥φ10                                   | 12   | 10   | 8    | 5    | 4    | 3                                    | 3    | 3           | 4           | 4    | 6    | 6    | — (at 120Hz) |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 85°C.                                                                                                                                   |                                        |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±20% of the initial value             |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤200% of the initial specified value   |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value           |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                        |      |      |      |      |      |                                      |      |             |             |      |      |      |              |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                          | 6.3 to 100V <sub>dc</sub>              |      |      |      |      |      | 160 to 450V <sub>dc</sub>            |      |             |             |      |      |      |              |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±20% of the initial value             |      |      |      |      |      | ≤±20% of the initial value           |      |             |             |      |      |      |              |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤200% of the initial specified value   |      |      |      |      |      | ≤200% of the initial specified value |      |             |             |      |      |      |              |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value           |      |      |      |      |      | ≤500% of the initial specified value |      |             |             |      |      |      |              |
|                                                        |                                                                                                                                                                                                                                                                                        |                                        |      |      |      |      |      |                                      |      |             |             |      |      |      |              |

## ◆ DIMENSIONS [mm]

- Terminal Code : E



| φD  | 5          | 6.3 | 8   | 10  | 12.5 | 16  | 18  | 20         | 22   |
|-----|------------|-----|-----|-----|------|-----|-----|------------|------|
| φd  | 0.5        | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 | 1.0        | 1.0  |
| F   | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 | 10.0       | 10.0 |
| φD' | φD+0.5max. |     |     |     |      |     |     | φD+0.5max. |      |
| L'  | L+1.5max.  |     |     |     |      |     |     | L+2.0max.  |      |

## ◆ PART NUMBERING SYSTEM

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

E SMQ [ ] [ ] E [ ] [ ] M [ ] [ ] [ ]

Supplement code

Size code

Capacitance tolerance code

Capacitance code (ex. 1.0μF:1R0, 10μF:100, 100μF:101)

Lead forming-taping code

Terminal code

Voltage code (ex. 6.3V:6R3, 50V:500, 100V:101)

Series code

Category

Please refer to "Product code guide (radial lead type)"



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85°C

SMQ Series

## ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (mA rms/85°C, 120Hz) | Part No.            | WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (mA rms/85°C, 120Hz) | Part No.            |
|----------|----------|--------------------|------|-------------------------------------------|---------------------|----------|----------|--------------------|------|-------------------------------------------|---------------------|
| 6.3      | 1,000    | 8×11.5             | 0.28 | 540                                       | ESMQ6R3E□□102MHB5D  | 50       | 330      | 10×16              | 0.12 | 590                                       | ESMQ500E□□331MJ16S  |
|          | 2,200    | 10×16              | 0.30 | 890                                       | ESMQ6R3E□□222MJ16S  |          | 470      | 10×20              | 0.12 | 760                                       | ESMQ500E□□471MJ20S  |
|          | 3,300    | 10×20              | 0.32 | 1,190                                     | ESMQ6R3E□□332MJ20S  |          | 1,000    | 12.5×25            | 0.12 | 1,350                                     | ESMQ500E□□102MK25S  |
|          | 4,700    | 12.5×20            | 0.34 | 1,550                                     | ESMQ6R3E□□472MK20S  |          | 2,200    | 16×31.5            | 0.14 | 1,980                                     | ESMQ500E□□222MLN3S  |
|          | 6,800    | 12.5×25            | 0.38 | 1,920                                     | ESMQ6R3E□□682MK25S  |          | 3,300    | 18×35.5            | 0.16 | 2,500                                     | ESMQ500E□□332MMP1S  |
|          | 10,000   | 16×25              | 0.46 | 2,350                                     | ESMQ6R3E□□103ML25S  |          | 4,700    | 20×40              | 0.18 | 2,900                                     | ESMQ500E□□472MNA40S |
|          | 15,000   | 16×31.5            | 0.56 | 2,550                                     | ESMQ6R3E□□153MLN3S  |          | 6,800    | 22×50              | 0.22 | 3,500                                     | ESMQ500E□□682MP50S  |
|          | 22,000   | 18×35.5            | 0.70 | 3,200                                     | ESMQ6R3E□□223MMP1S  |          | 22       | 5×11               | 0.09 | 100                                       | ESMQ630E□□220ME11D  |
|          | 33,000   | 20×40              | 0.92 | 3,500                                     | ESMQ6R3E□□333MNA40S |          | 33       | 6.3×11             | 0.09 | 140                                       | ESMQ630E□□330MF11D  |
|          | 47,000   | 22×50              | 1.20 | 3,900                                     | ESMQ6R3E□□473MP50S  |          | 47       | 6.3×11             | 0.09 | 170                                       | ESMQ630E□□470MF11D  |
| 10       | 220      | 5×11               | 0.24 | 240                                       | ESMQ100E□□221MF11D  | 63       | 68       | 8×11.5             | 0.09 | 220                                       | ESMQ630E□□680MHB5D  |
|          | 330      | 6.3×11             | 0.24 | 290                                       | ESMQ100E□□331MF11D  |          | 100      | 8×11.5             | 0.09 | 280                                       | ESMQ630E□□101MHB5D  |
|          | 470      | 6.3×11             | 0.24 | 350                                       | ESMQ100E□□471MF11D  |          | 220      | 10×16              | 0.09 | 490                                       | ESMQ630E□□221MJ16S  |
|          | 1,000    | 10×12.5            | 0.24 | 650                                       | ESMQ100E□□102MJC5S  |          | 330      | 10×20              | 0.09 | 710                                       | ESMQ630E□□331MJ20S  |
|          | 2,200    | 10×16              | 0.26 | 990                                       | ESMQ100E□□222MJ16S  |          | 470      | 12.5×20            | 0.09 | 900                                       | ESMQ630E□□471MK20S  |
|          | 3,300    | 12.5×20            | 0.28 | 1,450                                     | ESMQ100E□□332MK20S  |          | 1,000    | 16×25              | 0.09 | 1,300                                     | ESMQ630E□□102ML25S  |
|          | 4,700    | 12.5×25            | 0.30 | 1,800                                     | ESMQ100E□□472MK25S  |          | 2,200    | 18×35.5            | 0.11 | 2,300                                     | ESMQ630E□□222MMP1S  |
|          | 6,800    | 16×25              | 0.34 | 2,250                                     | ESMQ100E□□682ML25S  |          | 3,300    | 20×40              | 0.13 | 2,700                                     | ESMQ630E□□332MNA40S |
|          | 10,000   | 16×31.5            | 0.42 | 2,550                                     | ESMQ100E□□103MLN3S  |          | 4,700    | 22×50              | 0.15 | 3,400                                     | ESMQ630E□□472MP50S  |
|          | 15,000   | 16×35.5            | 0.52 | 2,880                                     | ESMQ100E□□153MLP1S  | 100      | 1.0      | 5×11               | 0.08 | 21                                        | ESMQ101E□□1R0ME11D  |
| 16       | 22,000   | 18×40              | 0.66 | 3,400                                     | ESMQ100E□□223MMA40S |          | 2.2      | 5×11               | 0.08 | 30                                        | ESMQ101E□□2R2ME11D  |
|          | 33,000   | 22×50              | 0.88 | 4,500                                     | ESMQ100E□□333MP50S  |          | 3.3      | 5×11               | 0.08 | 40                                        | ESMQ101E□□3R3ME11D  |
|          | 220      | 6.3×11             | 0.20 | 260                                       | ESMQ160E□□221MF11D  |          | 4.7      | 5×11               | 0.08 | 45                                        | ESMQ101E□□4R7ME11D  |
|          | 330      | 6.3×11             | 0.20 | 320                                       | ESMQ160E□□331MF11D  |          | 10       | 5×11               | 0.08 | 70                                        | ESMQ101E□□100ME11D  |
|          | 470      | 8×11.5             | 0.20 | 440                                       | ESMQ160E□□471MHB5D  |          | 22       | 6.3×11             | 0.08 | 130                                       | ESMQ101E□□220MF11D  |
|          | 1,000    | 10×12.5            | 0.20 | 700                                       | ESMQ160E□□102MJC5S  |          | 33       | 8×11.5             | 0.08 | 180                                       | ESMQ101E□□330MHB5D  |
|          | 2,200    | 10×20              | 0.22 | 1,000                                     | ESMQ160E□□222MJ20S  |          | 47       | 8×11.5             | 0.08 | 200                                       | ESMQ101E□□470MHB5D  |
|          | 3,300    | 12.5×25            | 0.24 | 1,700                                     | ESMQ160E□□332MK25S  |          | 68       | 10×12.5            | 0.08 | 270                                       | ESMQ101E□□680MJC5S  |
|          | 4,700    | 16×25              | 0.26 | 2,100                                     | ESMQ160E□□472ML25S  |          | 100      | 10×16              | 0.08 | 340                                       | ESMQ101E□□101MJ16S  |
|          | 6,800    | 16×25              | 0.30 | 2,250                                     | ESMQ160E□□682ML25S  | 160      | 220      | 12.5×20            | 0.08 | 550                                       | ESMQ101E□□221MK20S  |
| 25       | 10,000   | 16×35.5            | 0.38 | 2,710                                     | ESMQ160E□□103MLP1S  |          | 330      | 12.5×25            | 0.08 | 760                                       | ESMQ101E□□331MK25S  |
|          | 15,000   | 18×40              | 0.48 | 3,100                                     | ESMQ160E□□153MMA40S |          | 470      | 16×25              | 0.08 | 1,000                                     | ESMQ101E□□471ML25S  |
|          | 22,000   | 22×40              | 0.62 | 3,800                                     | ESMQ160E□□223MP40S  |          | 1,000    | 18×35.5            | 0.08 | 1,350                                     | ESMQ101E□□102MMP1S  |
|          | 100      | 5×11               | 0.16 | 180                                       | ESMQ250E□□101ME11D  |          | 2,200    | 22×50              | 0.10 | 2,400                                     | ESMQ101E□□222MP50S  |
|          | 220      | 6.3×11             | 0.16 | 280                                       | ESMQ250E□□221MF11D  |          | 10       | 8×11.5             | 0.20 | 80                                        | ESMQ161E□□100MHB5D  |
|          | 330      | 8×11.5             | 0.16 | 440                                       | ESMQ250E□□331MHB5D  |          | 22       | 10×12.5            | 0.20 | 130                                       | ESMQ161E□□220MJC5S  |
|          | 470      | 10×12.5            | 0.16 | 550                                       | ESMQ250E□□471MJC5S  |          | 33       | 10×16              | 0.20 | 180                                       | ESMQ161E□□330MJ16S  |
|          | 1,000    | 10×16              | 0.16 | 860                                       | ESMQ250E□□102MJ16S  |          | 47       | 10×20              | 0.20 | 210                                       | ESMQ161E□□470MJ20S  |
|          | 2,200    | 12.5×25            | 0.18 | 1,550                                     | ESMQ250E□□222MK25S  |          | 68       | 12.5×20            | 0.20 | 350                                       | ESMQ161E□□680MK20S  |
|          | 3,300    | 16×25              | 0.20 | 1,980                                     | ESMQ250E□□332ML25S  | 200      | 100      | 12.5×25            | 0.20 | 430                                       | ESMQ161E□□101MK25S  |
| 35       | 4,700    | 16×25              | 0.22 | 2,200                                     | ESMQ250E□□472ML25S  |          | 220      | 16×31.5            | 0.20 | 760                                       | ESMQ161E□□221MLN3S  |
|          | 6,800    | 16×35.5            | 0.26 | 2,600                                     | ESMQ250E□□682MLP1S  |          | 330      | 18×35.5            | 0.20 | 995                                       | ESMQ161E□□331MMP1S  |
|          | 10,000   | 18×40              | 0.34 | 2,800                                     | ESMQ250E□□103MMA40S |          | 470      | 18×40              | 0.20 | 1,200                                     | ESMQ161E□□471MMA40S |
|          | 15,000   | 22×50              | 0.44 | 3,800                                     | ESMQ250E□□153MP50S  |          | 1.0      | 6.3×11             | 0.20 | 22                                        | ESMQ201E□□1R0MF11D  |
|          | 47       | 5×11               | 0.14 | 130                                       | ESMQ350E□□470ME11D  |          | 2.2      | 6.3×11             | 0.20 | 33                                        | ESMQ201E□□2R2MF11D  |
|          | 68       | 6.3×11             | 0.14 | 160                                       | ESMQ350E□□680MF11D  |          | 3.3      | 6.3×11             | 0.20 | 40                                        | ESMQ201E□□3R3MF11D  |
|          | 100      | 6.3×11             | 0.14 | 210                                       | ESMQ350E□□101MF11D  |          | 4.7      | 6.3×11             | 0.20 | 50                                        | ESMQ201E□□4R7MF11D  |
|          | 220      | 8×11.5             | 0.14 | 385                                       | ESMQ350E□□221MHB5D  |          | 10       | 8×11.5             | 0.20 | 80                                        | ESMQ201E□□100MHB5D  |
|          | 330      | 10×12.5            | 0.14 | 490                                       | ESMQ350E□□331MJC5S  |          | 22       | 10×16              | 0.20 | 150                                       | ESMQ201E□□220MJ16S  |
|          | 470      | 10×16              | 0.14 | 650                                       | ESMQ350E□□471MJ16S  |          | 33       | 10×20              | 0.20 | 205                                       | ESMQ201E□□330MJ20S  |
| 50       | 1,000    | 12.5×20            | 0.14 | 1,150                                     | ESMQ350E□□102MK20S  |          | 47       | 12.5×20            | 0.20 | 270                                       | ESMQ201E□□470MK20S  |
|          | 2,200    | 16×25              | 0.16 | 1,800                                     | ESMQ350E□□222ML25S  | 250      | 68       | 12.5×25            | 0.20 | 350                                       | ESMQ201E□□680MK25S  |
|          | 3,300    | 16×31.5            | 0.18 | 2,100                                     | ESMQ350E□□332MLN3S  |          | 100      | 16×25              | 0.20 | 475                                       | ESMQ201E□□101ML25S  |
|          | 4,700    | 16×35.5            | 0.20 | 2,500                                     | ESMQ350E□□472MLP1S  |          | 220      | 16×35.5            | 0.20 | 700                                       | ESMQ201E□□221MLP1S  |
|          | 6,800    | 18×40              | 0.24 | 2,800                                     | ESMQ350E□□682MMA40S |          | 330      | 18×40              | 0.20 | 950                                       | ESMQ201E□□331MMA40S |
|          | 10,000   | 22×50              | 0.32 | 3,700                                     | ESMQ350E□□103MP50S  |          | 3.3      | 6.3×11             | 0.20 | 40                                        | ESMQ251E□□1R0MF11D  |
|          | 1.0      | 5×11               | 0.12 | 17                                        | ESMQ500E□□1R0ME11D  |          | 4.7      | 6.3×11             | 0.20 | 50                                        | ESMQ251E□□4R7MF11D  |
|          | 2.2      | 5×11               | 0.12 | 28                                        | ESMQ500E□□2R2ME11D  |          | 10       | 10×12.5            | 0.20 | 100                                       | ESMQ251E□□100MJC5S  |
|          | 3.3      | 5×11               | 0.12 | 35                                        | ESMQ500E□□3R3ME11D  |          | 22       | 10×20              | 0.20 | 170                                       | ESMQ251E□□220MJ20S  |
|          | 4.7      | 5×11               | 0.12 | 41                                        | ESMQ500E□□4R7ME11D  |          | 33       | 10×20              | 0.20 | 200                                       | ESMQ251E□□330MJ20S  |
|          | 10       | 5×11               | 0.12 | 60                                        | ESMQ500E□□100ME11D  |          | 47       | 12.5×20            | 0.20 | 270                                       | ESMQ251E□□470MK20S  |
| 50       | 22       | 5×11               | 0.12 | 95                                        | ESMQ500E□□220ME11D  |          | 68       | 16×25              | 0.20 | 380                                       | ESMQ251E□□680ML25S  |
|          | 33       | 5×11               | 0.12 | 125                                       | ESMQ500E□□330ME11D  | 350      | 100      | 16×25              | 0.20 | 440                                       | ESMQ251E□□101ML25S  |
|          | 47       | 6.3×11             | 0.12 | 155                                       | ESMQ500E□□470MF11D  |          | 220      | 18×35.5            | 0.20 | 680                                       | ESMQ251E□□221MMP1S  |
|          | 68       | 6.3×11             | 0.12 | 210                                       | ESMQ500E□□680MF11D  |          | 2.2      | 6.3×11             | 0.24 | 30                                        | ESMQ351E□□2R2MF11D  |
|          | 100      | 8×11.5             | 0.12 | 260                                       | ESMQ500E□□101MHB5D  |          | 3.3      | 8×11.5             | 0.24 | 46                                        | ESMQ351E□□3R3MHB5D  |
|          | 220      | 10×12.5            | 0.12 | 430                                       | ESMQ500E□□221MJC5S  |          | 4.7      | 8×11.5             | 0.24 | 55                                        | ESMQ351E□□4R7MHB5D  |

□□ : Enter the appropriate lead forming or taping code.


**SMQ** Series

### ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /85°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /85°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|------------------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|------------------------------------------------------------|--------------------|
| 350         | 10          | 10×12.5               | 0.24 | 90                                                         | ESMQ351E□□100MJC5S | 450         | 2.2         | 8×11.5                | 0.24 | 28                                                         | ESMQ451E□□2R2MHB5D |
|             | 22          | 12.5×20               | 0.24 | 185                                                        | ESMQ351E□□220MK20S |             | 3.3         | 10×12.5               | 0.24 | 40                                                         | ESMQ451E□□3R3MJC5S |
|             | 33          | 12.5×25               | 0.24 | 240                                                        | ESMQ351E□□330MK25S |             | 4.7         | 10×12.5               | 0.24 | 46                                                         | ESMQ451E□□4R7MJC5S |
|             | 47          | 16×25                 | 0.24 | 325                                                        | ESMQ351E□□470ML25S |             | 10          | 10×20                 | 0.24 | 80                                                         | ESMQ451E□□100MJ20S |
|             | 68          | 16×25                 | 0.24 | 400                                                        | ESMQ351E□□680ML25S |             | 22          | 12.5×25               | 0.24 | 140                                                        | ESMQ451E□□220MK25S |
|             | 100         | 18×31.5               | 0.24 | 530                                                        | ESMQ351E□□101MMN3S |             | 33          | 16×25                 | 0.24 | 180                                                        | ESMQ451E□□330ML25S |
| 400         | 1.0         | 6.3×11                | 0.24 | 22                                                         | ESMQ401E□□1R0MF11D |             | 47          | 16×31.5               | 0.24 | 220                                                        | ESMQ451E□□470MLN3S |
|             | 2.2         | 8×11.5                | 0.24 | 38                                                         | ESMQ401E□□2R2MHB5D |             | 68          | 18×35.5               | 0.24 | 260                                                        | ESMQ451E□□680MMP1S |
|             | 3.3         | 8×11.5                | 0.24 | 48                                                         | ESMQ401E□□3R3MHB5D |             | 100         | 18×40                 | 0.24 | 280                                                        | ESMQ451E□□101MM40S |
|             | 4.7         | 10×12.5               | 0.24 | 60                                                         | ESMQ401E□□4R7MJC5S |             |             |                       |      |                                                            |                    |
|             | 10          | 10×16                 | 0.24 | 90                                                         | ESMQ401E□□100MJ16S |             |             |                       |      |                                                            |                    |
|             | 22          | 12.5×25               | 0.24 | 205                                                        | ESMQ401E□□220MK25S |             |             |                       |      |                                                            |                    |
|             | 33          | 16×25                 | 0.24 | 275                                                        | ESMQ401E□□330ML25S |             |             |                       |      |                                                            |                    |
|             | 47          | 16×25                 | 0.24 | 280                                                        | ESMQ401E□□470ML25S |             |             |                       |      |                                                            |                    |
|             | 68          | 16×31.5               | 0.24 | 340                                                        | ESMQ401E□□680MLN3S |             |             |                       |      |                                                            |                    |
|             | 100         | 18×35.5               | 0.24 | 440                                                        | ESMQ401E□□101MMP1S |             |             |                       |      |                                                            |                    |

□□ : Enter the appropriate lead forming or taping code.

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

(φ5 to φ18)

| Capacitance (μF) | Frequency (Hz) | 50   | 120  | 300  | 1k   | 10k  | 100k |
|------------------|----------------|------|------|------|------|------|------|
| 1.0 to 4.7       |                | 0.65 | 1.00 | 1.35 | 1.75 | 2.30 | 2.50 |
| 10 to 68         |                | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 |
| 100 to 1,000     |                | 0.80 | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 |
| 2,200 to         |                | 0.85 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |

(φ20 to φ22)

| Rated Voltage (V <sub>dc</sub> ) | Frequency (Hz) | 50   | 120  | 300  | 1k   | 10k  | 100k |
|----------------------------------|----------------|------|------|------|------|------|------|
| 6.3 to 50                        |                | 0.95 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |
| 63 to 100                        |                | 0.92 | 1.00 | 1.07 | 1.13 | 1.19 | 1.20 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 105°C

# KMQ Series

- Downsized from current standard KMG series
- Solvent resistant type except 160 to 450V<sub>dc</sub>  
(see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

KMQ

↓  
Downsized  
KMG

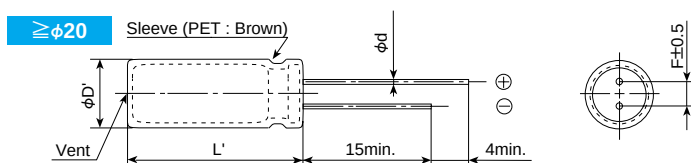
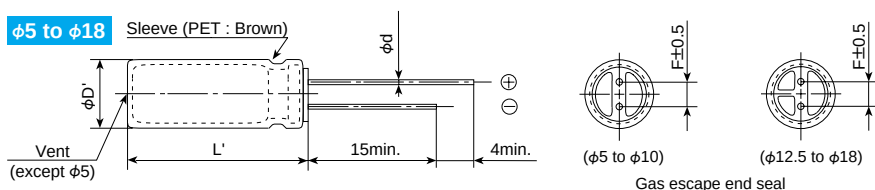


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                        |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------|------|------|------|------|---------------------------|--------------------------------------|-------------|-------------------|------|---------------|---|
| Category                                               |                                                                                                                                                                                                                                                                                         |                                        |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
| Temperature Range                                      | -55 to +105°C(6.3 to 100V <sub>dc</sub> ) -40 to +105°C(160 to 400V <sub>dc</sub> ) -25 to +105°C(450V <sub>dc</sub> )                                                                                                                                                                  |                                        |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
| Rated Voltage Range                                    | 6.3 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                        |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                        |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
| Leakage Current                                        | 6.3 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                        |      |      |      |      |      | 160 to 450V <sub>dc</sub> |                                      |             |                   |      |               |   |
|                                                        | ≤φ18                                                                                                                                                                                                                                                                                    | I=0.03CV or 4μA, whichever is greater. |      |      |      |      |      |                           | CV                                   |             | Time              |      | After 1minute |   |
|                                                        |                                                                                                                                                                                                                                                                                         | (at 20°C after 1 minute)               |      |      |      |      |      |                           | CV≤1,000                             |             | I=0.1CV+40 max.   |      |               |   |
|                                                        |                                                                                                                                                                                                                                                                                         |                                        |      |      |      |      |      |                           | CV>1,000                             |             | I=0.04CV+100 max. |      |               |   |
|                                                        | (at 20°C after 1 minute)                                                                                                                                                                                                                                                                |                                        |      |      |      |      |      | (at 20°C)                 |                                      |             |                   |      |               |   |
|                                                        | ≥φ20                                                                                                                                                                                                                                                                                    | I=0.03CV max.                          |      |      |      |      |      |                           | (at 20°C after 3 minutes)            |             |                   |      |               |   |
| Dissipation Factor (tanδ)                              | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                                                                                               |                                        |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 6.3V                                   | 10V  | 16V  | 25V  | 35V  | 50V  | 63V                       | 100V                                 | 160 to 250V | 350 to 400V       | 450V |               |   |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.28                                   | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10                      | 0.08                                 | 0.20        | 0.24              | 0.24 |               |   |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                       |                                        |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 6.3V                                   | 10V  | 16V  | 25V  | 35V  | 50V  | 63 to 100V                | 160 to 200V                          | 250V        | 350V              | 400V | 450V          |   |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | ≤φ8                                    | 5    | 4    | 3    | 2    | 2    | 2                         | 2                                    | 3           | 3                 | 4    | 4             | 6 |
|                                                        |                                                                                                                                                                                                                                                                                         | ≥φ10                                   | 5    | 4    | 3    | 2    | 2    | 2                         | 2                                    | 3           | 3                 | 4    | 4             | 6 |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | ≤φ8                                    | 10   | 8    | 6    | 4    | 3    | 3                         | 3                                    | 8           | 10                | 8    | 8             | — |
| ≥φ10                                                   |                                                                                                                                                                                                                                                                                         | 10                                     | 8    | 6    | 4    | 3    | 3    | 3                         | 4                                    | 4           | 6                 | 6    | —             |   |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 1,000 hours (2,000 hours for φ10 and more at 105°C).                                                                |                                        |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value             |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value   |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value           |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                        |      |      |      |      |      |                           |                                      |             |                   |      |               |   |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                           | 6.3 to 100V <sub>dc</sub>              |      |      |      |      |      |                           | 160 to 450V <sub>dc</sub>            |             |                   |      |               |   |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value             |      |      |      |      |      |                           | ≤±20% of the initial value           |             |                   |      |               |   |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value   |      |      |      |      |      |                           | ≤200% of the initial specified value |             |                   |      |               |   |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value           |      |      |      |      |      |                           | ≤500% of the initial specified value |             |                   |      |               |   |
|                                                        |                                                                                                                                                                                                                                                                                         |                                        |      |      |      |      |      |                           |                                      |             |                   |      |               |   |

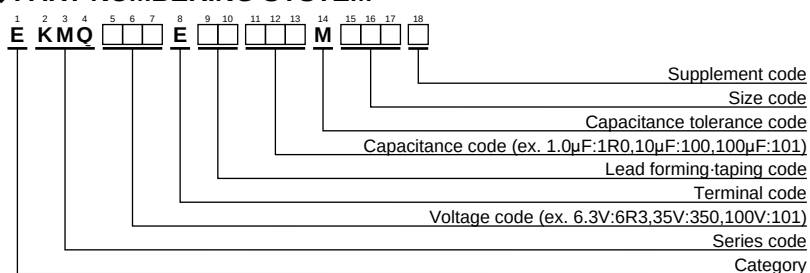
## ◆ DIMENSIONS [mm]

- Terminal Code : E



| φD  | 5          | 6.3 | 8   | 10  | 12.5 | 16  | 18         | 20   | 22   |
|-----|------------|-----|-----|-----|------|-----|------------|------|------|
| φd  | 0.5        | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8        | 1.0  | 1.0  |
| F   | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5        | 10.0 | 10.0 |
| φD' | φD+0.5max. |     |     |     |      |     | φD+0.5max. |      |      |
| L'  | L+1.5max.  |     |     |     |      |     | L+2.0max.  |      |      |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide  
(radial lead type)"



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 105°C

KMQ Series

## ◆STANDARD RATINGS

□ is not solvent resistant.

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (mA rms/105°C, 120Hz) | Part No.            | WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (mA rms/105°C, 120Hz) | Part No.            |
|----------|----------|--------------------|------|--------------------------------------------|---------------------|----------|----------|--------------------|------|--------------------------------------------|---------------------|
| 6.3      | 1,000    | 8×11.5             | 0.28 | 390                                        | EKMQR3E□□102MHB5D   | 50       | 330      | 10×16              | 0.12 | 410                                        | EKMQR50E□□331MJ16S  |
|          | 2,200    | 10×16              | 0.30 | 635                                        | EKMQR3E□□222MJ16S   |          | 470      | 10×20              | 0.12 | 540                                        | EKMQR50E□□471MJ20S  |
|          | 3,300    | 10×20              | 0.32 | 840                                        | EKMQR3E□□332MJ20S   |          | 1,000    | 12.5×25            | 0.12 | 950                                        | EKMQR50E□□102MK25S  |
|          | 4,700    | 12.5×20            | 0.34 | 1,090                                      | EKMQR3E□□472MK20S   |          | 2,200    | 16×31.5            | 0.14 | 1,410                                      | EKMQR50E□□222MLN3S  |
|          | 6,800    | 12.5×25            | 0.38 | 1,350                                      | EKMQR3E□□682MK25S   |          | 3,300    | 18×35.5            | 0.16 | 1,770                                      | EKMQR50E□□332MMP1S  |
|          | 10,000   | 16×25              | 0.46 | 1,650                                      | EKMQR3E□□103ML25S   |          | 4,700    | 20×40              | 0.18 | 2,100                                      | EKMQR50E□□472MN40S  |
|          | 15,000   | 16×31.5            | 0.56 | 1,820                                      | EKMQR3E□□153MLN3S   |          | 6,800    | 22×50              | 0.22 | 2,500                                      | EKMQR50E□□682MP50S  |
|          | 22,000   | 18×35.5            | 0.70 | 2,280                                      | EKMQR3E□□223MMP1S   |          | 22       | 5×11               | 0.10 | 71                                         | EKMQR63E□□220ME11D  |
|          | 33,000   | 20×40              | 0.92 | 2,500                                      | EKMQR3E□□333MN40S   |          | 33       | 6.3×11             | 0.10 | 100                                        | EKMQR63E□□330MF11D  |
|          | 47,000   | 22×50              | 1.20 | 2,780                                      | EKMQR3E□□473MP50S   |          | 47       | 6.3×11             | 0.10 | 120                                        | EKMQR63E□□470MF11D  |
| 10       | 220      | 5×11               | 0.24 | 155                                        | EKMQR100E□□221ME11D | 63       | 68       | 8×11.5             | 0.10 | 155                                        | EKMQR63E□□680MHB5D  |
|          | 330      | 6.3×11             | 0.24 | 210                                        | EKMQR100E□□331MF11D |          | 100      | 8×11.5             | 0.10 | 200                                        | EKMQR63E□□101MHB5D  |
|          | 470      | 6.3×11             | 0.24 | 250                                        | EKMQR100E□□471MF11D |          | 220      | 10×16              | 0.10 | 335                                        | EKMQR63E□□221MJ16S  |
|          | 1,000    | 10×12.5            | 0.24 | 460                                        | EKMQR100E□□102MJC5S |          | 330      | 10×20              | 0.10 | 510                                        | EKMQR63E□□331MJ20S  |
|          | 2,200    | 10×16              | 0.26 | 705                                        | EKMQR100E□□222MJ16S |          | 470      | 12.5×20            | 0.10 | 640                                        | EKMQR63E□□471MK20S  |
|          | 3,300    | 12.5×20            | 0.28 | 1,000                                      | EKMQR100E□□332MK20S |          | 1,000    | 16×25              | 0.10 | 930                                        | EKMQR63E□□102ML25S  |
|          | 4,700    | 12.5×25            | 0.30 | 1,260                                      | EKMQR100E□□472MK25S |          | 2,200    | 18×35.5            | 0.12 | 1,650                                      | EKMQR63E□□222MMP1S  |
|          | 6,800    | 16×25              | 0.34 | 1,570                                      | EKMQR100E□□682ML25S |          | 3,300    | 20×40              | 0.14 | 1,950                                      | EKMQR63E□□332MN40S  |
|          | 10,000   | 16×31.5            | 0.42 | 1,820                                      | EKMQR100E□□103MLN3S |          | 4,700    | 22×50              | 0.16 | 2,450                                      | EKMQR63E□□472MP50S  |
|          | 15,000   | 16×35.5            | 0.52 | 2,050                                      | EKMQR100E□□153MLP1S | 100      | 1.0      | 5×11               | 0.08 | 15                                         | EKMQR101E□□1R0ME11D |
| 16       | 22,000   | 18×40              | 0.66 | 2,420                                      | EKMQR100E□□223MM40S |          | 2.2      | 5×11               | 0.08 | 21                                         | EKMQR101E□□2R2ME11D |
|          | 33,000   | 22×50              | 0.88 | 3,210                                      | EKMQR100E□□333MP50S |          | 3.3      | 5×11               | 0.08 | 29                                         | EKMQR101E□□3R3ME11D |
|          | 220      | 6.3×11             | 0.20 | 190                                        | EKMQR160E□□221MF11D |          | 4.7      | 5×11               | 0.08 | 32                                         | EKMQR101E□□4R7ME11D |
|          | 330      | 6.3×11             | 0.20 | 225                                        | EKMQR160E□□331MF11D |          | 10       | 5×11               | 0.08 | 50                                         | EKMQR101E□□100ME11D |
|          | 470      | 8×11.5             | 0.20 | 315                                        | EKMQR160E□□471MHB5D |          | 22       | 6.3×11             | 0.08 | 93                                         | EKMQR101E□□220MF11D |
|          | 1,000    | 10×12.5            | 0.20 | 500                                        | EKMQR160E□□102MJC5S |          | 33       | 8×11.5             | 0.08 | 130                                        | EKMQR101E□□330MHB5D |
|          | 2,200    | 10×20              | 0.22 | 710                                        | EKMQR160E□□222MJ20S |          | 47       | 8×11.5             | 0.08 | 140                                        | EKMQR101E□□470MHB5D |
|          | 3,300    | 12.5×25            | 0.24 | 1,170                                      | EKMQR160E□□332MK25S |          | 68       | 10×12.5            | 0.08 | 190                                        | EKMQR101E□□680MJC5S |
|          | 4,700    | 16×25              | 0.26 | 1,500                                      | EKMQR160E□□472ML25S |          | 100      | 10×16              | 0.08 | 240                                        | EKMQR101E□□101MJ16S |
|          | 6,800    | 16×25              | 0.30 | 1,600                                      | EKMQR160E□□682ML25S |          | 220      | 12.5×20            | 0.08 | 390                                        | EKMQR101E□□221MK20S |
| 25       | 10,000   | 16×35.5            | 0.38 | 1,930                                      | EKMQR160E□□103MLP1S |          | 330      | 12.5×25            | 0.08 | 540                                        | EKMQR101E□□331MK25S |
|          | 15,000   | 18×40              | 0.48 | 2,210                                      | EKMQR160E□□153MM40S | 160      | 470      | 16×25              | 0.08 | 715                                        | EKMQR101E□□471ML25S |
|          | 22,000   | 22×40              | 0.62 | 2,710                                      | EKMQR160E□□223MP40S |          | 1,000    | 18×35.5            | 0.08 | 960                                        | EKMQR101E□□102MMP1S |
|          | 100      | 5×11               | 0.16 | 125                                        | EKMQR250E□□101ME11D |          | 2,200    | 22×50              | 0.10 | 1,750                                      | EKMQR101E□□222MP50S |
|          | 220      | 6.3×11             | 0.16 | 200                                        | EKMQR250E□□221MF11D |          | 10       | 8×11.5             | 0.20 | 41                                         | EKMQR161E□□100MHB5D |
|          | 330      | 8×11.5             | 0.16 | 310                                        | EKMQR250E□□331MHB5D |          | 22       | 10×12.5            | 0.20 | 92                                         | EKMQR161E□□220MJC5S |
|          | 470      | 10×12.5            | 0.16 | 380                                        | EKMQR250E□□471MJC5S |          | 33       | 10×16              | 0.20 | 125                                        | EKMQR161E□□330MJ16S |
|          | 1,000    | 10×16              | 0.16 | 610                                        | EKMQR250E□□102MJ16S |          | 47       | 10×20              | 0.20 | 150                                        | EKMQR161E□□470MJ20S |
|          | 2,200    | 12.5×25            | 0.18 | 1,090                                      | EKMQR250E□□222MK25S |          | 68       | 12.5×20            | 0.20 | 250                                        | EKMQR161E□□680MK20S |
|          | 3,300    | 16×25              | 0.20 | 1,400                                      | EKMQR250E□□332ML25S |          | 100      | 12.5×25            | 0.20 | 310                                        | EKMQR161E□□101MK25S |
|          | 4,700    | 16×25              | 0.22 | 1,570                                      | EKMQR250E□□472ML25S | 200      | 220      | 16×31.5            | 0.20 | 540                                        | EKMQR161E□□221MLN3S |
| 35       | 6,800    | 16×35.5            | 0.26 | 1,850                                      | EKMQR250E□□682MLP1S |          | 330      | 18×35.5            | 0.20 | 705                                        | EKMQR161E□□331MMP1S |
|          | 10,000   | 18×40              | 0.34 | 2,000                                      | EKMQR250E□□103MM40S |          | 470      | 18×40              | 0.20 | 855                                        | EKMQR161E□□471MM40S |
|          | 15,000   | 22×50              | 0.44 | 2,750                                      | EKMQR250E□□153MP50S |          | 1.0      | 6.3×11             | 0.20 | 16                                         | EKMQR201E□□1R0MF11D |
|          | 47       | 5×11               | 0.14 | 93                                         | EKMQR350E□□470ME11D |          | 2.2      | 6.3×11             | 0.20 | 25                                         | EKMQR201E□□2R2MF11D |
|          | 68       | 6.3×11             | 0.14 | 110                                        | EKMQR350E□□680MF11D |          | 3.3      | 6.3×11             | 0.20 | 30                                         | EKMQR201E□□3R3MF11D |
|          | 100      | 6.3×11             | 0.14 | 150                                        | EKMQR350E□□101MF11D |          | 4.7      | 6.3×11             | 0.20 | 35                                         | EKMQR201E□□4R7MF11D |
|          | 220      | 8×11.5             | 0.14 | 270                                        | EKMQR350E□□221MHB5D |          | 10       | 8×11.5             | 0.20 | 57                                         | EKMQR201E□□100MHB5D |
|          | 330      | 10×12.5            | 0.14 | 350                                        | EKMQR350E□□331MJC5S |          | 22       | 10×16              | 0.20 | 105                                        | EKMQR201E□□220MJ16S |
|          | 470      | 10×16              | 0.14 | 460                                        | EKMQR350E□□471MJ16S |          | 33       | 10×20              | 0.20 | 140                                        | EKMQR201E□□330MJ20S |
|          | 1,000    | 12.5×20            | 0.14 | 810                                        | EKMQR350E□□102MK20S | 250      | 47       | 12.5×20            | 0.20 | 195                                        | EKMQR201E□□470MK20S |
| 50       | 2,200    | 16×25              | 0.16 | 1,260                                      | EKMQR350E□□222ML25S |          | 68       | 12.5×25            | 0.20 | 250                                        | EKMQR201E□□680MK25S |
|          | 3,300    | 16×31.5            | 0.18 | 1,500                                      | EKMQR350E□□332MLN3S |          | 100      | 16×25              | 0.20 | 335                                        | EKMQR201E□□101ML25S |
|          | 4,700    | 16×35.5            | 0.20 | 1,780                                      | EKMQR350E□□472MLP1S |          | 220      | 16×35.5            | 0.20 | 500                                        | EKMQR201E□□221MLP1S |
|          | 6,800    | 18×40              | 0.24 | 2,000                                      | EKMQR350E□□682MM40S |          | 330      | 18×40              | 0.20 | 675                                        | EKMQR201E□□331MM40S |
|          | 10,000   | 22×50              | 0.32 | 2,650                                      | EKMQR350E□□103MP50S |          | 3.3      | 6.3×11             | 0.20 | 28                                         | EKMQR251E□□3R3MF11D |
|          | 1.0      | 5×11               | 0.12 | 13                                         | EKMQR500E□□1R0ME11D |          | 4.7      | 6.3×11             | 0.20 | 35                                         | EKMQR251E□□4R7MF11D |
|          | 2.2      | 5×11               | 0.12 | 20                                         | EKMQR500E□□2R2ME11D |          | 10       | 10×12.5            | 0.20 | 71                                         | EKMQR251E□□100MJC5S |
|          | 3.3      | 5×11               | 0.12 | 25                                         | EKMQR500E□□3R3ME11D |          | 22       | 10×20              | 0.20 | 105                                        | EKMQR251E□□220MJ20S |
|          | 4.7      | 5×11               | 0.12 | 30                                         | EKMQR500E□□4R7ME11D |          | 33       | 10×20              | 0.20 | 140                                        | EKMQR251E□□330MJ20S |
|          | 10       | 5×11               | 0.12 | 46                                         | EKMQR500E□□100ME11D |          | 47       | 12.5×20            | 0.20 | 190                                        | EKMQR251E□□470MK20S |
|          | 22       | 5×11               | 0.12 | 68                                         | EKMQR500E□□220ME11D | 350      | 68       | 16×25              | 0.20 | 270                                        | EKMQR251E□□680ML25S |
|          | 33       | 5×11               | 0.12 | 90                                         | EKMQR500E□□330ME11D |          | 100      | 16×25              | 0.20 | 310                                        | EKMQR251E□□101ML25S |
|          | 47       | 6.3×11             | 0.12 | 115                                        | EKMQR500E□□470MF11D |          | 220      | 18×35.5            | 0.20 | 485                                        | EKMQR251E□□221MMP1S |
|          | 68       | 6.3×11             | 0.12 | 150                                        | EKMQR500E□□680MF11D |          | 2.2      | 6.3×11             | 0.24 | 21                                         | EKMQR351E□□2R2MF11D |
|          | 100      | 8×11.5             | 0.12 | 190                                        | EKMQR500E□□101MHB5D |          | 3.3      | 8×11.5             | 0.24 | 30                                         | EKMQR351E□□3R3MHB5D |
|          | 220      | 10×12.5            | 0.12 | 300                                        | EKMQR500E□□221MJC5S |          | 4.7      | 8×11.5             | 0.24 | 39                                         | EKMQR351E□□4R7MHB5D |

□ : Enter the appropriate lead forming or taping code.


**KMQ**Series

### ◆STANDARD RATINGS

☐ is not solvent resistant.

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.          | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.          |
|-------------|-------------|-----------------------|------|-------------------------------------------------------------|-------------------|-------------|-------------|-----------------------|------|-------------------------------------------------------------|-------------------|
| 350         | 10          | 10×12.5               | 0.24 | 64                                                          | EKM351E□□100MJC5S | 450         | 2.2         | 8×11.5                | 0.24 | 20                                                          | EKM451E□□2R2MHB5D |
|             | 22          | 12.5×20               | 0.24 | 130                                                         | EKM351E□□220MK20S |             | 3.3         | 10×12.5               | 0.24 | 28                                                          | EKM451E□□3R3MJC5S |
|             | 33          | 12.5×25               | 0.24 | 170                                                         | EKM351E□□330MK25S |             | 4.7         | 10×12.5               | 0.24 | 32                                                          | EKM451E□□4R7MJC5S |
|             | 47          | 16×25                 | 0.24 | 230                                                         | EKM351E□□470ML25S |             | 10          | 10×20                 | 0.24 | 56                                                          | EKM451E□□100MJ20S |
|             | 68          | 16×25                 | 0.24 | 285                                                         | EKM351E□□680ML25S |             | 22          | 12.5×25               | 0.24 | 100                                                         | EKM451E□□220MK25S |
|             | 100         | 18×31.5               | 0.24 | 375                                                         | EKM351E□□101MMN3S |             | 33          | 16×25                 | 0.24 | 125                                                         | EKM451E□□330ML25S |
| 400         | 1.0         | 6.3×11                | 0.24 | 15                                                          | EKM401E□□1R0MF11D |             | 47          | 16×31.5               | 0.24 | 155                                                         | EKM451E□□470MLN3S |
|             | 2.2         | 8×11.5                | 0.24 | 27                                                          | EKM401E□□2R2MHB5D |             | 68          | 18×35.5               | 0.24 | 185                                                         | EKM451E□□680MMP1S |
|             | 3.3         | 8×11.5                | 0.24 | 34                                                          | EKM401E□□3R3MHB5D |             | 100         | 18×40                 | 0.24 | 200                                                         | EKM451E□□101MM40S |
|             | 4.7         | 10×12.5               | 0.24 | 42                                                          | EKM401E□□4R7MJC5S |             |             |                       |      |                                                             |                   |
|             | 10          | 10×16                 | 0.24 | 64                                                          | EKM401E□□100MJ16S |             |             |                       |      |                                                             |                   |
|             | 22          | 12.5×25               | 0.24 | 145                                                         | EKM401E□□220MK25S |             |             |                       |      |                                                             |                   |
|             | 33          | 16×25                 | 0.24 | 195                                                         | EKM401E□□330ML25S |             |             |                       |      |                                                             |                   |
|             | 47          | 16×25                 | 0.24 | 200                                                         | EKM401E□□470ML25S |             |             |                       |      |                                                             |                   |
|             | 68          | 16×31.5               | 0.24 | 240                                                         | EKM401E□□680MLN3S |             |             |                       |      |                                                             |                   |
|             | 100         | 18×35.5               | 0.24 | 310                                                         | EKM401E□□101MMP1S |             |             |                       |      |                                                             |                   |

□□ : Enter the appropriate lead forming or taping code.

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

(φ5 to φ18)

| Capacitance (μF) \ Frequency (Hz) | 50   | 120  | 300  | 1k   | 10k  | 100k |
|-----------------------------------|------|------|------|------|------|------|
| 1.0 to 4.7                        | 0.65 | 1.00 | 1.35 | 1.75 | 2.30 | 2.50 |
| 10 to 68                          | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 |
| 100 to 1,000                      | 0.80 | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 |
| 2,200 to                          | 0.85 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |

(φ20 to φ22)

| Rated Voltage (Vdc) \ Frequency (Hz) | 50   | 120  | 300  | 1k   | 10k  | 100k |
|--------------------------------------|------|------|------|------|------|------|
| 6.3 to 50                            | 0.95 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |
| 63 to 100                            | 0.92 | 1.00 | 1.07 | 1.13 | 1.19 | 1.20 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85°C

# SMG Series

- Endurance : 2,000 hours at 85°C
- Solvent resistant type except 315 to 450V<sub>dc</sub>  
(see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

SMQ  
↑  
Downsized  
SMG

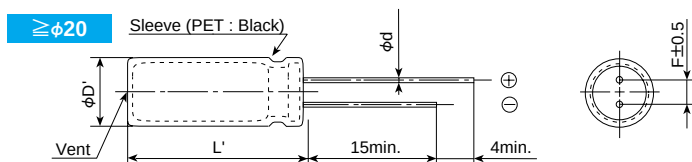
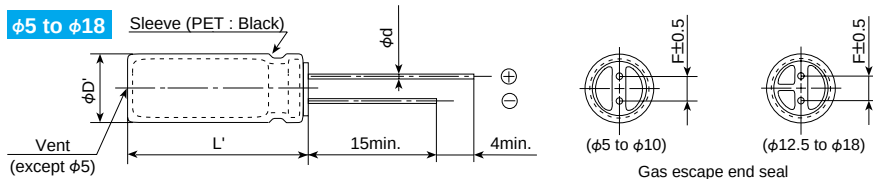


## ◆SPECIFICATIONS

| Items                                                                                                             | Characteristics                                                                                                                                                                                                                                                                        |                                                                        |                                      |      |      |      |                                      |                           |      |                   |             |                  |      |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------|------|------|------|--------------------------------------|---------------------------|------|-------------------|-------------|------------------|------|
| Category                                                                                                          |                                                                                                                                                                                                                                                                                        |                                                                        |                                      |      |      |      |                                      |                           |      |                   |             |                  |      |
| Temperature Range                                                                                                 | -40 to +85°C(6.3 to 400V <sub>dc</sub> )    -25 to +85°C(450V <sub>dc</sub> )                                                                                                                                                                                                          |                                                                        |                                      |      |      |      |                                      |                           |      |                   |             |                  |      |
| Rated Voltage Range                                                                                               | 6.3 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                                                        |                                      |      |      |      |                                      |                           |      |                   |             |                  |      |
| Capacitance Tolerance                                                                                             | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                              |                                                                        |                                      |      |      |      |                                      |                           |      |                   |             |                  |      |
| Leakage Current                                                                                                   |                                                                                                                                                                                                                                                                                        | 6.3 to 100V <sub>dc</sub>                                              |                                      |      |      |      |                                      | 160 to 450V <sub>dc</sub> |      |                   |             |                  |      |
|                                                                                                                   | ≤φ18                                                                                                                                                                                                                                                                                   | I=0.03CV or 4μA, whichever is greater.<br><br>(at 20°C after 1 minute) |                                      |      |      |      |                                      | CV \ Time                 |      | After 1minute     |             | After 5minutes   |      |
|                                                                                                                   |                                                                                                                                                                                                                                                                                        |                                                                        |                                      |      |      |      |                                      | CV≤1,000                  |      | I=0.1CV+40 max.   |             | I=0.03CV+15 max. |      |
|                                                                                                                   |                                                                                                                                                                                                                                                                                        |                                                                        |                                      |      |      |      |                                      | CV>1,000                  |      | I=0.04CV+100 max. |             | I=0.02CV+25 max. |      |
|                                                                                                                   |                                                                                                                                                                                                                                                                                        |                                                                        |                                      |      |      |      | (at 20°C)                            |                           |      |                   |             |                  |      |
|                                                                                                                   | ≥φ20                                                                                                                                                                                                                                                                                   | I=0.03CV                                                               |                                      |      |      |      |                                      | (at 20°C after 3 minutes) |      |                   |             |                  |      |
| Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                         |                                                                                                                                                                                                                                                                                        |                                                                        |                                      |      |      |      |                                      |                           |      |                   |             |                  |      |
| Dissipation Factor (tanδ)                                                                                         | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       |                                                                        | 6.3V                                 | 10V  | 16V  | 25V  | 35V                                  | 50V                       | 63V  | 100V              | 160 to 250V | 315 to 400V      | 450V |
|                                                                                                                   | tanδ (Max.)                                                                                                                                                                                                                                                                            | ≤φ18                                                                   | 0.34                                 | 0.24 | 0.20 | 0.16 | 0.14                                 | 0.12                      | 0.09 | 0.08              | 0.20        | 0.24             | 0.24 |
|                                                                                                                   |                                                                                                                                                                                                                                                                                        | ≥φ20                                                                   | 0.28                                 | 0.24 | 0.20 | 0.16 | 0.14                                 | 0.12                      | 0.09 | 0.08              | 0.15        | 0.15             | 0.20 |
| When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz) |                                                                                                                                                                                                                                                                                        |                                                                        |                                      |      |      |      |                                      |                           |      |                   |             |                  |      |
| Low Temperature Characteristics (Max. Impedance Ratio)                                                            | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       |                                                                        | 6.3V                                 | 10V  | 16V  | 25V  | 35V                                  | 50V                       | 63V  | 100V              | 160 to 250V | 315 to 400V      | 450V |
|                                                                                                                   | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | ≤φ18                                                                   | 5                                    | 4    | 3    | 2    | 2                                    | 2                         | 2    | 2                 | 3           | 6                | 6    |
|                                                                                                                   |                                                                                                                                                                                                                                                                                        | ≥φ20                                                                   | 5                                    | 4    | 3    | 2    | 2                                    | 2                         | 2    | 2                 | 4           | 6                | 6    |
|                                                                                                                   | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | ≤φ18                                                                   | 12                                   | 10   | 8    | 5    | 4                                    | 3                         | 3    | 3                 | 4           | 6                | —    |
| (at 120Hz)                                                                                                        |                                                                                                                                                                                                                                                                                        |                                                                        |                                      |      |      |      |                                      |                           |      |                   |             |                  |      |
| Endurance                                                                                                         | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 85°C.                                                                                                                                   |                                                                        |                                      |      |      |      |                                      |                           |      |                   |             |                  |      |
|                                                                                                                   | Capacitance change                                                                                                                                                                                                                                                                     |                                                                        | ≤±20% of the initial value           |      |      |      |                                      |                           |      |                   |             |                  |      |
|                                                                                                                   | D.F. (tanδ)                                                                                                                                                                                                                                                                            |                                                                        | ≤200% of the initial specified value |      |      |      |                                      |                           |      |                   |             |                  |      |
|                                                                                                                   | Leakage current                                                                                                                                                                                                                                                                        |                                                                        | ≤The initial specified value         |      |      |      |                                      |                           |      |                   |             |                  |      |
| Shelf Life                                                                                                        | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                                        |                                      |      |      |      |                                      |                           |      |                   |             |                  |      |
|                                                                                                                   | Rated voltage                                                                                                                                                                                                                                                                          |                                                                        | 6.3 to 100V <sub>dc</sub>            |      |      |      | 160 to 450V <sub>dc</sub>            |                           |      |                   |             |                  |      |
|                                                                                                                   | Capacitance change                                                                                                                                                                                                                                                                     |                                                                        | ≤±20% of the initial value           |      |      |      | ≤±20% of the initial value           |                           |      |                   |             |                  |      |
|                                                                                                                   | D.F. (tanδ)                                                                                                                                                                                                                                                                            |                                                                        | ≤200% of the initial specified value |      |      |      | ≤200% of the initial specified value |                           |      |                   |             |                  |      |
|                                                                                                                   | Leakage current                                                                                                                                                                                                                                                                        |                                                                        | ≤The initial specified value         |      |      |      | ≤500% of the initial specified value |                           |      |                   |             |                  |      |
|                                                                                                                   |                                                                                                                                                                                                                                                                                        |                                                                        |                                      |      |      |      |                                      |                           |      |                   |             |                  |      |

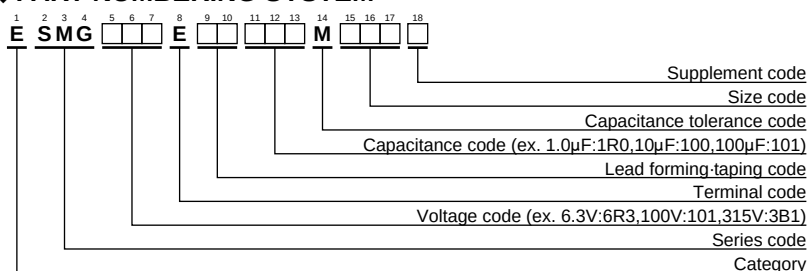
## ◆DIMENSIONS [mm]

- Terminal Code : E



| φD  | 5          | 6.3 | 8   | 10  | 12.5 | 16  | 18  | 20         | 22   |
|-----|------------|-----|-----|-----|------|-----|-----|------------|------|
| φd  | 0.5        | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 | 1.0        | 1.0  |
| F   | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 | 10.0       | 10.0 |
| φD' | φD+0.5max. |     |     |     |      |     |     | φD+0.5max. |      |
| L'  | L+1.5max.  |     |     |     |      |     |     | L+2.0max.  |      |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide  
(radial lead type)"



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85°C

SMG Series

## ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA rms/85°C, 120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA rms/85°C, 120Hz) | Part No.           |
|----------|----------|--------------------|------|-------------------------------------------|--------------------|----------|----------|--------------------|------|-------------------------------------------|--------------------|
| 6.3      | 220      | 5X11               | 0.34 | 200                                       | ESMG6R3E□□221ME11D | 25       | 6,800    | 22X30              | 0.26 | 2,510                                     | ESMG250E□□682MP30S |
|          | 330      | 6.3X11             | 0.34 | 270                                       | ESMG6R3E□□331MF11D |          | 8,200    | 20X40              | 0.30 | 2,810                                     | ESMG250E□□822MN40S |
|          | 470      | 6.3X11             | 0.34 | 320                                       | ESMG6R3E□□471MF11D |          | 8,200    | 22X35              | 0.30 | 2,810                                     | ESMG250E□□822MP35S |
|          | 1,000    | 8X11.5             | 0.34 | 540                                       | ESMG6R3E□□102MHB5D |          | 10,000   | 22X40              | 0.34 | 3,240                                     | ESMG250E□□103MP40S |
|          | 2,200    | 10X20              | 0.36 | 1,000                                     | ESMG6R3E□□222MJ20S |          | 12,000   | 22X40              | 0.38 | 3,240                                     | ESMG250E□□123MP40S |
|          | 3,300    | 10X20              | 0.38 | 1,185                                     | ESMG6R3E□□332MJ20S | 35       | 47       | 5X11               | 0.14 | 130                                       | ESMG350E□□470ME11D |
|          | 4,700    | 12.5X20            | 0.40 | 1,545                                     | ESMG6R3E□□472MK20S |          | 100      | 6.3X11             | 0.14 | 210                                       | ESMG350E□□101MF11D |
|          | 6,800    | 12.5X25            | 0.44 | 1,915                                     | ESMG6R3E□□682MK25S |          | 220      | 8X11.5             | 0.14 | 385                                       | ESMG350E□□221MHB5D |
|          | 10,000   | 16X25              | 0.52 | 2,330                                     | ESMG6R3E□□103ML25S |          | 330      | 10X12.5            | 0.14 | 490                                       | ESMG350E□□331MJC5S |
|          | 10,000   | 20X25              | 0.46 | 2,310                                     | ESMG6R3E□□103MN25S |          | 470      | 10X16              | 0.14 | 645                                       | ESMG350E□□471MJ16S |
|          | 15,000   | 16X35.5            | 0.62 | 2,845                                     | ESMG6R3E□□153MLP1S |          | 1,000    | 12.5X20            | 0.14 | 1,145                                     | ESMG350E□□102MK20S |
|          | 15,000   | 20X30              | 0.56 | 2,660                                     | ESMG6R3E□□153MN30S |          | 2,200    | 16X25              | 0.16 | 1,785                                     | ESMG350E□□222ML25S |
|          | 18,000   | 20X35              | 0.62 | 2,890                                     | ESMG6R3E□□183MN35S |          | 2,200    | 20X20              | 0.16 | 1,670                                     | ESMG350E□□222MN20S |
|          | 18,000   | 22X30              | 0.62 | 2,860                                     | ESMG6R3E□□183MP30S |          | 3,300    | 16X35.5            | 0.18 | 2,275                                     | ESMG350E□□332MLP1S |
|          | 22,000   | 18X40              | 0.76 | 3,320                                     | ESMG6R3E□□223MM40S |          | 3,300    | 20X25              | 0.18 | 2,050                                     | ESMG350E□□332MN25S |
|          | 22,000   | 20X40              | 0.70 | 3,130                                     | ESMG6R3E□□223MN40S |          | 3,900    | 20X30              | 0.18 | 2,310                                     | ESMG350E□□392MN30S |
|          | 22,000   | 22X35              | 0.70 | 3,130                                     | ESMG6R3E□□223MP35S |          | 4,700    | 18X35.5            | 0.20 | 2,700                                     | ESMG350E□□472MMP1S |
|          | 27,000   | 22X40              | 0.80 | 3,280                                     | ESMG6R3E□□273MP40S |          | 4,700    | 20X35              | 0.20 | 2,510                                     | ESMG350E□□472MN35S |
|          |          |                    |      |                                           |                    |          | 4,700    | 22X30              | 0.20 | 2,380                                     | ESMG350E□□472MP30S |
|          |          |                    |      |                                           |                    |          | 5,600    | 20X40              | 0.22 | 2,690                                     | ESMG350E□□562MN40S |
| 10       | 220      | 5X11               | 0.24 | 240                                       | ESMG100E□□221ME11D |          | 5,600    | 22X35              | 0.22 | 2,690                                     | ESMG350E□□562MP35S |
|          | 330      | 6.3X11             | 0.24 | 290                                       | ESMG100E□□331MF11D |          | 6,800    | 22X40              | 0.24 | 3,090                                     | ESMG350E□□682MP40S |
|          | 470      | 6.3X11             | 0.24 | 350                                       | ESMG100E□□471MF11D | 50       | 1.0      | 5X11               | 0.12 | 17                                        | ESMG500E□□1R0ME11D |
|          | 1,000    | 10X12.5            | 0.24 | 650                                       | ESMG100E□□102MJC5S |          | 2.2      | 5X11               | 0.12 | 28                                        | ESMG500E□□2R2ME11D |
|          | 2,200    | 10X20              | 0.26 | 1,070                                     | ESMG100E□□222MJ20S |          | 3.3      | 5X11               | 0.12 | 35                                        | ESMG500E□□3R3ME11D |
|          | 3,300    | 12.5X20            | 0.28 | 1,420                                     | ESMG100E□□332MK20S |          | 4.7      | 5X11               | 0.12 | 41                                        | ESMG500E□□4R7ME11D |
|          | 4,700    | 12.5X25            | 0.30 | 1,780                                     | ESMG100E□□472MK25S |          | 10       | 5X11               | 0.12 | 60                                        | ESMG500E□□100ME11D |
|          | 6,800    | 16X25              | 0.34 | 2,220                                     | ESMG100E□□682ML25S |          | 22       | 5X11               | 0.12 | 95                                        | ESMG500E□□220ME11D |
|          | 6,800    | 20X20              | 0.34 | 2,080                                     | ESMG100E□□682MN20S |          | 33       | 5X11               | 0.12 | 125                                       | ESMG500E□□330ME11D |
|          | 10,000   | 16X35.5            | 0.42 | 2,670                                     | ESMG100E□□103MLP1S |          | 47       | 6.3X11             | 0.12 | 155                                       | ESMG500E□□471MF11D |
|          | 10,000   | 20X25              | 0.42 | 2,410                                     | ESMG100E□□103MN25S |          | 100      | 8X11.5             | 0.12 | 260                                       | ESMG500E□□101MHB5D |
|          | 12,000   | 20X30              | 0.46 | 2,620                                     | ESMG100E□□123MN30S |          | 220      | 10X12.5            | 0.12 | 430                                       | ESMG500E□□221MJC5S |
|          | 15,000   | 18X35.5            | 0.52 | 3,080                                     | ESMG100E□□153MMP1S |          | 330      | 10X16              | 0.12 | 585                                       | ESMG500E□□331MJ16S |
|          | 15,000   | 20X35              | 0.52 | 2,870                                     | ESMG100E□□153MN35S |          | 470      | 10X20              | 0.12 | 755                                       | ESMG500E□□471MJ20S |
|          | 15,000   | 22X30              | 0.52 | 2,660                                     | ESMG100E□□153MP30S |          | 1,000    | 12.5X25            | 0.12 | 1,340                                     | ESMG500E□□102MK25S |
|          | 18,000   | 22X35              | 0.58 | 3,050                                     | ESMG100E□□183MP35S |          | 1,500    | 20X20              | 0.12 | 1,570                                     | ESMG500E□□152MN20S |
|          | 22,000   | 22X40              | 0.66 | 3,480                                     | ESMG100E□□223MP40S |          | 2,200    | 16X35.5            | 0.14 | 2,075                                     | ESMG500E□□222MLP1S |
| 16       | 100      | 5X11               | 0.20 | 160                                       | ESMG160E□□101ME11D |          | 2,200    | 20X25              | 0.14 | 1,880                                     | ESMG500E□□222MN25S |
|          | 220      | 6.3X11             | 0.20 | 260                                       | ESMG160E□□221MF11D |          | 2,700    | 20X30              | 0.14 | 2,150                                     | ESMG500E□□272MN30S |
|          | 330      | 8X11.5             | 0.20 | 370                                       | ESMG160E□□331MHB5D |          | 3,300    | 18X35.5            | 0.16 | 2,500                                     | ESMG500E□□332MMP1S |
|          | 470      | 8X11.5             | 0.20 | 440                                       | ESMG160E□□471MHB5D |          | 3,300    | 20X35              | 0.16 | 2,420                                     | ESMG500E□□332MN35S |
|          | 1,000    | 10X16              | 0.20 | 785                                       | ESMG160E□□102MJ16S |          | 3,300    | 22X30              | 0.16 | 2,420                                     | ESMG500E□□332MP30S |
|          | 2,200    | 12.5X20            | 0.22 | 1,295                                     | ESMG160E□□222MK20S |          | 3,900    | 20X40              | 0.16 | 2,590                                     | ESMG500E□□392MN40S |
|          | 3,300    | 12.5X25            | 0.24 | 1,655                                     | ESMG160E□□332MK25S |          | 3,900    | 22X35              | 0.16 | 2,590                                     | ESMG500E□□392MP35S |
|          | 4,700    | 16X25              | 0.26 | 2,090                                     | ESMG160E□□472ML25S |          | 4,700    | 22X40              | 0.18 | 2,960                                     | ESMG500E□□472MP40S |
|          | 4,700    | 20X20              | 0.26 | 1,960                                     | ESMG160E□□472MN20S | 63       | 10       | 5X11               | 0.09 | 65                                        | ESMG630E□□100ME11D |
|          | 6,800    | 16X31.5            | 0.30 | 2,520                                     | ESMG160E□□682MLN3S |          | 22       | 5X11               | 0.09 | 100                                       | ESMG630E□□220ME11D |
|          | 6,800    | 20X25              | 0.30 | 2,330                                     | ESMG160E□□682MN25S |          | 33       | 6.3X11             | 0.09 | 140                                       | ESMG630E□□330MF11D |
|          | 8,200    | 20X30              | 0.34 | 2,500                                     | ESMG160E□□822MN30S |          | 47       | 6.3X11             | 0.09 | 170                                       | ESMG630E□□470MF11D |
|          | 10,000   | 18X35.5            | 0.38 | 2,920                                     | ESMG160E□□103MMP1S |          | 100      | 10X12.5            | 0.09 | 300                                       | ESMG630E□□101MJC5S |
|          | 10,000   | 20X35              | 0.38 | 2,720                                     | ESMG160E□□103MN35S |          | 220      | 10X16              | 0.09 | 490                                       | ESMG630E□□221MJ16S |
|          | 10,000   | 22X30              | 0.38 | 2,660                                     | ESMG160E□□103MP30S |          | 330      | 10X20              | 0.09 | 710                                       | ESMG630E□□331MJ20S |
|          | 12,000   | 20X40              | 0.42 | 2,900                                     | ESMG160E□□123MN40S |          | 470      | 12.5X20            | 0.09 | 900                                       | ESMG630E□□471MK20S |
|          | 12,000   | 22X35              | 0.42 | 2,900                                     | ESMG160E□□123MP35S |          | 820      | 20X20              | 0.09 | 1,370                                     | ESMG630E□□821MN20S |
|          | 15,000   | 22X40              | 0.48 | 3,380                                     | ESMG160E□□153MP40S |          | 1,000    | 16X25              | 0.09 | 1,300                                     | ESMG630E□□102ML25S |
| 25       | 47       | 5X11               | 0.16 | 115                                       | ESMG250E□□470ME11D |          | 1,000    | 20X25              | 0.09 | 1,600                                     | ESMG630E□□102MN25S |
|          | 100      | 6.3X11             | 0.16 | 190                                       | ESMG250E□□101MF11D |          | 1,500    | 20X30              | 0.09 | 1,850                                     | ESMG630E□□152MN30S |
|          | 220      | 8X11.5             | 0.16 | 330                                       | ESMG250E□□221MHB5D |          | 2,200    | 20X35              | 0.11 | 2,330                                     | ESMG630E□□222MN35S |
|          | 330      | 8X11.5             | 0.16 | 440                                       | ESMG250E□□331MHB5D |          | 2,200    | 22X30              | 0.11 | 2,190                                     | ESMG630E□□222MP30S |
|          | 470      | 10X12.5            | 0.16 | 545                                       | ESMG250E□□471MJC5S |          | 2,700    | 20X40              | 0.11 | 2,640                                     | ESMG630E□□272MN40S |
|          | 1,000    | 10X20              | 0.16 | 955                                       | ESMG250E□□102MJ20S |          | 3,300    | 22X40              | 0.13 | 2,810                                     | ESMG630E□□332MP40S |
|          | 2,200    | 12.5X25            | 0.18 | 1,540                                     | ESMG250E□□222MK25S | 100      | 1.0      | 5X11               | 0.08 | 21                                        | ESMG101E□□1R0ME11D |
|          | 3,300    | 16X25              | 0.20 | 1,975                                     | ESMG250E□□332ML25S |          | 2.2      | 5X11               | 0.08 | 30                                        | ESMG101E□□2R2ME11D |
|          | 3,300    | 20X20              | 0.20 | 1,850                                     | ESMG250E□□332MN20S |          | 3.3      | 5X11               | 0.08 | 40                                        | ESMG101E□□3R3ME11D |
|          | 4,700    | 16X31.5            | 0.22 | 2,420                                     | ESMG250E□□472MLN3S |          | 4.7      | 5X11               | 0.08 | 45                                        | ESMG101E□□4R7ME11D |
|          | 4,700    | 20X25              | 0.22 | 2,420                                     | ESMG250E□□472MN25S |          | 10       | 6.3X11             | 0.08 | 75                                        | ESMG101E□□100MF11D |
|          | 5,600    | 20X30              | 0.24 | 2,430                                     | ESMG250E□□562MN30S |          | 22       | 8X11.5             | 0.08 | 130                                       | ESMG101E□□220MHB5D |
|          | 6,800    | 18X35.5            | 0.26 | 2,880                                     | ESMG250E□□682MMP1S |          |          |                    |      |                                           |                    |
|          | 6,800    | 20X35              | 0.26 | 2,680                                     | ESMG250E□□682MN35S |          |          |                    |      |                                           |                    |
|          |          |                    |      |                                           |                    |          |          |                    |      |                                           |                    |
|          |          |                    |      |                                           |                    |          |          |                    |      |                                           |                    |

□□ : Enter the appropriate lead forming or taping code.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized, 85°C

SMG Series

## ◆STANDARD RATINGS

□ is not solvent resistant.

| WV (Vdc) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA rms/85°C, 120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (mA rms/85°C, 120Hz) | Part No.           |
|----------|----------|--------------------|------|-------------------------------------------|--------------------|----------|----------|--------------------|------|-------------------------------------------|--------------------|
| 100      | 33       | 8×11.5             | 0.08 | 180                                       | ESMG101E□□330MHB5D | 315      | 47       | 20×20              | 0.15 | 310                                       | ESMG3B1E□□470MN20S |
|          | 47       | 10×12.5            | 0.08 | 230                                       | ESMG101E□□470MJC5S |          | 68       | 20×25              | 0.15 | 400                                       | ESMG3B1E□□680MN25S |
|          | 100      | 10×20              | 0.08 | 370                                       | ESMG101E□□101MJ20S |          | 82       | 20×25              | 0.15 | 440                                       | ESMG3B1E□□820MN25S |
|          | 220      | 12.5×25            | 0.08 | 620                                       | ESMG101E□□221MK25S |          | 100      | 20×30              | 0.15 | 500                                       | ESMG3B1E□□101MN30S |
|          | 330      | 12.5×25            | 0.08 | 760                                       | ESMG101E□□331MK25S |          | 120      | 20×30              | 0.15 | 550                                       | ESMG3B1E□□121MN30S |
|          | 330      | 20×20              | 0.08 | 870                                       | ESMG101E□□331MN20S |          | 180      | 20×40              | 0.15 | 720                                       | ESMG3B1E□□181MN40S |
|          | 470      | 16×25              | 0.08 | 1,000                                     | ESMG101E□□471ML25S |          | 180      | 22×35              | 0.15 | 720                                       | ESMG3B1E□□181MP35S |
|          | 680      | 20×30              | 0.08 | 1,360                                     | ESMG101E□□681MN30S |          | 220      | 22×40              | 0.15 | 810                                       | ESMG3B1E□□221MP40S |
|          | 820      | 22×30              | 0.08 | 1,540                                     | ESMG101E□□821MP30S | 350      | 1.0      | 6.3×11             | 0.24 | 22                                        | ESMG351E□□1R0MF11D |
|          | 1,000    | 18×40              | 0.08 | 1,380                                     | ESMG101E□□102MM40S |          | 2.2      | 8×11.5             | 0.24 | 38                                        | ESMG351E□□2R2MHB5D |
|          | 1,000    | 20×35              | 0.08 | 1,720                                     | ESMG101E□□102MN35S |          | 3.3      | 8×11.5             | 0.24 | 46                                        | ESMG351E□□3R3MHB5D |
| 160      | 1,200    | 22×40              | 0.08 | 1,980                                     | ESMG101E□□122MP40S |          | 4.7      | 10×12.5            | 0.24 | 65                                        | ESMG351E□□4R7MJC5S |
|          | 3.3      | 6.3×11             | 0.20 | 40                                        | ESMG161E□□3R3MF11D |          | 10       | 10×20              | 0.24 | 115                                       | ESMG351E□□100MJ20S |
|          | 4.7      | 6.3×11             | 0.20 | 48                                        | ESMG161E□□4R7MF11D |          | 22       | 12.5×20            | 0.24 | 185                                       | ESMG351E□□2R2MK20S |
|          | 10       | 10×12.5            | 0.20 | 94                                        | ESMG161E□□100MJC5S |          | 33       | 16×25              | 0.24 | 275                                       | ESMG351E□□330ML25S |
|          | 22       | 10×20              | 0.20 | 170                                       | ESMG161E□□220MJ20S |          | 47       | 16×25              | 0.24 | 325                                       | ESMG351E□□470ML25S |
|          | 33       | 10×20              | 0.20 | 205                                       | ESMG161E□□330MJ20S |          | 47       | 20×20              | 0.15 | 310                                       | ESMG351E□□470MN20S |
|          | 47       | 12.5×20            | 0.20 | 270                                       | ESMG161E□□470MK20S |          | 68       | 20×25              | 0.15 | 400                                       | ESMG351E□□680MN25S |
|          | 100      | 12.5×25            | 0.20 | 430                                       | ESMG161E□□101MK25S |          | 100      | 18×31.5            | 0.24 | 530                                       | ESMG351E□□101MMN3S |
|          | 220      | 16×31.5            | 0.20 | 760                                       | ESMG161E□□221MLN3S |          | 100      | 20×30              | 0.15 | 500                                       | ESMG351E□□101MN30S |
|          | 220      | 20×25              | 0.15 | 730                                       | ESMG161E□□221MN25S |          | 120      | 20×35              | 0.15 | 560                                       | ESMG351E□□121MN35S |
|          | 330      | 18×35.5            | 0.20 | 995                                       | ESMG161E□□331MMP1S | 400      | 1.0      | 6.3×11             | 0.24 | 22                                        | ESMG401E□□1R0MF11D |
| 200      | 330      | 20×30              | 0.15 | 920                                       | ESMG161E□□331MN30S |          | 2.2      | 8×11.5             | 0.24 | 38                                        | ESMG401E□□2R2MHB5D |
|          | 390      | 20×35              | 0.15 | 1,160                                     | ESMG161E□□391MN35S |          | 3.3      | 10×12.5            | 0.24 | 54                                        | ESMG401E□□3R3MJC5S |
|          | 390      | 22×30              | 0.15 | 1,160                                     | ESMG161E□□391MP30S |          | 4.7      | 10×16              | 0.24 | 71                                        | ESMG401E□□4R7MJ16S |
|          | 470      | 20×40              | 0.15 | 1,340                                     | ESMG161E□□471MN40S |          | 10       | 10×20              | 0.24 | 115                                       | ESMG401E□□100MJ20S |
|          | 470      | 22×35              | 0.15 | 1,340                                     | ESMG161E□□471MP35S |          | 22       | 12.5×25            | 0.24 | 205                                       | ESMG401E□□220MK25S |
|          | 560      | 22×40              | 0.15 | 1,470                                     | ESMG161E□□561MP40S |          | 33       | 16×25              | 0.24 | 275                                       | ESMG401E□□330ML25S |
|          | 3.3      | 6.3×11             | 0.20 | 40                                        | ESMG201E□□3R3MF11D |          | 33       | 20×20              | 0.15 | 260                                       | ESMG401E□□330MN20S |
|          | 4.7      | 8×11.5             | 0.20 | 55                                        | ESMG201E□□4R7MHB5D |          | 47       | 16×31.5            | 0.24 | 350                                       | ESMG401E□□470MLN3S |
|          | 10       | 10×12.5            | 0.20 | 94                                        | ESMG201E□□100MJC5S |          | 56       | 20×25              | 0.15 | 350                                       | ESMG401E□□560MN25S |
|          | 22       | 10×20              | 0.20 | 170                                       | ESMG201E□□220MJ20S |          | 68       | 20×30              | 0.15 | 420                                       | ESMG401E□□680MN30S |
|          | 33       | 10×20              | 0.20 | 205                                       | ESMG201E□□330MJ20S | 450      | 100      | 20×35              | 0.15 | 520                                       | ESMG401E□□101MN35S |
| 250      | 47       | 12.5×20            | 0.20 | 270                                       | ESMG201E□□470MK20S |          | 100      | 22×30              | 0.15 | 520                                       | ESMG401E□□101MP30S |
|          | 100      | 16×25              | 0.20 | 475                                       | ESMG201E□□101ML25S |          | 120      | 20×40              | 0.15 | 580                                       | ESMG401E□□121MN40S |
|          | 100      | 20×20              | 0.15 | 460                                       | ESMG201E□□101MN20S |          | 120      | 22×35              | 0.15 | 580                                       | ESMG401E□□121MP35S |
|          | 180      | 20×25              | 0.15 | 660                                       | ESMG201E□□181MN25S |          | 2.2      | 10×12.5            | 0.24 | 32                                        | ESMG451E□□2R2MJC5S |
|          | 220      | 18×35.5            | 0.20 | 810                                       | ESMG201E□□221MMP1S |          | 3.3      | 10×16              | 0.24 | 44                                        | ESMG451E□□3R3MJ16S |
|          | 220      | 20×30              | 0.15 | 750                                       | ESMG201E□□221MN30S |          | 4.7      | 10×20              | 0.24 | 56                                        | ESMG451E□□4R7MJ20S |
|          | 270      | 20×30              | 0.15 | 830                                       | ESMG201E□□271MN30S |          | 10       | 12.5×20            | 0.24 | 91                                        | ESMG451E□□100MK20S |
|          | 330      | 20×35              | 0.15 | 1,070                                     | ESMG201E□□331MN35S |          | 22       | 16×25              | 0.24 | 165                                       | ESMG451E□□220ML25S |
|          | 330      | 22×30              | 0.15 | 1,070                                     | ESMG201E□□331MP30S |          | 22       | 20×20              | 0.20 | 180                                       | ESMG451E□□220MN20S |
|          | 390      | 20×40              | 0.15 | 1,190                                     | ESMG201E□□391MN40S |          | 33       | 16×31.5            | 0.24 | 215                                       | ESMG451E□□330MLN3S |
|          | 390      | 22×30              | 0.15 | 1,160                                     | ESMG201E□□391MP30S |          | 33       | 20×25              | 0.20 | 240                                       | ESMG451E□□330MN25S |
|          | 470      | 22×40              | 0.15 | 1,350                                     | ESMG201E□□471MP40S |          | 47       | 16×35.5            | 0.24 | 265                                       | ESMG451E□□470MLP1S |
| 250      | 560      | 22×40              | 0.15 | 1,430                                     | ESMG201E□□561MP40S |          | 47       | 20×25              | 0.20 | 290                                       | ESMG451E□□470MN25S |
|          | 2.2      | 6.3×11             | 0.20 | 32                                        | ESMG251E□□2R2MF11D |          | 56       | 20×30              | 0.20 | 320                                       | ESMG451E□□560MN30S |
|          | 3.3      | 8×11.5             | 0.20 | 46                                        | ESMG251E□□3R3MHB5D |          | 68       | 20×35              | 0.20 | 370                                       | ESMG451E□□680MN35S |
|          | 4.7      | 8×11.5             | 0.20 | 55                                        | ESMG251E□□4R7MHB5D |          | 68       | 22×30              | 0.20 | 370                                       | ESMG451E□□680MP30S |
|          | 10       | 10×16              | 0.20 | 105                                       | ESMG251E□□100MJ16S |          | 82       | 20×40              | 0.20 | 420                                       | ESMG451E□□820MN40S |
|          | 22       | 10×20              | 0.20 | 170                                       | ESMG251E□□220MJ20S |          | 82       | 22×35              | 0.20 | 420                                       | ESMG451E□□820MP35S |
|          | 33       | 12.5×20            | 0.20 | 230                                       | ESMG251E□□330MK20S |          | 100      | 22×40              | 0.20 | 470                                       | ESMG451E□□101MP40S |
|          | 47       | 12.5×25            | 0.20 | 295                                       | ESMG251E□□470MK25S |          |          |                    |      |                                           |                    |
|          | 82       | 20×20              | 0.15 | 420                                       | ESMG251E□□820MN20S |          |          |                    |      |                                           |                    |
|          | 100      | 16×31.5            | 0.20 | 515                                       | ESMG251E□□101MLN3S |          |          |                    |      |                                           |                    |
|          | 100      | 20×25              | 0.15 | 490                                       | ESMG251E□□101MN25S |          |          |                    |      |                                           |                    |
|          | 120      | 20×25              | 0.15 | 530                                       | ESMG251E□□121MN25S |          |          |                    |      |                                           |                    |
|          | 180      | 20×30              | 0.15 | 680                                       | ESMG251E□□181MN30S |          |          |                    |      |                                           |                    |
|          | 220      | 18×40              | 0.20 | 825                                       | ESMG251E□□221MM40S |          |          |                    |      |                                           |                    |
|          | 220      | 20×35              | 0.15 | 780                                       | ESMG251E□□221MN35S |          |          |                    |      |                                           |                    |
|          | 220      | 22×30              | 0.15 | 820                                       | ESMG251E□□221MP30S |          |          |                    |      |                                           |                    |
|          | 270      | 20×40              | 0.15 | 880                                       | ESMG251E□□271MN40S |          |          |                    |      |                                           |                    |
|          | 270      | 22×35              | 0.15 | 880                                       | ESMG251E□□271MP35S |          |          |                    |      |                                           |                    |
|          | 330      | 22×40              | 0.15 | 1,060                                     | ESMG251E□□331MP40S |          |          |                    |      |                                           |                    |

□□ : Enter the appropriate lead forming or taping code.


**SMG**Series

# ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

(φ5 to φ18)

| Capacitance (μF) \ Frequency (Hz) | 50   | 120  | 300  | 1k   | 10k  | 100k |
|-----------------------------------|------|------|------|------|------|------|
| <b>1.0 to 4.7</b>                 | 0.65 | 1.00 | 1.35 | 1.75 | 2.30 | 2.50 |
| <b>10 to 47</b>                   | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 |
| <b>100 to 1,000</b>               | 0.80 | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 |
| <b>2,200 to</b>                   | 0.85 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |

(φ20, φ22)

| Rated Voltage (V <sub>o</sub> ) \ Frequency (Hz) | 50   | 120  | 300  | 1k   | 10k  | 100k |
|--------------------------------------------------|------|------|------|------|------|------|
| <b>6.3 to 50</b>                                 | 0.95 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |
| <b>63 to 100</b>                                 | 0.92 | 1.00 | 1.07 | 1.13 | 1.19 | 1.20 |
| <b>160 to 250</b>                                | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| <b>315 to 450</b>                                | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Standard, Downsized, 105°C

# KMG Series

- Endurance with ripple current : 1,000 to 2,000 hours at 105°C
- Solvent resistant type except 350 to 450V<sub>dc</sub>  
(see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

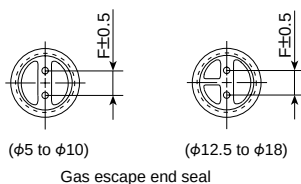
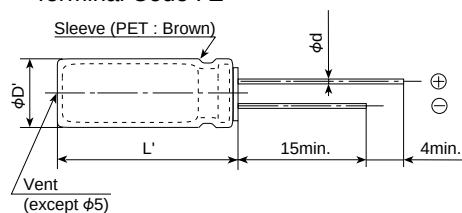


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                        |                                      |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|--------------------------------------|------|-------------|-------------|-------------------|------------------|------------------|-----------|--|
| Category                                               | -55 to +105°C(6.3 to 100V <sub>dc</sub> ) -40 to +105°C(160 to 400V <sub>dc</sub> ) -25 to +105°C(450V <sub>dc</sub> )                                                                                                                                                                                 |                                      |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                                        |                                      |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
| Rated Voltage Range                                    | 6.3 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                              |                                      |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                              |                                      |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
| Leakage Current                                        | 6.3 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                                              |                                      |      |      |      |      |      | 160 to 450V <sub>dc</sub>            |      |             |             |                   |                  |                  |           |  |
|                                                        | I=0.03CV or 4μA, whichever is greater.                                                                                                                                                                                                                                                                 |                                      |      |      |      |      |      | CV                                   |      | Time        |             | After 1minute     |                  | After 5minutes   |           |  |
|                                                        |                                                                                                                                                                                                                                                                                                        |                                      |      |      |      |      |      | CV≤1,000                             |      |             |             | I=0.1CV+40 max.   |                  | I=0.03CV+15 max. |           |  |
|                                                        |                                                                                                                                                                                                                                                                                                        |                                      |      |      |      |      |      | CV>1,000                             |      |             |             | I=0.04CV+100 max. |                  | I=0.02CV+25 max. |           |  |
|                                                        | (at 20°C after 1 minute)                                                                                                                                                                                                                                                                               |                                      |      |      |      |      |      |                                      |      |             |             |                   |                  |                  | (at 20°C) |  |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                                                                                                              |                                      |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                       | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | 63V                                  | 100V | 160 to 250V | 350 to 400V | 450V              | (at 20°C, 120Hz) |                  |           |  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                                            | 0.34                                 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.10                                 | 0.08 | 0.20        | 0.24        | 0.24              |                  |                  |           |  |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase.                                                                                                                                                                                                       |                                      |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                       | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | 63V                                  | 100V | 160 to 250V | 350 to 400V | 450V              | (at 120Hz)       |                  |           |  |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                                      | 5                                    | 4    | 3    | 2    | 2    | 2    | 2                                    | 2    | 3           | 6           | 6                 |                  |                  |           |  |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                                      | 12                                   | 10   | 8    | 5    | 4    | 3    | 3                                    | 3    | 4           | 6           | —                 |                  |                  |           |  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 1,000 hours (2,000 hours to meet the following two conditions 1) : 160V <sub>dc</sub> and larger, 2) : φ12.5 and larger) at 105°C. |                                      |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                                     | ≤±20% of the initial value           |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                                            | ≤200% of the initial specified value |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                                        | ≤The initial specified value         |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.                |                                      |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                                          | 6.3 to 100V <sub>dc</sub>            |      |      |      |      |      | 160 to 450V <sub>dc</sub>            |      |             |             |                   |                  |                  |           |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                                     | ≤±20% of the initial value           |      |      |      |      |      | ≤±20% of the initial value           |      |             |             |                   |                  |                  |           |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                                            | ≤200% of the initial specified value |      |      |      |      |      | ≤200% of the initial specified value |      |             |             |                   |                  |                  |           |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                                        | ≤The initial specified value         |      |      |      |      |      | ≤500% of the initial specified value |      |             |             |                   |                  |                  |           |  |
|                                                        |                                                                                                                                                                                                                                                                                                        |                                      |      |      |      |      |      |                                      |      |             |             |                   |                  |                  |           |  |

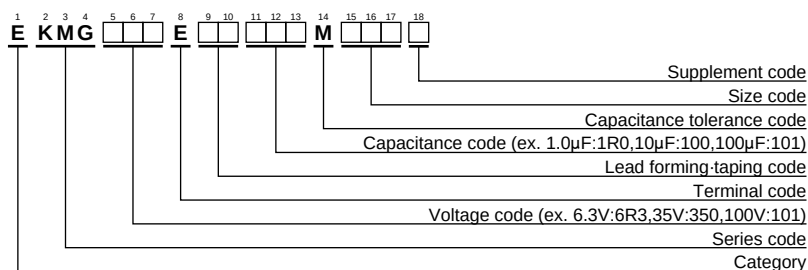
## ◆ DIMENSIONS [mm]

- Terminal Code : E



| φD  | 5          | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
|-----|------------|-----|-----|-----|------|-----|-----|
| φD  | 0.5        | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |
| F   | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| φD' | φD+0.5max. |     |     |     |      |     |     |
| L'  | L+1.5max   |     |     |     |      |     |     |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"


**KMG**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA rms/<br>105°C, 120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA rms/<br>105°C, 120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|------------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|------------------------------------------------------|--------------------|
| 6.3         | 220         | 5×11                  | 0.34 | 140                                                  | EKMG6R3E□□221ME11D | 63          | 10          | 5×11                  | 0.10 | 46                                                   | EKMG630E□□100ME11D |
|             | 330         | 6.3×11                | 0.34 | 190                                                  | EKMG6R3E□□331MF11D |             | 22          | 5×11                  | 0.10 | 71                                                   | EKMG630E□□220ME11D |
|             | 470         | 6.3×11                | 0.34 | 230                                                  | EKMG6R3E□□471MF11D |             | 33          | 6.3×11                | 0.10 | 100                                                  | EKMG630E□□330MF11D |
|             | 1,000       | 8×11.5                | 0.34 | 380                                                  | EKMG6R3E□□102MHB5D |             | 47          | 6.3×11                | 0.10 | 120                                                  | EKMG630E□□470MF11D |
|             | 2,200       | 10×20                 | 0.36 | 710                                                  | EKMG6R3E□□222MJ20S |             | 100         | 10×12.5               | 0.10 | 215                                                  | EKMG630E□□101MJ20S |
|             | 3,300       | 10×20                 | 0.38 | 840                                                  | EKMG6R3E□□332MJ20S |             | 220         | 10×16                 | 0.10 | 335                                                  | EKMG630E□□221MJ16S |
|             | 4,700       | 12.5×20               | 0.40 | 1,090                                                | EKMG6R3E□□472MK20S |             | 330         | 10×20                 | 0.10 | 510                                                  | EKMG630E□□331MJ20S |
|             | 6,800       | 12.5×25               | 0.44 | 1,350                                                | EKMG6R3E□□682MK25S |             | 470         | 12.5×20               | 0.10 | 640                                                  | EKMG630E□□471MK20S |
|             | 10,000      | 16×25                 | 0.52 | 1,650                                                | EKMG6R3E□□103ML25S |             | 1,000       | 16×25                 | 0.10 | 930                                                  | EKMG630E□□102ML25S |
|             | 15,000      | 16×35.5               | 0.62 | 2,010                                                | EKMG6R3E□□153MLP1S | 100         | 1.0         | 5×11                  | 0.08 | 15                                                   | EKMG101E□□1R0ME11D |
| 10          | 22,000      | 18×40                 | 0.76 | 2,350                                                | EKMG6R3E□□223MM40S |             | 2.2         | 5×11                  | 0.08 | 21                                                   | EKMG101E□□2R2ME11D |
|             | 220         | 6.3×11                | 0.24 | 170                                                  | EKMG100E□□221MF11D |             | 3.3         | 5×11                  | 0.08 | 29                                                   | EKMG101E□□3R3ME11D |
|             | 330         | 6.3×11                | 0.24 | 200                                                  | EKMG100E□□331MF11D |             | 4.7         | 5×11                  | 0.08 | 32                                                   | EKMG101E□□4R7ME11D |
|             | 470         | 8×11.5                | 0.24 | 250                                                  | EKMG100E□□471MHB5D |             | 10          | 6.3×11                | 0.08 | 54                                                   | EKMG101E□□100MF11D |
|             | 1,000       | 10×12.5               | 0.24 | 460                                                  | EKMG100E□□102MJ20S |             | 22          | 8×11.5                | 0.08 | 93                                                   | EKMG101E□□220MHB5D |
|             | 2,200       | 10×20                 | 0.26 | 760                                                  | EKMG100E□□222MJ20S |             | 33          | 8×11.5                | 0.08 | 130                                                  | EKMG101E□□330MHB5D |
|             | 3,300       | 12.5×20               | 0.28 | 1,000                                                | EKMG100E□□332MK20S |             | 47          | 10×12.5               | 0.08 | 165                                                  | EKMG101E□□470MJ20S |
|             | 4,700       | 12.5×25               | 0.30 | 1,260                                                | EKMG100E□□472MK25S |             | 100         | 10×20                 | 0.08 | 265                                                  | EKMG101E□□101MJ20S |
|             | 6,800       | 16×25                 | 0.34 | 1,570                                                | EKMG100E□□682ML25S |             | 220         | 12.5×25               | 0.08 | 440                                                  | EKMG101E□□221MK25S |
|             | 10,000      | 16×35.5               | 0.42 | 1,890                                                | EKMG100E□□103MLP1S |             | 330         | 16×25                 | 0.08 | 540                                                  | EKMG101E□□331ML25S |
| 16          | 15,000      | 18×35.5               | 0.52 | 2,180                                                | EKMG100E□□153MMP1S |             | 470         | 16×31.5               | 0.08 | 715                                                  | EKMG101E□□471MLN3S |
|             | 100         | 5×11                  | 0.20 | 110                                                  | EKMG160E□□101ME11D | 160         | 1,000       | 18×40                 | 0.08 | 985                                                  | EKMG101E□□102MM40S |
|             | 220         | 6.3×11                | 0.20 | 180                                                  | EKMG160E□□221MF11D |             | 3.3         | 6.3×11                | 0.20 | 28                                                   | EKMG161E□□3R3MF11D |
|             | 330         | 8×11.5                | 0.20 | 260                                                  | EKMG160E□□331MHB5D |             | 4.7         | 6.3×11                | 0.20 | 34                                                   | EKMG161E□□4R7MF11D |
|             | 470         | 8×11.5                | 0.20 | 310                                                  | EKMG160E□□471MHB5D |             | 10          | 10×12.5               | 0.20 | 67                                                   | EKMG161E□□100MJ20S |
|             | 1,000       | 10×16                 | 0.20 | 560                                                  | EKMG160E□□102MJ16S |             | 22          | 10×20                 | 0.20 | 120                                                  | EKMG161E□□220MJ20S |
|             | 2,200       | 12.5×20               | 0.22 | 920                                                  | EKMG160E□□222MK20S |             | 33          | 10×20                 | 0.20 | 145                                                  | EKMG161E□□330MJ20S |
|             | 3,300       | 12.5×25               | 0.24 | 1,170                                                | EKMG160E□□332MK25S |             | 47          | 12.5×20               | 0.20 | 195                                                  | EKMG161E□□470MK20S |
|             | 4,700       | 16×25                 | 0.26 | 1,480                                                | EKMG160E□□472ML25S |             | 100         | 16×25                 | 0.20 | 335                                                  | EKMG161E□□101ML25S |
|             | 6,800       | 16×31.5               | 0.30 | 1,780                                                | EKMG160E□□682MLN3S |             | 220         | 16×31.5               | 0.20 | 540                                                  | EKMG161E□□221MLN3S |
|             | 10,000      | 18×35.5               | 0.38 | 2,060                                                | EKMG160E□□103MMP1S |             | 330         | 18×35.5               | 0.20 | 705                                                  | EKMG161E□□331MMP1S |
| 25          | 47          | 5×11                  | 0.16 | 80                                                   | EKMG250E□□470ME11D | 200         | 3.3         | 6.3×11                | 0.20 | 28                                                   | EKMG201E□□3R3MF11D |
|             | 100         | 6.3×11                | 0.16 | 130                                                  | EKMG250E□□101MF11D |             | 4.7         | 8×11.5                | 0.20 | 39                                                   | EKMG201E□□4R7MHB5D |
|             | 220         | 8×11.5                | 0.16 | 230                                                  | EKMG250E□□221MHB5D |             | 10          | 10×16                 | 0.20 | 74                                                   | EKMG201E□□100MJ16S |
|             | 330         | 8×11.5                | 0.16 | 310                                                  | EKMG250E□□331MHB5D |             | 22          | 10×20                 | 0.20 | 120                                                  | EKMG201E□□220MJ20S |
|             | 470         | 10×12.5               | 0.16 | 380                                                  | EKMG250E□□471MJ20S |             | 33          | 12.5×20               | 0.20 | 160                                                  | EKMG201E□□330MK20S |
|             | 1,000       | 10×20                 | 0.16 | 680                                                  | EKMG250E□□102MJ20S |             | 47          | 12.5×20               | 0.20 | 195                                                  | EKMG201E□□470MK20S |
|             | 2,200       | 12.5×25               | 0.18 | 1,090                                                | EKMG250E□□222MK25S |             | 100         | 16×25                 | 0.20 | 335                                                  | EKMG201E□□101ML25S |
|             | 3,300       | 16×25                 | 0.20 | 1,400                                                | EKMG250E□□332ML25S |             | 220         | 18×35.5               | 0.20 | 575                                                  | EKMG201E□□221MMP1S |
|             | 4,700       | 16×31.5               | 0.22 | 1,710                                                | EKMG250E□□472MLN3S | 250         | 2.2         | 6.3×11                | 0.20 | 23                                                   | EKMG251E□□2R2MF11D |
|             | 6,800       | 18×35.5               | 0.26 | 2,040                                                | EKMG250E□□682MMP1S |             | 3.3         | 8×11.5                | 0.20 | 32                                                   | EKMG251E□□3R3MHB5D |
| 35          | 47          | 5×11                  | 0.14 | 90                                                   | EKMG350E□□470ME11D |             | 4.7         | 8×11.5                | 0.20 | 39                                                   | EKMG251E□□4R7MHB5D |
|             | 100         | 6.3×11                | 0.14 | 150                                                  | EKMG350E□□101MF11D |             | 10          | 10×16                 | 0.20 | 74                                                   | EKMG251E□□100MJ16S |
|             | 220         | 8×11.5                | 0.14 | 270                                                  | EKMG350E□□221MHB5D |             | 22          | 12.5×20               | 0.20 | 130                                                  | EKMG251E□□220MK20S |
|             | 330         | 10×12.5               | 0.14 | 350                                                  | EKMG350E□□331MJ20S |             | 33          | 12.5×20               | 0.20 | 160                                                  | EKMG251E□□330MK20S |
|             | 470         | 10×16                 | 0.14 | 460                                                  | EKMG350E□□471MJ16S |             | 47          | 12.5×25               | 0.20 | 210                                                  | EKMG251E□□470MK25S |
|             | 1,000       | 12.5×20               | 0.14 | 810                                                  | EKMG350E□□102MK20S |             | 100         | 16×31.5               | 0.20 | 365                                                  | EKMG251E□□101MLN3S |
|             | 2,200       | 16×25                 | 0.16 | 1,260                                                | EKMG350E□□222ML25S |             | 220         | 18×40                 | 0.20 | 585                                                  | EKMG251E□□221MM40S |
|             | 3,300       | 16×35.5               | 0.18 | 1,610                                                | EKMG350E□□332MLP1S | 350         | 1.0         | 6.3×11                | 0.24 | 15                                                   | EKMG351E□□1R0MF11D |
|             | 4,700       | 18×35.5               | 0.20 | 1,910                                                | EKMG350E□□472MMP1S |             | 2.2         | 8×11.5                | 0.24 | 26                                                   | EKMG351E□□2R2MHB5D |
| 50          | 1.0         | 5×11                  | 0.12 | 13                                                   | EKMG500E□□1R0ME11D |             | 3.3         | 10×12.5               | 0.24 | 38                                                   | EKMG351E□□3R3MJ20S |
|             | 2.2         | 5×11                  | 0.12 | 20                                                   | EKMG500E□□2R2ME11D |             | 4.7         | 10×16                 | 0.24 | 50                                                   | EKMG351E□□4R7MJ16S |
|             | 3.3         | 5×11                  | 0.12 | 25                                                   | EKMG500E□□3R3ME11D |             | 10          | 10×20                 | 0.24 | 80                                                   | EKMG351E□□100MJ20S |
|             | 4.7         | 5×11                  | 0.12 | 30                                                   | EKMG500E□□4R7ME11D |             | 22          | 12.5×20               | 0.24 | 130                                                  | EKMG351E□□220MK20S |
|             | 10          | 5×11                  | 0.12 | 40                                                   | EKMG500E□□100ME11D |             | 33          | 16×25                 | 0.24 | 195                                                  | EKMG351E□□330ML25S |
|             | 22          | 5×11                  | 0.12 | 65                                                   | EKMG500E□□220ME11D |             | 47          | 16×25                 | 0.24 | 230                                                  | EKMG351E□□470ML25S |
|             | 33          | 5×11                  | 0.12 | 90                                                   | EKMG500E□□330ME11D |             | 100         | 18×31.5               | 0.24 | 375                                                  | EKMG351E□□101MMN3S |
|             | 47          | 6.3×11                | 0.12 | 110                                                  | EKMG500E□□470MF11D | 400         | 1.0         | 6.3×11                | 0.24 | 15                                                   | EKMG401E□□1R0MF11D |
|             | 100         | 8×11.5                | 0.12 | 180                                                  | EKMG500E□□101MHB5D |             | 2.2         | 8×11.5                | 0.24 | 26                                                   | EKMG401E□□2R2MHB5D |
|             | 220         | 10×12.5               | 0.12 | 300                                                  | EKMG500E□□221MJ20S |             | 3.3         | 10×12.5               | 0.24 | 38                                                   | EKMG401E□□3R3MJ20S |
|             | 330         | 10×16                 | 0.12 | 410                                                  | EKMG500E□□331MJ16S |             | 4.7         | 10×16                 | 0.24 | 50                                                   | EKMG401E□□4R7MJ16S |
|             | 470         | 10×20                 | 0.12 | 530                                                  | EKMG500E□□471MJ20S |             | 10          | 10×20                 | 0.24 | 80                                                   | EKMG401E□□100MJ20S |
|             | 1,000       | 12.5×25               | 0.12 | 950                                                  | EKMG500E□□102MK25S |             | 22          | 12.5×25               | 0.24 | 145                                                  | EKMG401E□□220MK25S |
|             | 2,200       | 16×35.5               | 0.14 | 1,470                                                | EKMG500E□□222MLP1S |             | 33          | 16×25                 | 0.24 | 195                                                  | EKMG401E□□330ML25S |
|             | 3,300       | 18×35.5               | 0.16 | 1,770                                                | EKMG500E□□332MMP1S |             | 47          | 16×31.5               | 0.24 | 250                                                  | EKMG401E□□470MLN3S |
|             |             |                       |      |                                                      |                    |             | 100         | 16×40                 | 0.24 | 350                                                  | EKMG401E□□101ML40S |

□□ : Enter the appropriate lead forming or taping code.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Standard, Downsized, 105°C

KMG Series

## ◆STANDARD RATINGS

□ is not solvent resistant.

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C, 120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|--------------------------------------------------------------|--------------------|
| 450         | 2.2         | 10×12.5               | 0.24 | 23                                                           | EKMG451E□□2R2MJC5S |
|             | 3.3         | 10×16                 | 0.24 | 31                                                           | EKMG451E□□3R3MJ16S |
|             | 4.7         | 10×20                 | 0.24 | 40                                                           | EKMG451E□□4R7MJ20S |
|             | 10          | 12.5×20               | 0.24 | 65                                                           | EKMG451E□□100MK20S |
|             | 22          | 16×25                 | 0.24 | 115                                                          | EKMG451E□□220ML25S |
|             | 33          | 16×31.5               | 0.24 | 155                                                          | EKMG451E□□330MLN3S |
|             | 47          | 16×35.5               | 0.24 | 185                                                          | EKMG451E□□470MLP1S |

□□ : Enter the appropriate lead forming or taping code.

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

| Frequency (Hz)   | 50   | 120  | 300  | 1k   | 10k  | 100k |
|------------------|------|------|------|------|------|------|
| Capacitance (μF) |      |      |      |      |      |      |
| 1.0 to 4.7       | 0.65 | 1.00 | 1.35 | 1.75 | 2.30 | 2.50 |
| 10 to 47         | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 |
| 100 to 1,000     | 0.80 | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 |
| 2,200 to         | 0.85 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Bi-polar, 85°C

## SME-BP Series

- Standard Bi-polar type
- Endurance : 2,000 hours at 85°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

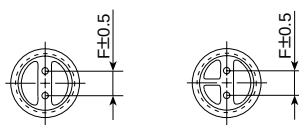
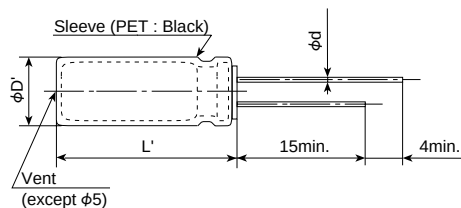


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                        |                                      |      |      |      |      |                            |      |      |      |  |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|----------------------------|------|------|------|--|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                      |                                      |      |      |      |      |                            |      |      |      |  |
| Rated Voltage Range                                    | -40 to +85°C                                                                                                                                                                                                                                                                           |                                      |      |      |      |      |                            |      |      |      |  |
| Capacitance Tolerance                                  | 6.3 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                      |      |      |      |      |                            |      |      |      |  |
| Leakage Current                                        | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                              |                                      |      |      |      |      |                            |      |      |      |  |
| Dissipation Factor (tanδ)                              | I=0.06CV or 10μA, whichever is greater. (at 20°C after 2 minutes)                                                                                                                                                                                                                      |                                      |      |      |      |      |                            |      |      |      |  |
|                                                        | I=0.03CV or 3μA, whichever is greater. (at 20°C after 5 minutes)                                                                                                                                                                                                                       |                                      |      |      |      |      |                            |      |      |      |  |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                                                                                              |                                      |      |      |      |      |                            |      |      |      |  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V                        | 63V  | 80V  | 100V |  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                            | 0.24                                 | 0.24 | 0.20 | 0.20 | 0.16 | 0.14                       | 0.12 | 0.12 | 0.10 |  |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                      |                                      |      |      |      |      |                            |      |      |      |  |
| Endurance                                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V                        | 63V  | 80V  | 100V |  |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | 4                                    | 3    | 2    | 2    | 2    | 2                          | 2    | 2    | 2    |  |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | 10                                   | 8    | 6    | 4    | 3    | 3                          | 3    | 3    | 3    |  |
| Shelf Life                                             | (at 120Hz)                                                                                                                                                                                                                                                                             |                                      |      |      |      |      |                            |      |      |      |  |
|                                                        | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 2,000 hours at 85°C, however the polarization shall be reversed every 250 hours.                                                                       |                                      |      |      |      |      |                            |      |      |      |  |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                          | 6.3 to 16V <sub>dc</sub>             |      |      |      |      | 25 to 100V <sub>dc</sub>   |      |      |      |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±25% of the initial value           |      |      |      |      | ≤±20% of the initial value |      |      |      |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤150% of the initial specified value |      |      |      |      |                            |      |      |      |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |      |      |      |      |                            |      |      |      |  |
|                                                        | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |                            |      |      |      |  |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                          | 6.3 to 16V <sub>dc</sub>             |      |      |      |      | 25 to 100V <sub>dc</sub>   |      |      |      |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±25% of the initial value           |      |      |      |      | ≤±20% of the initial value |      |      |      |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤150% of the initial specified value |      |      |      |      |                            |      |      |      |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |      |      |      |      |                            |      |      |      |  |

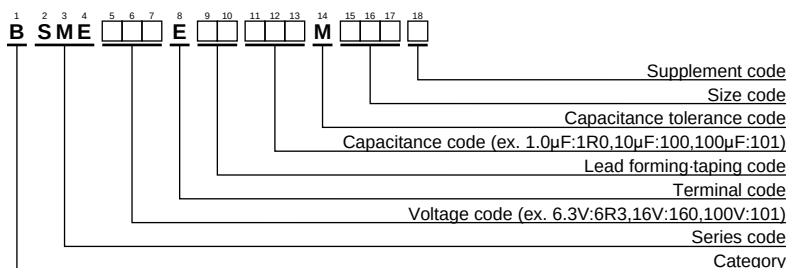
## ◆ DIMENSIONS [mm]

- Terminal Code : E



| φD  | 5          | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
|-----|------------|-----|-----|-----|------|-----|-----|
| φd  | 0.5        | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |
| F   | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| φD' | φD+0.5max. |     |     |     |      |     |     |
| L'  | L+1.5max.  |     |     |     |      |     |     |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"



# SME-BP Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /85°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /85°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|------------------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|------------------------------------------------------------|--------------------|
| 6.3         | 33          | 5×11                  | 0.24 | 64                                                         | BSME6R3E□□330ME11D | 35          | 100         | 10×16                 | 0.16 | 230                                                        | BSME350E□□101MJ16S |
|             | 47          | 5×11                  | 0.24 | 76                                                         | BSME6R3E□□470ME11D |             | 220         | 12.5×20               | 0.16 | 410                                                        | BSME350E□□221MK20S |
|             | 100         | 6.3×11                | 0.24 | 125                                                        | BSME6R3E□□101MF11D |             | 330         | 12.5×20               | 0.16 | 505                                                        | BSME350E□□331MK20S |
|             | 220         | 8×11.5                | 0.24 | 215                                                        | BSME6R3E□□221MHB5D |             | 470         | 12.5×25               | 0.16 | 655                                                        | BSME350E□□471MK25S |
|             | 330         | 8×11.5                | 0.24 | 265                                                        | BSME6R3E□□331MHB5D |             | 1,000       | 16×31.5               | 0.16 | 1,140                                                      | BSME350E□□102MLN3S |
|             | 470         | 10×12.5               | 0.24 | 370                                                        | BSME6R3E□□471MJC5S | 50          | 1.0         | 5×11                  | 0.14 | 17                                                         | BSME500E□□1R0ME11D |
|             | 1,000       | 10×20                 | 0.24 | 650                                                        | BSME6R3E□□102MJ20S |             | 2.2         | 5×11                  | 0.14 | 25                                                         | BSME500E□□2R2ME11D |
|             | 2,200       | 12.5×25               | 0.26 | 1,160                                                      | BSME6R3E□□222MK25S |             | 3.3         | 5×11                  | 0.14 | 27                                                         | BSME500E□□3R3ME11D |
|             | 3,300       | 16×25                 | 0.28 | 1,570                                                      | BSME6R3E□□332ML25S |             | 4.7         | 5×11                  | 0.14 | 34                                                         | BSME500E□□4R7ME11D |
|             | 4,700       | 16×31.5               | 0.30 | 2,020                                                      | BSME6R3E□□472MLN3S |             | 10          | 6.3×11                | 0.14 | 52                                                         | BSME500E□□100MF11D |
|             | 6,800       | 18×35.5               | 0.34 | 2,600                                                      | BSME6R3E□□682MMP1S |             | 22          | 8×11.5                | 0.14 | 89                                                         | BSME500E□□220MHB5D |
| 10          | 22          | 5×11                  | 0.24 | 57                                                         | BSME100E□□220ME11D |             | 33          | 8×11.5                | 0.14 | 105                                                        | BSME500E□□330MHB5D |
|             | 33          | 5×11                  | 0.24 | 64                                                         | BSME100E□□330ME11D |             | 47          | 10×12.5               | 0.14 | 150                                                        | BSME500E□□470MJC5S |
|             | 47          | 5×11                  | 0.24 | 76                                                         | BSME100E□□470ME11D |             | 100         | 10×20                 | 0.14 | 265                                                        | BSME500E□□101MJ20S |
|             | 100         | 6.3×11                | 0.24 | 125                                                        | BSME100E□□101MF11D |             | 220         | 12.5×25               | 0.14 | 480                                                        | BSME500E□□221MK25S |
|             | 220         | 8×11.5                | 0.24 | 215                                                        | BSME100E□□221MHB5D |             | 330         | 16×25                 | 0.14 | 650                                                        | BSME500E□□331ML25S |
|             | 330         | 10×16                 | 0.24 | 345                                                        | BSME100E□□331MJ16S |             | 470         | 16×31.5               | 0.14 | 835                                                        | BSME500E□□471MLN3S |
|             | 470         | 10×16                 | 0.24 | 410                                                        | BSME100E□□471MJ16S | 63          | 3.3         | 5×11                  | 0.12 | 28                                                         | BSME630E□□3R3ME11D |
|             | 1,000       | 12.5×20               | 0.24 | 720                                                        | BSME100E□□102MK20S |             | 4.7         | 6.3×11                | 0.12 | 34                                                         | BSME630E□□4R7MF11D |
| 16          | 2,200       | 16×25                 | 0.26 | 1,280                                                      | BSME100E□□222ML25S |             | 10          | 6.3×11                | 0.12 | 57                                                         | BSME630E□□100MF11D |
|             | 3,300       | 16×31.5               | 0.28 | 1,690                                                      | BSME100E□□332MLN3S |             | 22          | 8×11.5                | 0.12 | 95                                                         | BSME630E□□220MHB5D |
|             | 4,700       | 18×35.5               | 0.30 | 2,160                                                      | BSME100E□□472MMP1S |             | 33          | 10×12.5               | 0.12 | 135                                                        | BSME630E□□330MJC5S |
|             | 10          | 5×11                  | 0.20 | 42                                                         | BSME160E□□100ME11D |             | 47          | 10×16                 | 0.12 | 180                                                        | BSME630E□□470MJ16S |
|             | 22          | 5×11                  | 0.20 | 57                                                         | BSME160E□□220ME11D |             | 100         | 12.5×20               | 0.12 | 320                                                        | BSME630E□□101MK20S |
|             | 33          | 5×11                  | 0.20 | 70                                                         | BSME160E□□330ME11D |             | 220         | 16×25                 | 0.12 | 575                                                        | BSME630E□□221ML25S |
|             | 47          | 6.3×11                | 0.20 | 95                                                         | BSME160E□□470MF11D |             | 330         | 16×31.5               | 0.12 | 655                                                        | BSME630E□□331MLN3S |
|             | 100         | 8×11.5                | 0.20 | 160                                                        | BSME160E□□101MHB5D |             | 470         | 18×35.5               | 0.12 | 965                                                        | BSME630E□□471MMP1S |
| 25          | 220         | 10×12.5               | 0.20 | 275                                                        | BSME160E□□221MJC5S | 80          | 2.2         | 5×11                  | 0.12 | 29                                                         | BSME800E□□2R2ME11D |
|             | 330         | 10×16                 | 0.20 | 375                                                        | BSME160E□□331MJ16S |             | 3.3         | 6.3×11                | 0.12 | 39                                                         | BSME800E□□3R3MF11D |
|             | 470         | 10×20                 | 0.20 | 485                                                        | BSME160E□□471MJ20S |             | 4.7         | 6.3×11                | 0.12 | 47                                                         | BSME800E□□4R7MF11D |
|             | 1,000       | 12.5×25               | 0.20 | 855                                                        | BSME160E□□102MK25S |             | 10          | 8×11.5                | 0.12 | 65                                                         | BSME800E□□100MHB5D |
|             | 2,200       | 16×31.5               | 0.22 | 1,510                                                      | BSME160E□□222MLN3S |             | 22          | 10×16                 | 0.12 | 125                                                        | BSME800E□□220MJ16S |
|             | 3,300       | 18×35.5               | 0.24 | 1,980                                                      | BSME160E□□332MMP1S |             | 33          | 10×16                 | 0.12 | 150                                                        | BSME800E□□330MJ16S |
|             | 10          | 5×11                  | 0.20 | 42                                                         | BSME250E□□100ME11D |             | 47          | 10×20                 | 0.12 | 195                                                        | BSME800E□□470MJ20S |
|             | 22          | 6.3×11                | 0.20 | 65                                                         | BSME250E□□220MF11D | 100         | 100         | 12.5×25               | 0.12 | 350                                                        | BSME800E□□101MK25S |
| 35          | 33          | 6.3×11                | 0.20 | 80                                                         | BSME250E□□330MF11D |             | 220         | 16×31.5               | 0.12 | 615                                                        | BSME800E□□221MLN3S |
|             | 47          | 6.3×11                | 0.20 | 95                                                         | BSME250E□□470MF11D |             | 330         | 18×35.5               | 0.12 | 755                                                        | BSME800E□□331MMP1S |
|             | 100         | 8×11.5                | 0.20 | 160                                                        | BSME250E□□101MHB5D |             | 1.0         | 5×11                  | 0.10 | 21                                                         | BSME101E□□1R0ME11D |
|             | 220         | 10×16                 | 0.20 | 305                                                        | BSME250E□□221MJ16S |             | 2.2         | 6.3×11                | 0.10 | 34                                                         | BSME101E□□2R2MF11D |
|             | 330         | 12.5×20               | 0.20 | 450                                                        | BSME250E□□331MK20S |             | 3.3         | 6.3×11                | 0.10 | 39                                                         | BSME101E□□3R3MF11D |
|             | 470         | 12.5×20               | 0.20 | 540                                                        | BSME250E□□471MK20S |             | 4.7         | 6.3×11                | 0.10 | 47                                                         | BSME101E□□4R7MF11D |
|             | 1,000       | 16×25                 | 0.20 | 950                                                        | BSME250E□□102ML25S |             | 10          | 8×11.5                | 0.10 | 71                                                         | BSME101E□□100MHB5D |
|             | 2,200       | 18×35.5               | 0.22 | 1,620                                                      | BSME250E□□222MMP1S |             | 22          | 10×16                 | 0.10 | 135                                                        | BSME101E□□220MJ16S |
| 35          | 4.7         | 5×11                  | 0.16 | 34                                                         | BSME350E□□4R7ME11D |             | 33          | 12.5×20               | 0.10 | 220                                                        | BSME101E□□330MK20S |
|             | 10          | 5×11                  | 0.16 | 43                                                         | BSME350E□□100ME11D |             | 47          | 12.5×20               | 0.10 | 240                                                        | BSME101E□□470MK20S |
|             | 22          | 6.3×11                | 0.16 | 73                                                         | BSME350E□□220MF11D |             | 100         | 16×25                 | 0.10 | 425                                                        | BSME101E□□101ML25S |
|             | 33          | 8×11.5                | 0.16 | 100                                                        | BSME350E□□330MHB5D |             | 220         | 18×35.5               | 0.10 | 720                                                        | BSME101E□□221MMP1S |
|             | 47          | 8×11.5                | 0.16 | 120                                                        | BSME350E□□470MHB5D |             |             |                       |      |                                                            |                    |

□□ : Enter the appropriate lead forming or taping code.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Bi-polar, 105°C

## KME-BP Series

- Standard Bi-polar type
- Endurance : 1,000 hours at 105°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

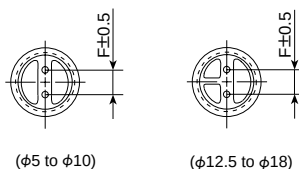
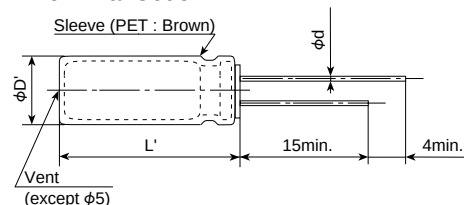


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |                            |      |      |      |  |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|----------------------------|------|------|------|--|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                     |                                      |      |      |      |      |                            |      |      |      |  |
| Rated Voltage Range                                    | -55 to +105°C                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |                            |      |      |      |  |
| Capacitance Tolerance                                  | 6.3 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                             |                                      |      |      |      |      |                            |      |      |      |  |
| Leakage Current                                        | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                             |                                      |      |      |      |      |                            |      |      |      |  |
| Dissipation Factor (tanδ)                              | I=0.06CV or 10μA, whichever is greater. (at 20°C after 2 minutes)                                                                                                                                                                                                                     |                                      |      |      |      |      |                            |      |      |      |  |
|                                                        | I=0.03CV or 3μA, whichever is greater. (at 20°C after 5 minutes)                                                                                                                                                                                                                      |                                      |      |      |      |      |                            |      |      |      |  |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                                                                                             |                                      |      |      |      |      |                            |      |      |      |  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V                        | 63V  | 80V  | 100V |  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.24                                 | 0.24 | 0.20 | 0.20 | 0.16 | 0.14                       | 0.12 | 0.12 | 0.10 |  |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                     |                                      |      |      |      |      |                            |      |      |      |  |
| Endurance                                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V                        | 63V  | 80V  | 100V |  |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 4                                    | 3    | 2    | 2    | 2    | 2                          | 2    | 2    | 2    |  |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 10                                   | 8    | 6    | 4    | 3    | 3                          | 3    | 3    | 3    |  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 1,000 hours at 105°C, however the polarization shall be reversed every 250 hours.                                                                     |                                      |      |      |      |      |                            |      |      |      |  |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                         | 6.3 to 16V <sub>dc</sub>             |      |      |      |      | 25 to 100V <sub>dc</sub>   |      |      |      |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value           |      |      |      |      | ≤±20% of the initial value |      |      |      |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤150% of the initial specified value |      |      |      |      |                            |      |      |      |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |                            |      |      |      |  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |                            |      |      |      |  |
|                                                        | Rated voltage                                                                                                                                                                                                                                                                         | 6.3 to 16V <sub>dc</sub>             |      |      |      |      | 25 to 100V <sub>dc</sub>   |      |      |      |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value           |      |      |      |      | ≤±20% of the initial value |      |      |      |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤150% of the initial specified value |      |      |      |      |                            |      |      |      |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |                            |      |      |      |  |

## ◆DIMENSIONS [mm]

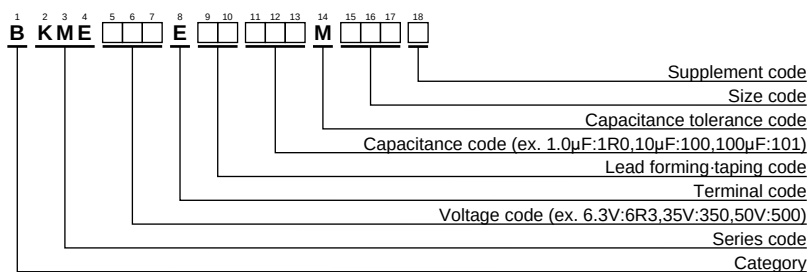
- Terminal Code : E



Gas escape end seal

| φD  | 5          | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
|-----|------------|-----|-----|-----|------|-----|-----|
| φd  | 0.5        | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |
| F   | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| φD' | φD+0.5max. |     |     |     |      |     |     |
| L'  | L+1.5max.  |     |     |     |      |     |     |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"



# KME-BP Series

## ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (mAmps/105°C,120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (mAmps/105°C,120Hz) | Part No.            |
|----------|----------|--------------------|------|------------------------------------------|--------------------|----------|----------|--------------------|------|------------------------------------------|---------------------|
| 6.3      | 33       | 5×11               | 0.24 | 45                                       | BKME6R3E□□330ME11D | 35       | 100      | 10×16              | 0.16 | 160                                      | BKME350E□□101MJ16S  |
|          | 47       | 5×11               | 0.24 | 54                                       | BKME6R3E□□470ME11D |          | 220      | 12.5×20            | 0.16 | 290                                      | BKME350E□□221MK20S  |
|          | 100      | 6.3×11             | 0.24 | 90                                       | BKME6R3E□□101MF11D |          | 330      | 12.5×20            | 0.16 | 350                                      | BKME350E□□331MK20S  |
|          | 220      | 8×11.5             | 0.24 | 150                                      | BKME6R3E□□221MHB5D |          | 470      | 12.5×25            | 0.16 | 465                                      | BKME350E□□471MK25S  |
|          | 330      | 8×11.5             | 0.24 | 185                                      | BKME6R3E□□331MHB5D |          | 1,000    | 16×31.5            | 0.16 | 805                                      | BKME350E□□102MLN3S  |
|          | 470      | 10×12.5            | 0.24 | 260                                      | BKME6R3E□□471MJC5S | 50       | 1.0      | 5×11               | 0.14 | 10                                       | BKME500E□□1R0ME11D  |
|          | 1,000    | 10×20              | 0.24 | 460                                      | BKME6R3E□□102MJ20S |          | 2.2      | 5×11               | 0.14 | 15                                       | BKME500E□□2R2ME11D  |
|          | 2,200    | 12.5×25            | 0.26 | 820                                      | BKME6R3E□□222MK25S |          | 3.3      | 5×11               | 0.14 | 18                                       | BKME500E□□3R3ME11D  |
|          | 3,300    | 16×25              | 0.28 | 1,110                                    | BKME6R3E□□332ML25S |          | 4.7      | 5×11               | 0.14 | 22                                       | BKME500E□□4R7ME11D  |
|          | 4,700    | 16×31.5            | 0.30 | 1,430                                    | BKME6R3E□□472MLN3S |          | 10       | 6.3×11             | 0.14 | 37                                       | BKME500E□□100MF11D  |
|          | 6,800    | 18×35.5            | 0.34 | 1,830                                    | BKME6R3E□□682MMP1S |          | 22       | 8×11.5             | 0.14 | 63                                       | BKME500E□□220MHB5D  |
| 10       | 22       | 5×11               | 0.24 | 37                                       | BKME100E□□220ME11D |          | 33       | 8×11.5             | 0.14 | 77                                       | BKME500E□□330MHB5D  |
|          | 33       | 5×11               | 0.24 | 45                                       | BKME100E□□330ME11D |          | 47       | 10×12.5            | 0.14 | 105                                      | BKME500E□□470MJC5S  |
|          | 47       | 5×11               | 0.24 | 54                                       | BKME100E□□470ME11D |          | 100      | 10×20              | 0.14 | 190                                      | BKME500E□□101MJ20S  |
|          | 100      | 6.3×11             | 0.24 | 90                                       | BKME100E□□101MF11D |          | 220      | 12.5×25            | 0.14 | 340                                      | BKME500E□□221MK25S  |
|          | 220      | 8×11.5             | 0.24 | 150                                      | BKME100E□□221MHB5D |          | 330      | 16×25              | 0.14 | 460                                      | BKME500E□□331ML25S  |
|          | 330      | 10×16              | 0.24 | 240                                      | BKME100E□□331MJ16S |          | 470      | 16×31.5            | 0.14 | 590                                      | BKME500E□□471MLN3S  |
|          | 470      | 10×16              | 0.24 | 290                                      | BKME100E□□471MJ16S | 63       | 3.3      | 5×11               | 0.12 | 20                                       | BKME630E□□3R3ME11D  |
|          | 1,000    | 12.5×20            | 0.24 | 510                                      | BKME100E□□102MK20S |          | 4.7      | 6.3×11             | 0.12 | 24                                       | BKME630E□□4R7MF11D  |
|          | 2,200    | 16×25              | 0.26 | 910                                      | BKME100E□□222ML25S |          | 10       | 6.3×11             | 0.12 | 40                                       | BKME630E□□100MF11D  |
|          | 3,300    | 16×31.5            | 0.28 | 1,200                                    | BKME100E□□332MLN3S |          | 22       | 8×11.5             | 0.12 | 68                                       | BKME630E□□220MHB5D  |
|          | 4,700    | 18×35.5            | 0.30 | 1,520                                    | BKME100E□□472MMP1S |          | 33       | 10×12.5            | 0.12 | 98                                       | BKME630E□□330MJC5S  |
| 16       | 10       | 5×11               | 0.20 | 27                                       | BKME160E□□100ME11D |          | 47       | 10×16              | 0.12 | 130                                      | BKME630E□□470MJ16S  |
|          | 22       | 5×11               | 0.20 | 40                                       | BKME160E□□220ME11D |          | 100      | 12.5×20            | 0.12 | 225                                      | BKME630E□□101MK20S  |
|          | 33       | 5×11               | 0.20 | 49                                       | BKME160E□□330ME11D |          | 220      | 16×25              | 0.12 | 405                                      | BKME630E□□221ML25S  |
|          | 47       | 6.3×11             | 0.20 | 67                                       | BKME160E□□470MF11D |          | 330      | 16×31.5            | 0.12 | 535                                      | BKME630E□□331MLN3S  |
|          | 100      | 8×11.5             | 0.20 | 110                                      | BKME160E□□101MHB5D |          | 470      | 18×35.5            | 0.12 | 680                                      | BKME630E□□471MMP1S  |
|          | 220      | 10×12.5            | 0.20 | 195                                      | BKME160E□□221MJC5S | 80       | 2.2      | 5×11               | 0.12 | 16                                       | BKME800E□□2R2ME11D  |
|          | 330      | 10×16              | 0.20 | 265                                      | BKME160E□□331MJ16S |          | 3.3      | 6.3×11             | 0.12 | 23                                       | BKME800E□□3R3MF11D  |
|          | 470      | 10×20              | 0.20 | 345                                      | BKME160E□□471MJ20S |          | 4.7      | 6.3×11             | 0.12 | 27                                       | BKME800E□□4R7MF11D  |
|          | 1,000    | 12.5×25            | 0.20 | 605                                      | BKME160E□□102MK25S |          | 10       | 8×11.5             | 0.12 | 46                                       | BKME800E□□100MHB5D  |
|          | 2,200    | 16×31.5            | 0.22 | 1,070                                    | BKME160E□□222MLN3S |          | 22       | 10×16              | 0.12 | 89                                       | BKME800E□□220MJ16S  |
|          | 3,300    | 18×35.5            | 0.24 | 1,400                                    | BKME160E□□332MMP1S |          | 33       | 10×16              | 0.12 | 105                                      | BKME800E□□330MJ16S  |
| 25       | 10       | 5×11               | 0.20 | 27                                       | BKME250E□□100ME11D |          | 47       | 10×20              | 0.12 | 140                                      | BKME800E□□470MJC20S |
|          | 22       | 6.3×11             | 0.20 | 46                                       | BKME250E□□220MF11D |          | 100      | 12.5×25            | 0.12 | 245                                      | BKME800E□□101MK25S  |
|          | 33       | 6.3×11             | 0.20 | 56                                       | BKME250E□□330MF11D |          | 220      | 16×31.5            | 0.12 | 435                                      | BKME800E□□221MLN3S  |
|          | 47       | 6.3×11             | 0.20 | 67                                       | BKME250E□□470MF11D |          | 330      | 18×35.5            | 0.12 | 570                                      | BKME800E□□331MMP1S  |
|          | 100      | 8×11.5             | 0.20 | 110                                      | BKME250E□□101MHB5D | 100      | 1.0      | 5×11               | 0.10 | 12                                       | BKME101E□□1R0ME11D  |
|          | 220      | 10×16              | 0.20 | 215                                      | BKME250E□□221MJ16S |          | 2.2      | 6.3×11             | 0.10 | 20                                       | BKME101E□□2R2MF11D  |
|          | 330      | 12.5×20            | 0.20 | 320                                      | BKME250E□□331MK20S |          | 3.3      | 6.3×11             | 0.10 | 25                                       | BKME101E□□3R3MF11D  |
|          | 470      | 12.5×20            | 0.20 | 380                                      | BKME250E□□471MK20S |          | 4.7      | 6.3×11             | 0.10 | 30                                       | BKME101E□□4R7MF11D  |
|          | 1,000    | 16×25              | 0.20 | 670                                      | BKME250E□□102ML25S |          | 10       | 8×11.5             | 0.10 | 50                                       | BKME101E□□100MHB5D  |
|          | 2,200    | 18×35.5            | 0.22 | 1,140                                    | BKME250E□□222MMP1S |          | 22       | 10×16              | 0.10 | 97                                       | BKME101E□□220MJ16S  |
| 35       | 4.7      | 5×11               | 0.16 | 21                                       | BKME350E□□4R7ME11D |          | 33       | 12.5×20            | 0.10 | 140                                      | BKME101E□□330MK20S  |
|          | 10       | 5×11               | 0.16 | 30                                       | BKME350E□□100ME11D |          | 47       | 12.5×20            | 0.10 | 170                                      | BKME101E□□470MK20S  |
|          | 22       | 6.3×11             | 0.16 | 51                                       | BKME350E□□220MF11D |          | 100      | 16×25              | 0.10 | 300                                      | BKME101E□□101ML25S  |
|          | 33       | 8×11.5             | 0.16 | 72                                       | BKME350E□□330MHB5D |          | 220      | 18×35.5            | 0.10 | 510                                      | BKME101E□□221MMP1S  |
|          | 47       | 8×11.5             | 0.16 | 86                                       | BKME350E□□470MHB5D |          |          |                    |      |                                          |                     |

□□ : Enter the appropriate lead forming or taping code.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

# KZM Series

- Long-Life version of KZH series
- Endurance with ripple current : 6,000 to 10,000 hours at 105°C
- Newly innovative electrolyte is employed to minimize ESR
- Rated voltage range : 6.3 to 50V<sub>dc</sub>, Nominal capacitance range : 27 to 10,000μF
- Non solvent resistant type
- RoHS Compliant

KZM

Longer life  
KZH  
Lower Z  
KZE

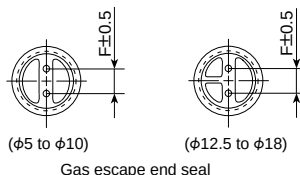
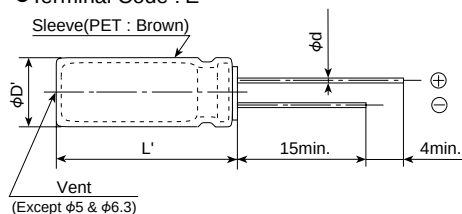


## SPECIFICATIONS

| Items                           | Characteristics                                                                                                                                                                                                                                                                       |                                                                 |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Category                        | -40 to +105°C                                                                                                                                                                                                                                                                         |                                                                 |
| Temperature Range               |                                                                                                                                                                                                                                                                                       |                                                                 |
| Rated Voltage Range             | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                                                 |
| Capacitance Tolerance           | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                             |                                                                 |
| Leakage Current                 | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                         |                                                                 |
| Dissipation Factor (tanδ)       | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V 10V 16V 25V 35V 50V                                        |
|                                 | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.22 0.19 0.16 0.14 0.12 0.10                                   |
|                                 | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                     |                                                                 |
| Low Temperature Characteristics | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 2 max.                                                          |
|                                 | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 3 max. (at 120Hz)                                               |
| Endurance                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for the specified period of time at 105°C.                                                                            |                                                                 |
|                                 | Time                                                                                                                                                                                                                                                                                  | φ5 & φ6.3 : 6,000hours φ8 : 8,000hours φ10 to φ18 : 10,000hours |
|                                 | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value (6.3, 10V <sub>dc</sub> : ≤±30%)     |
|                                 | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value                            |
|                                 | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value                                    |
| Shelf Life                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                                 |
|                                 | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value (6.3, 10V <sub>dc</sub> : ≤±30%)     |
|                                 | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value                            |
|                                 | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value                                    |

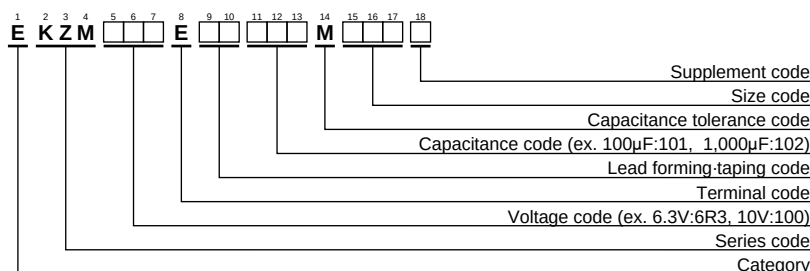
## DIMENSIONS [mm]

- Terminal Code : E



| φD  | 5          | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
|-----|------------|-----|-----|-----|------|-----|-----|
| φd  | 0.5        | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |
| F   | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| φD' | φD+0.5max. |     |     |     |      |     |     |
| L'  | L+1.5max.  |     |     |     |      |     |     |

## PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

## RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Capacitance (μF) | Frequency (Hz) |      |      |      |
|------------------|----------------|------|------|------|
|                  | 120            | 1k   | 10k  | 100k |
| 27 to 180        | 0.40           | 0.75 | 0.90 | 1.00 |
| 220 to 560       | 0.50           | 0.85 | 0.94 | 1.00 |
| 680 to 1,800     | 0.60           | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,900   | 0.75           | 0.90 | 0.95 | 1.00 |
| 4,700 to 10,000  | 0.85           | 0.95 | 0.98 | 1.00 |

Note : The endurance of capacitors is reduced with internal heating produced by ripple currents at the rate of halving the lifetime with every 5°C rise.  
When long life performance is required in actual use, the rms ripple current has to be reduced.


**KZM** Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Impedance<br>(Ωmax/100kHz) |       | Rated ripple current<br>(mA rms/105°C, 100kHz) | Part No.           |
|-------------|-------------|-----------------------|------|----------------------------|-------|------------------------------------------------|--------------------|
|             |             |                       |      | 20°C                       | -10°C |                                                |                    |
| 6.3         | 220         | 5 × 11                | 0.22 | 0.22                       | 0.80  | 345                                            | EKZM6R3E□□221ME11D |
|             | 470         | 6.3 × 11              | 0.22 | 0.094                      | 0.35  | 540                                            | EKZM6R3E□□471MF11D |
|             | 820         | 8 × 11.5              | 0.22 | 0.056                      | 0.19  | 945                                            | EKZM6R3E□□821MHB5D |
|             | 1,200       | 8 × 15                | 0.22 | 0.045                      | 0.15  | 1,250                                          | EKZM6R3E□□122MH15D |
|             | 1,200       | 10 × 12.5             | 0.22 | 0.039                      | 0.14  | 1,330                                          | EKZM6R3E□□122MJC5S |
|             | 1,500       | 8 × 20                | 0.22 | 0.029                      | 0.11  | 1,500                                          | EKZM6R3E□□152MH20D |
|             | 1,800       | 10 × 16               | 0.22 | 0.028                      | 0.10  | 1,760                                          | EKZM6R3E□□182MJ16S |
|             | 2,200       | 10 × 20               | 0.24 | 0.020                      | 0.060 | 1,960                                          | EKZM6R3E□□222MJ20S |
|             | 2,700       | 10 × 25               | 0.24 | 0.018                      | 0.054 | 2,250                                          | EKZM6R3E□□272MJ25S |
|             | 3,900       | 12.5 × 20             | 0.26 | 0.017                      | 0.043 | 2,480                                          | EKZM6R3E□□392MK20S |
|             | 4,700       | 12.5 × 25             | 0.28 | 0.015                      | 0.038 | 2,900                                          | EKZM6R3E□□472MK25S |
|             | 5,600       | 12.5 × 30             | 0.30 | 0.013                      | 0.033 | 3,450                                          | EKZM6R3E□□562MK30S |
|             | 6,800       | 12.5 × 35             | 0.32 | 0.012                      | 0.031 | 3,570                                          | EKZM6R3E□□682MK35S |
| 10          | 150         | 5 × 11                | 0.19 | 0.22                       | 0.80  | 345                                            | EKZM100E□□151ME11D |
|             | 330         | 6.3 × 11              | 0.19 | 0.094                      | 0.35  | 540                                            | EKZM100E□□331MF11D |
|             | 680         | 8 × 11.5              | 0.19 | 0.056                      | 0.19  | 945                                            | EKZM100E□□681MHB5D |
|             | 1,000       | 8 × 15                | 0.19 | 0.045                      | 0.15  | 1,250                                          | EKZM100E□□102MH15D |
|             | 1,000       | 10 × 12.5             | 0.19 | 0.039                      | 0.14  | 1,330                                          | EKZM100E□□102MJC5S |
|             | 1,500       | 8 × 20                | 0.19 | 0.029                      | 0.11  | 1,500                                          | EKZM100E□□152MH20D |
|             | 1,500       | 10 × 16               | 0.19 | 0.028                      | 0.10  | 1,760                                          | EKZM100E□□152MJ16S |
|             | 1,800       | 10 × 20               | 0.19 | 0.020                      | 0.060 | 1,960                                          | EKZM100E□□182MJ20S |
|             | 2,200       | 10 × 25               | 0.21 | 0.018                      | 0.054 | 2,250                                          | EKZM100E□□222MJ25S |
|             | 3,300       | 12.5 × 20             | 0.23 | 0.017                      | 0.043 | 2,480                                          | EKZM100E□□332MK20S |
|             | 3,900       | 12.5 × 25             | 0.23 | 0.015                      | 0.038 | 2,900                                          | EKZM100E□□392MK25S |
|             | 4,700       | 12.5 × 30             | 0.25 | 0.013                      | 0.033 | 3,450                                          | EKZM100E□□472MK30S |
|             | 4,700       | 16 × 20               | 0.25 | 0.015                      | 0.038 | 3,250                                          | EKZM100E□□472ML20S |
| 16          | 5,600       | 12.5 × 35             | 0.27 | 0.012                      | 0.031 | 3,570                                          | EKZM100E□□562MK35S |
|             | 6,800       | 16 × 25               | 0.29 | 0.013                      | 0.035 | 3,630                                          | EKZM100E□□682ML25S |
|             | 8,200       | 18 × 25               | 0.33 | 0.012                      | 0.031 | 3,650                                          | EKZM100E□□822MM25S |
|             | 100         | 5 × 11                | 0.16 | 0.22                       | 0.80  | 345                                            | EKZM160E□□101ME11D |
|             | 220         | 6.3 × 11              | 0.16 | 0.094                      | 0.35  | 540                                            | EKZM160E□□221MF11D |
|             | 470         | 8 × 11.5              | 0.16 | 0.056                      | 0.19  | 945                                            | EKZM160E□□471MHB5D |
|             | 680         | 8 × 15                | 0.16 | 0.045                      | 0.15  | 1,250                                          | EKZM160E□□681MH15D |
|             | 680         | 10 × 12.5             | 0.16 | 0.039                      | 0.14  | 1,330                                          | EKZM160E□□681MJC5S |
|             | 1,000       | 8 × 20                | 0.16 | 0.029                      | 0.11  | 1,500                                          | EKZM160E□□102MH20D |
|             | 1,000       | 10 × 16               | 0.16 | 0.028                      | 0.10  | 1,760                                          | EKZM160E□□102MJ16S |
|             | 1,500       | 10 × 20               | 0.16 | 0.020                      | 0.060 | 1,960                                          | EKZM160E□□152MJ20S |
|             | 1,800       | 10 × 25               | 0.16 | 0.018                      | 0.054 | 2,250                                          | EKZM160E□□182MJ25S |
|             | 2,200       | 12.5 × 20             | 0.18 | 0.017                      | 0.043 | 2,480                                          | EKZM160E□□222MK20S |
|             | 2,700       | 12.5 × 25             | 0.18 | 0.015                      | 0.038 | 2,900                                          | EKZM160E□□272MK25S |
|             | 3,300       | 12.5 × 30             | 0.20 | 0.013                      | 0.033 | 3,450                                          | EKZM160E□□332MK30S |
|             | 3,300       | 16 × 20               | 0.20 | 0.015                      | 0.038 | 3,250                                          | EKZM160E□□332ML20S |
|             | 3,900       | 12.5 × 35             | 0.20 | 0.012                      | 0.031 | 3,570                                          | EKZM160E□□392MK35S |
|             | 4,700       | 16 × 25               | 0.22 | 0.013                      | 0.035 | 3,630                                          | EKZM160E□□472ML25S |
|             | 5,600       | 18 × 25               | 0.24 | 0.012                      | 0.031 | 3,650                                          | EKZM160E□□562MM25S |

□□ : Enter the appropriate lead forming or taping code.


**KZM** Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Impedance<br>(Ωmax/100kHz) |       | Rated ripple current<br>(mA rms/105°C, 100kHz) | Part No.           |
|-------------|-------------|-----------------------|------|----------------------------|-------|------------------------------------------------|--------------------|
|             |             |                       |      | 20°C                       | -10°C |                                                |                    |
| 25          | 68          | 5 × 11                | 0.14 | 0.22                       | 0.80  | 345                                            | EKZM250E□□680ME11D |
|             | 150         | 6.3 × 11              | 0.14 | 0.094                      | 0.35  | 540                                            | EKZM250E□□151MF11D |
|             | 330         | 8 × 11.5              | 0.14 | 0.056                      | 0.19  | 945                                            | EKZM250E□□331MHB5D |
|             | 390         | 8 × 15                | 0.14 | 0.045                      | 0.15  | 1,250                                          | EKZM250E□□391MH15D |
|             | 470         | 10 × 12.5             | 0.14 | 0.039                      | 0.14  | 1,330                                          | EKZM250E□□471MJC5S |
|             | 560         | 8 × 20                | 0.14 | 0.029                      | 0.11  | 1,500                                          | EKZM250E□□561MH20D |
|             | 680         | 10 × 16               | 0.14 | 0.028                      | 0.10  | 1,760                                          | EKZM250E□□681MJ16S |
|             | 820         | 10 × 20               | 0.14 | 0.020                      | 0.060 | 1,960                                          | EKZM250E□□821MJ20S |
|             | 1,000       | 10 × 25               | 0.14 | 0.018                      | 0.054 | 2,250                                          | EKZM250E□□102MJ25S |
|             | 1,500       | 12.5 × 20             | 0.14 | 0.017                      | 0.043 | 2,480                                          | EKZM250E□□152MK20S |
|             | 1,800       | 12.5 × 25             | 0.14 | 0.015                      | 0.038 | 2,900                                          | EKZM250E□□182MK25S |
|             | 2,200       | 12.5 × 30             | 0.16 | 0.013                      | 0.033 | 3,450                                          | EKZM250E□□222MK30S |
|             | 2,200       | 16 × 20               | 0.16 | 0.015                      | 0.038 | 3,250                                          | EKZM250E□□222ML20S |
|             | 2,700       | 12.5 × 35             | 0.16 | 0.012                      | 0.031 | 3,570                                          | EKZM250E□□272MK35S |
| 35          | 3,300       | 16 × 25               | 0.18 | 0.013                      | 0.035 | 3,630                                          | EKZM250E□□332ML25S |
|             | 3,900       | 18 × 25               | 0.18 | 0.012                      | 0.031 | 3,650                                          | EKZM250E□□392MM25S |
|             | 47          | 5 × 11                | 0.12 | 0.22                       | 0.80  | 345                                            | EKZM350E□□470ME11D |
|             | 100         | 6.3 × 11              | 0.12 | 0.094                      | 0.35  | 540                                            | EKZM350E□□101MF11D |
|             | 220         | 8 × 11.5              | 0.12 | 0.056                      | 0.19  | 945                                            | EKZM350E□□221MHB5D |
|             | 270         | 8 × 15                | 0.12 | 0.045                      | 0.15  | 1,250                                          | EKZM350E□□271MH15D |
|             | 330         | 10 × 12.5             | 0.12 | 0.039                      | 0.14  | 1,330                                          | EKZM350E□□331MJC5S |
|             | 390         | 8 × 20                | 0.12 | 0.029                      | 0.11  | 1,500                                          | EKZM350E□□391MH20D |
|             | 470         | 10 × 16               | 0.12 | 0.028                      | 0.10  | 1,760                                          | EKZM350E□□471MJ16S |
|             | 560         | 10 × 20               | 0.12 | 0.020                      | 0.060 | 1,960                                          | EKZM350E□□561MJ20S |
|             | 680         | 10 × 25               | 0.12 | 0.018                      | 0.054 | 2,250                                          | EKZM350E□□681MJ25S |
|             | 1,000       | 12.5 × 20             | 0.12 | 0.017                      | 0.043 | 2,480                                          | EKZM350E□□102MK20S |
|             | 1,200       | 12.5 × 25             | 0.12 | 0.015                      | 0.038 | 2,900                                          | EKZM350E□□122MK25S |
|             | 1,500       | 12.5 × 30             | 0.12 | 0.013                      | 0.033 | 3,450                                          | EKZM350E□□152MK30S |
| 50          | 1,500       | 16 × 20               | 0.12 | 0.015                      | 0.038 | 3,250                                          | EKZM350E□□152ML20S |
|             | 1,800       | 12.5 × 35             | 0.12 | 0.012                      | 0.031 | 3,570                                          | EKZM350E□□182MK35S |
|             | 2,200       | 16 × 25               | 0.14 | 0.013                      | 0.035 | 3,630                                          | EKZM350E□□222ML25S |
|             | 2,700       | 18 × 25               | 0.14 | 0.012                      | 0.031 | 3,650                                          | EKZM350E□□272MM25S |
|             | 27          | 5 × 11                | 0.10 | 0.34                       | 1.18  | 238                                            | EKZM500E□□270ME11D |
|             | 56          | 6.3 × 11              | 0.10 | 0.14                       | 0.50  | 385                                            | EKZM500E□□560MF11D |
|             | 100         | 8 × 11.5              | 0.10 | 0.074                      | 0.22  | 724                                            | EKZM500E□□101MHB5D |
|             | 120         | 8 × 15                | 0.10 | 0.061                      | 0.18  | 950                                            | EKZM500E□□121MH15D |
|             | 150         | 10 × 12.5             | 0.10 | 0.061                      | 0.18  | 979                                            | EKZM500E□□151MJC5S |
|             | 180         | 8 × 20                | 0.10 | 0.046                      | 0.14  | 1,190                                          | EKZM500E□□181MH20D |
|             | 220         | 10 × 16               | 0.10 | 0.042                      | 0.12  | 1,370                                          | EKZM500E□□221MJ16S |
|             | 270         | 10 × 20               | 0.10 | 0.030                      | 0.090 | 1,580                                          | EKZM500E□□271MJ20S |
|             | 330         | 10 × 25               | 0.10 | 0.028                      | 0.085 | 1,870                                          | EKZM500E□□331MJ25S |
|             | 470         | 12.5 × 20             | 0.10 | 0.027                      | 0.068 | 2,050                                          | EKZM500E□□471MK20S |
|             | 560         | 12.5 × 25             | 0.10 | 0.023                      | 0.059 | 2,410                                          | EKZM500E□□561MK25S |
|             | 680         | 12.5 × 30             | 0.10 | 0.021                      | 0.052 | 2,860                                          | EKZM500E□□681MK30S |
|             | 820         | 12.5 × 35             | 0.10 | 0.019                      | 0.051 | 2,960                                          | EKZM500E□□821MK35S |
|             | 820         | 16 × 20               | 0.10 | 0.023                      | 0.059 | 2,730                                          | EKZM500E□□821ML20S |
|             | 1,000       | 16 × 25               | 0.10 | 0.021                      | 0.056 | 3,010                                          | EKZM500E□□102ML25S |
|             | 1,500       | 18 × 25               | 0.10 | 0.019                      | 0.051 | 3,290                                          | EKZM500E□□152MM25S |

□□ : Enter the appropriate lead forming or taping code.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

# KZH Series

- Ultra Low impedance for Personal Computers Storage Equipment
- Endurance with ripple current: 5,000 to 6,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

KZM  
↑ Longer life  
**KZH**  
↑ Lower Z  
KZE

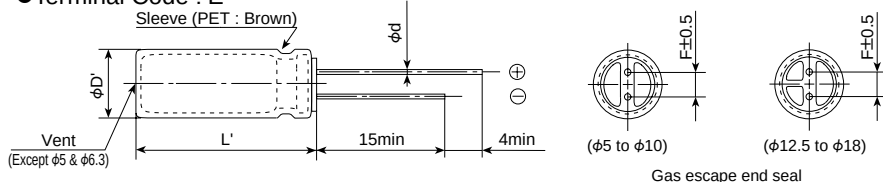


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                                             |      |      |      |      |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------|------|------|------|
| Category                                               |                                                                                                                                                                                                                                                                                       |                                                             |      |      |      |      |
| Temperature Range                                      | -40 to +105°C                                                                                                                                                                                                                                                                         |                                                             |      |      |      |      |
| Rated Voltage Range                                    | 6.3 to 35V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                                             |      |      |      |      |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                             |                                                             |      |      |      |      |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                         |                                                             |      |      |      |      |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                                        | 10V  | 16V  | 25V  | 35V  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.22                                                        | 0.19 | 0.16 | 0.14 | 0.12 |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                     |                                                             |      |      |      |      |
| Low Temperature Characteristics (Max. Impedance Ratio) | Z (-25°C) / Z (+20°C)                                                                                                                                                                                                                                                                 | 2max.                                                       |      |      |      |      |
|                                                        | Z (-40°C) / Z (+20°C)                                                                                                                                                                                                                                                                 | 3max.                                                       |      |      |      |      |
|                                                        | (at 120Hz)                                                                                                                                                                                                                                                                            |                                                             |      |      |      |      |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for the specified period of time at 105°C.                                                                            |                                                             |      |      |      |      |
|                                                        | Time                                                                                                                                                                                                                                                                                  | φ5 & φ6.3 : 5,000hours φ8 to φ16 : 6,000hours               |      |      |      |      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value (6.3, 10V <sub>dc</sub> : ≤±30%) |      |      |      |      |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value                        |      |      |      |      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value                                |      |      |      |      |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                             |      |      |      |      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value (6.3, 10V <sub>dc</sub> : ≤±30%) |      |      |      |      |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value                        |      |      |      |      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value                                |      |      |      |      |

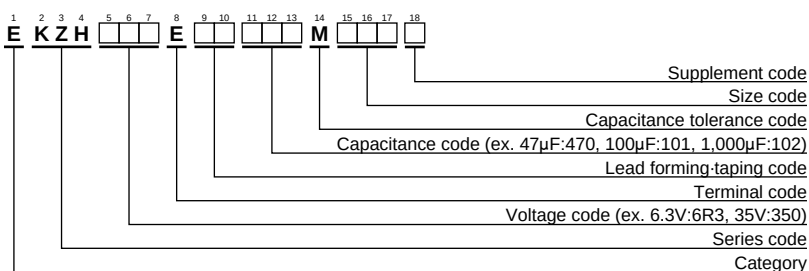
## ◆DIMENSIONS [mm]

## ●Terminal Code : E



| φD  | 5          | 6.3 | 8   | 10  | 12.5 | 16  |
|-----|------------|-----|-----|-----|------|-----|
| φd  | 0.5        | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 |
| F   | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 |
| φD' | φD+0.5max. |     |     |     |      |     |
| L'  | L+1.5max.  |     |     |     |      |     |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"



## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/100kHz) |       | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------|-------|------------------------------------------------------------|--------------------|
|             |             |                       | 20°C                       | -10°C |                                                            |                    |
| 6.3         | 220         | 5×11                  | 0.24                       | 0.80  | 330                                                        | EKZH6R3E□□221ME11D |
|             | 470         | 6.3×11                | 0.11                       | 0.35  | 500                                                        | EKZH6R3E□□471MF11D |
|             | 820         | 8×11.5                | 0.062                      | 0.19  | 900                                                        | EKZH6R3E□□821MHB5D |
|             | 1,200       | 8×15                  | 0.048                      | 0.15  | 1,210                                                      | EKZH6R3E□□122MH15D |
|             | 1,200       | 10×12.5               | 0.045                      | 0.14  | 1,240                                                      | EKZH6R3E□□122MJC5S |
|             | 1,500       | 8×20                  | 0.033                      | 0.11  | 1,410                                                      | EKZH6R3E□□152MH20D |
|             | 1,800       | 10×16                 | 0.032                      | 0.10  | 1,650                                                      | EKZH6R3E□□182MJ16S |
|             | 2,200       | 10×20                 | 0.020                      | 0.060 | 1,960                                                      | EKZH6R3E□□222MJ20S |
|             | 2,700       | 10×25                 | 0.018                      | 0.054 | 2,250                                                      | EKZH6R3E□□272MJ25S |
|             | 3,900       | 12.5×20               | 0.017                      | 0.043 | 2,480                                                      | EKZH6R3E□□392MK20S |
|             | 4,700       | 12.5×25               | 0.015                      | 0.038 | 2,900                                                      | EKZH6R3E□□472MK25S |
|             | 5,600       | 12.5×30               | 0.013                      | 0.033 | 3,450                                                      | EKZH6R3E□□562MK30S |
|             | 6,800       | 12.5×35               | 0.012                      | 0.031 | 3,570                                                      | EKZH6R3E□□682MK35S |
|             | 6,800       | 16×20                 | 0.015                      | 0.038 | 3,250                                                      | EKZH6R3E□□682ML20S |
|             | 8,200       | 16×25                 | 0.013                      | 0.035 | 3,630                                                      | EKZH6R3E□□822ML25S |
| 10          | 150         | 5×11                  | 0.24                       | 0.80  | 330                                                        | EKZH100E□□151ME11D |
|             | 330         | 6.3×11                | 0.11                       | 0.35  | 500                                                        | EKZH100E□□331MF11D |
|             | 680         | 8×11.5                | 0.062                      | 0.19  | 900                                                        | EKZH100E□□681MHB5D |
|             | 1,000       | 8×15                  | 0.048                      | 0.15  | 1,210                                                      | EKZH100E□□102MH15D |
|             | 1,000       | 10×12.5               | 0.045                      | 0.14  | 1,240                                                      | EKZH100E□□102MJC5S |
|             | 1,500       | 8×20                  | 0.033                      | 0.11  | 1,410                                                      | EKZH100E□□152MH20D |
|             | 1,500       | 10×16                 | 0.032                      | 0.10  | 1,650                                                      | EKZH100E□□152MJ16S |
|             | 1,800       | 10×20                 | 0.020                      | 0.060 | 1,960                                                      | EKZH100E□□182MJ20S |
|             | 2,200       | 10×25                 | 0.018                      | 0.054 | 2,250                                                      | EKZH100E□□222MJ25S |
|             | 3,300       | 12.5×20               | 0.017                      | 0.043 | 2,480                                                      | EKZH100E□□332MK20S |
|             | 3,900       | 12.5×25               | 0.015                      | 0.038 | 2,900                                                      | EKZH100E□□392MK25S |
|             | 4,700       | 12.5×30               | 0.013                      | 0.033 | 3,450                                                      | EKZH100E□□472MK30S |
|             | 4,700       | 16×20                 | 0.015                      | 0.038 | 3,250                                                      | EKZH100E□□472ML20S |
|             | 5,600       | 12.5×35               | 0.012                      | 0.031 | 3,570                                                      | EKZH100E□□562MK35S |
|             | 6,800       | 16×25                 | 0.013                      | 0.035 | 3,630                                                      | EKZH100E□□682ML25S |
| 16          | 100         | 5×11                  | 0.24                       | 0.80  | 330                                                        | EKZH160E□□101ME11D |
|             | 220         | 6.3×11                | 0.11                       | 0.35  | 500                                                        | EKZH160E□□221MF11D |
|             | 470         | 8×11.5                | 0.062                      | 0.19  | 900                                                        | EKZH160E□□471MHB5D |
|             | 680         | 8×15                  | 0.048                      | 0.15  | 1,210                                                      | EKZH160E□□681MH15D |
|             | 680         | 10×12.5               | 0.045                      | 0.14  | 1,240                                                      | EKZH160E□□681MJC5S |
|             | 1,000       | 8×20                  | 0.033                      | 0.11  | 1,410                                                      | EKZH160E□□102MH20D |
|             | 1,000       | 10×16                 | 0.032                      | 0.10  | 1,650                                                      | EKZH160E□□102MJ16S |
|             | 1,500       | 10×20                 | 0.020                      | 0.060 | 1,960                                                      | EKZH160E□□152MJ20S |
| 25          | 1,800       | 10×25                 | 0.018                      | 0.054 | 2,250                                                      | EKZH160E□□182MJ25S |
|             | 2,200       | 12.5×20               | 0.017                      | 0.043 | 2,480                                                      | EKZH160E□□222MK20S |
|             | 2,700       | 12.5×25               | 0.015                      | 0.038 | 2,900                                                      | EKZH160E□□272MK25S |
|             | 3,300       | 12.5×30               | 0.013                      | 0.033 | 3,450                                                      | EKZH160E□□332MK30S |
|             | 3,900       | 12.5×35               | 0.012                      | 0.031 | 3,570                                                      | EKZH160E□□392MK35S |
|             | 4,700       | 16×20                 | 0.015                      | 0.038 | 3,250                                                      | EKZH160E□□472ML20S |
|             | 5,600       | 16×25                 | 0.013                      | 0.035 | 3,630                                                      | EKZH160E□□562ML25S |
|             | 6,800       | 16×25                 | 0.013                      | 0.035 | 3,630                                                      | EKZH160E□□682ML25S |
| 35          | 47          | 5×11                  | 0.24                       | 0.80  | 330                                                        | EKZH350E□□470ME11D |
|             | 100         | 6.3×11                | 0.11                       | 0.35  | 500                                                        | EKZH350E□□101MF11D |
|             | 220         | 8×11.5                | 0.062                      | 0.19  | 900                                                        | EKZH350E□□221MHB5D |
|             | 270         | 8×15                  | 0.048                      | 0.15  | 1,210                                                      | EKZH350E□□271MH15D |
|             | 330         | 10×12.5               | 0.045                      | 0.14  | 1,240                                                      | EKZH350E□□331MJC5S |
|             | 390         | 8×20                  | 0.033                      | 0.11  | 1,410                                                      | EKZH350E□□391MH20D |
|             | 470         | 10×16                 | 0.032                      | 0.10  | 1,650                                                      | EKZH350E□□471MJ16S |
|             | 560         | 10×20                 | 0.020                      | 0.060 | 1,960                                                      | EKZH350E□□561MJ20S |
|             | 680         | 10×25                 | 0.018                      | 0.054 | 2,250                                                      | EKZH350E□□681MJ25S |
|             | 1,000       | 12.5×20               | 0.017                      | 0.043 | 2,480                                                      | EKZH350E□□102MK20S |
|             | 1,200       | 12.5×25               | 0.015                      | 0.038 | 2,900                                                      | EKZH350E□□122MK25S |
|             | 1,500       | 12.5×30               | 0.013                      | 0.033 | 3,450                                                      | EKZH350E□□152MK30S |
|             | 1,500       | 16×20                 | 0.015                      | 0.038 | 3,250                                                      | EKZH350E□□152ML20S |
|             | 1,800       | 12.5×35               | 0.012                      | 0.031 | 3,570                                                      | EKZH350E□□182MK35S |
|             | 2,200       | 16×25                 | 0.013                      | 0.035 | 3,630                                                      | EKZH350E□□222ML25S |

□ □ : Enter the appropriate lead forming or taping code.

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

| Capacitance(μF) | Frequency (Hz) | 120  | 1k   | 10k  | 100k |
|-----------------|----------------|------|------|------|------|
| 0.47 to 150     |                | 0.40 | 0.75 | 0.90 | 1.00 |
| 220 to 560      |                | 0.50 | 0.85 | 0.94 | 1.00 |
| 680 to 1,800    |                | 0.60 | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,900  |                | 0.75 | 0.90 | 0.95 | 1.00 |
| 4,700 to 8,200  |                | 0.85 | 0.95 | 0.98 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

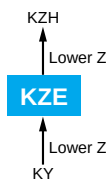


## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

## KZE Series

- Ultra Low impedance for Personal Computers Storage Equipment
- Endurance with ripple current: 1,000 to 5,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

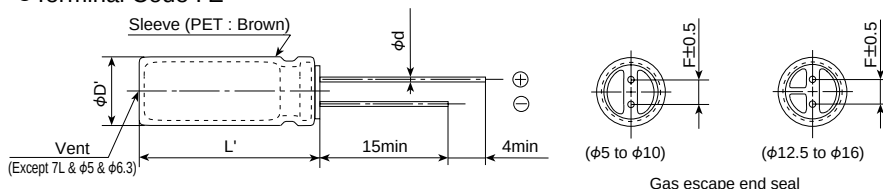


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                                                                                           |      |      |      |      |      |      |      |      |  |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|--|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                     |                                                                                                           |      |      |      |      |      |      |      |      |  |
| Temperature Range                                      | -40 to +105°C                                                                                                                                                                                                                                                                         |                                                                                                           |      |      |      |      |      |      |      |      |  |
| Rated Voltage Range                                    | 6.3 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                             |                                                                                                           |      |      |      |      |      |      |      |      |  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                             |                                                                                                           |      |      |      |      |      |      |      |      |  |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                         |                                                                                                           |      |      |      |      |      |      |      |      |  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                                                                                      | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  | 80V  | 100V |  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.22                                                                                                      | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | 0.09 | 0.09 | 0.08 |  |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                     |                                                                                                           |      |      |      |      |      |      |      |      |  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Z (-25°C) / Z (+20°C)                                                                                                                                                                                                                                                                 | 2max.                                                                                                     |      |      |      |      |      |      |      |      |  |
|                                                        | Z (-40°C) / Z (+20°C)                                                                                                                                                                                                                                                                 | 3max.                                                                                                     |      |      |      |      |      |      |      |      |  |
|                                                        | (at 120Hz)                                                                                                                                                                                                                                                                            |                                                                                                           |      |      |      |      |      |      |      |      |  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for the specified period of time at 105°C.                                                                            |                                                                                                           |      |      |      |      |      |      |      |      |  |
|                                                        | Time                                                                                                                                                                                                                                                                                  | 7L : 1,000hours   φ5 & φ6.3 : 2,000hours   φ8 : 3,000hours   φ10 : 4,000hours   φ12.5 to φ18 : 5,000hours |      |      |      |      |      |      |      |      |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value                                                                                |      |      |      |      |      |      |      |      |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value                                                                      |      |      |      |      |      |      |      |      |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value                                                                              |      |      |      |      |      |      |      |      |  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                                                                           |      |      |      |      |      |      |      |      |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value                                                                                |      |      |      |      |      |      |      |      |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value                                                                      |      |      |      |      |      |      |      |      |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value                                                                              |      |      |      |      |      |      |      |      |  |

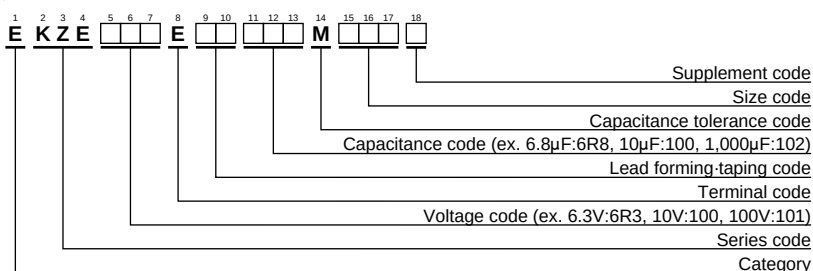
## ◆DIMENSIONS [mm]

## ●Terminal Code : E



| φD  | 5                          | 6.3  | 8    | 10, 12.5 | 16, 18 |
|-----|----------------------------|------|------|----------|--------|
| φL  | 0.45                       | 0.45 | 0.45 | —        | —      |
| φd  | 0.5                        | 0.5  | 0.6  | 0.6      | 0.8    |
| F   | 2.0                        | 2.5  | 3.5  | 5.0      | 7.5    |
| φD' | φD+0.5max.                 |      |      |          |        |
| L'  | L+1.5max. (7L : L+1.0max.) |      |      |          |        |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

KZE Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/100kHz) |       | Rated<br>ripple<br>current<br>(mA rms/<br>105°C,<br>100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------|-------|-------------------------------------------------------------|--------------------|
|             |             |                       | 20°C                       | -10°C |                                                             |                    |
| 6.3         | 68          | 5 × 7                 | 0.43                       | 1.3   | 210                                                         | EKZE6R3E□□680ME07D |
|             | 150         | 5 × 11                | 0.30                       | 1.0   | 250                                                         | EKZE6R3E□□151ME11D |
|             | 150         | 6.3 × 7               | 0.23                       | 0.69  | 300                                                         | EKZE6R3E□□151MF07D |
|             | 220         | 8 × 7                 | 0.15                       | 0.45  | 380                                                         | EKZE6R3E□□221MH07D |
|             | 330         | 6.3 × 11              | 0.13                       | 0.41  | 405                                                         | EKZE6R3E□□331MF11D |
|             | 560         | 8 × 11.5              | 0.072                      | 0.22  | 760                                                         | EKZE6R3E□□561MHB5D |
|             | 820         | 8 × 15                | 0.056                      | 0.17  | 995                                                         | EKZE6R3E□□821MH15D |
|             | 1,000       | 10 × 12.5             | 0.053                      | 0.16  | 1,030                                                       | EKZE6R3E□□102MJC5S |
|             | 1,200       | 8 × 20                | 0.041                      | 0.13  | 1,250                                                       | EKZE6R3E□□122MH20D |
|             | 1,200       | 10 × 16               | 0.038                      | 0.12  | 1,430                                                       | EKZE6R3E□□122MJ16S |
|             | 1,500       | 10 × 20               | 0.023                      | 0.069 | 1,820                                                       | EKZE6R3E□□152MJ20S |
|             | 2,200       | 10 × 25               | 0.022                      | 0.066 | 2,150                                                       | EKZE6R3E□□222MK25S |
|             | 3,300       | 12.5 × 20             | 0.021                      | 0.053 | 2,360                                                       | EKZE6R3E□□332MK20S |
|             | 3,900       | 12.5 × 25             | 0.018                      | 0.045 | 2,770                                                       | EKZE6R3E□□392MK25S |
|             | 4,700       | 12.5 × 30             | 0.016                      | 0.041 | 3,290                                                       | EKZE6R3E□□472MK30S |
|             | 5,600       | 12.5 × 35             | 0.015                      | 0.039 | 3,400                                                       | EKZE6R3E□□562MK35S |
|             | 5,600       | 16 × 20               | 0.018                      | 0.045 | 3,140                                                       | EKZE6R3E□□562ML20S |
|             | 6,800       | 16 × 25               | 0.016                      | 0.043 | 3,460                                                       | EKZE6R3E□□682ML25S |
| 10          | 56          | 5 × 7                 | 0.44                       | 1.4   | 210                                                         | EKZE100E□□560ME07D |
|             | 100         | 5 × 11                | 0.30                       | 1.0   | 250                                                         | EKZE100E□□101ME11D |
|             | 120         | 6.3 × 7               | 0.23                       | 0.69  | 300                                                         | EKZE100E□□121MF07D |
|             | 180         | 8 × 7                 | 0.15                       | 0.45  | 380                                                         | EKZE100E□□181MH07D |
|             | 220         | 6.3 × 11              | 0.13                       | 0.41  | 405                                                         | EKZE100E□□221MF11D |
|             | 470         | 8 × 11.5              | 0.072                      | 0.22  | 760                                                         | EKZE100E□□471MHB5D |
|             | 680         | 8 × 15                | 0.056                      | 0.17  | 995                                                         | EKZE100E□□681MH15D |
|             | 680         | 10 × 12.5             | 0.053                      | 0.16  | 1,030                                                       | EKZE100E□□681MJC5S |
|             | 1,000       | 8 × 20                | 0.041                      | 0.13  | 1,250                                                       | EKZE100E□□102MH20D |
|             | 1,000       | 10 × 16               | 0.038                      | 0.12  | 1,430                                                       | EKZE100E□□102MJ16S |
|             | 1,200       | 10 × 20               | 0.023                      | 0.069 | 1,820                                                       | EKZE100E□□122MJ20S |
|             | 1,500       | 10 × 25               | 0.022                      | 0.066 | 2,150                                                       | EKZE100E□□152MJ25S |
|             | 2,200       | 12.5 × 20             | 0.021                      | 0.053 | 2,360                                                       | EKZE100E□□222MK20S |
|             | 3,300       | 12.5 × 25             | 0.018                      | 0.045 | 2,770                                                       | EKZE100E□□332MK25S |
|             | 3,900       | 12.5 × 30             | 0.016                      | 0.041 | 3,290                                                       | EKZE100E□□392MK30S |
|             | 3,900       | 16 × 20               | 0.018                      | 0.045 | 3,140                                                       | EKZE100E□□392ML20S |
|             | 4,700       | 12.5 × 35             | 0.015                      | 0.039 | 3,400                                                       | EKZE100E□□472MK35S |
|             | 5,600       | 16 × 25               | 0.016                      | 0.043 | 3,460                                                       | EKZE100E□□562ML25S |
| 16          | 33          | 5 × 7                 | 0.45                       | 1.4   | 210                                                         | EKZE160E□□330ME07D |
|             | 56          | 5 × 11                | 0.30                       | 1.0   | 250                                                         | EKZE160E□□560ME11D |
|             | 68          | 6.3 × 7               | 0.24                       | 0.72  | 300                                                         | EKZE160E□□680MF07D |
|             | 120         | 6.3 × 11              | 0.13                       | 0.41  | 405                                                         | EKZE160E□□121MF11D |
|             | 120         | 8 × 7                 | 0.15                       | 0.45  | 380                                                         | EKZE160E□□121MH07D |
|             | 330         | 8 × 11.5              | 0.072                      | 0.22  | 760                                                         | EKZE160E□□331MHB5D |
|             | 470         | 8 × 15                | 0.056                      | 0.17  | 995                                                         | EKZE160E□□471MH15D |
|             | 470         | 10 × 12.5             | 0.053                      | 0.16  | 1,030                                                       | EKZE160E□□471MJC5S |
|             | 680         | 8 × 20                | 0.041                      | 0.13  | 1,250                                                       | EKZE160E□□681MH20D |
|             | 680         | 10 × 16               | 0.038                      | 0.12  | 1,430                                                       | EKZE160E□□681MJ16S |
|             | 1,000       | 10 × 20               | 0.023                      | 0.069 | 1,820                                                       | EKZE160E□□102MJ20S |
|             | 1,200       | 10 × 25               | 0.022                      | 0.066 | 2,150                                                       | EKZE160E□□122MJ25S |
|             | 1,500       | 12.5 × 20             | 0.021                      | 0.053 | 2,360                                                       | EKZE160E□□152MK20S |
|             | 2,200       | 12.5 × 25             | 0.018                      | 0.045 | 2,770                                                       | EKZE160E□□222MK25S |
|             | 2,700       | 12.5 × 30             | 0.016                      | 0.041 | 3,290                                                       | EKZE160E□□272MK30S |
|             | 2,700       | 16 × 20               | 0.018                      | 0.045 | 3,140                                                       | EKZE160E□□272ML20S |
|             | 3,300       | 12.5 × 35             | 0.015                      | 0.039 | 3,400                                                       | EKZE160E□□332MK35S |
|             | 3,900       | 16 × 25               | 0.016                      | 0.043 | 3,460                                                       | EKZE160E□□392ML25S |
| 25          | 27          | 5 × 7                 | 0.46                       | 1.4   | 210                                                         | EKZE250E□□270ME07D |
|             | 47          | 5 × 11                | 0.30                       | 1.0   | 250                                                         | EKZE250E□□470ME11D |
|             | 56          | 6.3 × 7               | 0.24                       | 0.72  | 300                                                         | EKZE250E□□560MF07D |
|             | 100         | 6.3 × 11              | 0.13                       | 0.41  | 405                                                         | EKZE250E□□101MF11D |
|             | 100         | 8 × 7                 | 0.15                       | 0.45  | 380                                                         | EKZE250E□□101MH07D |
|             | 220         | 8 × 11.5              | 0.072                      | 0.22  | 760                                                         | EKZE250E□□221MHB5D |
|             | 330         | 8 × 15                | 0.056                      | 0.17  | 995                                                         | EKZE250E□□331MH15D |
|             | 330         | 10 × 12.5             | 0.053                      | 0.16  | 1,030                                                       | EKZE250E□□331MJC5S |
|             | 470         | 8 × 20                | 0.041                      | 0.13  | 1,250                                                       | EKZE250E□□471MH20D |
|             | 470         | 10 × 16               | 0.038                      | 0.12  | 1,430                                                       | EKZE250E□□471MJ16S |
|             | 680         | 10 × 20               | 0.023                      | 0.069 | 1,820                                                       | EKZE250E□□681MJ20S |
|             |             |                       |                            |       |                                                             |                    |
| 25          | 820         | 10 × 25               | 0.022                      | 0.066 | 2,150                                                       | EKZE250E□□821MJ25S |
|             | 1,000       | 12.5 × 20             | 0.021                      | 0.053 | 2,360                                                       | EKZE250E□□102MK20S |
|             | 1,500       | 12.5 × 25             | 0.018                      | 0.045 | 2,770                                                       | EKZE250E□□152MK25S |
|             | 1,800       | 12.5 × 30             | 0.016                      | 0.041 | 3,290                                                       | EKZE250E□□182MK30S |
|             | 1,800       | 16 × 20               | 0.018                      | 0.045 | 3,140                                                       | EKZE250E□□182ML20S |
|             | 2,200       | 12.5 × 35             | 0.015                      | 0.039 | 3,400                                                       | EKZE250E□□222MK35S |
|             | 2,700       | 16 × 25               | 0.016                      | 0.043 | 3,460                                                       | EKZE250E□□272ML25S |
|             | 18          | 5 × 7                 | 0.47                       | 1.5   | 210                                                         | EKZE350E□□180ME07D |
|             | 33          | 5 × 11                | 0.30                       | 1.0   | 250                                                         | EKZE350E□□330ME11D |
|             | 39          | 6.3 × 7               | 0.25                       | 0.75  | 300                                                         | EKZE350E□□390MF07D |
|             | 56          | 6.3 × 11              | 0.13                       | 0.41  | 405                                                         | EKZE350E□□560MF11D |
|             | 56          | 8 × 7                 | 0.16                       | 0.48  | 380                                                         | EKZE350E□□560MH07D |
| 35          | 150         | 8 × 11.5              | 0.072                      | 0.22  | 760                                                         | EKZE350E□□151MHB5D |
|             | 220         | 8 × 15                | 0.056                      | 0.17  | 995                                                         | EKZE350E□□221MH15D |
|             | 220         | 10 × 12.5             | 0.053                      | 0.16  | 1,030                                                       | EKZE350E□□221MJC5S |
|             | 270         | 8 × 20                | 0.041                      | 0.13  | 1,250                                                       | EKZE350E□□271MH20D |
|             | 330         | 10 × 16               | 0.038                      | 0.12  | 1,430                                                       | EKZE350E□□331MJ16S |
|             | 470         | 10 × 20               | 0.023                      | 0.069 | 1,820                                                       | EKZE350E□□471MJ20S |
|             | 560         | 10 × 25               | 0.022                      | 0.066 | 2,150                                                       | EKZE350E□□561MJ25S |
|             | 680         | 12.5 × 20             | 0.021                      | 0.053 | 2,360                                                       | EKZE350E□□681MK20S |
|             | 1,000       | 12.5 × 25             | 0.018                      | 0.045 | 2,770                                                       | EKZE350E□□102MK25S |
|             | 1,200       | 12.5 × 30             | 0.016                      | 0.041 | 3,290                                                       | EKZE350E□□122MK30S |
|             | 1,200       | 16 × 20               | 0.018                      | 0.045 | 3,140                                                       | EKZE350E□□122ML20S |
|             | 1,500       | 12.5 × 35             | 0.015                      | 0.039 | 3,400                                                       | EKZE350E□□152MK35S |
| 50          | 1,800       | 16 × 25               | 0.016                      | 0.043 | 3,460                                                       | EKZE350E□□182ML25S |
|             | 10          | 5 × 7                 | 0.50                       | 1.5   | 210                                                         | EKZE500E□□100ME07D |
|             | 22          | 5 × 11                | 0.34                       | 1.18  | 238                                                         | EKZE500E□□220ME11D |
|             | 22          | 6.3 × 7               | 0.26                       | 0.78  | 300                                                         | EKZE500E□□220MF07D |
|             | 33          | 8 × 7                 | 0.17                       | 0.51  | 380                                                         | EKZE500E□□330MH07D |
|             | 56          | 6.3 × 11              | 0.14                       | 0.50  | 385                                                         | EKZE500E□□560MF11D |
|             | 100         | 8 × 11.5              | 0.074                      | 0.22  | 724                                                         | EKZE500E□□101MHB5D |
|             | 120         | 8 × 15                | 0.061                      | 0.18  | 950                                                         | EKZE500E□□121MH15D |
|             | 150         | 10 × 12.5             | 0.061                      | 0.18  | 979                                                         | EKZE500E□□151MJC5S |
|             | 180         | 8 × 20                | 0.046                      | 0.14  | 1,190                                                       | EKZE500E□□181MH20D |
|             | 220         | 10 × 16               | 0.042                      | 0.12  | 1,370                                                       | EKZE500E□□221MJ16S |
|             | 270         | 10 × 20               | 0.030                      | 0.090 | 1,580                                                       | EKZE500E□□271MJ20S |
| 63          | 330         | 10 × 25               | 0.028                      | 0.085 | 1,870                                                       | EKZE500E□□331MJ25S |
|             | 470         | 12.5 × 20             | 0.027                      | 0.068 | 2,050                                                       | EKZE500E□□471MK20S |
|             | 560         | 12.5 × 25             | 0.023                      | 0.059 | 2,410                                                       | EKZE500E□□561MK25S |
|             | 680         | 12.5 × 30             | 0.021                      | 0.052 | 2,860                                                       | EKZE500E□□681MK30S |
|             | 820         | 12.5 × 35             | 0.019                      | 0.051 | 2,960                                                       | EKZE500E□□821MK35S |
|             | 820         | 16 × 20               | 0.023                      | 0.059 | 2,730                                                       | EKZE500E□□821ML20S |
|             | 1,000       | 16 × 25               | 0.021                      | 0.056 | 3,010                                                       | EKZE500E□□102ML25S |
|             | 15          | 5 × 11                | 0.88                       | 3.5   | 165                                                         | EKZE630E□□150ME11D |
|             | 33          | 6.3 × 11              | 0.35                       | 1.4   | 265                                                         | EKZE630E□□330MF11D |
|             | 56          | 8 × 11.5              | 0.22                       | 0.88  | 500                                                         | EKZE630E□□560MHB5D |
|             | 82          | 8 × 15                | 0.16                       | 0.64  | 665                                                         | EKZE630E□□820MH15D |
|             | 82          | 10 × 12.5             | 0.11                       | 0.44  | 690                                                         | EKZE630E□□820MJC5S |
| 63          | 120         | 8 × 20                | 0.12                       | 0.48  | 820                                                         | EKZE630E□□121MH20D |
|             | 120         | 10 × 16               | 0.076                      | 0.31  | 950                                                         | EKZE630E□□121MJ16S |
|             | 180         | 10 × 20               | 0.056                      | 0.23  | 1,150                                                       | EKZE630E□□181MJ20S |
|             | 180         | 12.5 × 16             | 0.072                      | 0.29  | 1,150                                                       | EKZE630E□□181MK16S |
|             | 220         | 10 × 25               | 0.046                      | 0.19  | 1,350                                                       | EKZE630E□□221MJ25S |
|             | 270         | 12.5 × 20             | 0.041                      | 0.13  | 1,500                                                       | EKZE630E□□271MK20S |
|             | 390         | 12.5 × 25             | 0.031                      | 0.093 | 1,900                                                       | EKZE630E□□391MK25S |
|             | 470         | 12.5 × 30             | 0.028                      | 0.084 | 2,300                                                       | EKZE630E□□471MK30S |
|             | 470         | 16 × 20               | 0.032                      | 0.096 | 2,000                                                       | EKZE630E□□471ML20S |
|             | 560         | 12.5 × 35             | 0.024                      | 0.072 | 2,500                                                       | EKZE630E□□561MK35S |
|             | 680         | 12.5 × 40             | 0.021                      | 0.063 | 2,800                                                       | EKZE630E□□681MK40S |
|             | 680         | 16 × 25               | 0.025                      | 0.075 | 2,600                                                       | EKZE630E□□681ML25S |
| 63          | 680         | 18 × 20               | 0.030                      | 0.090 | 2,500                                                       | EKZE630E□□681MM20S |
|             | 820         | 16 × 31.5             | 0.021                      | 0.063 | 2,850                                                       | EKZE630E□□821MLN3S |
|             | 820         | 18 × 25               | 0.024                      | 0.072 | 2,800                                                       | EKZE630E□□821MM25S |
|             | 1,000       | 16 × 35.5             | 0.019                      | 0.057 | 2,900                                                       | EKZE630E□□102MLP1S |
|             | 1,200       | 16 × 40               | 0.018                      | 0.054 | 3,400                                                       | EKZE630E□□122ML40S |

□ □ : Enter the appropriate lead forming or taping code.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

KZE Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/100kHz) |       | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------|-------|------------------------------------------------------------|--------------------|
|             |             |                       | 20°C                       | -10°C |                                                            |                    |
| 63          | 1,200       | 18×31.5               | 0.020                      | 0.060 | 3,300                                                      | EKZE630E□□122MMN3S |
|             | 1,500       | 18×35.5               | 0.018                      | 0.054 | 3,400                                                      | EKZE630E□□152MMP1S |
|             | 1,800       | 18×40                 | 0.017                      | 0.051 | 3,500                                                      | EKZE630E□□182MM40S |
|             |             |                       |                            |       |                                                            |                    |
| 80          | 68          | 10×12.5               | 0.17                       | 0.66  | 480                                                        | EKZE800E□□680MJC5S |
|             | 100         | 10×16                 | 0.11                       | 0.47  | 600                                                        | EKZE800E□□101MJ16S |
|             | 120         | 10×20                 | 0.084                      | 0.34  | 800                                                        | EKZE800E□□121MJ20S |
|             | 150         | 10×25                 | 0.069                      | 0.28  | 900                                                        | EKZE800E□□151MJ25S |
|             | 150         | 12.5×16               | 0.11                       | 0.34  | 750                                                        | EKZE800E□□151MK16S |
|             | 220         | 12.5×20               | 0.062                      | 0.18  | 1,100                                                      | EKZE800E□□221MK20S |
|             | 330         | 12.5×25               | 0.047                      | 0.14  | 1,250                                                      | EKZE800E□□331MK25S |
|             | 330         | 16×20                 | 0.048                      | 0.15  | 1,350                                                      | EKZE800E□□331ML20S |
|             | 390         | 12.5×30               | 0.042                      | 0.13  | 1,500                                                      | EKZE800E□□391MK30S |
|             | 470         | 12.5×35               | 0.036                      | 0.11  | 1,650                                                      | EKZE800E□□471MK35S |
|             | 470         | 16×25                 | 0.038                      | 0.12  | 1,700                                                      | EKZE800E□□471ML25S |
|             | 470         | 18×20                 | 0.045                      | 0.14  | 1,500                                                      | EKZE800E□□471MM20S |
|             | 560         | 12.5×40               | 0.032                      | 0.095 | 1,800                                                      | EKZE800E□□561MK40S |
|             | 680         | 16×31.5               | 0.032                      | 0.095 | 1,850                                                      | EKZE800E□□681MLN3S |
|             | 680         | 18×25                 | 0.036                      | 0.11  | 1,750                                                      | EKZE800E□□681MM25S |
|             | 820         | 16×35.5               | 0.029                      | 0.086 | 2,000                                                      | EKZE800E□□821MLP1S |
|             | 820         | 18×31.5               | 0.030                      | 0.090 | 1,900                                                      | EKZE800E□□821MMN3S |
|             | 1,000       | 16×40                 | 0.027                      | 0.081 | 2,200                                                      | EKZE800E□□102ML40S |
|             | 1,000       | 18×35.5               | 0.027                      | 0.081 | 2,200                                                      | EKZE800E□□102MMP1S |
|             | 1,200       | 18×40                 | 0.026                      | 0.077 | 2,700                                                      | EKZE800E□□122MM40S |
|             |             |                       |                            |       |                                                            |                    |
| 100         | 6.8         | 5×11                  | 1.4                        | 5.6   | 125                                                        | EKZE101E□□6R8ME11D |
|             | 15          | 6.3×11                | 0.57                       | 2.3   | 205                                                        | EKZE101E□□150MF11D |
|             | 27          | 8×11.5                | 0.36                       | 1.4   | 355                                                        | EKZE101E□□270MHB5D |
|             | 39          | 8×15                  | 0.25                       | 1.0   | 450                                                        | EKZE101E□□390MH15D |
|             | 47          | 10×12.5               | 0.17                       | 0.66  | 480                                                        | EKZE101E□□470MJC5S |
|             | 56          | 8×20                  | 0.19                       | 0.76  | 565                                                        | EKZE101E□□560MH20D |
|             | 68          | 10×16                 | 0.11                       | 0.47  | 600                                                        | EKZE101E□□680MJ16S |
|             | 82          | 10×20                 | 0.084                      | 0.34  | 800                                                        | EKZE101E□□820MJ20S |
|             | 100         | 12.5×16               | 0.11                       | 0.34  | 750                                                        | EKZE101E□□101MK16S |
|             | 120         | 10×25                 | 0.069                      | 0.28  | 900                                                        | EKZE101E□□121MJ25S |
|             | 150         | 12.5×20               | 0.062                      | 0.18  | 1,100                                                      | EKZE101E□□151MK20S |
|             | 220         | 12.5×25               | 0.047                      | 0.14  | 1,250                                                      | EKZE101E□□221MK25S |
|             | 220         | 16×20                 | 0.048                      | 0.15  | 1,350                                                      | EKZE101E□□221ML20S |
|             | 270         | 12.5×30               | 0.042                      | 0.13  | 1,500                                                      | EKZE101E□□271MK30S |
|             | 330         | 12.5×35               | 0.036                      | 0.11  | 1,650                                                      | EKZE101E□□331MK35S |
|             | 330         | 16×25                 | 0.038                      | 0.12  | 1,700                                                      | EKZE101E□□331ML25S |
|             | 330         | 18×20                 | 0.045                      | 0.14  | 1,500                                                      | EKZE101E□□331MM20S |
|             | 390         | 12.5×40               | 0.032                      | 0.095 | 1,800                                                      | EKZE101E□□391MK40S |
|             | 470         | 16×31.5               | 0.032                      | 0.095 | 1,850                                                      | EKZE101E□□471MLN3S |
|             | 470         | 18×25                 | 0.036                      | 0.11  | 1,750                                                      | EKZE101E□□471MM25S |
|             | 560         | 16×35.5               | 0.029                      | 0.086 | 2,000                                                      | EKZE101E□□561MLP1S |
|             | 560         | 18×31.5               | 0.030                      | 0.090 | 1,900                                                      | EKZE101E□□561MMN3S |
|             | 680         | 16×40                 | 0.027                      | 0.081 | 2,200                                                      | EKZE101E□□681ML40S |
|             | 680         | 18×35.5               | 0.027                      | 0.081 | 2,200                                                      | EKZE101E□□681MMP1S |
|             | 820         | 18×40                 | 0.026                      | 0.077 | 2,700                                                      | EKZE101E□□821MM40S |

□ : Enter the appropriate lead forming or taping code.

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

7L

| Capacitance(μF) | Frequency (Hz) | 120  | 1k   | 10k  | 100k |
|-----------------|----------------|------|------|------|------|
| 10 to 33        |                | 0.42 | 0.70 | 0.90 | 1.00 |
| 39 to 220       |                | 0.50 | 0.73 | 0.92 | 1.00 |

11L to 40L

| Capacitance(μF) | Frequency (Hz) | 120  | 1k   | 10k  | 100k |
|-----------------|----------------|------|------|------|------|
| 6.8 to 180      |                | 0.40 | 0.75 | 0.90 | 1.00 |
| 220 to 560      |                | 0.50 | 0.85 | 0.94 | 1.00 |
| 680 to 1,800    |                | 0.60 | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,900  |                | 0.75 | 0.90 | 0.95 | 1.00 |
| 4,700 to        |                | 0.85 | 0.95 | 0.98 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

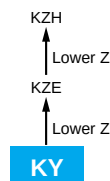


## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

# KY Series

- Newly innovative electrolyte is employed to minimize ESR
- Endurance with ripple current : 4,000 to 10,000 hours at 105°C
- Non solvent resistant type
- **RoHS Compliant**

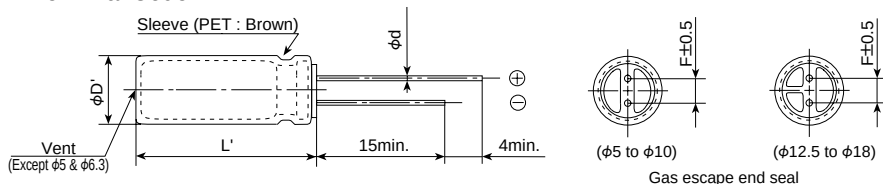


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |                       |      |                      |      |                           |      |      |      |            |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------|------|----------------------|------|---------------------------|------|------|------|------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                     |                                      |                       |      |                      |      |                           |      |      |      |            |
| Rated Voltage Range                                    | -40 to +105°C                                                                                                                                                                                                                                                                         |                                      |                       |      |                      |      |                           |      |      |      |            |
| Capacitance Tolerance                                  | 6.3 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                             |                                      |                       |      |                      |      |                           |      |      |      |            |
| Leakage Current                                        | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                             |                                      |                       |      |                      |      |                           |      |      |      |            |
| Dissipation Factor (tanδ)                              | I=0.01CV or 3μA, whichever is greater.                                                                                                                                                                                                                                                |                                      |                       |      |                      |      |                           |      |      |      |            |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                                                                   |                                      |                       |      |                      |      |                           |      |      |      |            |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V                   | 16V  | 25V                  | 35V  | 50V                       | 63V  | 80V  | 100V |            |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.22                                 | 0.19                  | 0.16 | 0.14                 | 0.12 | 0.10                      | 0.09 | 0.09 | 0.08 |            |
| Low Temperature Characteristics (Max. Impedance Ratio) | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                     |                                      |                       |      |                      |      |                           |      |      |      |            |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 6.3V                                 | 10V                   | 16V  | 25V                  | 35V  | 50V                       | 63V  | 80V  | 100V |            |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 4                                    | 3                     | 2    | 2                    | 2    | 2                         | 2    | 2    | 2    |            |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 8                                    | 6                     | 4    | 3                    | 3    | 3                         | 3    | 3    | 3    | (at 120Hz) |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for the specified period of time at 105°C.                                                                            |                                      |                       |      |                      |      |                           |      |      |      |            |
|                                                        | Time                                                                                                                                                                                                                                                                                  | 6.3 to 10V <sub>dc</sub>             | φ5 & 6.3 : 4,000hours |      | φ8 & 10 : 6,000hours |      | φ12.5 to 18 : 8,000hours  |      |      |      |            |
|                                                        |                                                                                                                                                                                                                                                                                       | 16 to 100V <sub>dc</sub>             | φ5 & 6.3 : 5,000hours |      | φ8 & 10 : 7,000hours |      | φ12.5 to 18 : 10,000hours |      |      |      |            |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value           |                       |      |                      |      |                           |      |      |      |            |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |                       |      |                      |      |                           |      |      |      |            |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |                       |      |                      |      |                           |      |      |      |            |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |                       |      |                      |      |                           |      |      |      |            |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value           |                       |      |                      |      |                           |      |      |      |            |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |                       |      |                      |      |                           |      |      |      |            |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |                       |      |                      |      |                           |      |      |      |            |

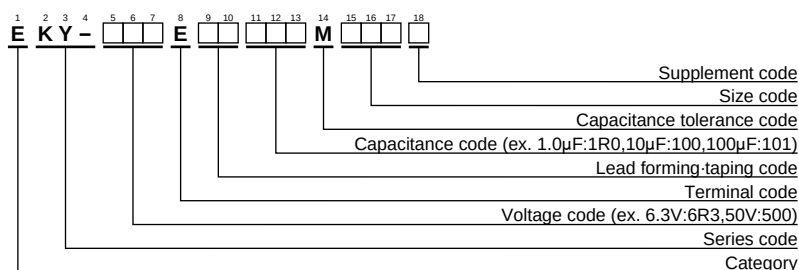
### ◆ DIMENSIONS [mm]

- Terminal Code : E



|           |                      |     |     |     |      |     |     |
|-----------|----------------------|-----|-----|-----|------|-----|-----|
| $\phi D$  | 5                    | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
| $\phi d$  | 0.5                  | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |
| F         | 2.0                  | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| $\phi D'$ | $\phi D + 0.5 \max.$ |     |     |     |      |     |     |
| L'        | L + 1.5 max.         |     |     |     |      |     |     |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

KY Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/100kHz) |       | Rated ripple<br>current<br>(mA rms/<br>105°C,<br>100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------|-------|----------------------------------------------------------|--------------------|
|             |             |                       | 20°C                       | -10°C |                                                          |                    |
| 6.3         | 150         | 5×11                  | 0.58                       | 2.3   | 210                                                      | EKY-6R3E□□151ME11D |
|             | 330         | 6.3×11                | 0.22                       | 0.87  | 340                                                      | EKY-6R3E□□331MF11D |
|             | 680         | 8×11.5                | 0.13                       | 0.52  | 640                                                      | EKY-6R3E□□681MHB5D |
|             | 820         | 10×12.5               | 0.080                      | 0.32  | 865                                                      | EKY-6R3E□□821MJC5S |
|             | 1,000       | 8×15                  | 0.087                      | 0.35  | 840                                                      | EKY-6R3E□□102MH15D |
|             | 1,200       | 8×20                  | 0.069                      | 0.27  | 1,050                                                    | EKY-6R3E□□122MH20D |
|             | 1,200       | 10×16                 | 0.060                      | 0.24  | 1,210                                                    | EKY-6R3E□□122MJ16S |
|             | 1,500       | 10×20                 | 0.046                      | 0.18  | 1,400                                                    | EKY-6R3E□□152MJ20S |
|             | 1,800       | 12.5×15               | 0.049                      | 0.16  | 1,450                                                    | EKY-6R3E□□182MK15S |
|             | 2,200       | 10×25                 | 0.042                      | 0.17  | 1,650                                                    | EKY-6R3E□□222MJ25S |
|             | 2,700       | 10×30                 | 0.031                      | 0.12  | 1,910                                                    | EKY-6R3E□□272MJ30S |
|             | 2,700       | 16×15                 | 0.042                      | 0.12  | 1,940                                                    | EKY-6R3E□□272ML15S |
|             | 3,300       | 12.5×20               | 0.035                      | 0.12  | 1,900                                                    | EKY-6R3E□□332MK20S |
|             | 3,900       | 12.5×25               | 0.027                      | 0.089 | 2,230                                                    | EKY-6R3E□□392MK25S |
|             | 3,900       | 18×15                 | 0.043                      | 0.11  | 2,210                                                    | EKY-6R3E□□392MM15S |
|             | 4,700       | 12.5×30               | 0.024                      | 0.078 | 2,650                                                    | EKY-6R3E□□472MK30S |
|             | 5,600       | 12.5×35               | 0.020                      | 0.065 | 2,880                                                    | EKY-6R3E□□562MK35S |
|             | 5,600       | 16×20                 | 0.027                      | 0.078 | 2,530                                                    | EKY-6R3E□□562ML20S |
|             | 6,800       | 12.5×40               | 0.017                      | 0.056 | 3,350                                                    | EKY-6R3E□□682MK40S |
|             | 6,800       | 16×25                 | 0.021                      | 0.060 | 2,930                                                    | EKY-6R3E□□682ML25S |
|             | 6,800       | 18×20                 | 0.026                      | 0.067 | 2,860                                                    | EKY-6R3E□□682MM20S |
|             | 8,200       | 16×31.5               | 0.017                      | 0.050 | 3,450                                                    | EKY-6R3E□□822MLN3S |
|             | 10,000      | 16×35.5               | 0.015                      | 0.044 | 3,610                                                    | EKY-6R3E□□103MLP1S |
|             | 10,000      | 18×25                 | 0.019                      | 0.049 | 3,140                                                    | EKY-6R3E□□103MM25S |
|             | 12,000      | 16×40                 | 0.013                      | 0.038 | 4,080                                                    | EKY-6R3E□□123ML40S |
|             | 12,000      | 18×31.5               | 0.015                      | 0.040 | 4,170                                                    | EKY-6R3E□□123MMN3S |
|             | 15,000      | 18×35.5               | 0.014                      | 0.038 | 4,220                                                    | EKY-6R3E□□153MMP1S |
|             | 18,000      | 18×40                 | 0.012                      | 0.032 | 4,280                                                    | EKY-6R3E□□183MM40S |
| 10          | 100         | 5×11                  | 0.58                       | 2.3   | 210                                                      | EKY-100E□□101ME11D |
|             | 220         | 6.3×11                | 0.22                       | 0.87  | 340                                                      | EKY-100E□□221MF11D |
|             | 470         | 8×11.5                | 0.13                       | 0.52  | 640                                                      | EKY-100E□□471MHB5D |
|             | 680         | 8×15                  | 0.087                      | 0.35  | 840                                                      | EKY-100E□□681MH15D |
|             | 680         | 10×12.5               | 0.080                      | 0.32  | 865                                                      | EKY-100E□□681MJC5S |
|             | 1,000       | 8×20                  | 0.069                      | 0.27  | 1,050                                                    | EKY-100E□□102MH20D |
|             | 1,000       | 10×16                 | 0.060                      | 0.24  | 1,210                                                    | EKY-100E□□102MJ16S |
|             | 1,200       | 10×20                 | 0.046                      | 0.18  | 1,400                                                    | EKY-100E□□122MJ20S |
|             | 1,500       | 10×25                 | 0.042                      | 0.17  | 1,650                                                    | EKY-100E□□152MJ25S |
|             | 1,500       | 12.5×15               | 0.049                      | 0.16  | 1,450                                                    | EKY-100E□□152MK15S |
|             | 2,200       | 10×30                 | 0.031                      | 0.12  | 1,910                                                    | EKY-100E□□222MJ30S |
|             | 2,200       | 12.5×20               | 0.035                      | 0.12  | 1,900                                                    | EKY-100E□□222MK20S |
|             | 2,200       | 16×15                 | 0.042                      | 0.12  | 1,940                                                    | EKY-100E□□222ML15S |
|             | 2,700       | 18×15                 | 0.043                      | 0.11  | 2,210                                                    | EKY-100E□□272MM15S |
|             | 3,300       | 12.5×25               | 0.027                      | 0.089 | 2,230                                                    | EKY-100E□□332MK25S |
|             | 3,900       | 12.5×30               | 0.024                      | 0.078 | 2,650                                                    | EKY-100E□□392MK30S |
|             | 3,900       | 16×20                 | 0.027                      | 0.078 | 2,530                                                    | EKY-100E□□392ML20S |
|             | 4,700       | 12.5×35               | 0.020                      | 0.065 | 2,880                                                    | EKY-100E□□472MK35S |
|             | 5,600       | 12.5×40               | 0.017                      | 0.056 | 3,350                                                    | EKY-100E□□562MK40S |
|             | 5,600       | 16×25                 | 0.021                      | 0.060 | 2,930                                                    | EKY-100E□□562ML25S |
|             | 5,600       | 18×20                 | 0.026                      | 0.067 | 2,860                                                    | EKY-100E□□562MM20S |
|             | 6,800       | 16×31.5               | 0.017                      | 0.050 | 3,450                                                    | EKY-100E□□682MLN3S |
|             | 6,800       | 18×25                 | 0.019                      | 0.049 | 3,140                                                    | EKY-100E□□682MM25S |
|             | 8,200       | 16×35.5               | 0.015                      | 0.044 | 3,610                                                    | EKY-100E□□822MLP1S |
|             | 8,200       | 18×31.5               | 0.015                      | 0.040 | 4,170                                                    | EKY-100E□□822MMN3S |
|             | 10,000      | 16×40                 | 0.013                      | 0.038 | 4,080                                                    | EKY-100E□□103ML40S |
|             | 10,000      | 18×35.5               | 0.014                      | 0.038 | 4,220                                                    | EKY-100E□□103MMP1S |
|             | 12,000      | 18×40                 | 0.012                      | 0.032 | 4,280                                                    | EKY-100E□□123MM40S |
| 16          | 56          | 5×11                  | 0.58                       | 2.3   | 210                                                      | EKY-160E□□560ME11D |
|             | 120         | 6.3×11                | 0.22                       | 0.87  | 340                                                      | EKY-160E□□121MF11D |
|             | 330         | 8×11.5                | 0.13                       | 0.52  | 640                                                      | EKY-160E□□331MHB5D |
|             | 470         | 8×15                  | 0.087                      | 0.35  | 840                                                      | EKY-160E□□471MH15D |
|             | 470         | 10×12.5               | 0.080                      | 0.32  | 865                                                      | EKY-160E□□471MJC5S |
|             | 680         | 8×20                  | 0.069                      | 0.27  | 1,050                                                    | EKY-160E□□681MH20D |
|             | 680         | 10×16                 | 0.060                      | 0.24  | 1,210                                                    | EKY-160E□□681MJ16S |
|             | 1,000       | 10×20                 | 0.046                      | 0.18  | 1,400                                                    | EKY-160E□□102MJ20S |
|             | 1,000       | 12.5×15               | 0.049                      | 0.16  | 1,450                                                    | EKY-160E□□102MK15S |
|             | 1,200       | 10×25                 | 0.042                      | 0.17  | 1,650                                                    | EKY-160E□□122MJ25S |
|             | 1,500       | 10×30                 | 0.031                      | 0.12  | 1,910                                                    | EKY-160E□□152MJ30S |
|             | 1,500       | 12.5×20               | 0.035                      | 0.12  | 1,900                                                    | EKY-160E□□152MK20S |
| 25          | 1,500       | 12.5×25               | 0.027                      | 0.089 | 2,230                                                    | EKY-160E□□152MK25S |
|             | 1,800       | 12.5×30               | 0.024                      | 0.078 | 2,650                                                    | EKY-160E□□182MK30S |
|             | 1,800       | 16×20                 | 0.027                      | 0.078 | 2,530                                                    | EKY-160E□□182ML20S |
|             | 2,200       | 12.5×35               | 0.020                      | 0.065 | 2,880                                                    | EKY-160E□□222MK35S |
|             | 2,200       | 18×20                 | 0.026                      | 0.067 | 2,860                                                    | EKY-160E□□222MM20S |
|             | 2,700       | 12.5×40               | 0.017                      | 0.056 | 3,350                                                    | EKY-160E□□272MK40S |
|             | 2,700       | 16×25                 | 0.021                      | 0.060 | 2,930                                                    | EKY-160E□□272ML25S |
|             | 3,300       | 16×31.5               | 0.017                      | 0.050 | 3,450                                                    | EKY-160E□□332MLN3S |
|             | 3,300       | 18×25                 | 0.019                      | 0.049 | 3,140                                                    | EKY-160E□□332MM25S |
|             | 3,900       | 16×35.5               | 0.015                      | 0.044 | 3,610                                                    | EKY-160E□□392MLP1S |
|             | 3,900       | 18×31.5               | 0.015                      | 0.040 | 4,170                                                    | EKY-160E□□392MMN3S |
|             | 4,700       | 16×40                 | 0.013                      | 0.038 | 4,080                                                    | EKY-160E□□472ML40S |
|             | 4,700       | 18×35.5               | 0.014                      | 0.038 | 4,220                                                    | EKY-160E□□472MMP1S |
|             | 5,600       | 18×40                 | 0.012                      | 0.032 | 4,280                                                    | EKY-160E□□562MM40S |
|             | 33          | 5×11                  | 0.58                       | 2.3   | 210                                                      | EKY-350E□□330ME11D |
|             | 56          | 6.3×11                | 0.22                       | 0.87  | 340                                                      | EKY-350E□□560MF11D |
|             | 150         | 8×11.5                | 0.13                       | 0.52  | 640                                                      | EKY-350E□□151MHB5D |
|             | 220         | 8×15                  | 0.087                      | 0.35  | 840                                                      | EKY-350E□□221MH15D |
|             | 220         | 10×12.5               | 0.080                      | 0.32  | 865                                                      | EKY-350E□□221MJC5S |
|             | 270         | 8×20                  | 0.069                      | 0.27  | 1,050                                                    | EKY-350E□□271MH20D |
|             | 330         | 10×16                 | 0.060                      | 0.24  | 1,210                                                    | EKY-350E□□331MJ16S |
|             | 470         | 10×20                 | 0.046                      | 0.18  | 1,400                                                    | EKY-350E□□471MJ20S |
|             | 470         | 12.5×15               | 0.049                      | 0.16  | 1,450                                                    | EKY-350E□□471MK15S |
|             | 560         | 10×25                 | 0.042                      | 0.17  | 1,650                                                    | EKY-350E□□561MJ25S |
|             | 680         | 10×30                 | 0.031                      | 0.12  | 1,910                                                    | EKY-350E□□681MJ30S |
|             | 680         | 12.5×20               | 0.035                      | 0.12  | 1,900                                                    | EKY-350E□□681MK20S |
|             | 680         | 16×15                 | 0.042                      | 0.12  | 1,940                                                    | EKY-350E□□681ML15S |
|             | 1,000       | 12.5×25               | 0.027                      | 0.089 | 2,230                                                    | EKY-350E□□102MK25S |
|             | 1,000       | 18×15                 | 0.043                      | 0.11  | 2,210                                                    | EKY-350E□□102MM15S |
|             | 1,200       | 12.5×30               | 0.024                      | 0.078 | 2,650                                                    | EKY-350E□□122MK30S |
|             | 1,200       | 16×20                 | 0.027                      | 0.078 | 2,530                                                    | EKY-350E□□122ML20S |
|             | 1,500       | 12.5×35               | 0.020                      | 0.065 | 2,880                                                    | EKY-350E□□152MK35S |
|             | 1,800       | 12.5×40               | 0.017                      | 0.056 | 3,350                                                    | EKY-350E□□182MK40S |
|             | 1,800       | 16×25                 | 0.021                      | 0.060 | 2,930                                                    | EKY-350E□□182ML25S |
|             | 1,800       | 18×20                 | 0.026                      | 0.067 | 2,860                                                    | EKY-350E□□182MM20S |
|             | 2,200       | 16×31.5               | 0.017                      | 0.050 | 3,450                                                    | EKY-350E□□222MLN3S |
| 35          | 2,200       | 18×35.5               | 0.014                      | 0.038 | 4,220                                                    | EKY-350E□□222MMP1S |
|             | 2,200       | 16×31.5               | 0.017                      | 0.050 | 3,450                                                    | EKY-350E□□222MLN3S |

□□ : Enter the appropriate lead forming or taping code.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

KY Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/100kHz) |       | Rated ripple current<br>(mA rms/<br>105°C,<br>100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------|-------|-------------------------------------------------------|--------------------|
|             |             |                       | 20°C                       | -10°C |                                                       |                    |
| 35          | 2,200       | 18×25                 | 0.019                      | 0.049 | 3,140                                                 | EKY-350E□□222MM25S |
|             | 2,700       | 16×35.5               | 0.015                      | 0.044 | 3,610                                                 | EKY-350E□□272MLP1S |
|             | 2,700       | 18×31.5               | 0.015                      | 0.040 | 4,170                                                 | EKY-350E□□272MMN3S |
|             | 3,300       | 16×40                 | 0.013                      | 0.038 | 4,080                                                 | EKY-350E□□332ML40S |
|             | 3,300       | 18×35.5               | 0.014                      | 0.038 | 4,220                                                 | EKY-350E□□332MMP1S |
|             | 3,900       | 18×40                 | 0.012                      | 0.032 | 4,280                                                 | EKY-350E□□392MM40S |
| 50          | 1.0         | 5×11                  | 4.0                        | 16.0  | 30                                                    | EKY-500E□□1R0ME11D |
|             | 2.2         | 5×11                  | 2.5                        | 10.0  | 43                                                    | EKY-500E□□2R2ME11D |
|             | 3.3         | 5×11                  | 2.2                        | 8.8   | 53                                                    | EKY-500E□□3R3ME11D |
|             | 4.7         | 5×11                  | 1.9                        | 7.6   | 88                                                    | EKY-500E□□4R7ME11D |
|             | 10          | 5×11                  | 1.5                        | 6.0   | 100                                                   | EKY-500E□□100ME11D |
|             | 22          | 5×11                  | 0.70                       | 2.8   | 180                                                   | EKY-500E□□220ME11D |
|             | 56          | 6.3×11                | 0.30                       | 1.2   | 295                                                   | EKY-500E□□560MF11D |
|             | 100         | 8×11.5                | 0.17                       | 0.68  | 555                                                   | EKY-500E□□101MHB5D |
|             | 120         | 8×15                  | 0.12                       | 0.48  | 730                                                   | EKY-500E□□121MH15D |
|             | 150         | 10×12.5               | 0.12                       | 0.48  | 760                                                   | EKY-500E□□151MJC5S |
|             | 180         | 8×20                  | 0.091                      | 0.36  | 910                                                   | EKY-500E□□181MH20D |
|             | 220         | 10×16                 | 0.084                      | 0.34  | 1,050                                                 | EKY-500E□□221MJ16S |
|             | 270         | 10×20                 | 0.060                      | 0.24  | 1,220                                                 | EKY-500E□□271MJ20S |
|             | 270         | 12.5×15               | 0.061                      | 0.20  | 1,260                                                 | EKY-500E□□271MK15S |
|             | 330         | 10×25                 | 0.055                      | 0.22  | 1,440                                                 | EKY-500E□□331MJ25S |
|             | 470         | 10×30                 | 0.043                      | 0.17  | 1,690                                                 | EKY-500E□□471MJ30S |
|             | 470         | 12.5×20               | 0.045                      | 0.15  | 1,660                                                 | EKY-500E□□471MK20S |
|             | 470         | 16×15                 | 0.055                      | 0.17  | 1,690                                                 | EKY-500E□□471ML15S |
|             | 560         | 12.5×25               | 0.034                      | 0.11  | 1,950                                                 | EKY-500E□□561MK25S |
|             | 560         | 18×15                 | 0.054                      | 0.15  | 1,930                                                 | EKY-500E□□561MM15S |
|             | 680         | 12.5×30               | 0.030                      | 0.10  | 2,310                                                 | EKY-500E□□681MK30S |
|             | 820         | 12.5×35               | 0.025                      | 0.083 | 2,510                                                 | EKY-500E□□821MK35S |
|             | 820         | 16×20                 | 0.034                      | 0.10  | 2,210                                                 | EKY-500E□□821ML20S |
|             | 1,000       | 12.5×40               | 0.021                      | 0.069 | 2,920                                                 | EKY-500E□□102MK40S |
|             | 1,000       | 16×25                 | 0.025                      | 0.075 | 2,555                                                 | EKY-500E□□102ML25S |
|             | 1,000       | 18×20                 | 0.036                      | 0.097 | 2,490                                                 | EKY-500E□□102MM20S |
|             | 1,200       | 16×31.5               | 0.022                      | 0.066 | 3,010                                                 | EKY-500E□□122MLN3S |
|             | 1,200       | 18×25                 | 0.026                      | 0.070 | 2,740                                                 | EKY-500E□□122MM25S |
|             | 1,500       | 16×35.5               | 0.019                      | 0.057 | 3,150                                                 | EKY-500E□□152MLP1S |
|             | 1,800       | 16×40                 | 0.016                      | 0.048 | 3,710                                                 | EKY-500E□□182ML40S |
|             | 1,800       | 18×31.5               | 0.021                      | 0.057 | 3,635                                                 | EKY-500E□□182MMN3S |
|             | 2,200       | 18×35.5               | 0.017                      | 0.046 | 3,680                                                 | EKY-500E□□222MMP1S |
|             | 2,700       | 18×40                 | 0.014                      | 0.038 | 3,800                                                 | EKY-500E□□272MM40S |
| 63          | 15          | 5×11                  | 0.88                       | 3.5   | 165                                                   | EKY-630E□□150ME11D |
|             | 33          | 6.3×11                | 0.35                       | 1.4   | 265                                                   | EKY-630E□□330MF11D |
|             | 56          | 8×11.5                | 0.22                       | 0.88  | 500                                                   | EKY-630E□□560MHB5D |
|             | 82          | 8×15                  | 0.16                       | 0.64  | 665                                                   | EKY-630E□□820MH15D |
|             | 82          | 10×12.5               | 0.11                       | 0.44  | 690                                                   | EKY-630E□□820MJC5S |
|             | 120         | 8×20                  | 0.12                       | 0.48  | 820                                                   | EKY-630E□□121MH20D |
|             | 120         | 10×16                 | 0.076                      | 0.31  | 950                                                   | EKY-630E□□121MJ16S |
|             | 180         | 10×20                 | 0.056                      | 0.23  | 1,150                                                 | EKY-630E□□181MJ20S |
|             | 180         | 12.5×16               | 0.072                      | 0.29  | 1,150                                                 | EKY-630E□□181MK16S |
|             | 220         | 10×25                 | 0.046                      | 0.19  | 1,350                                                 | EKY-630E□□221MJ25S |
|             | 270         | 12.5×20               | 0.041                      | 0.13  | 1,500                                                 | EKY-630E□□271MK20S |
|             | 390         | 12.5×25               | 0.031                      | 0.093 | 1,900                                                 | EKY-630E□□391MK25S |
|             | 470         | 12.5×30               | 0.028                      | 0.084 | 2,300                                                 | EKY-630E□□471MK30S |
|             | 470         | 16×20                 | 0.032                      | 0.096 | 2,000                                                 | EKY-630E□□471ML20S |
|             | 560         | 12.5×35               | 0.024                      | 0.072 | 2,500                                                 | EKY-630E□□561MK35S |
|             | 680         | 12.5×40               | 0.021                      | 0.063 | 2,800                                                 | EKY-630E□□681MK40S |
| 63          | 680         | 16×25                 | 0.025                      | 0.075 | 2,600                                                 | EKY-630E□□681ML25S |
|             | 680         | 18×20                 | 0.030                      | 0.090 | 2,500                                                 | EKY-630E□□681MM20S |
|             | 820         | 16×31.5               | 0.021                      | 0.063 | 2,850                                                 | EKY-630E□□821MLN3S |
|             | 820         | 18×25                 | 0.024                      | 0.072 | 2,800                                                 | EKY-630E□□821MM25S |
|             | 1,000       | 16×35.5               | 0.019                      | 0.057 | 2,900                                                 | EKY-630E□□102MLP1S |
|             | 1,200       | 16×40                 | 0.018                      | 0.054 | 3,400                                                 | EKY-630E□□122ML40S |
|             | 1,200       | 18×31.5               | 0.020                      | 0.060 | 3,300                                                 | EKY-630E□□122MMN3S |
|             | 1,500       | 18×35.5               | 0.018                      | 0.054 | 3,400                                                 | EKY-630E□□152MMP1S |
|             | 1,800       | 18×40                 | 0.017                      | 0.051 | 3,500                                                 | EKY-630E□□182MM40S |
| 80          | 68          | 10×12.5               | 0.17                       | 0.66  | 480                                                   | EKY-800E□□680MJC5S |
|             | 100         | 10×16                 | 0.11                       | 0.47  | 600                                                   | EKY-800E□□101MJ16S |
|             | 120         | 10×20                 | 0.084                      | 0.34  | 800                                                   | EKY-800E□□121MJ20S |
|             | 150         | 10×25                 | 0.069                      | 0.28  | 900                                                   | EKY-800E□□151MJ25S |
|             | 150         | 12.5×16               | 0.11                       | 0.34  | 750                                                   | EKY-800E□□151MK16S |
|             | 220         | 12.5×20               | 0.062                      | 0.18  | 1,100                                                 | EKY-800E□□221MK20S |
|             | 330         | 12.5×25               | 0.047                      | 0.14  | 1,250                                                 | EKY-800E□□331MK25S |
|             | 330         | 16×20                 | 0.048                      | 0.15  | 1,350                                                 | EKY-800E□□331ML20S |
|             | 390         | 12.5×30               | 0.042                      | 0.13  | 1,500                                                 | EKY-800E□□391MK30S |
|             | 470         | 12.5×35               | 0.036                      | 0.11  | 1,650                                                 | EKY-800E□□471MK35S |
|             | 470         | 16×25                 | 0.038                      | 0.12  | 1,700                                                 | EKY-800E□□471ML25S |
|             | 470         | 18×20                 | 0.045                      | 0.14  | 1,500                                                 | EKY-800E□□471MM20S |
|             | 560         | 12.5×40               | 0.032                      | 0.095 | 1,800                                                 | EKY-800E□□561MK40S |
|             | 680         | 16×31.5               | 0.032                      | 0.095 | 1,850                                                 | EKY-800E□□681MLN3S |
|             | 680         | 18×25                 | 0.036                      | 0.11  | 1,750                                                 | EKY-800E□□681MM25S |
|             | 820         | 16×35.5               | 0.029                      | 0.086 | 2,000                                                 | EKY-800E□□821MLP1S |
|             | 820         | 18×31.5               | 0.030                      | 0.090 | 1,900                                                 | EKY-800E□□821MMN3S |
|             | 1,000       | 16×40                 | 0.027                      | 0.081 | 2,200                                                 | EKY-800E□□102ML40S |
| 100         | 1,000       | 18×35.5               | 0.027                      | 0.081 | 2,200                                                 | EKY-800E□□102MMP1S |
|             | 1,200       | 18×40                 | 0.026                      | 0.077 | 2,700                                                 | EKY-800E□□122MM40S |
|             | 6.8         | 5×11                  | 1.4                        | 5.6   | 125                                                   | EKY-101E□□6R8ME11D |
|             | 15          | 6.3×11                | 0.57                       | 2.3   | 205                                                   | EKY-101E□□150MF11D |
|             | 27          | 8×11.5                | 0.36                       | 1.4   | 355                                                   | EKY-101E□□270MHB5D |
|             | 39          | 8×15                  | 0.25                       | 1.0   | 450                                                   | EKY-101E□□390MH15D |
|             | 47          | 10×12.5               | 0.17                       | 0.66  | 480                                                   | EKY-101E□□470MJC5S |
|             | 56          | 8×20                  | 0.19                       | 0.76  | 565                                                   | EKY-101E□□560MH20D |
|             | 68          | 10×16                 | 0.11                       | 0.47  | 600                                                   | EKY-101E□□680MJ16S |
|             | 82          | 10×20                 | 0.084                      | 0.34  | 800                                                   | EKY-101E□□820MJ20S |
|             | 100         | 12.5×16               | 0.11                       | 0.34  | 750                                                   | EKY-101E□□101MK16S |
|             | 120         | 10×25                 | 0.069                      | 0.28  | 900                                                   | EKY-101E□□121MJ25S |
|             | 150         | 12.5×20               | 0.062                      | 0.18  | 1,100                                                 | EKY-101E□□151MK20S |
|             | 220         | 12.5×25               | 0.047                      | 0.14  | 1,250                                                 | EKY-101E□□221MK25S |
|             | 220         | 16×20                 | 0.048                      | 0.15  | 1,350                                                 | EKY-101E□□221ML20S |
|             | 270         | 12.5×30               | 0.042                      | 0.13  | 1,500                                                 | EKY-101E□□271MK30S |
|             | 330         | 12.5×35               | 0.036                      | 0.11  | 1,650                                                 | EKY-101E□□331MK35S |
|             | 330         | 16×25                 | 0.038                      | 0.12  | 1,700                                                 | EKY-101E□□331ML25S |
|             | 330         | 18×20                 | 0.045                      | 0.14  | 1,500                                                 | EKY-101E□□331MM20S |
|             | 390         | 12.5×40               | 0.032                      | 0.095 | 1,800                                                 | EKY-101E□□391MK40S |
|             | 470         | 16×31.5               | 0.032                      | 0.095 | 1,850                                                 | EKY-101E□□471MLN3S |
|             | 470         | 18×25                 | 0.036                      | 0.11  | 1,750                                                 | EKY-101E□□471MM25S |
|             | 560         | 16×35.5               | 0.029                      | 0.086 | 2,000                                                 | EKY-101E□□561MLP1S |
|             | 560         | 18×31.5               | 0.030                      | 0.090 | 1,900                                                 | EKY-101E□□561MMN3S |
|             | 680         | 16×40                 | 0.027                      | 0.081 | 2,200                                                 | EKY-101E□□681ML40S |
|             | 680         | 18×35.5               | 0.027                      | 0.081 | 2,200                                                 | EKY-101E□□681MMP1S |
|             | 820         | 18×40                 | 0.026                      | 0.077 | 2,700                                                 | EKY-101E□□821MM40S |

□ : Enter the appropriate lead forming or taping code.

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

| Capacitance (μF) | Frequency (Hz) | 120  | 1k   | 10k  | 100k |
|------------------|----------------|------|------|------|------|
| 1.0 to 180       |                | 0.40 | 0.75 | 0.90 | 1.00 |
| 220 to 560       |                | 0.50 | 0.85 | 0.94 | 1.00 |
| 680 to 1,800     |                | 0.60 | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,900   |                | 0.75 | 0.90 | 0.95 | 1.00 |
| 4,700 to         |                | 0.85 | 0.95 | 0.98 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise.  
When long life performance is required in actual use, the rms ripple current has to be reduced.

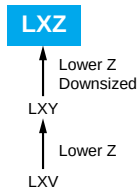


# MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, Downsized, 105°C

## LXZ Series

- Adoption of innovative electrolyte and new technologies
- Very low impedance at high frequency
- Endurance with ripple current: 2,000 to 8,000 hours at 105°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant



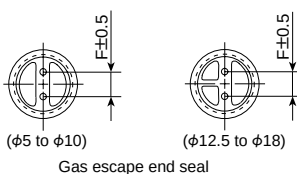
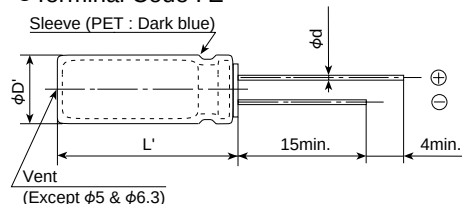
### SPECIFICATIONS

| Items                      | Characteristics                                                                                                                                                                                                                                                                         |                                                                                                         |      |      |      |      |      |      |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|
| Category Temperature Range | -55 to +105°C                                                                                                                                                                                                                                                                           |                                                                                                         |      |      |      |      |      |      |
| Rated Voltage Range        | 6.3 to 63V <sub>dc</sub>                                                                                                                                                                                                                                                                |                                                                                                         |      |      |      |      |      |      |
| Capacitance Tolerance      | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                                                                                         |      |      |      |      |      |      |
| Leakage Current            | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                           |                                                                                                         |      |      |      |      |      |      |
| Dissipation Factor (tanδ)  | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 6.3V                                                                                                    | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  |
|                            | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.22                                                                                                    | 0.19 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 |
|                            | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                       |                                                                                                         |      |      |      |      |      |      |
| Endurance                  | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for the specified period of time at 105°C.                                                                              |                                                                                                         |      |      |      |      |      |      |
|                            | Time                                                                                                                                                                                                                                                                                    | φ5 & 6.3 : 2,000hours   φ8 : 3,000hours   φ10 : 5,000hours   φ12.5 : 7,000hours   φ16 & 18 : 8,000hours |      |      |      |      |      |      |
|                            | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value                                                                              |      |      |      |      |      |      |
|                            | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value                                                                    |      |      |      |      |      |      |
|                            | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                                                                            |      |      |      |      |      |      |
| Shelf Life                 | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                                                                         |      |      |      |      |      |      |
|                            | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value                                                                              |      |      |      |      |      |      |
|                            | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value                                                                    |      |      |      |      |      |      |
|                            | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                                                                            |      |      |      |      |      |      |

### DIMENSIONS [mm]

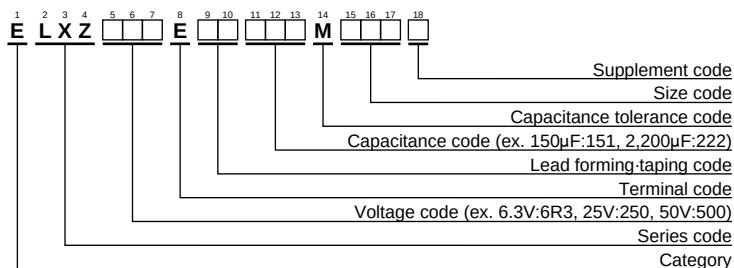
- Terminal Code : E

Sleeve (PET : Dark blue)



| φD  | 5          | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
|-----|------------|-----|-----|-----|------|-----|-----|
| φd  | 0.5        | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |
| F   | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| φD' | φD+0.5max. |     |     |     |      |     |     |
| L'  | L+1.5max.  |     |     |     |      |     |     |

### PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, Downsized, 105°C

LXZ Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/100kHz) |       | Rated ripple<br>current<br>(mA rms/<br>105°C,<br>100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------|-------|----------------------------------------------------------|--------------------|
|             |             |                       | 20°C                       | -10°C |                                                          |                    |
| 6.3         | 150         | 5×11.5                | 0.50                       | 1.0   | 175                                                      | ELXZ6R3E□□151MEB5D |
|             | 330         | 6.3×11.5              | 0.25                       | 0.50  | 290                                                      | ELXZ6R3E□□331MFB5D |
|             | 470         | 6.3×15                | 0.18                       | 0.36  | 400                                                      | ELXZ6R3E□□471MF15D |
|             | 680         | 8×12                  | 0.12                       | 0.24  | 555                                                      | ELXZ6R3E□□681MH12D |
|             | 820         | 10×12.5               | 0.090                      | 0.18  | 760                                                      | ELXZ6R3E□□821MJC5S |
|             | 1,000       | 8×15                  | 0.090                      | 0.18  | 730                                                      | ELXZ6R3E□□102MH15D |
|             | 1,200       | 8×20                  | 0.080                      | 0.16  | 810                                                      | ELXZ6R3E□□122MH20D |
|             | 1,200       | 10×16                 | 0.068                      | 0.136 | 1,050                                                    | ELXZ6R3E□□122MJ16S |
|             | 1,500       | 10×20                 | 0.052                      | 0.104 | 1,220                                                    | ELXZ6R3E□□152MJ20S |
|             | 2,200       | 10×25                 | 0.045                      | 0.090 | 1,440                                                    | ELXZ6R3E□□222MJ25S |
|             | 2,700       | 10×30                 | 0.037                      | 0.074 | 1,690                                                    | ELXZ6R3E□□272MJ30S |
|             | 3,300       | 12.5×20               | 0.038                      | 0.076 | 1,660                                                    | ELXZ6R3E□□332MK20S |
|             | 3,900       | 12.5×25               | 0.030                      | 0.060 | 1,950                                                    | ELXZ6R3E□□392MK25S |
|             | 4,700       | 12.5×30               | 0.025                      | 0.050 | 2,310                                                    | ELXZ6R3E□□472MK30S |
|             | 5,600       | 12.5×35               | 0.022                      | 0.044 | 2,510                                                    | ELXZ6R3E□□562MK35S |
|             | 5,600       | 16×20                 | 0.029                      | 0.058 | 2,210                                                    | ELXZ6R3E□□562ML20S |
|             | 6,800       | 12.5×40               | 0.017                      | 0.034 | 2,870                                                    | ELXZ6R3E□□682MK40S |
|             | 6,800       | 16×25                 | 0.022                      | 0.044 | 2,560                                                    | ELXZ6R3E□□682ML25S |
|             | 6,800       | 18×20                 | 0.028                      | 0.056 | 2,490                                                    | ELXZ6R3E□□682MM20S |
|             | 8,200       | 16×30                 | 0.019                      | 0.038 | 3,010                                                    | ELXZ6R3E□□822ML30S |
|             | 10,000      | 16×35                 | 0.017                      | 0.034 | 3,150                                                    | ELXZ6R3E□□103ML35S |
| 10          | 10,000      | 18×25                 | 0.020                      | 0.040 | 2,740                                                    | ELXZ6R3E□□103MM25S |
|             | 12,000      | 16×40                 | 0.015                      | 0.030 | 3,710                                                    | ELXZ6R3E□□123ML40S |
|             | 12,000      | 18×30                 | 0.018                      | 0.036 | 3,330                                                    | ELXZ6R3E□□123MM30S |
|             | 15,000      | 18×35                 | 0.016                      | 0.032 | 3,680                                                    | ELXZ6R3E□□153MM35S |
|             | 18,000      | 18×40                 | 0.015                      | 0.030 | 3,800                                                    | ELXZ6R3E□□183MM40S |
|             | 100         | 5×11.5                | 0.50                       | 1.0   | 175                                                      | ELXZ100E□□101MEB5D |
|             | 220         | 6.3×11.5              | 0.25                       | 0.50  | 290                                                      | ELXZ100E□□221MFB5D |
|             | 330         | 6.3×15                | 0.18                       | 0.36  | 400                                                      | ELXZ100E□□331MF15D |
|             | 470         | 8×12                  | 0.12                       | 0.24  | 555                                                      | ELXZ100E□□471MH12D |
|             | 680         | 8×15                  | 0.090                      | 0.18  | 730                                                      | ELXZ100E□□681MH15D |
|             | 680         | 10×12.5               | 0.090                      | 0.18  | 760                                                      | ELXZ100E□□681MJC5S |
|             | 1,000       | 8×20                  | 0.080                      | 0.16  | 810                                                      | ELXZ100E□□102MH20D |
|             | 1,000       | 10×16                 | 0.068                      | 0.136 | 1,050                                                    | ELXZ100E□□102MJ16S |
|             | 1,200       | 10×20                 | 0.052                      | 0.104 | 1,220                                                    | ELXZ100E□□122MJ20S |
|             | 1,500       | 10×25                 | 0.045                      | 0.090 | 1,440                                                    | ELXZ100E□□152MJ25S |
|             | 1,800       | 10×30                 | 0.037                      | 0.074 | 1,690                                                    | ELXZ100E□□182MJ30S |
|             | 2,200       | 12.5×20               | 0.038                      | 0.076 | 1,660                                                    | ELXZ100E□□222MK20S |
|             | 3,300       | 12.5×25               | 0.030                      | 0.060 | 1,950                                                    | ELXZ100E□□332MK25S |
|             | 3,900       | 12.5×30               | 0.025                      | 0.050 | 2,310                                                    | ELXZ100E□□392MK30S |
|             | 3,900       | 16×20                 | 0.029                      | 0.058 | 2,210                                                    | ELXZ100E□□392ML20S |
|             | 4,700       | 12.5×35               | 0.022                      | 0.044 | 2,510                                                    | ELXZ100E□□472MK35S |
| 16          | 5,600       | 12.5×40               | 0.017                      | 0.034 | 2,870                                                    | ELXZ100E□□562MK40S |
|             | 5,600       | 16×25                 | 0.022                      | 0.044 | 2,560                                                    | ELXZ100E□□562ML25S |
|             | 5,600       | 18×20                 | 0.028                      | 0.056 | 2,490                                                    | ELXZ100E□□562MM20S |
|             | 6,800       | 16×30                 | 0.019                      | 0.038 | 3,010                                                    | ELXZ100E□□682ML30S |
|             | 6,800       | 18×25                 | 0.020                      | 0.040 | 2,740                                                    | ELXZ100E□□682MM25S |
|             | 8,200       | 16×35                 | 0.017                      | 0.034 | 3,150                                                    | ELXZ100E□□822ML35S |
|             | 8,200       | 18×30                 | 0.018                      | 0.036 | 3,330                                                    | ELXZ100E□□822MM30S |
|             | 10,000      | 16×40                 | 0.015                      | 0.030 | 3,710                                                    | ELXZ100E□□103ML40S |
|             | 10,000      | 18×35                 | 0.016                      | 0.032 | 3,680                                                    | ELXZ100E□□103MM35S |
|             | 12,000      | 18×40                 | 0.015                      | 0.030 | 3,800                                                    | ELXZ100E□□123MM40S |
|             | 47          | 5×11.5                | 0.50                       | 1.0   | 175                                                      | ELXZ160E□□470MEB5D |
|             | 100         | 6.3×11.5              | 0.25                       | 0.50  | 290                                                      | ELXZ160E□□101MFB5D |
|             | 220         | 6.3×15                | 0.18                       | 0.36  | 400                                                      | ELXZ160E□□221MF15D |
|             | 330         | 8×12                  | 0.12                       | 0.24  | 555                                                      | ELXZ160E□□331MH12D |
|             | 470         | 8×15                  | 0.090                      | 0.18  | 730                                                      | ELXZ160E□□471MH15D |
|             | 470         | 10×12.5               | 0.090                      | 0.18  | 760                                                      | ELXZ160E□□471MJC5S |
|             | 560         | 8×20                  | 0.080                      | 0.16  | 810                                                      | ELXZ160E□□561MH20D |
|             | 680         | 10×16                 | 0.068                      | 0.136 | 1,050                                                    | ELXZ160E□□681MJ16S |
|             | 1,000       | 10×20                 | 0.052                      | 0.104 | 1,220                                                    | ELXZ160E□□102MJ20S |
|             | 1,200       | 10×25                 | 0.045                      | 0.090 | 1,440                                                    | ELXZ160E□□122MJ25S |
|             | 1,500       | 10×30                 | 0.037                      | 0.074 | 1,690                                                    | ELXZ160E□□152MJ30S |
|             | 1,500       | 12.5×20               | 0.038                      | 0.076 | 1,660                                                    | ELXZ160E□□152MK20S |
| 25          | 2,200       | 12.5×25               | 0.030                      | 0.060 | 1,950                                                    | ELXZ160E□□222MK25S |
|             | 2,700       | 12.5×30               | 0.025                      | 0.050 | 2,310                                                    | ELXZ160E□□272MK30S |
|             | 2,700       | 16×20                 | 0.029                      | 0.058 | 2,210                                                    | ELXZ160E□□272ML20S |
|             | 3,300       | 16×25                 | 0.022                      | 0.044 | 2,510                                                    | ELXZ160E□□332MK35S |
|             | 3,300       | 18×20                 | 0.018                      | 0.036 | 3,330                                                    | ELXZ160E□□332MM30S |
|             | 3,900       | 18×30                 | 0.015                      | 0.030 | 3,710                                                    | ELXZ160E□□392MK40S |
|             | 4,700       | 18×35                 | 0.016                      | 0.032 | 3,680                                                    | ELXZ160E□□472MM35S |
|             | 5,600       | 18×40                 | 0.015                      | 0.030 | 3,800                                                    | ELXZ160E□□562MM40S |
|             | 33          | 5×11.5                | 0.50                       | 1.0   | 175                                                      | ELXZ350E□□330MEB5D |
|             | 56          | 6.3×11.5              | 0.25                       | 0.50  | 290                                                      | ELXZ350E□□560MFB5D |
|             | 100         | 6.3×15                | 0.18                       | 0.36  | 400                                                      | ELXZ350E□□101MF15D |
|             | 150         | 8×12                  | 0.12                       | 0.24  | 555                                                      | ELXZ350E□□151MH12D |
|             | 220         | 8×15                  | 0.090                      | 0.18  | 730                                                      | ELXZ350E□□221MH15D |
|             | 220         | 10×12.5               | 0.090                      | 0.18  | 760                                                      | ELXZ350E□□221MJC5S |
|             | 270         | 8×20                  | 0.080                      | 0.16  | 810                                                      | ELXZ350E□□271MH20D |
|             | 330         | 10×16                 | 0.068                      | 0.136 | 1,050                                                    | ELXZ350E□□331MJ16S |
|             | 470         | 10×20                 | 0.052                      | 0.104 | 1,220                                                    | ELXZ350E□□471MJ20S |
|             | 560         | 10×25                 | 0.045                      | 0.090 | 1,440                                                    | ELXZ350E□□561MJ25S |
|             | 680         | 10×30                 | 0.037                      | 0.074 | 1,690                                                    | ELXZ350E□□681MJ30S |
|             | 680         | 12.5×20               | 0.038                      | 0.076 | 1,660                                                    | ELXZ350E□□681MK20S |
|             | 1,000       | 12.5×25               | 0.030                      | 0.060 | 1,950                                                    | ELXZ350E□□102MK25S |
| 35          | 1,200       | 12.5×30               | 0.025                      | 0.050 | 2,310                                                    | ELXZ350E□□122MK30S |
|             | 1,200       | 16×20                 | 0.029                      | 0.058 | 2,210                                                    | ELXZ350E□□122ML20S |
|             | 1,500       | 12.5×35               | 0.022                      | 0.044 | 2,510                                                    | ELXZ350E□□152MK35S |
|             | 1,800       | 12.5×40               | 0.017                      | 0.034 | 2,870                                                    | ELXZ350E□□182MK40S |
|             | 1,800       | 16×25                 | 0.022                      | 0.044 | 2,560                                                    | ELXZ350E□□182ML25S |
|             | 1,800       | 18×20                 | 0.028                      | 0.056 | 2,490                                                    | ELXZ350E□□182MM20S |
|             | 2,200       | 16×30                 | 0.019                      | 0.038 | 3,010                                                    | ELXZ350E□□222ML30S |
|             | 2,200       | 18×25                 | 0.020                      | 0.040 | 2,740                                                    | ELXZ350E□□222MM25S |
|             | 2,700       | 16×35                 | 0.017                      | 0.034 | 3,150                                                    | ELXZ350E□□272ML35S |
|             | 2,700       | 18×30                 | 0.018                      | 0.036 | 3,330                                                    | ELXZ350E□□272MM30S |
|             | 3,300       | 16×40                 | 0.015                      | 0.030 | 3,710                                                    | ELXZ350E□□332ML40S |
|             | 3,300       | 18×35                 | 0.016                      | 0.032 | 3,680                                                    | ELXZ350E□□332MM35S |
|             | 3,900       | 18×40                 | 0.015                      | 0.030 | 3,800                                                    | ELXZ350E□□392MM40S |
|             | 22          | 5×11.5                | 0.90                       | 1.8   | 155                                                      | ELXZ500E□□220MEB5D |
|             | 47          | 6.3×11.5              | 0.45                       | 0.90  | 260                                                      | ELXZ500E□□470MFB5D |
|             | 68          | 6.3×15                | 0.31                       | 0.62  | 360                                                      | ELXZ500E□□680MF15D |
|             | 100         | 8×12                  | 0.22                       | 0.44  | 485                                                      | ELXZ500E□□101MH12D |

□□ : Enter the appropriate lead forming or taping code.



## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/100kHz) |       | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,<br>100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------|-------|------------------------------------------------------------------|--------------------|
|             |             |                       | 20°C                       | -10°C |                                                                  |                    |
| 50          | 120         | 8×15                  | 0.16                       | 0.32  | 635                                                              | ELXZ500E□□121MH15D |
|             | 120         | 10×12.5               | 0.16                       | 0.32  | 620                                                              | ELXZ500E□□121MJC5S |
|             | 180         | 8×20                  | 0.12                       | 0.24  | 730                                                              | ELXZ500E□□181MH20D |
|             | 180         | 10×16                 | 0.13                       | 0.26  | 850                                                              | ELXZ500E□□181MJ16S |
|             | 220         | 10×20                 | 0.088                      | 0.18  | 1,050                                                            | ELXZ500E□□221MJ20S |
|             | 330         | 10×25                 | 0.073                      | 0.15  | 1,250                                                            | ELXZ500E□□331MJ25S |
|             | 390         | 10×30                 | 0.054                      | 0.11  | 1,500                                                            | ELXZ500E□□391MJ30S |
|             | 390         | 12.5×20               | 0.059                      | 0.12  | 1,480                                                            | ELXZ500E□□391MK20S |
|             | 560         | 12.5×25               | 0.044                      | 0.088 | 1,840                                                            | ELXZ500E□□561MK25S |
|             | 680         | 12.5×30               | 0.039                      | 0.078 | 2,220                                                            | ELXZ500E□□681MK30S |
|             | 680         | 16×20                 | 0.048                      | 0.096 | 1,840                                                            | ELXZ500E□□681ML20S |
|             | 820         | 12.5×35               | 0.033                      | 0.066 | 2,290                                                            | ELXZ500E□□821MK35S |
|             | 820         | 18×20                 | 0.042                      | 0.084 | 1,980                                                            | ELXZ500E□□821MM20S |
|             | 1,000       | 12.5×40               | 0.029                      | 0.058 | 2,500                                                            | ELXZ500E□□102MK40S |
|             | 1,000       | 16×25                 | 0.034                      | 0.068 | 2,240                                                            | ELXZ500E□□102ML25S |
|             | 1,200       | 16×30                 | 0.028                      | 0.056 | 2,700                                                            | ELXZ500E□□122ML30S |
|             | 1,200       | 18×25                 | 0.029                      | 0.058 | 2,610                                                            | ELXZ500E□□122MM25S |
|             | 1,500       | 16×35                 | 0.025                      | 0.050 | 2,800                                                            | ELXZ500E□□152ML35S |
|             | 1,800       | 16×40                 | 0.021                      | 0.042 | 3,200                                                            | ELXZ500E□□182ML40S |
|             | 1,800       | 18×30                 | 0.025                      | 0.050 | 3,000                                                            | ELXZ500E□□182MM30S |
|             | 2,200       | 18×35                 | 0.023                      | 0.046 | 3,100                                                            | ELXZ500E□□222MM35S |
|             | 2,700       | 18×40                 | 0.020                      | 0.040 | 3,400                                                            | ELXZ500E□□272MM40S |
| 63          | 12          | 5×11.5                | 1.9                        | 4.0   | 145                                                              | ELXZ630E□□120MEB5D |
|             | 22          | 6.3×11.5              | 1.0                        | 2.0   | 240                                                              | ELXZ630E□□220MFB5D |

□□ : Enter the appropriate lead forming or taping code.

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

| Capacitance (μF) | Frequency (Hz) |      |      |      |
|------------------|----------------|------|------|------|
|                  | 120            | 1k   | 10k  | 100k |
| 12 to 180        | 0.40           | 0.75 | 0.90 | 1.00 |
| 220 to 560       | 0.50           | 0.85 | 0.94 | 1.00 |
| 680 to 1,800     | 0.60           | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,900   | 0.75           | 0.90 | 0.95 | 1.00 |
| 4,700 to 18,000  | 0.85           | 0.95 | 0.98 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

High reliability, Low impedance, 105°C

## LXY Series

- Adoption of innovative electrolyte and new technologies
- Endurance with ripple current : 2,000 to 8,000 hours at 105°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

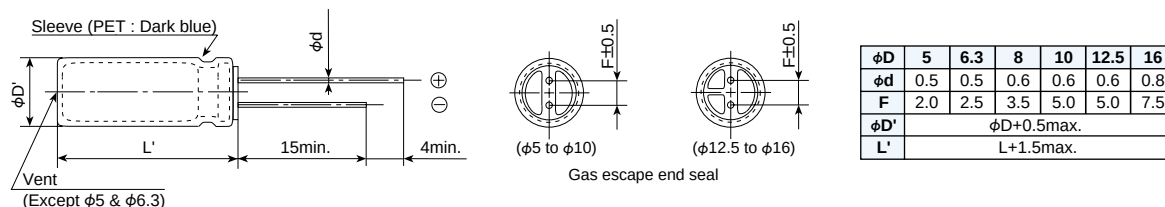


## ◆ SPECIFICATIONS

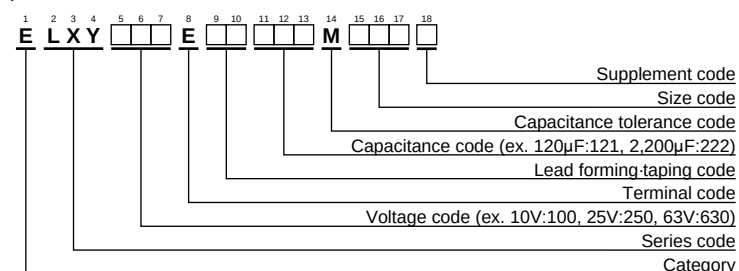
| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                                                                                         |      |      |      |      |      |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------|------|------|------|------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                       |                                                                                                         |      |      |      |      |      |
| Temperature Range                                      | -55 to +105°C                                                                                                                                                                                                                                                                           |                                                                                                         |      |      |      |      |      |
| Rated Voltage Range                                    | 10 to 63V <sub>dc</sub>                                                                                                                                                                                                                                                                 |                                                                                                         |      |      |      |      |      |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                                                                                         |      |      |      |      |      |
| Leakage Current                                        | I=0.01CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                           |                                                                                                         |      |      |      |      |      |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 10V                                                                                                     | 16V  | 25V  | 35V  | 50V  | 63V  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.19                                                                                                    | 0.16 | 0.14 | 0.12 | 0.10 | 0.10 |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                       |                                                                                                         |      |      |      |      |      |
| Low Temperature Characteristics (Max. Impedance Ratio) | Z(-55°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 10V <sub>dc</sub> to 50V <sub>dc</sub> : 3max.                                                          |      |      |      |      |      |
|                                                        |                                                                                                                                                                                                                                                                                         | 63V <sub>dc</sub> : 6max.                                                                               |      |      |      |      |      |
|                                                        | (at 120Hz)                                                                                                                                                                                                                                                                              |                                                                                                         |      |      |      |      |      |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for the specified period of time at 105°C.                                                                              |                                                                                                         |      |      |      |      |      |
|                                                        | Time                                                                                                                                                                                                                                                                                    | φ5 & 6.3 : 2,000hours   φ8 : 3,000hours   φ10 : 5,000hours   φ12.5 : 7,000hours   φ16 & 18 : 8,000hours |      |      |      |      |      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value                                                                              |      |      |      |      |      |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value                                                                    |      |      |      |      |      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                                                                            |      |      |      |      |      |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                                                                         |      |      |      |      |      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value                                                                              |      |      |      |      |      |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value                                                                    |      |      |      |      |      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                                                                            |      |      |      |      |      |

## ◆ DIMENSIONS [mm]

- Terminal Code : E



## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

## ◆ RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Capacitance (µF) | Frequency (Hz) | 120  | 1k   | 10k  | 100k |
|------------------|----------------|------|------|------|------|
| 10 to 180        |                | 0.40 | 0.75 | 0.90 | 1.00 |
| 220 to 560       |                | 0.50 | 0.85 | 0.94 | 1.00 |
| 680 to 1,800     |                | 0.60 | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,900   |                | 0.75 | 0.90 | 0.95 | 1.00 |
| 4,700 to 8,200   |                | 0.85 | 0.95 | 0.98 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise.  
When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

High reliability, Low impedance, 105°C

LXY Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/100kHz) |       | Rated<br>ripple<br>current<br>(mA rms/<br>105°C,<br>100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------|-------|-------------------------------------------------------------|--------------------|
|             |             |                       | 20°C                       | -10°C |                                                             |                    |
| 10          | 82          | 5 × 11.5              | 0.75                       | 1.5   | 163                                                         | ELXY100E□□820MEB5D |
|             | 180         | 6.3 × 11.5            | 0.35                       | 0.70  | 273                                                         | ELXY100E□□181MFB5D |
|             | 220         | 6.3 × 15              | 0.25                       | 0.50  | 390                                                         | ELXY100E□□221MF15D |
|             | 330         | 8 × 12                | 0.17                       | 0.34  | 445                                                         | ELXY100E□□331MH12D |
|             | 390         | 10 × 12.5             | 0.12                       | 0.24  | 625                                                         | ELXY100E□□391MJC5S |
|             | 470         | 8 × 15                | 0.13                       | 0.26  | 555                                                         | ELXY100E□□471MH15D |
|             | 680         | 8 × 20                | 0.095                      | 0.19  | 740                                                         | ELXY100E□□681MH20D |
|             | 680         | 10 × 16               | 0.084                      | 0.17  | 825                                                         | ELXY100E□□681MJ16S |
|             | 1,000       | 10 × 20               | 0.062                      | 0.13  | 1,040                                                       | ELXY100E□□102MJ20S |
|             | 1,200       | 10 × 25               | 0.052                      | 0.11  | 1,260                                                       | ELXY100E□□122MJ25S |
|             | 1,500       | 10 × 30               | 0.044                      | 0.088 | 1,440                                                       | ELXY100E□□152MJ30S |
|             | 1,800       | 12.5 × 20             | 0.046                      | 0.092 | 1,340                                                       | ELXY100E□□182MK20S |
|             | 2,200       | 12.5 × 25             | 0.034                      | 0.068 | 1,690                                                       | ELXY100E□□222MK25S |
|             | 2,700       | 12.5 × 30             | 0.030                      | 0.060 | 1,950                                                       | ELXY100E□□272MK30S |
|             | 3,300       | 12.5 × 35             | 0.024                      | 0.048 | 2,220                                                       | ELXY100E□□332MK35S |
|             | 3,300       | 16 × 20               | 0.038                      | 0.076 | 1,630                                                       | ELXY100E□□332ML20S |
|             | 3,900       | 12.5 × 40             | 0.022                      | 0.044 | 2,390                                                       | ELXY100E□□392MK40S |
|             | 3,900       | 16 × 25               | 0.028                      | 0.056 | 2,070                                                       | ELXY100E□□392ML25S |
|             | 5,600       | 16 × 30               | 0.025                      | 0.050 | 2,350                                                       | ELXY100E□□562ML30S |
|             | 6,800       | 16 × 35               | 0.022                      | 0.044 | 2,550                                                       | ELXY100E□□682ML35S |
|             | 8,200       | 16 × 40               | 0.018                      | 0.036 | 2,900                                                       | ELXY100E□□822ML40S |
| 16          | 56          | 5 × 11.5              | 0.75                       | 1.5   | 163                                                         | ELXY160E□□560MEB5D |
|             | 120         | 6.3 × 11.5            | 0.35                       | 0.70  | 273                                                         | ELXY160E□□121MFB5D |
|             | 180         | 6.3 × 15              | 0.25                       | 0.50  | 390                                                         | ELXY160E□□181MF15D |
|             | 270         | 8 × 12                | 0.17                       | 0.34  | 445                                                         | ELXY160E□□271MH12D |
|             | 270         | 10 × 12.5             | 0.12                       | 0.24  | 625                                                         | ELXY160E□□271MJC5S |
|             | 330         | 8 × 15                | 0.13                       | 0.26  | 555                                                         | ELXY160E□□331MH15D |
|             | 470         | 8 × 20                | 0.095                      | 0.19  | 740                                                         | ELXY160E□□471MH20D |
|             | 470         | 10 × 16               | 0.084                      | 0.17  | 825                                                         | ELXY160E□□471MJ16S |
|             | 680         | 10 × 20               | 0.062                      | 0.13  | 1,040                                                       | ELXY160E□□681MJ20S |
|             | 820         | 10 × 25               | 0.052                      | 0.11  | 1,260                                                       | ELXY160E□□821MJ25S |
|             | 1,200       | 10 × 30               | 0.044                      | 0.088 | 1,440                                                       | ELXY160E□□122MJ30S |
|             | 1,200       | 12.5 × 20             | 0.046                      | 0.092 | 1,340                                                       | ELXY160E□□122MK20S |
|             | 1,500       | 12.5 × 25             | 0.034                      | 0.068 | 1,690                                                       | ELXY160E□□152MK25S |
|             | 2,200       | 12.5 × 30             | 0.030                      | 0.060 | 1,950                                                       | ELXY160E□□222MK30S |
|             | 2,200       | 16 × 20               | 0.038                      | 0.076 | 1,630                                                       | ELXY160E□□222ML20S |
|             | 2,700       | 12.5 × 35             | 0.024                      | 0.048 | 2,220                                                       | ELXY160E□□272MK35S |
|             | 2,700       | 16 × 25               | 0.028                      | 0.056 | 2,070                                                       | ELXY160E□□272ML25S |
|             | 3,300       | 12.5 × 40             | 0.022                      | 0.044 | 2,390                                                       | ELXY160E□□332MK40S |
|             | 3,900       | 16 × 30               | 0.025                      | 0.050 | 2,350                                                       | ELXY160E□□392ML30S |
|             | 4,700       | 16 × 35               | 0.022                      | 0.044 | 2,550                                                       | ELXY160E□□472ML35S |
|             | 5,600       | 16 × 40               | 0.018                      | 0.036 | 2,900                                                       | ELXY160E□□562ML40S |
| 25          | 39          | 5 × 11.5              | 0.75                       | 1.5   | 163                                                         | ELXY250E□□390MEB5D |
|             | 82          | 6.3 × 11.5            | 0.35                       | 0.70  | 273                                                         | ELXY250E□□820MFB5D |
|             | 120         | 6.3 × 15              | 0.25                       | 0.50  | 390                                                         | ELXY250E□□121MF15D |
|             | 150         | 8 × 12                | 0.17                       | 0.34  | 445                                                         | ELXY250E□□151MH12D |
|             | 180         | 10 × 12.5             | 0.12                       | 0.24  | 625                                                         | ELXY250E□□181MJC5S |
|             | 220         | 8 × 15                | 0.13                       | 0.26  | 555                                                         | ELXY250E□□221MH15D |
|             | 330         | 8 × 20                | 0.095                      | 0.19  | 740                                                         | ELXY250E□□331MH20D |
|             | 330         | 10 × 16               | 0.084                      | 0.17  | 825                                                         | ELXY250E□□331MJ16S |
|             | 470         | 10 × 20               | 0.062                      | 0.13  | 1,040                                                       | ELXY250E□□471MJ20S |
|             | 560         | 10 × 25               | 0.052                      | 0.11  | 1,260                                                       | ELXY250E□□561MJ25S |
|             | 820         | 10 × 30               | 0.044                      | 0.088 | 1,440                                                       | ELXY250E□□821MJ30S |
|             | 820         | 12.5 × 20             | 0.046                      | 0.092 | 1,340                                                       | ELXY250E□□821MK20S |
|             | 1,000       | 12.5 × 25             | 0.034                      | 0.068 | 1,690                                                       | ELXY250E□□102MK25S |
|             | 1,500       | 12.5 × 30             | 0.030                      | 0.060 | 1,950                                                       | ELXY250E□□152MK30S |
|             | 1,500       | 16 × 20               | 0.038                      | 0.076 | 1,630                                                       | ELXY250E□□152ML20S |
|             | 1,800       | 12.5 × 35             | 0.024                      | 0.048 | 2,220                                                       | ELXY250E□□182MK35S |
|             | 1,800       | 16 × 25               | 0.028                      | 0.056 | 2,070                                                       | ELXY250E□□182ML25S |
|             | 2,200       | 12.5 × 40             | 0.022                      | 0.044 | 2,390                                                       | ELXY250E□□222MK40S |
|             | 2,700       | 16 × 30               | 0.025                      | 0.050 | 2,350                                                       | ELXY250E□□272ML30S |
|             | 3,300       | 16 × 35               | 0.022                      | 0.044 | 2,550                                                       | ELXY250E□□332ML35S |
|             | 3,900       | 16 × 40               | 0.018                      | 0.036 | 2,900                                                       | ELXY250E□□392ML40S |
| 35          | 27          | 5 × 11.5              | 0.75                       | 1.5   | 163                                                         | ELXY350E□□270MEB5D |
|             | 56          | 6.3 × 11.5            | 0.35                       | 0.70  | 273                                                         | ELXY350E□□560MFB5D |
|             | 82          | 6.3 × 15              | 0.25                       | 0.50  | 390                                                         | ELXY350E□□820MF15D |
|             | 120         | 8 × 12                | 0.17                       | 0.34  | 445                                                         | ELXY350E□□121MH12D |
|             | 120         | 10 × 12.5             | 0.12                       | 0.24  | 625                                                         | ELXY350E□□121MJC5S |
|             | 180         | 8 × 15                | 0.13                       | 0.26  | 555                                                         | ELXY350E□□181MH15D |
|             | 220         | 8 × 20                | 0.095                      | 0.19  | 740                                                         | ELXY350E□□221MH20D |
|             | 220         | 10 × 16               | 0.084                      | 0.17  | 825                                                         | ELXY350E□□221MJ16S |
|             | 330         | 10 × 20               | 0.062                      | 0.13  | 1,040                                                       | ELXY350E□□331MJ20S |
|             | 390         | 10 × 25               | 0.052                      | 0.11  | 1,260                                                       | ELXY350E□□391MJ25S |
|             | 560         | 10 × 30               | 0.044                      | 0.088 | 1,440                                                       | ELXY350E□□561MJ30S |
|             | 560         | 12.5 × 20             | 0.046                      | 0.092 | 1,340                                                       | ELXY350E□□561MK20S |
|             | 680         | 12.5 × 25             | 0.034                      | 0.068 | 1,690                                                       | ELXY350E□□681MK25S |
|             | 1,000       | 12.5 × 30             | 0.030                      | 0.060 | 1,950                                                       | ELXY350E□□102MK30S |
|             | 1,000       | 16 × 20               | 0.038                      | 0.076 | 1,630                                                       | ELXY350E□□102ML20S |
|             | 1,200       | 12.5 × 35             | 0.024                      | 0.048 | 2,220                                                       | ELXY350E□□122MK35S |
|             | 1,200       | 16 × 25               | 0.028                      | 0.056 | 2,070                                                       | ELXY350E□□122ML25S |
|             | 1,500       | 12.5 × 40             | 0.022                      | 0.044 | 2,390                                                       | ELXY350E□□152MK40S |
|             | 1,800       | 16 × 30               | 0.025                      | 0.050 | 2,350                                                       | ELXY350E□□182ML30S |
|             | 2,200       | 16 × 35               | 0.022                      | 0.044 | 2,550                                                       | ELXY350E□□222ML35S |
|             | 2,700       | 16 × 40               | 0.018                      | 0.036 | 2,900                                                       | ELXY350E□□272ML40S |
| 50          | 18          | 5 × 11.5              | 1.2                        | 2.4   | 129                                                         | ELXY500E□□180MEB5D |
|             | 39          | 6.3 × 11.5            | 0.54                       | 1.1   | 219                                                         | ELXY500E□□390MFB5D |
|             | 56          | 6.3 × 15              | 0.34                       | 0.68  | 310                                                         | ELXY500E□□560MF15D |
|             | 68          | 8 × 12                | 0.30                       | 0.60  | 340                                                         | ELXY500E□□680MH12D |
|             | 82          | 8 × 15                | 0.20                       | 0.40  | 470                                                         | ELXY500E□□820MH15D |
|             | 82          | 10 × 12.5             | 0.20                       | 0.40  | 480                                                         | ELXY500E□□820MJC5S |
|             | 120         | 8 × 20                | 0.14                       | 0.28  | 610                                                         | ELXY500E□□121MH20D |
|             | 120         | 10 × 16               | 0.13                       | 0.26  | 755                                                         | ELXY500E□□121MJ16S |
|             | 180         | 10 × 20               | 0.088                      | 0.18  | 945                                                         | ELXY500E□□181MJ20S |
|             | 220         | 10 × 25               | 0.073                      | 0.15  | 1,150                                                       | ELXY500E□□221MJ25S |
|             | 330         | 10 × 30               | 0.054                      | 0.11  | 1,260                                                       | ELXY500E□□331MJ30S |
|             | 330         | 12.5 × 20             | 0.059                      | 0.12  | 1,190                                                       | ELXY500E□□331MK20S |
|             | 470         | 12.5 × 25             | 0.044                      | 0.088 | 1,490                                                       | ELXY500E□□471MK25S |
|             | 560         | 12.5 × 30             | 0.039                      | 0.078 | 1,720                                                       | ELXY500E□□561MK30S |
|             | 680         | 12.5 × 35             | 0.033                      | 0.066 | 1,890                                                       | ELXY500E□□681MK35S |
|             | 680         | 16 × 20               | 0.050                      | 0.10  | 1,420                                                       | ELXY500E□□681ML20S |
|             | 820         | 12.5 × 40             | 0.029                      | 0.058 | 2,030                                                       | ELXY500E□□821MK40S |
|             | 820         | 16 × 25               | 0.034                      | 0.068 | 1,880                                                       | ELXY500E□□821ML25S |
|             | 1,000       | 16 × 30               | 0.030                      | 0.060 | 2,150                                                       | ELXY500E□□102ML30S |
|             | 1,200       | 16 × 35               | 0.027                      | 0.054 | 2,320                                                       | ELXY500E□□122ML35S |
|             | 1,500       | 16 × 40               | 0.024                      | 0.048 | 2,540                                                       | ELXY500E□□152ML40S |
| 63          | 10          | 5 × 11.5              | 1.9                        | 4.8   | 103                                                         | ELXY630E□□100MEB5D |
|             | 18          | 6.3 × 11.5            | 1.0                        | 2.5   | 161                                                         | ELXY630E□□180MFB5D |
|             | 33          | 6.3 × 15              | 0.61                       | 1.6   | 233                                                         | ELXY630E□□330MF15D |
|             | 47          | 8 × 12                | 0.47                       | 1.2   | 274                                                         | ELXY630E□□470MH12D |
|             | 56          | 10 × 12.5             | 0.27                       | 0.68  | 418                                                         | ELXY630E□□560MJC5S |
|             | 68          | 8 × 15                | 0.34                       | 0.85  | 360                                                         | ELXY630E□□680MH15D |
|             | 68          | 10 × 16               | 0.21                       | 0.53  | 525                                                         | ELXY630E□□680MJ16S |
|             | 82          | 8 × 20                | 0.21                       | 0.53  | 500                                                         | ELXY630E□□820MH20D |
|             | 120         | 10 × 20               | 0.16                       | 0.40  | 650                                                         | ELXY630E□□121MJ20S |
|             | 150         | 10 × 25               | 0.13                       | 0.33  | 783                                                         | ELXY630E□□151MJ25S |
|             | 180         | 10 × 30               | 0.10                       | 0.25  | 960                                                         | ELXY630E□□181MJ30S |
|             | 220         | 12.5 × 20             | 0.11                       | 0.28  | 870                                                         | ELXY630E□□221MK20S |
|             | 270         | 12.5 × 25             | 0.074                      | 0.19  | 1,150                                                       | ELXY630E□□271MK25S |
|             | 330         | 16 × 20               | 0.085                      | 0.22  | 1,100                                                       | ELXY630E□□331ML20S |
|             | 390         | 12.5 × 30             | 0.068                      | 0.17  | 1,280                                                       | ELXY630E□□391MK30S |
|             | 470         | 12.5 × 35             | 0.063                      | 0.16  | 1,390                                                       | ELXY630E□□471MK35S |
|             | 470         | 16 × 25               | 0.055                      | 0.14  | 1,480                                                       | ELXY630E□□471ML25S |
|             | 560         | 12.5 × 40             | 0.051                      | 0.13  | 1,530                                                       | ELXY630E□□561MK40S |
|             | 680         | 16 × 30               | 0.046                      | 0.12  | 1,720                                                       | ELXY630E□□681ML30S |
|             | 820         | 16 × 35               | 0.040                      | 0.10  | 1,910                                                       | ELXY630E□□821ML35S |
|             | 1,000       | 16 × 40               | 0.036                      | 0.09  | 2,070                                                       | ELXY630E□□102ML40S |

□□ : Enter the appropriate lead forming or taping code.

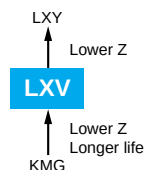


## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

## LXV Series

- Low impedance
- Endurance with ripple current : 2,000 to 5,000 hours at 105°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

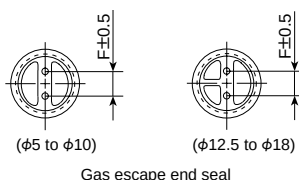
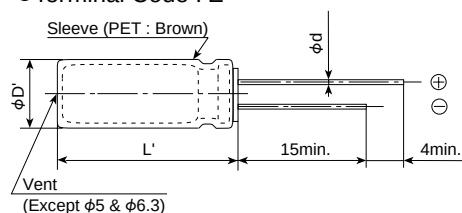


## ◆ SPECIFICATIONS

| Items                           | Characteristics                                                                                                                                                                                                                                                                         |                                                                           |      |      |      |                                              |      |      |      |      |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|------|------|------|----------------------------------------------|------|------|------|------|
| Category                        | Temperature Range                                                                                                                                                                                                                                                                       |                                                                           |      |      |      |                                              |      |      |      |      |
| Rated Voltage Range             | -55 to +105°C                                                                                                                                                                                                                                                                           |                                                                           |      |      |      |                                              |      |      |      |      |
| Capacitance Tolerance           | 6.3 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                                                           |      |      |      |                                              |      |      |      |      |
| Leakage Current                 | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                                                           |      |      |      |                                              |      |      |      |      |
| Dissipation Factor (tanδ)       | I=0.01CV or 3μA, whichever is greater.                                                                                                                                                                                                                                                  |                                                                           |      |      |      |                                              |      |      |      |      |
|                                 | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                                                                     |                                                                           |      |      |      |                                              |      |      |      |      |
|                                 | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 6.3V                                                                      | 10V  | 16V  | 25V  | 35V                                          | 50V  | 63V  | 80V  | 100V |
|                                 | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.22                                                                      | 0.19 | 0.16 | 0.14 | 0.12                                         | 0.10 | 0.10 | 0.09 | 0.08 |
|                                 | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                       |                                                                           |      |      |      |                                              |      |      |      |      |
| Low Temperature Characteristics | Capacitance change ΔC (-55°C /+20°C)                                                                                                                                                                                                                                                    |                                                                           |      |      |      | 0.7min.                                      |      |      |      |      |
|                                 | Max. impedance ratio (-55°C /+20°C)                                                                                                                                                                                                                                                     |                                                                           |      |      |      | 3max.(6.3V <sub>dc</sub> : 4max.) (at 120Hz) |      |      |      |      |
| Endurance                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for the specified period of time at 105°C.                                                                              |                                                                           |      |      |      |                                              |      |      |      |      |
|                                 | Time                                                                                                                                                                                                                                                                                    | φ5 to 6.3 : 2,000hours   φ8 & 10 : 3,000hours   φ12.5 to φ18 : 5,000hours |      |      |      |                                              |      |      |      |      |
|                                 | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value                                                |      |      |      |                                              |      |      |      |      |
|                                 | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value                                      |      |      |      |                                              |      |      |      |      |
|                                 | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                                              |      |      |      |                                              |      |      |      |      |
| Shelf Life                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                                           |      |      |      |                                              |      |      |      |      |
|                                 | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value                                                |      |      |      |                                              |      |      |      |      |
|                                 | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value                                      |      |      |      |                                              |      |      |      |      |
|                                 | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                                              |      |      |      |                                              |      |      |      |      |

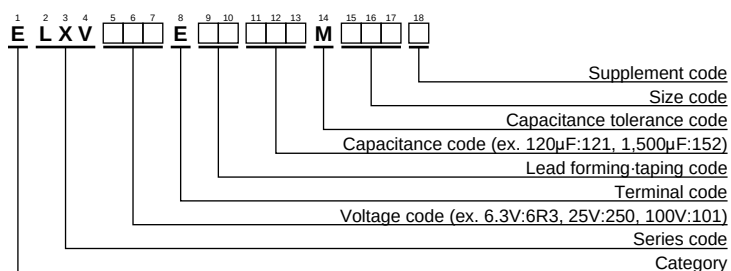
## ◆ DIMENSIONS [mm]

## ● Terminal Code : E



| φD  | 5          | 6.3 | 8   | 10  | 12.5 | 16  | 18  |
|-----|------------|-----|-----|-----|------|-----|-----|
| φd  | 0.5        | 0.5 | 0.6 | 0.6 | 0.6  | 0.8 | 0.8 |
| F   | 2.0        | 2.5 | 3.5 | 5.0 | 5.0  | 7.5 | 7.5 |
| φD' | φD+0.5max. |     |     |     |      |     |     |
| L'  | L+1.5max.  |     |     |     |      |     |     |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

LXV Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/100kHz) |       | Rated<br>ripple<br>current<br>(mA rms/<br>105°C,<br>100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------|-------|-------------------------------------------------------------|--------------------|
|             |             |                       | 20°C                       | -10°C |                                                             |                    |
| 6.3         | 120         | 5×11.5                | 0.72                       | 1.8   | 165                                                         | ELXV6R3E□□121MEB5D |
|             | 220         | 6.3×11.5              | 0.38                       | 0.95  | 255                                                         | ELXV6R3E□□221MFB5D |
|             | 330         | 6.3×15                | 0.27                       | 0.68  | 330                                                         | ELXV6R3E□□331MF15D |
|             | 390         | 8×12                  | 0.20                       | 0.50  | 415                                                         | ELXV6R3E□□391MH12D |
|             | 470         | 10×12.5               | 0.12                       | 0.30  | 635                                                         | ELXV6R3E□□471MJC5S |
|             | 560         | 8×15                  | 0.16                       | 0.40  | 495                                                         | ELXV6R3E□□561MH15D |
|             | 680         | 10×16                 | 0.084                      | 0.21  | 825                                                         | ELXV6R3E□□681MJ16S |
|             | 820         | 8×20                  | 0.11                       | 0.28  | 640                                                         | ELXV6R3E□□821MH20D |
|             | 1,200       | 10×20                 | 0.062                      | 0.16  | 1,060                                                       | ELXV6R3E□□122MJ20S |
|             | 1,500       | 10×25                 | 0.052                      | 0.13  | 1,260                                                       | ELXV6R3E□□152MJ25S |
|             | 2,200       | 10×30                 | 0.044                      | 0.11  | 1,450                                                       | ELXV6R3E□□222MJ30S |
|             | 2,200       | 12.5×20               | 0.046                      | 0.12  | 1,360                                                       | ELXV6R3E□□222MK20S |
|             | 2,700       | 12.5×25               | 0.034                      | 0.085 | 1,700                                                       | ELXV6R3E□□272MK25S |
|             | 3,900       | 12.5×30               | 0.030                      | 0.075 | 1,980                                                       | ELXV6R3E□□392MK30S |
|             | 3,900       | 16×20                 | 0.038                      | 0.095 | 1,770                                                       | ELXV6R3E□□392ML20S |
|             | 4,700       | 12.5×35               | 0.027                      | 0.068 | 2,230                                                       | ELXV6R3E□□472MK35S |
|             | 5,600       | 12.5×40               | 0.024                      | 0.060 | 2,460                                                       | ELXV6R3E□□562MK40S |
|             | 5,600       | 16×25                 | 0.028                      | 0.070 | 2,190                                                       | ELXV6R3E□□562ML25S |
|             | 5,600       | 18×20                 | 0.036                      | 0.090 | 1,940                                                       | ELXV6R3E□□562MM20S |
|             | 6,800       | 16×30                 | 0.025                      | 0.063 | 2,510                                                       | ELXV6R3E□□682ML30S |
|             | 6,800       | 18×25                 | 0.027                      | 0.068 | 2,350                                                       | ELXV6R3E□□682MM25S |
| 10          | 820         | 16×35                 | 0.022                      | 0.055 | 2,770                                                       | ELXV6R3E□□822ML35S |
|             | 10,000      | 16×40                 | 0.018                      | 0.045 | 3,110                                                       | ELXV6R3E□□103ML40S |
|             | 10,000      | 18×30                 | 0.024                      | 0.060 | 2,720                                                       | ELXV6R3E□□103MM30S |
|             | 12,000      | 18×35                 | 0.021                      | 0.053 | 3,050                                                       | ELXV6R3E□□123MM35S |
|             | 15,000      | 18×40                 | 0.017                      | 0.043 | 3,300                                                       | ELXV6R3E□□153MM40S |
|             | 82          | 5×11.5                | 0.72                       | 1.8   | 165                                                         | ELXV100E□□820MEB5D |
|             | 180         | 6.3×11.5              | 0.38                       | 0.95  | 255                                                         | ELXV100E□□181MFB5D |
|             | 270         | 6.3×15                | 0.27                       | 0.68  | 330                                                         | ELXV100E□□271MF15D |
|             | 330         | 8×12                  | 0.20                       | 0.50  | 415                                                         | ELXV100E□□331MH12D |
|             | 390         | 10×12.5               | 0.12                       | 0.30  | 635                                                         | ELXV100E□□391MJC5S |
|             | 470         | 8×15                  | 0.16                       | 0.40  | 495                                                         | ELXV100E□□471MH15D |
|             | 680         | 8×20                  | 0.11                       | 0.28  | 640                                                         | ELXV100E□□681MH20D |
|             | 680         | 10×16                 | 0.084                      | 0.21  | 825                                                         | ELXV100E□□681MJ16S |
|             | 1,000       | 10×20                 | 0.062                      | 0.16  | 1,060                                                       | ELXV100E□□102MJ20S |
|             | 1,200       | 10×25                 | 0.052                      | 0.13  | 1,260                                                       | ELXV100E□□122MJ25S |
|             | 1,500       | 10×30                 | 0.044                      | 0.11  | 1,450                                                       | ELXV100E□□152MJ30S |
|             | 1,800       | 12.5×20               | 0.046                      | 0.12  | 1,360                                                       | ELXV100E□□182MK20S |
|             | 2,200       | 12.5×25               | 0.034                      | 0.085 | 1,700                                                       | ELXV100E□□222MK25S |
|             | 2,700       | 12.5×30               | 0.030                      | 0.075 | 1,980                                                       | ELXV100E□□272MK30S |
|             | 3,300       | 12.5×35               | 0.027                      | 0.068 | 2,230                                                       | ELXV100E□□332MK35S |
|             | 3,300       | 16×20                 | 0.038                      | 0.095 | 1,770                                                       | ELXV100E□□332ML20S |
| 16          | 3,900       | 12.5×40               | 0.024                      | 0.060 | 2,460                                                       | ELXV100E□□392MK40S |
|             | 3,900       | 16×25                 | 0.028                      | 0.070 | 2,190                                                       | ELXV100E□□392ML25S |
|             | 3,900       | 18×20                 | 0.036                      | 0.090 | 1,940                                                       | ELXV100E□□392MM20S |
|             | 4,700       | 18×25                 | 0.027                      | 0.068 | 2,350                                                       | ELXV100E□□472MM25S |
|             | 5,600       | 16×30                 | 0.025                      | 0.063 | 2,510                                                       | ELXV100E□□562ML30S |
|             | 6,800       | 16×35                 | 0.022                      | 0.055 | 2,770                                                       | ELXV100E□□682ML35S |
|             | 6,800       | 18×30                 | 0.024                      | 0.060 | 2,720                                                       | ELXV100E□□682MM30S |
|             | 8,200       | 16×40                 | 0.018                      | 0.045 | 3,110                                                       | ELXV100E□□822ML40S |
|             | 8,200       | 18×35                 | 0.021                      | 0.053 | 3,050                                                       | ELXV100E□□822MM35S |
|             | 10,000      | 18×40                 | 0.017                      | 0.043 | 3,300                                                       | ELXV100E□□103MM40S |
|             | 56          | 5×11.5                | 0.72                       | 1.8   | 165                                                         | ELXV160E□□560MEB5D |
|             | 120         | 6.3×11.5              | 0.38                       | 0.95  | 255                                                         | ELXV160E□□121MFB5D |
|             | 180         | 6.3×15                | 0.27                       | 0.68  | 330                                                         | ELXV160E□□181MF15D |
|             | 270         | 8×12                  | 0.20                       | 0.50  | 415                                                         | ELXV160E□□271MH12D |
|             | 270         | 10×12.5               | 0.12                       | 0.30  | 635                                                         | ELXV160E□□271MJC5S |
|             | 330         | 8×15                  | 0.16                       | 0.40  | 495                                                         | ELXV160E□□331MH15D |
|             | 470         | 8×20                  | 0.11                       | 0.28  | 640                                                         | ELXV160E□□471MH20D |
|             | 470         | 10×16                 | 0.084                      | 0.21  | 825                                                         | ELXV160E□□471MJ16S |
|             | 680         | 10×20                 | 0.062                      | 0.16  | 1,060                                                       | ELXV160E□□681MJ20S |
|             | 820         | 10×25                 | 0.052                      | 0.13  | 1,260                                                       | ELXV160E□□821MJ25S |
|             | 1,200       | 10×30                 | 0.044                      | 0.11  | 1,450                                                       | ELXV160E□□122MJ30S |
|             | 1,200       | 12.5×20               | 0.046                      | 0.12  | 1,360                                                       | ELXV160E□□122MK20S |
| 25          | 1,500       | 12.5×25               | 0.034                      | 0.085 | 1,700                                                       | ELXV160E□□152MK25S |
|             | 2,200       | 12.5×30               | 0.030                      | 0.075 | 1,980                                                       | ELXV160E□□222MK30S |
|             | 2,200       | 16×20                 | 0.038                      | 0.095 | 1,770                                                       | ELXV160E□□222ML20S |
|             | 2,200       | 16×25                 | 0.036                      | 0.090 | 1,940                                                       | ELXV160E□□222MM20S |
|             | 2,700       | 16×30                 | 0.027                      | 0.068 | 2,350                                                       | ELXV160E□□272MM25S |
|             | 2,700       | 18×25                 | 0.027                      | 0.068 | 2,350                                                       | ELXV160E□□272MM25S |
|             | 3,300       | 16×35                 | 0.022                      | 0.055 | 2,770                                                       | ELXV160E□□332ML35S |
|             | 3,300       | 18×30                 | 0.024                      | 0.060 | 2,720                                                       | ELXV160E□□332MM30S |
|             | 3,900       | 16×40                 | 0.018                      | 0.045 | 3,110                                                       | ELXV160E□□392ML40S |
|             | 3,900       | 18×35                 | 0.021                      | 0.053 | 3,050                                                       | ELXV160E□□392MM35S |
|             | 4,700       | 18×40                 | 0.017                      | 0.043 | 3,300                                                       | ELXV160E□□472MM40S |
|             | 27          | 5×11.5                | 0.72                       | 1.8   | 165                                                         | ELXV350E□□270MEB5D |
|             | 56          | 6.3×11.5              | 0.38                       | 0.95  | 255                                                         | ELXV350E□□560MFB5D |
|             | 82          | 6.3×15                | 0.27                       | 0.68  | 330                                                         | ELXV350E□□820MF15D |
|             | 120         | 8×12                  | 0.20                       | 0.50  | 415                                                         | ELXV350E□□121MH12D |
|             | 120         | 10×12.5               | 0.12                       | 0.30  | 635                                                         | ELXV350E□□121MJC5S |
|             | 180         | 8×15                  | 0.16                       | 0.40  | 495                                                         | ELXV350E□□181MH15D |
|             | 220         | 8×20                  | 0.11                       | 0.28  | 640                                                         | ELXV350E□□221MH20D |
|             | 220         | 10×16                 | 0.084                      | 0.21  | 825                                                         | ELXV350E□□221MJ16S |
|             | 330         | 10×20                 | 0.062                      | 0.16  | 1,060                                                       | ELXV350E□□331MJ20S |
|             | 390         | 10×25                 | 0.052                      | 0.13  | 1,260                                                       | ELXV350E□□391MJ25S |
|             | 560         | 10×30                 | 0.044                      | 0.11  | 1,450                                                       | ELXV350E□□561MJ30S |
| 35          | 560         | 12.5×20               | 0.046                      | 0.12  | 1,360                                                       | ELXV350E□□561MK20S |
|             | 680         | 12.5×25               | 0.034                      | 0.085 | 1,700                                                       | ELXV350E□□681MK25S |
|             | 1,000       | 12.5×30               | 0.030                      | 0.075 | 1,980                                                       | ELXV350E□□102MK30S |
|             | 1,000       | 16×20                 | 0.038                      | 0.095 | 1,770                                                       | ELXV350E□□102ML20S |
|             | 1,200       | 12.5×35               | 0.027                      | 0.068 | 2,230                                                       | ELXV350E□□122MK35S |
|             | 1,200       | 16×25                 | 0.028                      | 0.070 | 2,190                                                       | ELXV350E□□122ML25S |
|             | 1,500       | 12.5×40               | 0.024                      | 0.060 | 2,460                                                       | ELXV350E□□152MK40S |
|             | 1,500       | 18×20                 | 0.036                      | 0.090 | 1,940                                                       | ELXV350E□□152MM20S |
|             | 1,800       | 16×30                 | 0.025                      | 0.063 | 2,510                                                       | ELXV350E□□182ML30S |
|             | 1,800       | 18×25                 | 0.027                      | 0.068 | 2,350                                                       | ELXV350E□□182MM25S |
|             | 2,200       | 16×35                 | 0.022                      | 0.055 | 2,770                                                       | ELXV350E□□222ML35S |
|             | 2,200       | 18×30                 | 0.024                      | 0.060 | 2,720                                                       | ELXV350E□□222MM30S |
|             | 2,700       | 16×40                 | 0.018                      | 0.045 | 3,110                                                       | ELXV350E□□272ML40S |
|             | 2,700       | 18×35                 | 0.021                      | 0.053 | 3,050                                                       | ELXV350E□□272MM35S |
|             | 3,300       | 18×40                 | 0.017                      | 0.043 | 3,300                                                       | ELXV350E□□332MM40S |
|             | 18          | 5×11.5                | 1.1                        | 3.3   | 165                                                         | ELXV500E□□180MEB5D |
|             | 39          | 6.3×11.5              | 0.56                       | 1.6   | 255                                                         | ELXV500E□□390MFB5D |
|             | 56          | 6.3×15                | 0.41                       | 1.2   | 310                                                         | ELXV500E□□560MF15D |
|             | 68          | 8×12                  | 0.29                       | 0.84  | 415                                                         | ELXV500E□□680MH12D |

□ : Enter the appropriate lead forming or taping code.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Low impedance, 105°C

LXV Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/100kHz) |       | Rated<br>ripple<br>current<br>(mA rms/<br>105°C,<br>100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------|-------|-------------------------------------------------------------|--------------------|
|             |             |                       | 20°C                       | -10°C |                                                             |                    |
| 50          | 82          | 8×15                  | 0.24                       | 0.72  | 505                                                         | ELXV500E□□820MH15D |
|             | 82          | 10×12.5               | 0.16                       | 0.40  | 530                                                         | ELXV500E□□820MJC5S |
|             | 120         | 8×20                  | 0.18                       | 0.52  | 610                                                         | ELXV500E□□121MH20D |
|             | 120         | 10×16                 | 0.12                       | 0.30  | 755                                                         | ELXV500E□□121MJ16S |
|             | 180         | 10×20                 | 0.088                      | 0.22  | 945                                                         | ELXV500E□□181MJ20S |
|             | 220         | 10×25                 | 0.068                      | 0.17  | 1,150                                                       | ELXV500E□□221MJ25S |
|             | 330         | 10×30                 | 0.059                      | 0.15  | 1,260                                                       | ELXV500E□□331MJ30S |
|             | 330         | 12.5×20               | 0.059                      | 0.15  | 1,190                                                       | ELXV500E□□331MK20S |
|             | 470         | 12.5×25               | 0.045                      | 0.11  | 1,500                                                       | ELXV500E□□471MK25S |
|             | 560         | 12.5×30               | 0.039                      | 0.098 | 1,720                                                       | ELXV500E□□561MK30S |
|             | 680         | 12.5×35               | 0.033                      | 0.083 | 1,900                                                       | ELXV500E□□681MK35S |
|             | 680         | 16×20                 | 0.043                      | 0.11  | 1,500                                                       | ELXV500E□□681ML20S |
|             | 820         | 12.5×40               | 0.029                      | 0.073 | 2,120                                                       | ELXV500E□□821MK40S |
|             | 820         | 16×25                 | 0.033                      | 0.083 | 1,880                                                       | ELXV500E□□821ML25S |
|             | 820         | 18×20                 | 0.039                      | 0.098 | 1,660                                                       | ELXV500E□□821MM20S |
|             | 1,000       | 16×30                 | 0.029                      | 0.073 | 2,150                                                       | ELXV500E□□102ML30S |
|             | 1,000       | 18×25                 | 0.030                      | 0.075 | 2,020                                                       | ELXV500E□□102MM25S |
|             | 1,200       | 16×35                 | 0.025                      | 0.063 | 2,320                                                       | ELXV500E□□122ML35S |
|             | 1,500       | 16×40                 | 0.021                      | 0.053 | 2,650                                                       | ELXV500E□□152ML40S |
|             | 1,500       | 18×30                 | 0.026                      | 0.065 | 2,340                                                       | ELXV500E□□152MM30S |
|             | 1,800       | 18×35                 | 0.023                      | 0.058 | 2,620                                                       | ELXV500E□□182MM35S |
|             | 2,200       | 18×40                 | 0.020                      | 0.050 | 2,790                                                       | ELXV500E□□222MM40S |
| 63          | 12          | 5×11.5                | 1.9                        | 4.8   | 100                                                         | ELXV630E□□120MEB5D |
|             | 27          | 6.3×11.5              | 1.1                        | 2.8   | 160                                                         | ELXV630E□□270MFB5D |
|             | 39          | 6.3×15                | 0.62                       | 1.6   | 230                                                         | ELXV630E□□390MF15D |
|             | 47          | 8×12                  | 0.49                       | 1.3   | 275                                                         | ELXV630E□□470MH12D |
|             | 56          | 10×12.5               | 0.27                       | 0.68  | 420                                                         | ELXV630E□□560MJC5S |
|             | 68          | 8×15                  | 0.34                       | 0.85  | 360                                                         | ELXV630E□□680MH15D |
|             | 68          | 10×16                 | 0.21                       | 0.53  | 523                                                         | ELXV630E□□680MJ16S |
|             | 82          | 8×20                  | 0.21                       | 0.53  | 500                                                         | ELXV630E□□820MH20D |
|             | 120         | 10×20                 | 0.16                       | 0.40  | 650                                                         | ELXV630E□□121MJ20S |
|             | 150         | 10×25                 | 0.13                       | 0.33  | 780                                                         | ELXV630E□□151MJ25S |
|             | 180         | 10×30                 | 0.10                       | 0.25  | 960                                                         | ELXV630E□□181MJ30S |
|             | 220         | 12.5×20               | 0.11                       | 0.28  | 870                                                         | ELXV630E□□221MK20S |
|             | 270         | 12.5×25               | 0.074                      | 0.19  | 1,150                                                       | ELXV630E□□271MK25S |
|             | 390         | 12.5×30               | 0.068                      | 0.17  | 1,280                                                       | ELXV630E□□391MK30S |
|             | 390         | 16×20                 | 0.085                      | 0.22  | 1,100                                                       | ELXV630E□□391ML20S |
|             | 470         | 12.5×35               | 0.063                      | 0.16  | 1,390                                                       | ELXV630E□□471MK35S |
|             | 470         | 16×25                 | 0.055                      | 0.14  | 1,480                                                       | ELXV630E□□471ML25S |
|             | 560         | 12.5×40               | 0.051                      | 0.13  | 1,530                                                       | ELXV630E□□561MK40S |
|             | 560         | 18×20                 | 0.085                      | 0.22  | 1,170                                                       | ELXV630E□□561MM20S |
|             | 680         | 16×30                 | 0.046                      | 0.12  | 1,720                                                       | ELXV630E□□681ML30S |
|             | 680         | 18×25                 | 0.055                      | 0.14  | 1,520                                                       | ELXV630E□□681MM25S |
|             | 820         | 16×35                 | 0.040                      | 0.10  | 1,910                                                       | ELXV630E□□821ML35S |
|             | 820         | 18×30                 | 0.046                      | 0.12  | 1,770                                                       | ELXV630E□□821MM30S |
|             | 1,000       | 16×40                 | 0.036                      | 0.09  | 2,070                                                       | ELXV630E□□102ML40S |
|             | 1,000       | 18×35                 | 0.040                      | 0.10  | 1,970                                                       | ELXV630E□□102MM35S |
|             | 1,200       | 18×40                 | 0.036                      | 0.09  | 2,130                                                       | ELXV630E□□122MM40S |
| 80          | 8.2         | 5×11.5                | 1.9                        | 5.1   | 100                                                         | ELXV800E□□8R2MEB5D |
|             | 18          | 6.3×11.5              | 1.1                        | 3.0   | 150                                                         | ELXV800E□□180MFB5D |
| 80          | 27          | 6.3×15                | 0.62                       | 1.7   | 220                                                         | ELXV800E□□270MF15D |
|             | 33          | 8×12                  | 0.53                       | 1.5   | 275                                                         | ELXV800E□□330MH12D |
|             | 39          | 10×12.5               | 0.47                       | 1.3   | 380                                                         | ELXV800E□□390MJC5S |
|             | 47          | 8×15                  | 0.35                       | 0.97  | 360                                                         | ELXV800E□□470MH15D |
|             | 56          | 8×20                  | 0.27                       | 0.74  | 490                                                         | ELXV800E□□560MH20D |
|             | 56          | 10×16                 | 0.33                       | 0.90  | 500                                                         | ELXV800E□□560MJ16S |
|             | 82          | 10×20                 | 0.26                       | 0.70  | 620                                                         | ELXV800E□□820MJ20S |
|             | 100         | 10×25                 | 0.19                       | 0.52  | 795                                                         | ELXV800E□□101MJ25S |
|             | 150         | 10×30                 | 0.15                       | 0.41  | 955                                                         | ELXV800E□□151MJ30S |
|             | 150         | 12.5×20               | 0.15                       | 0.41  | 890                                                         | ELXV800E□□151MK20S |
|             | 180         | 12.5×25               | 0.11                       | 0.30  | 1,040                                                       | ELXV800E□□181MK25S |
|             | 270         | 12.5×30               | 0.094                      | 0.26  | 1,270                                                       | ELXV800E□□271MK30S |
|             | 270         | 16×20                 | 0.11                       | 0.30  | 1,240                                                       | ELXV800E□□271ML20S |
|             | 330         | 12.5×35               | 0.087                      | 0.24  | 1,450                                                       | ELXV800E□□331MK35S |
|             | 330         | 16×25                 | 0.081                      | 0.22  | 1,440                                                       | ELXV800E□□331ML25S |
|             | 390         | 12.5×40               | 0.060                      | 0.17  | 1,610                                                       | ELXV800E□□391MK40S |
|             | 390         | 18×20                 | 0.085                      | 0.23  | 1,450                                                       | ELXV800E□□391MM20S |
|             | 470         | 16×30                 | 0.058                      | 0.16  | 1,790                                                       | ELXV800E□□471ML30S |
|             | 470         | 18×25                 | 0.070                      | 0.19  | 1,650                                                       | ELXV800E□□471MM25S |
|             | 560         | 16×35                 | 0.052                      | 0.14  | 2,000                                                       | ELXV800E□□561ML35S |
|             | 680         | 16×40                 | 0.041                      | 0.11  | 2,200                                                       | ELXV800E□□681ML40S |
|             | 680         | 18×30                 | 0.058                      | 0.16  | 1,850                                                       | ELXV800E□□681MM30S |
|             | 820         | 18×35                 | 0.052                      | 0.14  | 1,990                                                       | ELXV800E□□821MM35S |
|             | 1,000       | 18×40                 | 0.041                      | 0.11  | 2,370                                                       | ELXV800E□□102MM40S |
| 100         | 5.6         | 5×11.5                | 1.9                        | 5.1   | 100                                                         | ELXV101E□□5R6MEB5D |
|             | 12          | 6.3×11.5              | 1.1                        | 3.0   | 150                                                         | ELXV101E□□120MFB5D |
|             | 18          | 6.3×15                | 0.62                       | 1.7   | 220                                                         | ELXV101E□□180MF15D |
|             | 22          | 8×12                  | 0.53                       | 1.5   | 275                                                         | ELXV101E□□220MH12D |
|             | 27          | 10×12.5               | 0.47                       | 1.3   | 380                                                         | ELXV101E□□270MJC5S |
|             | 33          | 8×15                  | 0.35                       | 0.97  | 360                                                         | ELXV101E□□330MH15D |
|             | 33          | 10×16                 | 0.33                       | 0.90  | 500                                                         | ELXV101E□□330MJ16S |
|             | 39          | 8×20                  | 0.27                       | 0.74  | 490                                                         | ELXV101E□□390MH20D |
|             | 56          | 10×20                 | 0.26                       | 0.70  | 620                                                         | ELXV101E□□560MJ20S |
|             | 68          | 10×25                 | 0.19                       | 0.52  | 795                                                         | ELXV101E□□680MJ25S |
|             | 100         | 10×30                 | 0.15                       | 0.41  | 955                                                         | ELXV101E□□101MJ30S |
|             | 100         | 12.5×20               | 0.15                       | 0.41  | 890                                                         | ELXV101E□□101MK20S |
|             | 120         | 12.5×25               | 0.11                       | 0.30  | 1,040                                                       | ELXV101E□□121MK25S |
|             | 180         | 12.5×30               | 0.094                      | 0.26  | 1,270                                                       | ELXV101E□□181MK30S |
|             | 180         | 16×20                 | 0.11                       | 0.30  | 1,240                                                       | ELXV101E□□181ML20S |
|             | 220         | 12.5×35               | 0.087                      | 0.24  | 1,450                                                       | ELXV101E□□221MK35S |
|             | 220         | 16×25                 | 0.081                      | 0.22  | 1,440                                                       | ELXV101E□□221ML25S |
|             | 270         | 12.5×40               | 0.060                      | 0.17  | 1,610                                                       | ELXV101E□□271MK40S |
|             | 270         | 18×20                 | 0.085                      | 0.23  | 1,450                                                       | ELXV101E□□271MM20S |
|             | 330         | 16×30                 | 0.058                      | 0.16  | 1,790                                                       | ELXV101E□□331ML30S |
|             | 330         | 18×25                 | 0.070                      | 0.19  | 1,650                                                       | ELXV101E□□331MM25S |
|             | 390         | 16×35                 | 0.052                      | 0.14  | 2,000                                                       | ELXV101E□□391ML35S |
|             | 390         | 18×30                 | 0.058                      | 0.16  | 1,850                                                       | ELXV101E□□391MM30S |
|             | 470         | 16×40                 | 0.041                      | 0.11  | 2,200                                                       | ELXV101E□□471ML40S |
|             | 560         | 18×35                 | 0.052                      | 0.14  | 1,990                                                       | ELXV101E□□561MM35S |
|             | 680         | 18×40                 | 0.041                      | 0.11  | 2,370                                                       | ELXV101E□□681MM40S |

□□ : Enter the appropriate lead forming or taping code.

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

| Rated<br>voltage<br>(Vdc) | Case size<br>φD (mm) | Frequency (Hz) |      |      |      | Rated<br>voltage<br>(Vdc) | Case size<br>φD (mm) | Frequency (Hz) |      |      |      |
|---------------------------|----------------------|----------------|------|------|------|---------------------------|----------------------|----------------|------|------|------|
|                           |                      | 120            | 1k   | 10k  | 100k |                           |                      | 120            | 1k   | 10k  | 100k |
| 6.3 & 10                  | 5 to 8               | 0.65           | 0.83 | 0.95 | 1.00 | 35 & 50                   | 5 to 8               | 0.40           | 0.66 | 0.85 | 1.00 |
|                           | 10 & 12.5            | 0.70           | 0.85 | 0.96 | 1.00 |                           | 10 & 12.5            | 0.50           | 0.73 | 0.89 | 1.00 |
|                           | 16 & 18              | 0.85           | 0.92 | 0.97 | 1.00 |                           | 16 & 18              | 0.60           | 0.81 | 0.94 | 1.00 |
| 16 & 25                   | 5 to 8               | 0.55           | 0.76 | 0.91 | 1.00 | 63 to 100                 | 5 to 8               | 0.20           | 0.55 | 0.80 | 1.00 |
|                           | 10 & 12.5            | 0.65           | 0.83 | 0.93 | 1.00 |                           | 10 & 12.5            | 0.35           | 0.65 | 0.85 | 1.00 |
|                           | 16 & 18              | 0.70           | 0.87 | 0.96 | 1.00 |                           | 16 & 18              | 0.50           | 0.75 | 0.90 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise.

When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

160 to 450V<sub>dc</sub> long life, 105°C

# KXJ Series

- Downsized and Longer life from current KXG series
- Endurance with ripple current : 10,000 to 12,000 hours at 105°C
- Rated voltage range : 160 to 450V, Capacitance range : 6.8 to 680μF
- For electronic ballast circuits and other long life applications
- Non solvent resistant type
- RoHS Compliant

KXJ

Downsized  
KXG

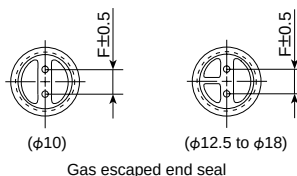
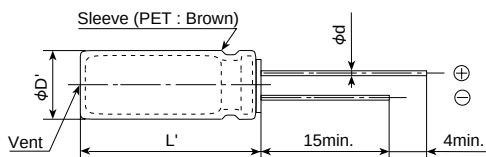


## SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |                 |                 |  |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------|-----------------|--|
| Category                                               |                                                                                                                                                                                                                                                                                       |                                      |                 |                 |  |
| Temperature Range                                      | -40 to +105℃ (160 to 400V <sub>dc</sub> )    -25 to +105℃ (420, 450V <sub>dc</sub> )                                                                                                                                                                                                  |                                      |                 |                 |  |
| Rated Voltage Range                                    | 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                             |                                      |                 |                 |  |
| Capacitance Tolerance                                  | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                              |                                      |                 |                 |  |
| Leakage Current                                        |                                                                                                                                                                                                                                                                                       | After 1 minute                       | After 5 minutes |                 |  |
|                                                        | CV≤1000                                                                                                                                                                                                                                                                               | I=0.1CV+40                           | I=0.03CV+15     |                 |  |
|                                                        | CV>1000                                                                                                                                                                                                                                                                               | I=0.04CV+100                         | I=0.02CV+25     |                 |  |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃)                                                                                                                                                                                    |                                      |                 |                 |  |
|                                                        |                                                                                                                                                                                                                                                                                       |                                      |                 |                 |  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 160 to 250V                          | 350 to 450V     |                 |  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.20                                 | 0.24            | (at 20℃, 120Hz) |  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 160 to 250V                          | 350, 400V       | 420, 450V       |  |
|                                                        | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 3                                    | 5               | 6               |  |
|                                                        | Z(-40℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 6                                    | 6               | —               |  |
|                                                        | (at 120Hz)                                                                                                                                                                                                                                                                            |                                      |                 |                 |  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 12,000 hours (10,000 hours for 20L max.) at 105℃.                                                                  |                                      |                 |                 |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |                 |                 |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |                 |                 |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |                 |                 |  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |                 |                 |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |                 |                 |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |                 |                 |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤500% of the initial specified value |                 |                 |  |

## DIMENSIONS [mm]

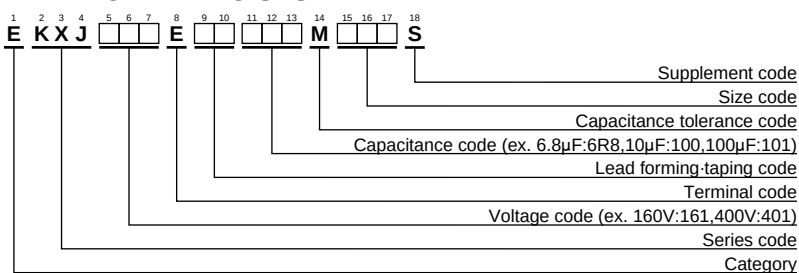
- Terminal Code : E



Gas escaped end seal

| φD  | 10         | 12.5 | 14.5 | 16  | 18  |
|-----|------------|------|------|-----|-----|
| φd  | 0.6        | 0.6  | 0.8  | 0.8 | 0.8 |
| F   | 5.0        | 5.0  | 7.5  | 7.5 | 7.5 |
| φD' | φD+0.5max. |      |      |     |     |
| L'  | L+1.5max.  |      |      |     |     |

## PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

## RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Frequency (Hz)  | 120  | 1k   | 10k  | 100k |
|-----------------|------|------|------|------|
| Less than 100μF | 1.00 | 1.75 | 2.25 | 2.50 |
| 100μF or more   | 1.00 | 1.67 | 2.05 | 2.25 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

160 to 450V<sub>dc</sub> long life, 105°C

KXJ Series

## ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size<br>ΦDXL(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           | WV (V <sub>dc</sub> ) | Cap (μF) | Case size<br>ΦDXL(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           |
|-----------------------|----------|-----------------------|------|-------------------------------------------------------------|--------------------|-----------------------|----------|-----------------------|------|-------------------------------------------------------------|--------------------|
| 160                   | 39       | 10×16                 | 0.20 | 245                                                         | EKXJ161E□□390MJ16S | 220                   | 27       | 10×16                 | 0.20 | 200                                                         | EKXJ221E□□270MJ16S |
|                       | 56       | 10×20                 | 0.20 | 315                                                         | EKXJ161E□□560MJ20S |                       | 39       | 10×20                 | 0.20 | 265                                                         | EKXJ221E□□390MJ20S |
|                       | 82       | 10×25                 | 0.20 | 415                                                         | EKXJ161E□□820MJ25S |                       | 56       | 10×25                 | 0.20 | 345                                                         | EKXJ221E□□560MJ25S |
|                       | 82       | 10×30                 | 0.20 | 445                                                         | EKXJ161E□□820MJ30S |                       | 56       | 10×30                 | 0.20 | 370                                                         | EKXJ221E□□560MJ30S |
|                       | 100      | 12.5×20               | 0.20 | 575                                                         | EKXJ161E□□101MK20S |                       | 68       | 12.5×20               | 0.20 | 475                                                         | EKXJ221E□□680MK20S |
|                       | 120      | 10×35                 | 0.20 | 570                                                         | EKXJ161E□□121MJ35S |                       | 82       | 10×35                 | 0.20 | 470                                                         | EKXJ221E□□820MJ35S |
|                       | 120      | 14.5×20               | 0.20 | 675                                                         | EKXJ161E□□121MU20S |                       | 82       | 14.5×20               | 0.20 | 555                                                         | EKXJ221E□□820MU20S |
|                       | 150      | 10×40                 | 0.20 | 665                                                         | EKXJ161E□□151MJ40S |                       | 100      | 10×40                 | 0.20 | 545                                                         | EKXJ221E□□101MJ40S |
|                       | 150      | 10×45                 | 0.20 | 695                                                         | EKXJ161E□□151MJ45S |                       | 100      | 10×45                 | 0.20 | 565                                                         | EKXJ221E□□101MJ45S |
|                       | 150      | 12.5×25               | 0.20 | 765                                                         | EKXJ161E□□151MK25S |                       | 100      | 12.5×25               | 0.20 | 625                                                         | EKXJ221E□□101MK25S |
|                       | 180      | 10×50                 | 0.20 | 785                                                         | EKXJ161E□□181MJ50S |                       | 120      | 10×50                 | 0.20 | 645                                                         | EKXJ221E□□121MJ50S |
|                       | 180      | 12.5×30               | 0.20 | 885                                                         | EKXJ161E□□181MK30S |                       | 120      | 12.5×30               | 0.20 | 725                                                         | EKXJ221E□□121MK30S |
|                       | 180      | 14.5×25               | 0.20 | 890                                                         | EKXJ161E□□181MU25S |                       | 120      | 14.5×25               | 0.20 | 725                                                         | EKXJ221E□□121MU25S |
|                       | 180      | 16×20                 | 0.20 | 855                                                         | EKXJ161E□□181ML20S |                       | 120      | 16×20                 | 0.20 | 695                                                         | EKXJ221E□□121ML20S |
|                       | 220      | 12.5×35               | 0.20 | 1,040                                                       | EKXJ161E□□221MK35S |                       | 150      | 12.5×35               | 0.20 | 860                                                         | EKXJ221E□□151MK35S |
|                       | 220      | 16×25                 | 0.20 | 1,020                                                       | EKXJ161E□□221ML25S |                       | 150      | 16×25                 | 0.20 | 845                                                         | EKXJ221E□□151ML25S |
|                       | 220      | 18×20                 | 0.20 | 990                                                         | EKXJ161E□□221MM20S |                       | 150      | 18×20                 | 0.20 | 815                                                         | EKXJ221E□□151MM20S |
|                       | 270      | 12.5×40               | 0.20 | 1,190                                                       | EKXJ161E□□271MK40S |                       | 180      | 12.5×40               | 0.20 | 975                                                         | EKXJ221E□□181MK40S |
|                       | 270      | 12.5×45               | 0.20 | 1,230                                                       | EKXJ161E□□271MK45S |                       | 180      | 12.5×45               | 0.20 | 1,005                                                       | EKXJ221E□□181MK45S |
|                       | 270      | 14.5×31.5             | 0.20 | 1,170                                                       | EKXJ161E□□271MUN3S |                       | 180      | 14.5×31.5             | 0.20 | 955                                                         | EKXJ221E□□181MUN3S |
|                       | 270      | 14.5×35.5             | 0.20 | 1,210                                                       | EKXJ161E□□271MUP1S |                       | 220      | 12.5×50               | 0.20 | 1,145                                                       | EKXJ221E□□221MK50S |
|                       | 330      | 12.5×50               | 0.20 | 1,400                                                       | EKXJ161E□□331MK50S |                       | 220      | 14.5×35.5             | 0.20 | 1,095                                                       | EKXJ221E□□221MUP1S |
|                       | 330      | 14.5×40               | 0.20 | 1,385                                                       | EKXJ161E□□331MU40S |                       | 220      | 14.5×40               | 0.20 | 1,130                                                       | EKXJ221E□□221MU40S |
|                       | 330      | 16×31.5               | 0.20 | 1,350                                                       | EKXJ161E□□331MLN3S |                       | 220      | 16×31.5               | 0.20 | 1,100                                                       | EKXJ221E□□221MLN3S |
|                       | 330      | 18×25                 | 0.20 | 1,290                                                       | EKXJ161E□□331MM25S |                       | 220      | 18×25                 | 0.20 | 1,050                                                       | EKXJ221E□□221MM25S |
|                       | 390      | 14.5×45               | 0.20 | 1,545                                                       | EKXJ161E□□391MU45S |                       | 270      | 14.5×45               | 0.20 | 1,285                                                       | EKXJ221E□□271MU45S |
|                       | 390      | 16×35.5               | 0.20 | 1,500                                                       | EKXJ161E□□391MLP1S |                       | 270      | 14.5×50               | 0.20 | 1,315                                                       | EKXJ221E□□271MU50S |
|                       | 470      | 14.5×50               | 0.20 | 1,735                                                       | EKXJ161E□□471MU50S |                       | 270      | 16×35.5               | 0.20 | 1,245                                                       | EKXJ221E□□271MLP1S |
|                       | 470      | 16×40                 | 0.20 | 1,700                                                       | EKXJ161E□□471ML40S |                       | 270      | 18×31.5               | 0.20 | 1,260                                                       | EKXJ221E□□271MMN3S |
|                       | 470      | 16×45                 | 0.20 | 1,730                                                       | EKXJ161E□□471ML45S |                       | 330      | 16×40                 | 0.20 | 1,425                                                       | EKXJ221E□□331ML40S |
|                       | 470      | 18×31.5               | 0.20 | 1,660                                                       | EKXJ161E□□471MMN3S |                       | 330      | 16×45                 | 0.20 | 1,450                                                       | EKXJ221E□□331ML45S |
|                       | 470      | 18×35.5               | 0.20 | 1,715                                                       | EKXJ161E□□471MMP1S |                       | 330      | 18×35.5               | 0.20 | 1,440                                                       | EKXJ221E□□331MMP1S |
|                       | 560      | 16×50                 | 0.20 | 1,920                                                       | EKXJ161E□□561ML50S |                       | 390      | 16×50                 | 0.20 | 1,600                                                       | EKXJ221E□□391ML50S |
|                       | 560      | 18×40                 | 0.20 | 1,905                                                       | EKXJ161E□□561MM40S |                       | 390      | 18×40                 | 0.20 | 1,590                                                       | EKXJ221E□□391MM40S |
|                       | 680      | 18×45                 | 0.20 | 2,130                                                       | EKXJ161E□□681MM45S |                       | 390      | 18×45                 | 0.20 | 1,620                                                       | EKXJ221E□□391MM45S |
|                       | 680      | 18×50                 | 0.20 | 2,145                                                       | EKXJ161E□□681MM50S |                       | 470      | 18×50                 | 0.20 | 1,785                                                       | EKXJ221E□□471MM50S |
| 200                   | 27       | 10×16                 | 0.20 | 200                                                         | EKXJ201E□□270MJ16S | 250                   | 22       | 10×16                 | 0.20 | 185                                                         | EKXJ251E□□220MJ16S |
|                       | 47       | 10×20                 | 0.20 | 290                                                         | EKXJ201E□□470MJ20S |                       | 33       | 10×20                 | 0.20 | 240                                                         | EKXJ251E□□330MJ20S |
|                       | 56       | 10×25                 | 0.20 | 345                                                         | EKXJ201E□□560MJ25S |                       | 47       | 10×25                 | 0.20 | 315                                                         | EKXJ251E□□470MJ25S |
|                       | 68       | 10×30                 | 0.20 | 405                                                         | EKXJ201E□□680MJ30S |                       | 47       | 10×30                 | 0.20 | 340                                                         | EKXJ251E□□470MJ30S |
|                       | 82       | 12.5×20               | 0.20 | 520                                                         | EKXJ201E□□820MK20S |                       | 56       | 12.5×20               | 0.20 | 430                                                         | EKXJ251E□□560MK20S |
|                       | 100      | 10×35                 | 0.20 | 520                                                         | EKXJ201E□□101MJ35S |                       | 68       | 10×35                 | 0.20 | 430                                                         | EKXJ251E□□680MJ35S |
|                       | 100      | 12.5×25               | 0.20 | 625                                                         | EKXJ201E□□101MK25S |                       | 68       | 14.5×20               | 0.20 | 505                                                         | EKXJ251E□□680MU20S |
|                       | 100      | 14.5×20               | 0.20 | 615                                                         | EKXJ201E□□101MU20S |                       | 82       | 10×40                 | 0.20 | 495                                                         | EKXJ251E□□820MJ40S |
|                       | 120      | 10×40                 | 0.20 | 595                                                         | EKXJ201E□□121MJ40S |                       | 82       | 10×45                 | 0.20 | 515                                                         | EKXJ251E□□820MJ45S |
|                       | 120      | 10×45                 | 0.20 | 620                                                         | EKXJ201E□□121MJ45S |                       | 82       | 12.5×25               | 0.20 | 565                                                         | EKXJ251E□□820MK25S |
|                       | 120      | 12.5×30               | 0.20 | 725                                                         | EKXJ201E□□121MK30S |                       | 100      | 10×50                 | 0.20 | 585                                                         | EKXJ251E□□101MJ50S |
|                       | 120      | 16×20                 | 0.20 | 695                                                         | EKXJ201E□□121ML20S |                       | 100      | 12.5×30               | 0.20 | 660                                                         | EKXJ251E□□101MK30S |
|                       | 150      | 10×50                 | 0.20 | 720                                                         | EKXJ201E□□151MJ50S |                       | 100      | 14.5×25               | 0.20 | 665                                                         | EKXJ251E□□101MU25S |
|                       | 150      | 12.5×35               | 0.20 | 860                                                         | EKXJ201E□□151MK35S |                       | 100      | 16×20                 | 0.20 | 635                                                         | EKXJ251E□□101ML20S |
|                       | 150      | 14.5×25               | 0.20 | 810                                                         | EKXJ201E□□151MU25S |                       | 120      | 12.5×35               | 0.20 | 770                                                         | EKXJ251E□□121MK35S |
|                       | 180      | 14.5×31.5             | 0.20 | 955                                                         | EKXJ201E□□181MUN3S |                       | 120      | 16×25                 | 0.20 | 755                                                         | EKXJ251E□□121ML25S |
|                       | 180      | 16×25                 | 0.20 | 925                                                         | EKXJ201E□□181ML25S |                       | 120      | 18×20                 | 0.20 | 730                                                         | EKXJ251E□□121MM20S |
|                       | 180      | 18×20                 | 0.20 | 895                                                         | EKXJ201E□□181MM20S |                       | 150      | 12.5×40               | 0.20 | 890                                                         | EKXJ251E□□151MK40S |
|                       | 220      | 12.5×40               | 0.20 | 1,075                                                       | EKXJ201E□□221MK40S |                       | 150      | 12.5×45               | 0.20 | 920                                                         | EKXJ251E□□151MK45S |
|                       | 220      | 12.5×45               | 0.20 | 1,110                                                       | EKXJ201E□□221MK45S |                       | 150      | 14.5×31.5             | 0.20 | 870                                                         | EKXJ251E□□151MUN3S |
|                       | 220      | 14.5×35.5             | 0.20 | 1,095                                                       | EKXJ201E□□221MUP1S |                       | 180      | 12.5×50               | 0.20 | 1,035                                                       | EKXJ251E□□181MK50S |
|                       | 220      | 18×25                 | 0.20 | 1,050                                                       | EKXJ201E□□221MM25S |                       | 180      | 14.5×35.5             | 0.20 | 990                                                         | EKXJ251E□□181MUP1S |
|                       | 270      | 12.5×50               | 0.20 | 1,265                                                       | EKXJ201E□□271MK50S |                       | 180      | 14.5×40               | 0.20 | 1,020                                                       | EKXJ251E□□181MU40S |
|                       | 270      | 14.5×40               | 0.20 | 1,250                                                       | EKXJ201E□□271MU40S |                       | 180      | 16×31.5               | 0.20 | 995                                                         | EKXJ251E□□181MLN3S |
|                       | 270      | 14.5×45               | 0.20 | 1,290                                                       | EKXJ201E□□271MU45S |                       | 180      | 18×25                 | 0.20 | 950                                                         | EKXJ251E□□181MM25S |
|                       | 270      | 16×31.5               | 0.20 | 1,220                                                       | EKXJ201E□□271MLN3S |                       | 220      | 14.5×45               | 0.20 | 1,160                                                       | EKXJ251E□□221MU45S |
|                       | 270      | 16×35.5               | 0.20 | 1,250                                                       | EKXJ201E□□271MLP1S |                       | 220      | 14.5×50               | 0.20 | 1,185                                                       | EKXJ251E□□221MU50S |
|                       | 330      | 14.5×50               | 0.20 | 1,450                                                       | EKXJ201E□□331MU50S |                       | 220      | 16×35.5               | 0.20 | 1,125                                                       | EKXJ251E□□221MLP1S |
|                       | 330      | 16×40                 | 0.20 | 1,425                                                       | EKXJ201E□□331ML40S |                       | 220      | 18×31.5               | 0.20 | 1,135                                                       | EKXJ251E□□221MMN3S |
|                       | 330      | 18×31.5               | 0.20 | 1,395                                                       | EKXJ201E□□331MMN3S |                       | 270      | 16×40                 | 0.20 | 1,285                                                       | EKXJ251E□□271ML40S |
|                       | 390      | 16×45                 | 0.20 | 1,575                                                       | EKXJ201E□□391ML45S |                       | 270      | 16×45                 | 0.20 | 1,310                                                       | EKXJ251E□□271ML45S |
|                       | 390      | 18×35.5               | 0.20 | 1,565                                                       | EKXJ201E□□391MMP1S |                       | 270      | 18×35.5               | 0.20 | 1,300                                                       | EKXJ251E□□271MMP1S |
|                       | 470      | 16×50                 | 0.20 | 1,755                                                       | EKXJ201E□□471ML50S |                       | 330      | 16×50                 | 0.20 | 1,475                                                       | EKXJ251E□□331ML50S |
|                       | 470      | 18×40                 | 0.20 | 1,745                                                       | EKXJ201E□□471MM40S |                       | 330      | 18×40                 | 0.20 | 1,460                                                       | EKXJ251E□□331MM40S |
|                       | 470      | 18×45                 | 0.20 | 1,770                                                       | EKXJ201E□□471MM45S |                       | 330      | 18×45                 | 0.20 | 1,485                                                       | EKXJ251E□□331MM45S |
|                       | 560      | 18×50                 | 0.20 | 1,945                                                       | EKXJ201E□□561MM50S |                       | 390      | 18×50                 | 0.20 | 1,625                                                       | EKXJ251E□□391MM50S |

□□ : Enter the appropriate lead forming or taping code.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

160 to 450V<sub>dc</sub> long life, 105°C

KXJ Series

## ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size<br>Φ×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           | WV (V <sub>dc</sub> ) | Cap (μF) | Case size<br>Φ×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           |
|-----------------------|----------|----------------------|------|-------------------------------------------------------------|--------------------|-----------------------|----------|----------------------|------|-------------------------------------------------------------|--------------------|
| 350                   | 12       | 10×16                | 0.24 | 135                                                         | EKXJ351E□□120MJ16S | 420                   | 6.8      | 10×16                | 0.24 | 105                                                         | EKXJ421E□□6R8MJ16S |
|                       | 22       | 10×20                | 0.24 | 200                                                         | EKXJ351E□□220MJ20S |                       | 12       | 10×20                | 0.24 | 150                                                         | EKXJ421E□□120MJ20S |
|                       | 27       | 10×25                | 0.24 | 240                                                         | EKXJ351E□□270MJ25S |                       | 15       | 10×25                | 0.24 | 185                                                         | EKXJ421E□□150MJ25S |
|                       | 27       | 10×30                | 0.24 | 255                                                         | EKXJ351E□□270MJ30S |                       | 18       | 10×30                | 0.24 | 215                                                         | EKXJ421E□□180MJ30S |
|                       | 33       | 12.5×20              | 0.24 | 330                                                         | EKXJ351E□□330MK20S |                       | 22       | 12.5×20              | 0.24 | 285                                                         | EKXJ421E□□220MK20S |
|                       | 39       | 10×35                | 0.24 | 325                                                         | EKXJ351E□□390MJ35S |                       | 27       | 10×35                | 0.24 | 275                                                         | EKXJ421E□□270MJ35S |
|                       | 47       | 10×40                | 0.24 | 375                                                         | EKXJ351E□□470MJ40S |                       | 27       | 10×40                | 0.24 | 290                                                         | EKXJ421E□□270MJ40S |
|                       | 47       | 12.5×25              | 0.24 | 425                                                         | EKXJ351E□□470MK25S |                       | 27       | 12.5×25              | 0.24 | 340                                                         | EKXJ421E□□270MK25S |
|                       | 47       | 14.5×20              | 0.24 | 420                                                         | EKXJ351E□□470MU20S |                       | 27       | 14.5×20              | 0.24 | 335                                                         | EKXJ421E□□270MU20S |
|                       | 56       | 10×45                | 0.24 | 425                                                         | EKXJ351E□□560MJ45S |                       | 33       | 10×45                | 0.24 | 335                                                         | EKXJ421E□□330MJ45S |
|                       | 56       | 12.5×30              | 0.24 | 495                                                         | EKXJ351E□□560MK30S |                       | 33       | 12.5×30              | 0.24 | 400                                                         | EKXJ421E□□330MK30S |
|                       | 56       | 16×20                | 0.24 | 475                                                         | EKXJ351E□□560ML20S |                       | 33       | 16×20                | 0.24 | 385                                                         | EKXJ421E□□330ML20S |
|                       | 68       | 10×50                | 0.24 | 485                                                         | EKXJ351E□□680MJ50S |                       | 39       | 10×50                | 0.24 | 375                                                         | EKXJ421E□□390MJ50S |
|                       | 68       | 12.5×35              | 0.24 | 580                                                         | EKXJ351E□□680MK35S |                       | 39       | 14.5×25              | 0.24 | 435                                                         | EKXJ421E□□390MU25S |
|                       | 68       | 14.5×25              | 0.24 | 545                                                         | EKXJ351E□□680MJ25S |                       | 47       | 12.5×35              | 0.24 | 505                                                         | EKXJ421E□□470MK35S |
|                       | 68       | 18×20                | 0.24 | 550                                                         | EKXJ351E□□680MM20S |                       | 47       | 16×25                | 0.24 | 500                                                         | EKXJ421E□□470ML25S |
|                       | 82       | 12.5×40              | 0.24 | 655                                                         | EKXJ351E□□820MK40S |                       | 47       | 18×20                | 0.24 | 480                                                         | EKXJ421E□□470MM20S |
|                       | 82       | 14.5×31.5            | 0.24 | 645                                                         | EKXJ351E□□820MUN3S |                       | 56       | 12.5×40              | 0.24 | 570                                                         | EKXJ421E□□560MK40S |
|                       | 82       | 16×25                | 0.24 | 625                                                         | EKXJ351E□□820ML25S |                       | 56       | 12.5×45              | 0.24 | 590                                                         | EKXJ421E□□560MK45S |
|                       | 100      | 12.5×45              | 0.24 | 750                                                         | EKXJ351E□□101MK45S |                       | 56       | 14.5×31.5            | 0.24 | 560                                                         | EKXJ421E□□560MUN3S |
|                       | 100      | 12.5×50              | 0.24 | 770                                                         | EKXJ351E□□101MK50S |                       | 68       | 12.5×50              | 0.24 | 670                                                         | EKXJ421E□□680MK50S |
|                       | 100      | 14.5×35.5            | 0.24 | 740                                                         | EKXJ351E□□101MUP1S |                       | 68       | 14.5×35.5            | 0.24 | 640                                                         | EKXJ421E□□680MUP1S |
|                       | 100      | 16×31.5              | 0.24 | 740                                                         | EKXJ351E□□101MLN3S |                       | 68       | 14.5×40              | 0.24 | 660                                                         | EKXJ421E□□680MU40S |
|                       | 100      | 18×25                | 0.24 | 710                                                         | EKXJ351E□□101MM25S |                       | 68       | 16×31.5              | 0.24 | 645                                                         | EKXJ421E□□680MLN3S |
|                       | 120      | 14.5×40              | 0.24 | 835                                                         | EKXJ351E□□121MU40S |                       | 68       | 18×25                | 0.24 | 615                                                         | EKXJ421E□□680MM25S |
|                       | 120      | 14.5×45              | 0.24 | 860                                                         | EKXJ351E□□121MU45S |                       | 82       | 14.5×45              | 0.24 | 750                                                         | EKXJ421E□□820MU45S |
|                       | 120      | 16×35.5              | 0.24 | 830                                                         | EKXJ351E□□121MLP1S |                       | 82       | 16×35.5              | 0.24 | 725                                                         | EKXJ421E□□820MLP1S |
| 400                   | 150      | 14.5×50              | 0.24 | 980                                                         | EKXJ351E□□151MU50S | 450                   | 82       | 18×31.5              | 0.24 | 730                                                         | EKXJ421E□□820MMN3S |
|                       | 150      | 16×40                | 0.24 | 960                                                         | EKXJ351E□□151ML40S |                       | 100      | 14.5×50              | 0.24 | 845                                                         | EKXJ421E□□101MU50S |
|                       | 150      | 16×45                | 0.24 | 975                                                         | EKXJ351E□□151ML45S |                       | 100      | 16×40                | 0.24 | 825                                                         | EKXJ421E□□101ML40S |
|                       | 150      | 18×31.5              | 0.24 | 940                                                         | EKXJ351E□□151MMN3S |                       | 100      | 16×45                | 0.24 | 840                                                         | EKXJ421E□□101ML45S |
|                       | 180      | 16×50                | 0.24 | 1,090                                                       | EKXJ351E□□181ML50S |                       | 100      | 18×35.5              | 0.24 | 835                                                         | EKXJ421E□□101MMP1S |
|                       | 180      | 18×35.5              | 0.24 | 1,065                                                       | EKXJ351E□□181MMP1S |                       | 120      | 16×50                | 0.24 | 935                                                         | EKXJ421E□□121ML50S |
|                       | 180      | 18×40                | 0.24 | 1,080                                                       | EKXJ351E□□181MM40S |                       | 120      | 18×40                | 0.24 | 930                                                         | EKXJ421E□□121MM40S |
|                       | 220      | 18×45                | 0.24 | 1,210                                                       | EKXJ351E□□221MM45S |                       | 120      | 18×45                | 0.24 | 945                                                         | EKXJ421E□□121MM45S |
|                       | 220      | 18×50                | 0.24 | 1,220                                                       | EKXJ351E□□221MM50S |                       | 150      | 18×50                | 0.24 | 1,060                                                       | EKXJ421E□□151MM50S |
|                       | 10       | 10×16                | 0.24 | 125                                                         | EKXJ401E□□100MJ16S |                       | 6.8      | 10×16                | 0.24 | 105                                                         | EKXJ451E□□6R8MJ16S |
|                       | 18       | 10×20                | 0.24 | 180                                                         | EKXJ401E□□180MJ20S |                       | 12       | 10×20                | 0.24 | 150                                                         | EKXJ451E□□120MJ20S |
|                       | 22       | 10×25                | 0.24 | 215                                                         | EKXJ401E□□220MJ25S |                       | 15       | 10×25                | 0.24 | 185                                                         | EKXJ451E□□150MJ25S |
|                       | 27       | 10×30                | 0.24 | 255                                                         | EKXJ401E□□270MJ30S |                       | 18       | 10×30                | 0.24 | 215                                                         | EKXJ451E□□180MJ30S |
|                       | 27       | 12.5×20              | 0.24 | 300                                                         | EKXJ401E□□270MK20S |                       | 18       | 12.5×20              | 0.24 | 255                                                         | EKXJ451E□□180MK20S |
|                       | 33       | 10×35                | 0.24 | 300                                                         | EKXJ401E□□330MJ35S |                       | 22       | 10×35                | 0.24 | 250                                                         | EKXJ451E□□220MJ35S |
|                       | 39       | 10×40                | 0.24 | 340                                                         | EKXJ401E□□390MJ40S |                       | 27       | 10×40                | 0.24 | 290                                                         | EKXJ451E□□270MJ40S |
|                       | 39       | 10×45                | 0.24 | 355                                                         | EKXJ401E□□390MJ45S |                       | 27       | 10×45                | 0.24 | 305                                                         | EKXJ451E□□270MJ45S |
|                       | 39       | 12.5×25              | 0.24 | 390                                                         | EKXJ401E□□390MK25S |                       | 27       | 12.5×25              | 0.24 | 340                                                         | EKXJ451E□□270MK25S |
|                       | 39       | 14.5×20              | 0.24 | 385                                                         | EKXJ401E□□390MU20S |                       | 27       | 14.5×20              | 0.24 | 335                                                         | EKXJ451E□□270MU20S |
|                       | 47       | 12.5×30              | 0.24 | 455                                                         | EKXJ401E□□470MK30S |                       | 33       | 12.5×30              | 0.24 | 400                                                         | EKXJ451E□□330MK30S |
|                       | 47       | 16×20                | 0.24 | 435                                                         | EKXJ401E□□470ML20S |                       | 33       | 14.5×25              | 0.24 | 400                                                         | EKXJ451E□□330MU25S |
|                       | 56       | 10×50                | 0.24 | 440                                                         | EKXJ401E□□560MJ50S |                       | 33       | 16×20                | 0.24 | 385                                                         | EKXJ451E□□330ML20S |
|                       | 56       | 12.5×35              | 0.24 | 525                                                         | EKXJ401E□□560MK35S |                       | 39       | 10×50                | 0.24 | 375                                                         | EKXJ451E□□390MJ50S |
|                       | 56       | 14.5×25              | 0.24 | 495                                                         | EKXJ401E□□560MU25S |                       | 39       | 12.5×35              | 0.24 | 460                                                         | EKXJ451E□□390MK35S |
|                       | 56       | 18×20                | 0.24 | 500                                                         | EKXJ401E□□560MM20S |                       | 39       | 18×20                | 0.24 | 440                                                         | EKXJ451E□□390MM20S |
|                       | 68       | 12.5×40              | 0.24 | 600                                                         | EKXJ401E□□680MK40S |                       | 47       | 12.5×40              | 0.24 | 525                                                         | EKXJ451E□□470MK40S |
|                       | 68       | 14.5×31.5            | 0.24 | 585                                                         | EKXJ401E□□680MUN3S |                       | 47       | 14.5×31.5            | 0.24 | 515                                                         | EKXJ451E□□470MUN3S |
|                       | 68       | 16×25                | 0.24 | 570                                                         | EKXJ401E□□680ML25S |                       | 47       | 16×25                | 0.24 | 500                                                         | EKXJ451E□□470ML25S |
|                       | 82       | 12.5×45              | 0.24 | 680                                                         | EKXJ401E□□820MK45S |                       | 56       | 12.5×45              | 0.24 | 590                                                         | EKXJ451E□□560MK45S |
|                       | 82       | 12.5×50              | 0.24 | 700                                                         | EKXJ401E□□820MK50S |                       | 56       | 14.5×35.5            | 0.24 | 580                                                         | EKXJ451E□□560MUP1S |
|                       | 82       | 14.5×35.5            | 0.24 | 670                                                         | EKXJ401E□□820MUP1S |                       | 56       | 16×31.5              | 0.24 | 585                                                         | EKXJ451E□□560MLN3S |
|                       | 82       | 16×31.5              | 0.24 | 670                                                         | EKXJ401E□□820MLN3S |                       | 56       | 18×25                | 0.24 | 560                                                         | EKXJ451E□□560MM25S |
|                       | 82       | 18×25                | 0.24 | 640                                                         | EKXJ401E□□820MM25S |                       | 68       | 12.5×50              | 0.24 | 670                                                         | EKXJ451E□□680MK50S |
|                       | 100      | 14.5×40              | 0.24 | 760                                                         | EKXJ401E□□101MU40S |                       | 68       | 14.5×40              | 0.24 | 660                                                         | EKXJ451E□□680MU40S |
|                       | 100      | 14.5×45              | 0.24 | 785                                                         | EKXJ401E□□101MU45S |                       | 68       | 14.5×45              | 0.24 | 680                                                         | EKXJ451E□□680MU45S |
|                       | 100      | 16×35.5              | 0.24 | 760                                                         | EKXJ401E□□101MLP1S |                       | 68       | 16×35.5              | 0.24 | 660                                                         | EKXJ451E□□680MLP1S |
|                       | 120      | 14.5×50              | 0.24 | 875                                                         | EKXJ401E□□121MU50S |                       | 82       | 14.5×50              | 0.24 | 765                                                         | EKXJ451E□□820MU50S |
|                       | 120      | 16×40                | 0.24 | 860                                                         | EKXJ401E□□121ML40S |                       | 82       | 16×40                | 0.24 | 750                                                         | EKXJ451E□□820ML40S |
|                       | 120      | 16×45                | 0.24 | 875                                                         | EKXJ401E□□121ML45S |                       | 82       | 16×45                | 0.24 | 760                                                         | EKXJ451E□□820ML45S |
|                       | 120      | 18×31.5              | 0.24 | 840                                                         | EKXJ401E□□121MMN3S |                       | 82       | 18×31.5              | 0.24 | 730                                                         | EKXJ451E□□820MMN3S |
|                       | 120      | 18×35.5              | 0.24 | 870                                                         | EKXJ401E□□121MMP1S |                       | 100      | 16×50                | 0.24 | 855                                                         | EKXJ451E□□101ML50S |
|                       | 150      | 16×50                | 0.24 | 995                                                         | EKXJ401E□□151ML50S |                       | 100      | 18×35.5              | 0.24 | 835                                                         | EKXJ451E□□101MMP1S |
|                       | 150      | 18×40                | 0.24 | 985                                                         | EKXJ401E□□151MM40S |                       | 120      | 18×40                | 0.24 | 930                                                         | EKXJ451E□□121MM40S |
|                       | 180      | 18×45                | 0.24 | 1,095                                                       | EKXJ401E□□181MM45S |                       | 120      | 18×45                | 0.24 | 945                                                         | EKXJ451E□□121MM45S |
|                       | 220      | 18×50                | 0.24 | 1,220                                                       | EKXJ401E□□221MM50S |                       | 150      | 18×50                | 0.24 | 1,060                                                       | EKXJ451E□□151MM50S |

□□ : Enter the appropriate lead forming or taping code.

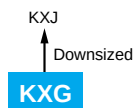


## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

160 to 450V<sub>dc</sub> long life, 105°C

## KXG Series

- For electronic ballast circuits and other long life applications
- Endurance with ripple current : 8,000 to 10,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

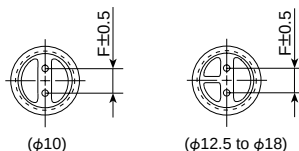
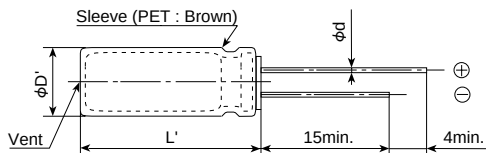


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |                 |                 |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------|-----------------|
| Category                                               |                                                                                                                                                                                                                                                                                       |                                      |                 |                 |
| Temperature Range                                      | −40 to +105℃ (160 to 400V <sub>dc</sub> )   −25 to+105℃ (450V <sub>dc</sub> )                                                                                                                                                                                                         |                                      |                 |                 |
| Rated Voltage Range                                    | 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                             |                                      |                 |                 |
| Capacitance Tolerance                                  | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                              |                                      |                 |                 |
| Leakage Current                                        |                                                                                                                                                                                                                                                                                       | After 1 minute                       | After 5 minutes |                 |
|                                                        | CV≤1,000                                                                                                                                                                                                                                                                              | I=0.1CV+40                           | I=0.03CV+15     |                 |
|                                                        | CV>1,000                                                                                                                                                                                                                                                                              | I=0.04CV+100                         | I=0.02CV+25     |                 |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                                                                                             |                                      |                 | (at 20℃)        |
|                                                        |                                                                                                                                                                                                                                                                                       |                                      |                 |                 |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 160 to 250V                          | 350 to 450V     |                 |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.20                                 | 0.24            | (at 20℃, 120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 160 to 250V                          | 350 & 400V      | 450V            |
|                                                        | Z(−25℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 3                                    | 5               | 6               |
|                                                        | Z(−40℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 6                                    | 6               | —               |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 10,000 hours (8,000 hours for ϕ10) at 105℃.                                                                        |                                      |                 |                 |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |                 |                 |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |                 |                 |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |                 |                 |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |                 |                 |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |                 |                 |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |                 |                 |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤500% of the initial specified value |                 |                 |

## ◆DIMENSIONS [mm]

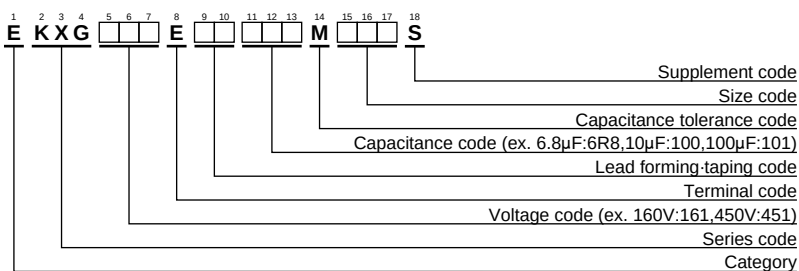
- Terminal Code : E



Gas escape end seal

| φD  | 10         | 12.5 | 16  | 18  |
|-----|------------|------|-----|-----|
| φd  | 0.6        | 0.6  | 0.8 | 0.8 |
| F   | 5.0        | 5.0  | 7.5 | 7.5 |
| φD' | φD+0.5max. |      |     |     |
| L'  | L+1.5max.  |      |     |     |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

## ◆RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Capacitance (μF) | Frequency (Hz) |      |      |      |
|------------------|----------------|------|------|------|
|                  | 120            | 1k   | 10k  | 100k |
| 6.8 to 82        | 1.00           | 1.75 | 2.25 | 2.50 |
| 100 to 330       | 1.00           | 1.67 | 2.05 | 2.25 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

160 to 450V<sub>dc</sub> long life, 105°C

KXG Series

## ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple current(mArms/105°C) |        | Part No.           |
|--------------------------|-------------|-----------------------|------|-----------------------------------|--------|--------------------|
|                          |             |                       |      | 120Hz                             | 100kHz |                    |
| 160                      | 10          | 10 × 16               | 0.20 | 125                               | 315    | EKXG161E□□100MJ16S |
|                          | 22          | 10 × 20               | 0.20 | 200                               | 500    | EKXG161E□□220MJ20S |
|                          | 33          | 10 × 20               | 0.20 | 250                               | 625    | EKXG161E□□330MJ20S |
|                          | 47          | 10 × 20               | 0.20 | 300                               | 750    | EKXG161E□□470MJ20S |
|                          | 68          | 12.5 × 20             | 0.20 | 470                               | 1,175  | EKXG161E□□680MK20S |
|                          | 82          | 12.5 × 20             | 0.20 | 510                               | 1,275  | EKXG161E□□820MK20S |
|                          | 100         | 12.5 × 25             | 0.20 | 620                               | 1,395  | EKXG161E□□101MK25S |
|                          | 100         | 16 × 20               | 0.20 | 630                               | 1,420  | EKXG161E□□101ML20S |
|                          | 150         | 16 × 20               | 0.20 | 770                               | 1,735  | EKXG161E□□151ML20S |
|                          | 220         | 16 × 25               | 0.20 | 1,020                             | 2,295  | EKXG161E□□221ML25S |
| 200                      | 330         | 18 × 31.5             | 0.20 | 1,390                             | 3,130  | EKXG161E□□331MMN3S |
|                          | 10          | 10 × 16               | 0.20 | 125                               | 315    | EKXG201E□□100MJ16S |
|                          | 22          | 10 × 20               | 0.20 | 200                               | 500    | EKXG201E□□220MJ20S |
|                          | 33          | 10 × 20               | 0.20 | 260                               | 650    | EKXG201E□□330MJ20S |
|                          | 47          | 12.5 × 20             | 0.20 | 390                               | 975    | EKXG201E□□470MK20S |
|                          | 68          | 12.5 × 20             | 0.20 | 470                               | 1,175  | EKXG201E□□680MK20S |
|                          | 82          | 16 × 20               | 0.20 | 550                               | 1,375  | EKXG201E□□820ML20S |
|                          | 100         | 16 × 20               | 0.20 | 630                               | 1,420  | EKXG201E□□101ML20S |
|                          | 150         | 16 × 25               | 0.20 | 840                               | 1,890  | EKXG201E□□151ML25S |
|                          | 220         | 18 × 25               | 0.20 | 1,050                             | 2,365  | EKXG201E□□221MM25S |
| 250                      | 330         | 18 × 35.5             | 0.20 | 1,430                             | 3,220  | EKXG201E□□331MMP1S |
|                          | 10          | 10 × 20               | 0.20 | 140                               | 350    | EKXG251E□□100MJ20S |
|                          | 22          | 10 × 20               | 0.20 | 200                               | 500    | EKXG251E□□220MJ20S |
|                          | 33          | 12.5 × 20             | 0.20 | 320                               | 800    | EKXG251E□□330MK20S |
|                          | 47          | 12.5 × 20             | 0.20 | 390                               | 975    | EKXG251E□□470MK20S |
|                          | 68          | 16 × 20               | 0.20 | 520                               | 1,300  | EKXG251E□□680ML20S |
|                          | 82          | 16 × 20               | 0.20 | 550                               | 1,375  | EKXG251E□□820ML20S |
|                          | 100         | 16 × 25               | 0.20 | 680                               | 1,530  | EKXG251E□□101ML25S |
|                          | 150         | 18 × 25               | 0.20 | 860                               | 1,935  | EKXG251E□□151MM25S |
|                          | 220         | 18 × 31.5             | 0.20 | 1,130                             | 2,545  | EKXG251E□□221MMN3S |
| 350                      | 6.8         | 10 × 16               | 0.24 | 110                               | 275    | EKXG351E□□6R8MJ16S |
|                          | 10          | 10 × 20               | 0.24 | 140                               | 350    | EKXG351E□□100MJ20S |
|                          | 22          | 12.5 × 20             | 0.24 | 260                               | 650    | EKXG351E□□220MK20S |
|                          | 33          | 16 × 20               | 0.24 | 360                               | 900    | EKXG351E□□330ML20S |
|                          | 47          | 16 × 20               | 0.24 | 430                               | 1,075  | EKXG351E□□470ML20S |
|                          | 68          | 16 × 25               | 0.24 | 560                               | 1,400  | EKXG351E□□680ML25S |
|                          | 68          | 18 × 20               | 0.24 | 550                               | 1,375  | EKXG351E□□680MM20S |
|                          | 82          | 18 × 25               | 0.24 | 610                               | 1,525  | EKXG351E□□820MM25S |
|                          | 100         | 18 × 25               | 0.24 | 700                               | 1,575  | EKXG351E□□101MM25S |
|                          | 120         | 18 × 31.5             | 0.24 | 830                               | 1,865  | EKXG351E□□121MMN3S |
| 400                      | 150         | 18 × 35.5             | 0.24 | 960                               | 2,160  | EKXG351E□□151MMP1S |
|                          | 6.8         | 10 × 16               | 0.24 | 110                               | 275    | EKXG401E□□6R8MJ16S |
|                          | 10          | 10 × 20               | 0.24 | 140                               | 350    | EKXG401E□□100MJ20S |
|                          | 15          | 12.5 × 20             | 0.24 | 220                               | 550    | EKXG401E□□150MK20S |
|                          | 22          | 12.5 × 20             | 0.24 | 260                               | 650    | EKXG401E□□220MK20S |
|                          | 33          | 16 × 20               | 0.24 | 360                               | 900    | EKXG401E□□330ML20S |
|                          | 47          | 16 × 25               | 0.24 | 470                               | 1,175  | EKXG401E□□470ML25S |
|                          | 47          | 18 × 20               | 0.24 | 450                               | 1,125  | EKXG401E□□470MM20S |
|                          | 68          | 18 × 25               | 0.24 | 585                               | 1,465  | EKXG401E□□680MM25S |
|                          | 82          | 18 × 25               | 0.24 | 610                               | 1,525  | EKXG401E□□820MM25S |
| 450                      | 100         | 18 × 31.5             | 0.24 | 765                               | 1,720  | EKXG401E□□101MMN3S |
|                          | 120         | 18 × 35.5             | 0.24 | 865                               | 1,945  | EKXG401E□□121MMP1S |
|                          | 150         | 18 × 40               | 0.24 | 985                               | 2,215  | EKXG401E□□151MM40S |
|                          | 6.8         | 10 × 20               | 0.24 | 110                               | 275    | EKXG451E□□6R8MJ20S |
|                          | 10          | 12.5 × 20             | 0.24 | 180                               | 450    | EKXG451E□□100MK20S |
|                          | 15          | 12.5 × 25             | 0.24 | 240                               | 600    | EKXG451E□□150MK25S |
|                          | 22          | 16 × 20               | 0.24 | 290                               | 725    | EKXG451E□□220ML20S |
|                          | 33          | 16 × 25               | 0.24 | 390                               | 975    | EKXG451E□□330ML25S |
|                          | 33          | 18 × 20               | 0.24 | 380                               | 950    | EKXG451E□□330MM20S |
|                          | 47          | 18 × 25               | 0.24 | 480                               | 1,200  | EKXG451E□□470MM25S |
| 450                      | 68          | 18 × 31.5             | 0.24 | 630                               | 1,575  | EKXG451E□□680MMN3S |
|                          | 82          | 18 × 35.5             | 0.24 | 715                               | 1,785  | EKXG451E□□820MMP1S |
|                          | 100         | 18 × 40               | 0.24 | 800                               | 1,800  | EKXG451E□□101MM40S |

□□ : Enter the appropriate lead forming or taping code.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

200 to 450V<sub>dc</sub>, Downsized, 105°C

## PAG Series

- Downsize, high ripple design (φ10 to 18)
- Rated voltage range : 200 to 450V<sub>dc</sub>, Capacitance range : 18 to 560μF
- Endurance with ripple current : 2,000 hours at 105°C
- Ideal for low profile power supply applications
- Non solvent resistant type
- RoHS Compliant

PAG

↓  
Downsized  
Higher ripple  
KMG



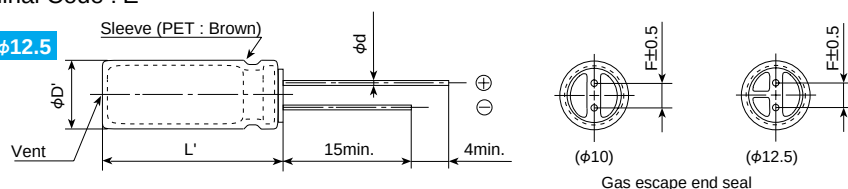
## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |                 |      |            |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|-----------------|------|------------|
| Category                                               | —40 to +105℃ (200, 400V <sub>dc</sub> ) —25 to+105℃ (420, 450V <sub>dc</sub> )                                                                                                                                                                                                        |                                      |      |                 |      |            |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                       |                                      |      |                 |      |            |
| Rated Voltage Range                                    | 200 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                             |                                      |      |                 |      |            |
| Capacitance Tolerance                                  | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                              |                                      |      |                 |      |            |
| Leakage Current                                        |                                                                                                                                                                                                                                                                                       | After 1 minute                       |      | After 5 minutes |      |            |
|                                                        | CV≤1,000                                                                                                                                                                                                                                                                              | I=0.1CV+40                           |      | I=0.03CV+15     |      |            |
|                                                        | CV>1,000                                                                                                                                                                                                                                                                              | I=0.04CV+100                         |      | I=0.02CV+25     |      |            |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃)                                                                                                                                                                                    |                                      |      |                 |      |            |
|                                                        | Dissipation Factor (tanδ)                                                                                                                                                                                                                                                             | Rated voltage (V <sub>dc</sub> )     | 200V | 400V            | 420V | 450V       |
| tanδ (Max.)                                            |                                                                                                                                                                                                                                                                                       | 0.12                                 | 0.15 | 0.20            | 0.20 |            |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 200V                                 | 400V | 420V            | 450V | (at 120Hz) |
|                                                        | Z(−25℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 3                                    | 5    | 6               | 6    |            |
|                                                        | Z(−40℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 6                                    | 6    | —               | —    |            |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105℃.                                                                                               |                                      |      |                 |      |            |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |      |                 |      |            |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |      |                 |      |            |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |                 |      |            |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |                 |      |            |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |      |                 |      |            |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |      |                 |      |            |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤500% of the initial specified value |      |                 |      |            |

## ◆DIMENSIONS [mm]

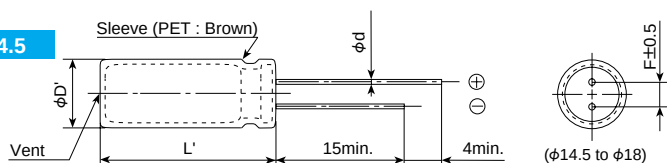
●Terminal Code : E

φ10 &amp; φ12.5

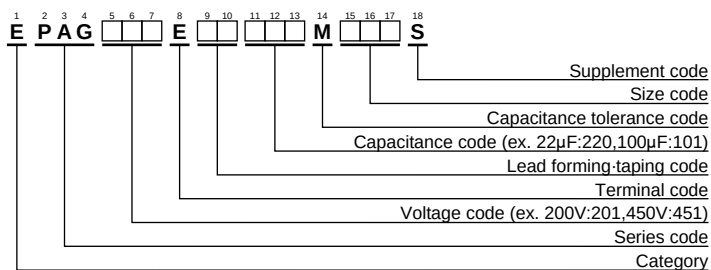


| φD  | 10          | 12.5 | 14.5 | 16  | 18  |
|-----|-------------|------|------|-----|-----|
| φd  | 0.6         | 0.6  | 0.8  | 0.8 | 0.8 |
| F   | 5.0         | 5.0  | 7.5  | 7.5 | 7.5 |
| φD' | φD+0.5 max. |      |      |     |     |
| L'  | L+2.0 max.  |      |      |     |     |

≥φ14.5



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"


**PAG** Series

### ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           | WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|------|-------------------------------------------------------------|--------------------|--------------------------|-------------|-----------------------|------|-------------------------------------------------------------|--------------------|
| 200                      | 82          | 10×30                 | 0.12 | 440                                                         | EPAG201E□□820MJ30S | 420                      | 22          | 10×30                 | 0.20 | 230                                                         | EPAG421E□□220MJ30S |
|                          | 100         | 10×35                 | 0.12 | 510                                                         | EPAG201E□□101MJ35S |                          | 27          | 10×35                 | 0.20 | 270                                                         | EPAG421E□□270MJ35S |
|                          | 120         | 10×40                 | 0.12 | 590                                                         | EPAG201E□□121MJ40S |                          | 33          | 10×40                 | 0.20 | 310                                                         | EPAG421E□□330MJ40S |
|                          | 150         | 12.5×30               | 0.12 | 650                                                         | EPAG201E□□151MK30S |                          | 39          | 12.5×30               | 0.20 | 330                                                         | EPAG421E□□390MK30S |
|                          | 180         | 12.5×35               | 0.12 | 750                                                         | EPAG201E□□181MK35S |                          | 47          | 12.5×35               | 0.20 | 390                                                         | EPAG421E□□470MK35S |
|                          | 220         | 12.5×40               | 0.12 | 830                                                         | EPAG201E□□221MK40S |                          | 56          | 12.5×40               | 0.20 | 430                                                         | EPAG421E□□560MK40S |
|                          | 220         | 14.5×30               | 0.12 | 830                                                         | EPAG201E□□221MU30S |                          | 56          | 14.5×30               | 0.20 | 430                                                         | EPAG421E□□560MU30S |
|                          | 270         | 14.5×35               | 0.12 | 960                                                         | EPAG201E□□271MU35S |                          | 68          | 14.5×35               | 0.20 | 510                                                         | EPAG421E□□680MU35S |
|                          | 270         | 16×30                 | 0.12 | 960                                                         | EPAG201E□□271ML30S |                          | 68          | 16×30                 | 0.20 | 510                                                         | EPAG421E□□680ML30S |
|                          | 330         | 16×35                 | 0.12 | 1,100                                                       | EPAG201E□□331ML35S |                          | 82          | 14.5×40               | 0.20 | 570                                                         | EPAG421E□□820MU40S |
|                          | 330         | 18×30                 | 0.12 | 1,100                                                       | EPAG201E□□331MM30S |                          | 82          | 16×35                 | 0.20 | 570                                                         | EPAG421E□□820ML35S |
|                          | 390         | 16×40                 | 0.12 | 1,240                                                       | EPAG201E□□391ML40S |                          | 100         | 16×40                 | 0.20 | 610                                                         | EPAG421E□□101ML40S |
|                          | 390         | 18×35                 | 0.12 | 1,240                                                       | EPAG201E□□391MM35S |                          | 100         | 18×30                 | 0.20 | 610                                                         | EPAG421E□□101MM30S |
|                          | 470         | 18×40                 | 0.12 | 1,390                                                       | EPAG201E□□471MM40S |                          | 120         | 18×35                 | 0.20 | 690                                                         | EPAG421E□□121MM35S |
| 400                      | 560         | 18×45                 | 0.12 | 1,560                                                       | EPAG201E□□561MM45S |                          | 150         | 18×40                 | 0.20 | 790                                                         | EPAG421E□□151MM40S |
|                          | 27          | 10×30                 | 0.15 | 260                                                         | EPAG401E□□270MJ30S | 450                      | 18          | 10×30                 | 0.20 | 210                                                         | EPAG451E□□180MJ30S |
|                          | 33          | 10×35                 | 0.15 | 300                                                         | EPAG401E□□330MJ35S |                          | 22          | 10×35                 | 0.20 | 240                                                         | EPAG451E□□220MJ35S |
|                          | 39          | 10×40                 | 0.15 | 340                                                         | EPAG401E□□390MJ40S |                          | 27          | 10×40                 | 0.20 | 280                                                         | EPAG451E□□270MJ40S |
|                          | 47          | 12.5×30               | 0.15 | 370                                                         | EPAG401E□□470MK30S |                          | 33          | 12.5×30               | 0.20 | 310                                                         | EPAG451E□□330MK30S |
|                          | 56          | 12.5×35               | 0.15 | 420                                                         | EPAG401E□□560MK35S |                          | 39          | 12.5×35               | 0.20 | 350                                                         | EPAG451E□□390MK35S |
|                          | 68          | 12.5×40               | 0.15 | 480                                                         | EPAG401E□□680MK40S |                          | 47          | 12.5×40               | 0.20 | 390                                                         | EPAG451E□□470MK40S |
|                          | 68          | 14.5×30               | 0.15 | 480                                                         | EPAG401E□□680MU30S |                          | 47          | 14.5×30               | 0.20 | 390                                                         | EPAG451E□□470MU30S |
|                          | 82          | 14.5×35               | 0.15 | 530                                                         | EPAG401E□□820MU35S |                          | 56          | 14.5×35               | 0.20 | 440                                                         | EPAG451E□□560MU35S |
|                          | 100         | 14.5×40               | 0.15 | 580                                                         | EPAG401E□□101MU40S |                          | 56          | 16×30                 | 0.20 | 440                                                         | EPAG451E□□560ML30S |
|                          | 100         | 16×30                 | 0.15 | 580                                                         | EPAG401E□□101ML30S |                          | 68          | 14.5×40               | 0.20 | 500                                                         | EPAG451E□□680MU40S |
|                          | 120         | 16×35                 | 0.15 | 670                                                         | EPAG401E□□121ML35S |                          | 68          | 16×35                 | 0.20 | 500                                                         | EPAG451E□□680ML35S |
|                          | 120         | 18×30                 | 0.15 | 670                                                         | EPAG401E□□121MM30S |                          | 82          | 16×40                 | 0.20 | 550                                                         | EPAG451E□□820ML40S |
|                          | 150         | 16×40                 | 0.15 | 770                                                         | EPAG401E□□151ML40S |                          | 82          | 18×30                 | 0.20 | 550                                                         | EPAG451E□□820MM30S |
|                          | 150         | 18×35                 | 0.15 | 770                                                         | EPAG401E□□151MM35S |                          | 100         | 18×35                 | 0.20 | 650                                                         | EPAG451E□□101MM35S |
|                          | 180         | 18×40                 | 0.15 | 880                                                         | EPAG401E□□181MM40S |                          | 120         | 18×40                 | 0.20 | 740                                                         | EPAG451E□□121MM40S |
|                          | 220         | 18×45                 | 0.15 | 1,000                                                       | EPAG401E□□221MM45S |                          | 150         | 18×45                 | 0.20 | 810                                                         | EPAG451E□□151MM45S |

□□ : Enter the appropriate lead forming or taping code.

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Capacitance (μF) | Frequency (Hz) | 120  | 1k   | 10k  | 100k |
|------------------|----------------|------|------|------|------|
| 18 to 82         |                | 1.00 | 1.50 | 1.75 | 1.80 |
| 100 to 560       |                | 1.00 | 1.30 | 1.40 | 1.50 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Overvoltage resistant design, 105°C

# KLJ Series

- Doesn't spark with DC over voltage
- Endurance with ripple current : 2,000 hours at 105°C
- Non solvent resistant type
- ESR value prescribed
- RoHS Compliant

KLJ

Downsized

KLG

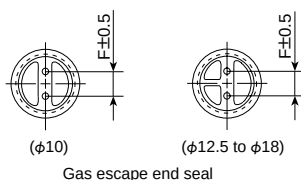
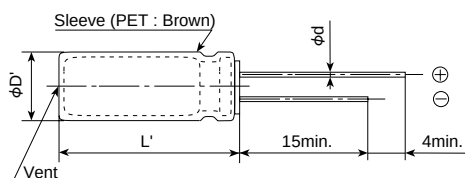


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |      |                  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                       |                                      |      |                  |
| Temperature Range                                      | -25 to +105°C                                                                                                                                                                                                                                                                           |                                      |      |                  |
| Rated Voltage Range                                    | 200 & 400V <sub>dc</sub>                                                                                                                                                                                                                                                                |                                      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |      |                  |
| Leakage Current                                        | I=0.04CV+100<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 1 minute)                                                                                                                                                      |                                      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 200V                                 | 400V | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.20                                 | 0.24 |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 200V                                 | 400V | (at 120Hz)       |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 6    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105°C.                                                                                               |                                      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤500% of the initial specified value |      |                  |

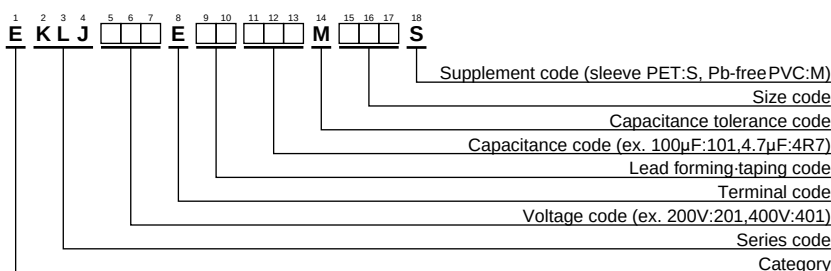
## ◆DIMENSIONS [mm]

- Terminal Code : E



| φD  | 10         | 12.5 | 16  | 18  |
|-----|------------|------|-----|-----|
| φd  | 0.6        | 0.6  | 0.8 | 0.8 |
| F   | 5.0        | 5.0  | 7.5 | 7.5 |
| φD' | φD+0.5max. |      |     |     |
| L'  | L+1.5max.  |      |     |     |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"



## ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | ESR<br>(Ω <sub>max</sub> /20°C, 100kHz) | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|------|-----------------------------------------|-----------------------------------------------------------|--------------------|
| 200                      | 33          | 10×20                 | 0.20 | 1.8                                     | 165                                                       | EKLJ201E□□330MJ20S |
|                          | 39          | 10×25                 | 0.20 | 1.4                                     | 200                                                       | EKLJ201E□□390MJ25S |
|                          | 56          | 12.5×20               | 0.20 | 1.0                                     | 265                                                       | EKLJ201E□□560MK20S |
|                          | 82          | 12.5×25               | 0.20 | 0.72                                    | 350                                                       | EKLJ201E□□820MK25S |
|                          | 100         | 16×20                 | 0.20 | 0.63                                    | 390                                                       | EKLJ201E□□101ML20S |
|                          | 120         | 16×25                 | 0.20 | 0.44                                    | 465                                                       | EKLJ201E□□121ML25S |
|                          | 150         | 18×20                 | 0.20 | 0.31                                    | 505                                                       | EKLJ201E□□151MM20S |
|                          | 180         | 16×31.5               | 0.20 | 0.36                                    | 615                                                       | EKLJ201E□□181MLN3S |
|                          | 180         | 18×25                 | 0.20 | 0.30                                    | 585                                                       | EKLJ201E□□181MM25S |
|                          | 220         | 16×35.5               | 0.20 | 0.30                                    | 695                                                       | EKLJ201E□□221MLP1S |
|                          | 220         | 18×31.5               | 0.20 | 0.28                                    | 700                                                       | EKLJ201E□□221MMN3S |
| 400                      | 270         | 18×35.5               | 0.20 | 0.24                                    | 805                                                       | EKLJ201E□□271MMP1S |
|                          | 330         | 18×40                 | 0.20 | 0.21                                    | 900                                                       | EKLJ201E□□331MM40S |
|                          | 4.7         | 10×12.5               | 0.24 | 8.4                                     | 36                                                        | EKLJ401E□□4R7MJC5S |
|                          | 10          | 10×16                 | 0.24 | 5.7                                     | 64                                                        | EKLJ401E□□100MJ16S |
|                          | 15          | 10×20                 | 0.24 | 4.0                                     | 105                                                       | EKLJ401E□□150MJ20S |
|                          | 18          | 10×25                 | 0.24 | 3.2                                     | 110                                                       | EKLJ401E□□180MJ25S |
|                          | 22          | 12.5×20               | 0.24 | 2.7                                     | 165                                                       | EKLJ401E□□220MK20S |
|                          | 27          | 12.5×25               | 0.24 | 1.9                                     | 200                                                       | EKLJ401E□□270MK25S |
|                          | 33          | 16×20                 | 0.24 | 1.5                                     | 225                                                       | EKLJ401E□□330ML20S |
|                          | 39          | 18×20                 | 0.24 | 1.2                                     | 255                                                       | EKLJ401E□□390MM20S |
|                          | 39          | 18×25                 | 0.24 | 0.72                                    | 270                                                       | EKLJ401E□□390MM25S |
|                          | 47          | 16×25                 | 0.24 | 1.1                                     | 290                                                       | EKLJ401E□□470ML25S |
|                          | 47          | 18×20                 | 0.24 | 1.2                                     | 280                                                       | EKLJ401E□□470MM20S |
|                          | 56          | 16×31.5               | 0.24 | 0.84                                    | 340                                                       | EKLJ401E□□560MLN3S |
|                          | 68          | 16×35.5               | 0.24 | 0.72                                    | 385                                                       | EKLJ401E□□680MLP1S |
|                          | 68          | 18×25                 | 0.24 | 0.88                                    | 360                                                       | EKLJ401E□□680MM25S |
|                          | 82          | 16×40                 | 0.24 | 0.65                                    | 435                                                       | EKLJ401E□□820ML40S |
|                          | 82          | 18×31.5               | 0.24 | 0.64                                    | 425                                                       | EKLJ401E□□820MMN3S |
|                          | 100         | 18×35.5               | 0.24 | 0.54                                    | 490                                                       | EKLJ401E□□101MMP1S |
|                          | 120         | 18×40                 | 0.24 | 0.49                                    | 540                                                       | EKLJ401E□□121MM40S |

□□ : Enter the appropriate lead forming or taping code.

Sleeve PET : suffix is S, Pb-free PVC : suffix is M

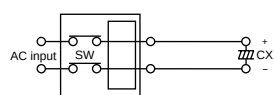
## ◆DC OVERVOLTAGE TEST CONDITIONS

The vent will operate and the capacitor shall become an open circuit without burning materials when the following excess DC voltage is applied.

## ●Test DC voltage

| Rated voltage      | Current limit | Test DC voltage        |
|--------------------|---------------|------------------------|
| 200V <sub>dc</sub> | 4A            | 300/375V <sub>dc</sub> |
| 400V <sub>dc</sub> | 2A            | 500/600V <sub>dc</sub> |

## ●Test circuit



Constant DC voltage/current power supply

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

| Frequency (Hz) | 50   | 120  | 300  | 1k   | 10k  | 50k  | 100k |
|----------------|------|------|------|------|------|------|------|
| 4.7 to 10μF    | 0.65 | 1.00 | 1.35 | 1.75 | 2.30 | 2.50 | 2.70 |
| 15 to 47μF     | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 | 1.85 |
| 56 to 330μF    | 0.80 | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 | 1.60 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise.

When long life performance is required in actual use, the rms ripple current has to be reduced.

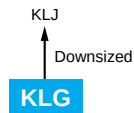


## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Overvoltage resistant design, 105°C

# KLG Series

- Doesn't spark with DC over voltage
- Endurance with ripple current : 2,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

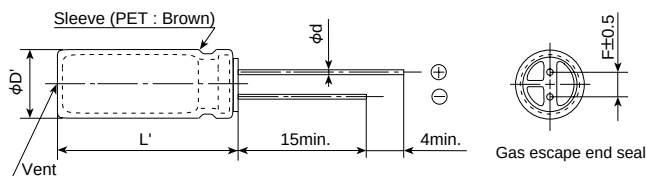


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |      |                  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------------------|
| Category                                               |                                                                                                                                                                                                                                                                                         |                                      |      |                  |
| Temperature Range                                      | -25 to +105°C                                                                                                                                                                                                                                                                           |                                      |      |                  |
| Rated Voltage Range                                    | 200 & 400V <sub>dc</sub>                                                                                                                                                                                                                                                                |                                      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |      |                  |
| Leakage Current                                        | I=0.04CV+100<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 1 minute)                                                                                                                                                      |                                      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 200V                                 | 400V | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.20                                 | 0.24 |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 200V                                 | 400V | (at 120Hz)       |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 6    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105°C.                                                                                               |                                      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤500% of the initial specified value |      |                  |

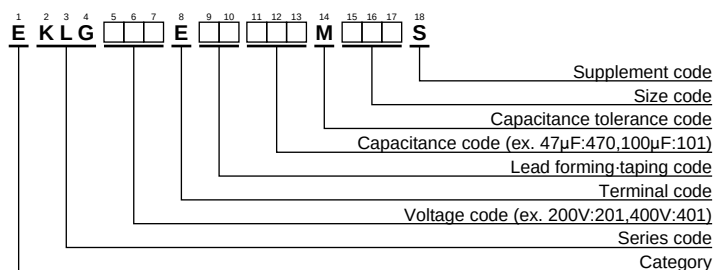
## ◆DIMENSIONS [mm]

- Terminal Code : E



|     |            |    |
|-----|------------|----|
| φD  | 16         | 18 |
| φd  | 0.8        |    |
| F   | 7.5        |    |
| φD' | φD+0.5max. |    |
| L'  | L+1.5max.  |    |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"


**KLG** Series

### ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|------|-------------------------------------------------------------|--------------------|
| 200                      | 82          | 16×20                 | 0.20 | 230                                                         | EKLG201E□□820ML20S |
|                          | 100         | 16×25                 | 0.20 | 425                                                         | EKLG201E□□101ML25S |
|                          | 100         | 18×20                 | 0.20 | 250                                                         | EKLG201E□□101MM20S |
|                          | 120         | 16×31.5               | 0.20 | 500                                                         | EKLG201E□□121MLN3S |
|                          | 120         | 18×25                 | 0.20 | 475                                                         | EKLG201E□□121MM25S |
|                          | 130         | 18×20                 | 0.20 | 285                                                         | EKLG201E□□131MM20S |
|                          | 150         | 16×31.5               | 0.20 | 560                                                         | EKLG201E□□151MLN3S |
|                          | 150         | 18×20                 | 0.20 | 315                                                         | EKLG201E□□151MM20S |
|                          | 150         | 18×25                 | 0.20 | 530                                                         | EKLG201E□□151MM25S |
|                          | 180         | 16×40                 | 0.20 | 645                                                         | EKLG201E□□181ML40S |
|                          | 180         | 18×31.5               | 0.20 | 630                                                         | EKLG201E□□181MMN3S |
|                          | 220         | 18×35.5               | 0.20 | 725                                                         | EKLG201E□□221MMP1S |
|                          | 220         | 18×40                 | 0.20 | 735                                                         | EKLG201E□□221MM40S |
|                          | 270         | 18×45                 | 0.20 | 830                                                         | EKLG201E□□271MM45S |
|                          | 330         | 18×45                 | 0.20 | 920                                                         | EKLG201E□□331MM45S |
| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(mA <sub>rms</sub> /105°C,120Hz) | Part No.           |
| 400                      | 22          | 16×20                 | 0.24 | 145                                                         | EKLG401E□□220ML20S |
|                          | 22          | 16×25                 | 0.24 | 200                                                         | EKLG401E□□220ML25S |
|                          | 33          | 16×25                 | 0.24 | 220                                                         | EKLG401E□□330ML25S |
|                          | 33          | 18×20                 | 0.24 | 225                                                         | EKLG401E□□330MM20S |
|                          | 39          | 16×31.5               | 0.24 | 245                                                         | EKLG401E□□390MLN3S |
|                          | 39          | 18×25                 | 0.24 | 250                                                         | EKLG401E□□390MM25S |
|                          | 47          | 16×31.5               | 0.24 | 275                                                         | EKLG401E□□470MLN3S |
|                          | 47          | 18×25                 | 0.24 | 280                                                         | EKLG401E□□470MM25S |
|                          | 56          | 16×40                 | 0.24 | 350                                                         | EKLG401E□□560ML40S |
|                          | 56          | 18×31.5               | 0.24 | 315                                                         | EKLG401E□□560MMN3S |
|                          | 68          | 18×35.5               | 0.24 | 350                                                         | EKLG401E□□680MMP1S |
|                          | 82          | 18×40                 | 0.24 | 395                                                         | EKLG401E□□820MM40S |
|                          | 100         | 18×40                 | 0.24 | 450                                                         | EKLG401E□□101MM40S |

□□ : Enter the appropriate lead forming or taping code.

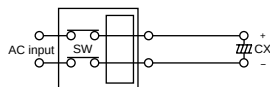
### ◆DC OVERVOLTAGE TEST CONDITIONS

The vent will operate and the capacitor shall become an open circuit without burning materials when the following excess DC voltage is applied.

#### ●Test DC voltage

| Rated voltage      | Current limit | Test DC voltage        |
|--------------------|---------------|------------------------|
| 200V <sub>dc</sub> | 4A            | 300/375V <sub>dc</sub> |
| 400V <sub>dc</sub> | 2A            | 500/600V <sub>dc</sub> |

#### ●Test circuit



Constant DC voltage/current power supply

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency (Hz) | 50   | 120  | 300  | 1k   | 10k  | 50k  | 100k |
|----------------|------|------|------|------|------|------|------|
| 22 to 47μF     | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 | 1.85 |
| 56 to 330μF    | 0.80 | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 | 1.60 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Long life for  $\phi 4$  to  $\phi 8$  product, 105°C

## FL Series

- Long life and high reliability for  $\phi 4 \times 5L$  to  $\phi 8 \times 7L$  mm range
- Endurance with ripple current : 3,000 hours at 105°C
- Suitable for long life and high reliability products
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

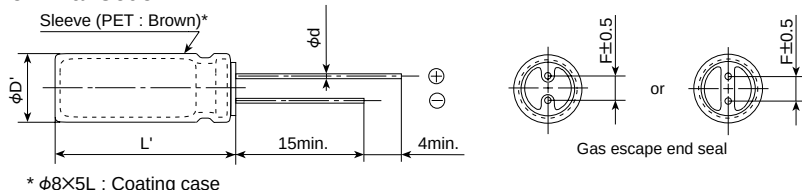


## ◆ SPECIFICATIONS

| Items                     | Characteristics                                                                                                                                                                                                                                                                         |                                                |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Category                  | -40 to +105°C                                                                                                                                                                                                                                                                           |                                                |
| Temperature Range         |                                                                                                                                                                                                                                                                                         |                                                |
| Rated Voltage Range       | 6.3 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                                |                                                |
| Capacitance Tolerance     | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                                |
| Leakage Current           | I=0.03CV or 3μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                           |                                                |
| Dissipation Factor (tanδ) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 6.3V 10V 16V 25V 35V 50V                       |
|                           | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.50 0.40 0.35 0.30 0.25 0.25 (at 20°C, 120Hz) |
| Endurance                 | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 3,000 hours at 105°C.                                                                                               |                                                |
|                           | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value                     |
|                           | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value           |
|                           | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                   |
| Shelf Life                | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                |
|                           | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value                     |
|                           | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value           |
|                           | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                   |

## ◆ DIMENSIONS [mm]

- Terminal Code : E

\*  $\phi 8 \times 5L$  : Coating case

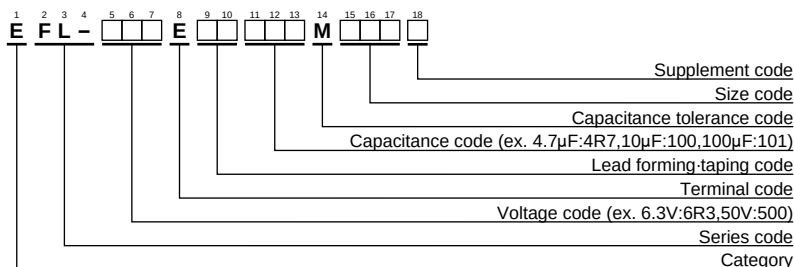
5mm Height

| φD  | 4          | 5    | 6.3  | 8    |
|-----|------------|------|------|------|
| φd  | 0.45       | 0.45 | 0.45 | 0.45 |
| F   | 1.5        | 2.0  | 2.5  | 2.5  |
| φD' | φD+0.5max. |      |      |      |
| L'  | L+1.0max.  |      |      |      |

7mm Height

| φD  | 4          | 5    | 6.3  | 8    |
|-----|------------|------|------|------|
| φd  | 0.45       | 0.45 | 0.45 | 0.45 |
| F   | 1.5        | 2.0  | 2.5  | 3.5  |
| φD' | φD+0.5max. |      |      |      |
| L'  | L+1.0max.  |      |      |      |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"



FL Series

## ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size $\phi$ DXL(mm) | tan $\delta$ | Impedance ( $\Omega_{\max}/20^\circ\text{C}, 100\text{kHz}$ ) | Rated ripple current (mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|----------|----------|--------------------------|--------------|---------------------------------------------------------------|---------------------------------------------------------|--------------------|
| 6.3      | 33       | 4×5                      | 0.50         | 5.4                                                           | 37                                                      | EFL-6R3E□□330MD05D |
|          | 47       | 4×7                      | 0.50         | 4.5                                                           | 44                                                      | EFL-6R3E□□470MD07D |
|          | 56       | 5×5                      | 0.50         | 3.1                                                           | 57                                                      | EFL-6R3E□□560ME05D |
|          | 82       | 5×7                      | 0.50         | 2.5                                                           | 70                                                      | EFL-6R3E□□820ME07D |
|          | 100      | 6.3×5                    | 0.50         | 1.7                                                           | 82                                                      | EFL-6R3E□□101MF05D |
|          | 150      | 6.3×7                    | 0.50         | 1.3                                                           | 116                                                     | EFL-6R3E□□151MF07D |
|          | 220      | 8×5                      | 0.50         | 1.5                                                           | 110                                                     | EFL-6R3E□□221MH05G |
| 10       | 270      | 8×7                      | 0.50         | 0.90                                                          | 162                                                     | EFL-6R3E□□271MH07D |
|          | 22       | 4×5                      | 0.40         | 5.4                                                           | 37                                                      | EFL-100E□□220MD05D |
|          | 33       | 4×7                      | 0.40         | 4.5                                                           | 44                                                      | EFL-100E□□330MD07D |
|          | 33       | 5×5                      | 0.40         | 3.1                                                           | 57                                                      | EFL-100E□□330ME05D |
|          | 47       | 5×7                      | 0.40         | 2.5                                                           | 70                                                      | EFL-100E□□470ME07D |
|          | 68       | 6.3×5                    | 0.40         | 1.7                                                           | 82                                                      | EFL-100E□□680MF05D |
|          | 100      | 6.3×7                    | 0.40         | 1.3                                                           | 116                                                     | EFL-100E□□101MF07D |
| 16       | 150      | 8×5                      | 0.40         | 1.5                                                           | 110                                                     | EFL-100E□□151MH05G |
|          | 220      | 8×7                      | 0.40         | 0.90                                                          | 162                                                     | EFL-100E□□221MH07D |
|          | 15       | 4×5                      | 0.35         | 5.4                                                           | 37                                                      | EFL-160E□□150MD05D |
|          | 22       | 4×7                      | 0.35         | 4.5                                                           | 44                                                      | EFL-160E□□220MD07D |
|          | 22       | 5×5                      | 0.35         | 3.1                                                           | 57                                                      | EFL-160E□□220ME05D |
|          | 33       | 5×7                      | 0.35         | 2.5                                                           | 70                                                      | EFL-160E□□330ME07D |
|          | 47       | 6.3×5                    | 0.35         | 1.7                                                           | 82                                                      | EFL-160E□□470MF05D |
| 25       | 68       | 6.3×7                    | 0.35         | 1.3                                                           | 116                                                     | EFL-160E□□680MF07D |
|          | 100      | 8×5                      | 0.35         | 1.5                                                           | 110                                                     | EFL-160E□□101MH05G |
|          | 150      | 8×7                      | 0.35         | 0.90                                                          | 162                                                     | EFL-160E□□151MH07D |
|          | 10       | 4×5                      | 0.30         | 5.4                                                           | 37                                                      | EFL-250E□□100MD05D |
|          | 15       | 4×7                      | 0.30         | 4.5                                                           | 44                                                      | EFL-250E□□150MD07D |
|          | 15       | 5×5                      | 0.30         | 3.1                                                           | 57                                                      | EFL-250E□□150ME05D |
|          | 22       | 5×7                      | 0.30         | 2.5                                                           | 70                                                      | EFL-250E□□220ME07D |
| 35       | 33       | 6.3×5                    | 0.30         | 1.7                                                           | 82                                                      | EFL-250E□□330MF05D |
|          | 56       | 6.3×7                    | 0.30         | 1.3                                                           | 116                                                     | EFL-250E□□560MF07D |
|          | 68       | 8×5                      | 0.30         | 1.5                                                           | 110                                                     | EFL-250E□□680MH05G |
|          | 100      | 8×7                      | 0.30         | 0.90                                                          | 162                                                     | EFL-250E□□101MH07D |
|          | 4.7      | 4×5                      | 0.25         | 5.4                                                           | 37                                                      | EFL-350E□□4R7MD05D |
|          | 6.8      | 4×7                      | 0.25         | 4.5                                                           | 44                                                      | EFL-350E□□6R8MD07D |
|          | 10       | 5×5                      | 0.25         | 3.1                                                           | 57                                                      | EFL-350E□□100ME05D |
| 50       | 10       | 5×7                      | 0.25         | 2.5                                                           | 70                                                      | EFL-350E□□100ME07D |
|          | 22       | 6.3×5                    | 0.25         | 1.7                                                           | 82                                                      | EFL-350E□□220MF05D |
|          | 22       | 6.3×7                    | 0.25         | 1.3                                                           | 116                                                     | EFL-350E□□220MF07D |
|          | 33       | 8×5                      | 0.25         | 1.5                                                           | 110                                                     | EFL-350E□□330MH05G |
|          | 47       | 8×7                      | 0.25         | 0.90                                                          | 162                                                     | EFL-350E□□470MH07D |
|          | 1.0      | 4×5                      | 0.25         | 19                                                            | 18                                                      | EFL-500E□□1R0MD05D |
|          | 2.2      | 4×5                      | 0.25         | 14                                                            | 22                                                      | EFL-500E□□2R2MD05D |
| 50       | 3.3      | 4×5                      | 0.25         | 11                                                            | 26                                                      | EFL-500E□□3R3MD05D |
|          | 4.7      | 4×7                      | 0.25         | 9.0                                                           | 30                                                      | EFL-500E□□4R7MD07D |
|          | 4.7      | 5×5                      | 0.25         | 6.0                                                           | 40                                                      | EFL-500E□□4R7ME05D |
|          | 6.8      | 5×7                      | 0.25         | 4.8                                                           | 50                                                      | EFL-500E□□6R8ME07D |
|          | 10       | 6.3×5                    | 0.25         | 2.9                                                           | 63                                                      | EFL-500E□□100MF05D |
|          | 15       | 6.3×7                    | 0.25         | 2.2                                                           | 90                                                      | EFL-500E□□150MF07D |
|          | 22       | 8×5                      | 0.25         | 2.6                                                           | 84                                                      | EFL-500E□□220MH05G |
| 50       | 22       | 8×7                      | 0.25         | 1.6                                                           | 120                                                     | EFL-500E□□220MH07D |

□□ : Enter the appropriate lead forming or taping code.

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

| Capacitance(μF) | Frequency(Hz) | 120  | 1k   | 10k  | 100k |
|-----------------|---------------|------|------|------|------|
| to 3.3          |               | 0.20 | 0.66 | 0.90 | 1.00 |
| 4.7 to 6.8      |               | 0.35 | 0.70 | 0.90 | 1.00 |
| 10 to 150       |               | 0.40 | 0.75 | 0.90 | 1.00 |
| 220 to 270      |               | 0.50 | 0.85 | 0.94 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

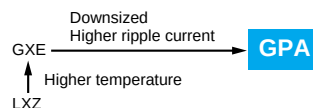


## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Longer life, Downsized, 125°C

## GPA Series

- Downsized, low impedance and high-ripple current version of GXE series
- For automobile modules and other high temperature applications
- Endurance with ripple current : 3,000 to 5,000 hours at 125°C
- Solvent resistant type
- RoHS Compliant

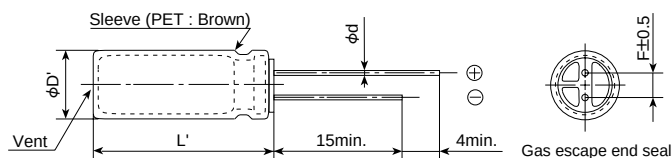


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |      |      |                  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                       |                                      |      |      |                  |
| Rated Voltage Range                                    | 25 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                                 |                                      |      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |      |      |                  |
| Leakage Current                                        | I=0.03CV or 4μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C, 1 minute)                                                                                                                                 |                                      |      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 25                                   | 35   | 50   | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.14                                 | 0.12 | 0.10 |                  |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the above value for each 1,000μF increase.                                                                                                                                                                                        |                                      |      |      |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 25                                   | 35   | 50   | (at 120Hz)       |
|                                                        | Z(−25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 2                                    | 2    | 2    |                  |
|                                                        | Z(−40°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 4    | 4    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 5,000 hours (3,000 hours for 25L and less) at 125°C.                                                                |                                      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value           |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 125°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value           |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |                  |

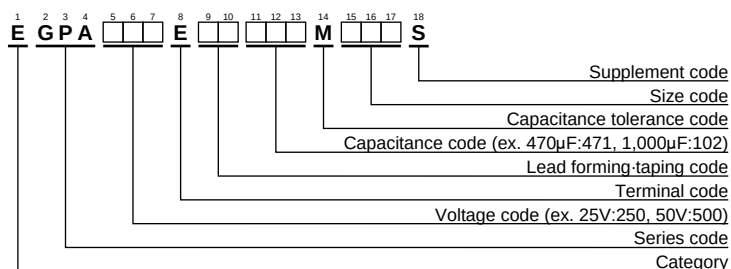
## ◆DIMENSIONS [mm]

- Terminal Code : E



| φD  | 12.5       | 14.5 | 16  | 18  |
|-----|------------|------|-----|-----|
| φd  | 0.6        | 0.8  | 0.8 | 0.8 |
| F   | 5.0        | 7.5  | 7.5 | 7.5 |
| φD' | φD+0.5max. |      |     |     |
| L'  | L+1.5max.  |      |     |     |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"



GPA Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | ESR<br>(Ωmax/100kHz) |       | Rated<br>ripple<br>current<br>(mA <sub>rms</sub> /125°C,<br>100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------|-------|---------------------------------------------------------------------|--------------------|
|             |             |                       | 20°C                 | -40°C |                                                                     |                    |
| 25          | 1,200       | 12.5×20               | 0.044                | 0.22  | 1,820                                                               | EGPA250E□□122MK20S |
|             | 1,500       | 14.5×20               | 0.037                | 0.19  | 2,100                                                               | EGPA250E□□152MU20S |
|             | 1,800       | 12.5×25               | 0.033                | 0.17  | 2,280                                                               | EGPA250E□□182MK25S |
|             | 1,800       | 16×20                 | 0.034                | 0.17  | 2,280                                                               | EGPA250E□□182ML20S |
|             | 2,200       | 12.5×30               | 0.029                | 0.13  | 2,560                                                               | EGPA250E□□222MK30S |
|             | 2,200       | 14.5×25               | 0.028                | 0.14  | 2,620                                                               | EGPA250E□□222MU25S |
|             | 2,700       | 12.5×35               | 0.024                | 0.11  | 2,970                                                               | EGPA250E□□272MK35S |
|             | 2,700       | 14.5×30               | 0.023                | 0.10  | 3,060                                                               | EGPA250E□□272MU30S |
|             | 2,700       | 16×25                 | 0.026                | 0.13  | 2,860                                                               | EGPA250E□□272ML25S |
|             | 2,700       | 18×20                 | 0.032                | 0.16  | 2,490                                                               | EGPA250E□□272MM20S |
|             | 3,300       | 12.5×40               | 0.021                | 0.095 | 3,340                                                               | EGPA250E□□332MK40S |
|             | 3,300       | 14.5×35               | 0.021                | 0.095 | 3,380                                                               | EGPA250E□□332MU35S |
|             | 3,300       | 16×30                 | 0.023                | 0.10  | 3,160                                                               | EGPA250E□□332ML30S |
|             | 3,900       | 16×35                 | 0.020                | 0.090 | 3,590                                                               | EGPA250E□□392ML35S |
|             | 3,900       | 18×25                 | 0.024                | 0.12  | 3,010                                                               | EGPA250E□□392MM25S |
|             | 4,700       | 14.5×40               | 0.018                | 0.081 | 3,730                                                               | EGPA250E□□472MU40S |
|             | 4,700       | 18×30                 | 0.022                | 0.099 | 3,390                                                               | EGPA250E□□472MM30S |
|             | 5,600       | 16×40                 | 0.017                | 0.077 | 3,970                                                               | EGPA250E□□562ML40S |
| 35          | 5,600       | 18×35                 | 0.019                | 0.086 | 3,840                                                               | EGPA250E□□562MM35S |
|             | 6,800       | 18×40                 | 0.016                | 0.072 | 4,230                                                               | EGPA250E□□682MM40S |
|             | 680         | 12.5×20               | 0.044                | 0.22  | 1,820                                                               | EGPA350E□□681MK20S |
|             | 1,000       | 12.5×25               | 0.033                | 0.17  | 2,280                                                               | EGPA350E□□102MK25S |
|             | 1,000       | 14.5×20               | 0.037                | 0.19  | 2,100                                                               | EGPA350E□□102MU20S |
|             | 1,200       | 12.5×30               | 0.029                | 0.13  | 2,560                                                               | EGPA350E□□122MK30S |
|             | 1,200       | 16×20                 | 0.034                | 0.17  | 2,280                                                               | EGPA350E□□122ML20S |
|             | 1,200       | 14.5×25               | 0.028                | 0.14  | 2,620                                                               | EGPA350E□□122MU25S |
|             | 1,500       | 12.5×35               | 0.024                | 0.11  | 2,970                                                               | EGPA350E□□152MK35S |
|             | 1,500       | 14.5×30               | 0.023                | 0.10  | 3,060                                                               | EGPA350E□□152MU30S |
|             | 1,500       | 18×20                 | 0.032                | 0.16  | 2,490                                                               | EGPA350E□□152MM20S |
|             | 1,800       | 12.5×40               | 0.021                | 0.095 | 3,340                                                               | EGPA350E□□182MK40S |
| 50          | 1,800       | 16×25                 | 0.026                | 0.13  | 2,860                                                               | EGPA350E□□182ML25S |
|             | 2,200       | 14.5×35               | 0.021                | 0.095 | 3,380                                                               | EGPA350E□□222MU35S |
|             | 2,200       | 16×30                 | 0.023                | 0.10  | 3,160                                                               | EGPA350E□□222ML30S |
|             | 2,200       | 18×25                 | 0.024                | 0.12  | 3,010                                                               | EGPA350E□□222MM25S |
|             | 2,700       | 14.5×40               | 0.018                | 0.081 | 3,730                                                               | EGPA350E□□272MU40S |
|             | 2,700       | 16×35                 | 0.020                | 0.090 | 3,590                                                               | EGPA350E□□272ML35S |
|             | 2,700       | 18×30                 | 0.022                | 0.099 | 3,390                                                               | EGPA350E□□272MM30S |
|             | 3,300       | 16×40                 | 0.017                | 0.077 | 3,970                                                               | EGPA350E□□332ML40S |
|             | 3,300       | 18×35                 | 0.019                | 0.086 | 3,840                                                               | EGPA350E□□332MM35S |
|             | 4,700       | 18×40                 | 0.016                | 0.072 | 4,230                                                               | EGPA350E□□472MM40S |
|             | 470         | 12.5×20               | 0.065                | 0.33  | 1,500                                                               | EGPA500E□□471MK20S |
|             | 560         | 14.5×20               | 0.055                | 0.28  | 1,740                                                               | EGPA500E□□561MU20S |
|             | 680         | 12.5×25               | 0.048                | 0.24  | 1,900                                                               | EGPA500E□□681MK25S |
|             | 680         | 16×20                 | 0.043                | 0.22  | 2,040                                                               | EGPA500E□□681ML20S |
|             | 820         | 12.5×30               | 0.041                | 0.18  | 2,150                                                               | EGPA500E□□821MK30S |
|             | 820         | 14.5×25               | 0.040                | 0.20  | 2,190                                                               | EGPA500E□□821MU25S |
|             | 1,000       | 12.5×35               | 0.034                | 0.15  | 2,510                                                               | EGPA500E□□102MK35S |
|             | 1,000       | 14.5×30               | 0.036                | 0.16  | 2,470                                                               | EGPA500E□□102MU30S |
|             | 1,000       | 16×25                 | 0.031                | 0.16  | 2,620                                                               | EGPA500E□□102ML25S |
|             | 1,000       | 18×20                 | 0.039                | 0.20  | 2,240                                                               | EGPA500E□□102MM20S |
|             | 1,200       | 12.5×40               | 0.028                | 0.13  | 2,870                                                               | EGPA500E□□122MK40S |
|             | 1,200       | 14.5×35               | 0.029                | 0.13  | 2,840                                                               | EGPA500E□□122MU35S |
|             | 1,200       | 16×30                 | 0.027                | 0.13  | 2,940                                                               | EGPA500E□□122ML30S |
|             | 1,200       | 18×25                 | 0.029                | 0.15  | 2,750                                                               | EGPA500E□□122MM25S |
|             | 1,500       | 16×35                 | 0.023                | 0.10  | 3,300                                                               | EGPA500E□□152ML35S |
|             | 1,800       | 14.5×40               | 0.024                | 0.11  | 3,230                                                               | EGPA500E□□182MU40S |
|             | 1,800       | 18×30                 | 0.026                | 0.12  | 3,140                                                               | EGPA500E□□182MM30S |
|             | 2,200       | 16×40                 | 0.020                | 0.090 | 3,720                                                               | EGPA500E□□222ML40S |
|             | 2,200       | 18×35                 | 0.022                | 0.10  | 3,510                                                               | EGPA500E□□222MM35S |
|             | 2,700       | 18×40                 | 0.018                | 0.080 | 3,940                                                               | EGPA500E□□272MM40S |

□□ : Enter the appropriate lead forming or taping code.

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

| Capacitance(μF) | Frequency(Hz) | 120  | 1k   | 10k  | 100k |
|-----------------|---------------|------|------|------|------|
| 470 to 560      |               | 0.50 | 0.85 | 0.94 | 1.00 |
| 680 to 1,800    |               | 0.60 | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,900  |               | 0.75 | 0.90 | 0.95 | 1.00 |
| 4,700 to 6,800  |               | 0.85 | 0.95 | 0.98 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Long Life, Downsized, 125°C

# GXE Series

- For automobile modules and other high temperature applications
- Downsize, long life, low impedance and better low temperature characteristics
- Endurance with ripple current : 2,000 to 5,000 hours at 125°C
- Solvent resistant type except 63 to 450V (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

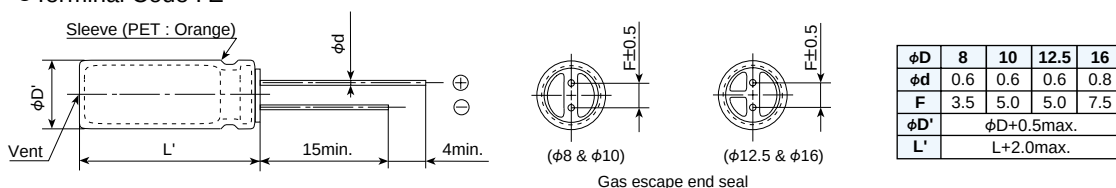


## SPECIFICATIONS

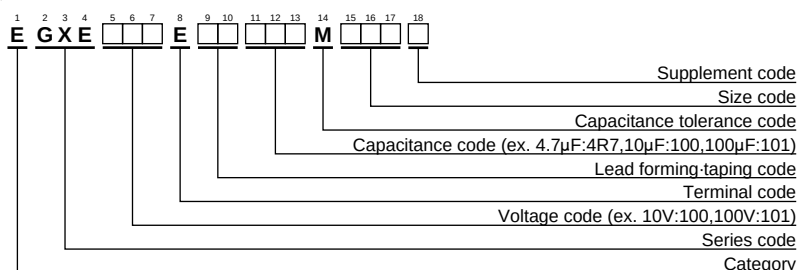
| Items                                                  | Characteristics                                                                                                                                                                                                                                                                                                                    |                                                           |      |      |      |                           |                                      |              |      |                                      |                  |   |                     |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|------|------|------|---------------------------|--------------------------------------|--------------|------|--------------------------------------|------------------|---|---------------------|
| Category                                               |                                                                                                                                                                                                                                                                                                                                    |                                                           |      |      |      |                           |                                      |              |      |                                      |                  |   |                     |
| Temperature Range                                      | -40 to +125°C (10 to 250V <sub>dc</sub> ) -25 to +125°C (350 to 450V <sub>dc</sub> )                                                                                                                                                                                                                                               |                                                           |      |      |      |                           |                                      |              |      |                                      |                  |   |                     |
| Rated Voltage Range                                    | 10 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                                                           |                                                           |      |      |      |                           |                                      |              |      |                                      |                  |   |                     |
| Capacitance Tolerance                                  | ±20% (M)                                                                                                                                                                                                                                                                                                                           |                                                           |      |      |      |                           |                                      |              |      |                                      | (at 20°C, 120Hz) |   |                     |
| Leakage Current                                        | 10 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                                                                           |                                                           |      |      |      | 160 to 450V <sub>dc</sub> |                                      |              |      |                                      |                  |   |                     |
|                                                        | I=0.03CV or 4μA, whichever is greater.                                                                                                                                                                                                                                                                                             |                                                           |      |      |      | CV≤1,000                  |                                      | I=0.1CV+40   |      |                                      |                  |   |                     |
|                                                        |                                                                                                                                                                                                                                                                                                                                    |                                                           |      |      |      | CV>1,000                  |                                      | I=0.04CV+100 |      |                                      |                  |   |                     |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                                                                                                                                          |                                                           |      |      |      |                           |                                      |              |      |                                      |                  |   | (at 20°C, 1 minute) |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                   | 10V                                                       | 16V  | 25V  | 35V  | 50V                       | 63V                                  | 80V          | 100V | 160 to 250V                          | 350 to 450V      |   |                     |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                                                                        | 0.20                                                      | 0.16 | 0.14 | 0.12 | 0.10                      | 0.10                                 | 0.08         | 0.08 | 0.20                                 | 0.24             |   |                     |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the above value for each 1,000μF increase.                                                                                                                                                                                                                                   |                                                           |      |      |      |                           |                                      |              |      |                                      |                  |   | (at 20°C, 120Hz)    |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                   | 10V                                                       | 16V  | 25V  | 35V  | 50V                       | 63V                                  | 80V          | 100V | 160 to 250V                          | 350 to 450V      |   |                     |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                                  | 3                                                         | 2    | 2    | 2    | 2                         | 2                                    | 2            | 2    | 3                                    | 6                |   |                     |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                                                                  | 6                                                         | 4    | 4    | 4    | 4                         | 4                                    | 4            | 4    | 4                                    | 6                | — | (at 120Hz)          |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for the specified time at 125°C.                                                                                                                                   |                                                           |      |      |      |                           |                                      |              |      |                                      |                  |   |                     |
|                                                        |                                                                                                                                                                                                                                                                                                                                    | 10 to 100V <sub>dc</sub>                                  |      |      |      |                           |                                      |              |      | 160 to 450V <sub>dc</sub>            |                  |   |                     |
|                                                        | Time                                                                                                                                                                                                                                                                                                                               | φ8 : 2,000hours φ10 : 3,000hours φ12.5 & φ16 : 5,000hours |      |      |      |                           |                                      |              |      | 2,000hours                           |                  |   |                     |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                                                                 | ≤±30% of the initial value                                |      |      |      |                           |                                      |              |      | ≤±20% of the initial value           |                  |   |                     |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                                                                        | ≤300% of the initial specified value                      |      |      |      |                           |                                      |              |      | ≤200% of the initial specified value |                  |   |                     |
|                                                        | Leakage current                                                                                                                                                                                                                                                                                                                    | ≤The initial specified value                              |      |      |      |                           |                                      |              |      | ≤The initial specified value         |                  |   |                     |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours (500 hours for 350 to 450V <sub>dc</sub> ) at 125°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                           |      |      |      |                           |                                      |              |      |                                      |                  |   |                     |
|                                                        |                                                                                                                                                                                                                                                                                                                                    | 10 to 100V <sub>dc</sub>                                  |      |      |      |                           | 160 to 450V <sub>dc</sub>            |              |      |                                      |                  |   |                     |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                                                                 | ≤±30% of the initial value                                |      |      |      |                           | ≤±20% of the initial value           |              |      |                                      |                  |   |                     |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                                                                        | ≤300% of the initial specified value                      |      |      |      |                           | ≤200% of the initial specified value |              |      |                                      |                  |   |                     |
|                                                        | Leakage current                                                                                                                                                                                                                                                                                                                    | ≤The initial specified value                              |      |      |      |                           | ≤500% of the initial specified value |              |      |                                      |                  |   |                     |
|                                                        |                                                                                                                                                                                                                                                                                                                                    |                                                           |      |      |      |                           |                                      |              |      |                                      |                  |   |                     |

## DIMENSIONS [mm]

- Terminal Code : E



## PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"


**GXE** Series

**◆STANDARD RATINGS**
☐ is not solvent resistant.

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ω <sub>max</sub> /20°C,<br>100kHz) | Rated ripple<br>current<br>(mA <sub>rms</sub> /125°C,<br>Note1) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ω <sub>max</sub> /20°C,<br>100kHz) | Rated ripple<br>current<br>(mA <sub>rms</sub> /125°C,<br>Note1) | Part No.            |
|-------------|-------------|-----------------------|--------------------------------------------------|-----------------------------------------------------------------|--------------------|-------------|-------------|-----------------------|--------------------------------------------------|-----------------------------------------------------------------|---------------------|
| 10          | 220         | 8×12                  | 0.32                                             | 340                                                             | EGXE100E□□221MH12D | 80          | 47          | 10×12.5               | 0.80                                             | 480                                                             | EGXE800E□□470MJC5S  |
|             | 330         | 10×12.5               | 0.15                                             | 620                                                             | EGXE100E□□331MJC5S |             | 100         | 10×20                 | 0.39                                             | 790                                                             | EGXE800E□□101MJ20S  |
|             | 470         | 10×12.5               | 0.15                                             | 620                                                             | EGXE100E□□471MJC5S |             | 220         | 12.5×25               | 0.18                                             | 1,240                                                           | EGXE800E□□221MK25S  |
|             | 1,000       | 10×20                 | 0.075                                            | 950                                                             | EGXE100E□□102MJ20S |             | 330         | 12.5×30               | 0.16                                             | 1,390                                                           | EGXE800E□□331MK30S  |
|             | 2,200       | 12.5×25               | 0.040                                            | 1,350                                                           | EGXE100E□□222MK25S |             | 470         | 16×25                 | 0.11                                             | 1,500                                                           | EGXE800E□□471ML25S  |
|             | 3,300       | 16×25                 | 0.031                                            | 1,620                                                           | EGXE100E□□332ML25S | 100         | 4.7         | 8×12                  | 2.0                                              | 130                                                             | EGXE101E□□4R7MH12D  |
|             | 4,700       | 16×31.5               | 0.025                                            | 1,860                                                           | EGXE100E□□472MLN3S |             | 10          | 8×12                  | 1.5                                              | 150                                                             | EGXE101E□□100MH12D  |
| 16          | 100         | 8×12                  | 0.32                                             | 340                                                             | EGXE160E□□101MH12D |             | 22          | 10×12.5               | 0.80                                             | 480                                                             | EGXE101E□□220MJC5S  |
|             | 220         | 10×12.5               | 0.15                                             | 620                                                             | EGXE160E□□221MJC5S |             | 33          | 10×12.5               | 0.80                                             | 480                                                             | EGXE101E□□330MJC5S  |
|             | 330         | 10×12.5               | 0.15                                             | 620                                                             | EGXE160E□□331MJC5S |             | 47          | 10×16                 | 0.55                                             | 630                                                             | EGXE101E□□470MJC16S |
|             | 470         | 10×16                 | 0.094                                            | 790                                                             | EGXE160E□□471MJ16S |             | 100         | 12.5×20               | 0.25                                             | 990                                                             | EGXE101E□□101MK20S  |
|             | 1,000       | 12.5×20               | 0.058                                            | 1,080                                                           | EGXE160E□□102MK20S |             | 220         | 16×25                 | 0.11                                             | 1,500                                                           | EGXE101E□□221ML25S  |
|             | 2,200       | 16×25                 | 0.031                                            | 1,620                                                           | EGXE160E□□222ML25S |             | 330         | 16×31.5               | 0.079                                            | 1,790                                                           | EGXE101E□□331MLN3S  |
|             | 3,300       | 16×31.5               | 0.025                                            | 1,860                                                           | EGXE160E□□332MLN3S | 160         | 22          | 10×20                 | —                                                | 115                                                             | EGXE161E□□220MJ20S  |
| 25          | 100         | 8×12                  | 0.32                                             | 340                                                             | EGXE250E□□101MH12D |             | 33          | 10×25                 | —                                                | 154                                                             | EGXE161E□□330MJ25S  |
|             | 220         | 10×12.5               | 0.15                                             | 620                                                             | EGXE250E□□221MJC5S |             | 47          | 12.5×20               | —                                                | 187                                                             | EGXE161E□□470MK20S  |
|             | 330         | 10×16                 | 0.094                                            | 790                                                             | EGXE250E□□331MJ16S |             | 68          | 12.5×25               | —                                                | 245                                                             | EGXE161E□□680MK25S  |
|             | 470         | 10×20                 | 0.075                                            | 950                                                             | EGXE250E□□471MJ20S |             | 100         | 16×25                 | —                                                | 329                                                             | EGXE161E□□101ML25S  |
|             | 1,000       | 12.5×25               | 0.040                                            | 1,350                                                           | EGXE250E□□102MK25S |             | 150         | 16×31.5               | —                                                | 434                                                             | EGXE161E□□151MLN3S  |
|             | 2,200       | 16×31.5               | 0.025                                            | 1,860                                                           | EGXE250E□□222MLN3S | 200         | 10          | 10×20                 | —                                                | 78                                                              | EGXE201E□□100MJ20S  |
| 35          | 100         | 8×12                  | 0.32                                             | 340                                                             | EGXE350E□□101MH12D |             | 22          | 10×25                 | —                                                | 126                                                             | EGXE201E□□220MJ25S  |
|             | 100         | 10×12.5               | 0.15                                             | 620                                                             | EGXE350E□□101MJC5S |             | 33          | 12.5×20               | —                                                | 157                                                             | EGXE201E□□330MK20S  |
|             | 220         | 10×16                 | 0.094                                            | 790                                                             | EGXE350E□□221MJ16S |             | 47          | 12.5×25               | —                                                | 204                                                             | EGXE201E□□470MK25S  |
|             | 330         | 10×20                 | 0.075                                            | 950                                                             | EGXE350E□□331MJ20S |             | 68          | 16×20                 | —                                                | 250                                                             | EGXE201E□□680ML20S  |
|             | 470         | 12.5×20               | 0.058                                            | 1,080                                                           | EGXE350E□□471MK20S |             | 100         | 16×25                 | —                                                | 329                                                             | EGXE201E□□101ML25S  |
|             | 1,000       | 16×25                 | 0.031                                            | 1,620                                                           | EGXE350E□□102MLN3S | 250         | 10          | 10×20                 | —                                                | 78                                                              | EGXE251E□□100MJ20S  |
| 50          | 10          | 8×12                  | 0.75                                             | 180                                                             | EGXE500E□□100MH12D |             | 22          | 12.5×20               | —                                                | 128                                                             | EGXE251E□□220MK20S  |
|             | 22          | 8×12                  | 0.50                                             | 250                                                             | EGXE500E□□220MH12D |             | 33          | 12.5×25               | —                                                | 171                                                             | EGXE251E□□330MK25S  |
|             | 33          | 8×12                  | 0.50                                             | 280                                                             | EGXE500E□□330MH12D |             | 47          | 16×25                 | —                                                | 225                                                             | EGXE251E□□470ML25S  |
|             | 47          | 8×12                  | 0.50                                             | 280                                                             | EGXE500E□□470MH12D |             | 68          | 16×31.5               | —                                                | 292                                                             | EGXE251E□□680MLN3S  |
|             | 100         | 10×12.5               | 0.20                                             | 520                                                             | EGXE500E□□101MJC5S | 350         | 4.7         | 10×20                 | —                                                | 53                                                              | EGXE351E□□4R7MJ20S  |
|             | 220         | 10×20                 | 0.098                                            | 880                                                             | EGXE500E□□221MJ20S |             | 10          | 10×25                 | —                                                | 85                                                              | EGXE351E□□100MJ25S  |
|             | 330         | 12.5×20               | 0.081                                            | 990                                                             | EGXE500E□□331MK20S |             | 22          | 12.5×25               | —                                                | 139                                                             | EGXE351E□□220MK25S  |
|             | 470         | 12.5×25               | 0.059                                            | 1,150                                                           | EGXE500E□□471MK25S |             | 33          | 16×25                 | —                                                | 189                                                             | EGXE351E□□330ML25S  |
|             | 1,000       | 16×31.5               | 0.032                                            | 1,590                                                           | EGXE500E□□102MLN3S |             | 47          | 16×31.5               | —                                                | 243                                                             | EGXE351E□□470MLN3S  |
| 63          | 33          | 8×12                  | 1.5                                              | 150                                                             | EGXE630E□□330MH12D | 400         | 4.7         | 10×20                 | —                                                | 53                                                              | EGXE401E□□4R7MJ20S  |
|             | 47          | 10×12.5               | 0.59                                             | 530                                                             | EGXE630E□□470MJC5S |             | 10          | 10×25                 | —                                                | 86                                                              | EGXE401E□□100MJ25S  |
|             | 100         | 10×16                 | 0.41                                             | 690                                                             | EGXE630E□□101MJ16S |             | 22          | 12.5×30               | —                                                | 142                                                             | EGXE401E□□220MK30S  |
|             | 220         | 12.5×20               | 0.16                                             | 1,050                                                           | EGXE630E□□221MK20S |             | 33          | 16×25                 | —                                                | 189                                                             | EGXE401E□□330ML25S  |
|             | 330         | 12.5×25               | 0.12                                             | 1,290                                                           | EGXE630E□□331MK25S |             | 47          | 16×31.5               | —                                                | 243                                                             | EGXE401E□□470MLN3S  |
|             | 470         | 12.5×30               | 0.097                                            | 1,460                                                           | EGXE630E□□471MK30S | 450         | 4.7         | 10×25                 | —                                                | 58                                                              | EGXE451E□□4R7MJ25S  |
| 80          | 1,000       | 16×31.5               | 0.059                                            | 1,850                                                           | EGXE630E□□102MLN3S |             | 10          | 12.5×20               | —                                                | 86                                                              | EGXE451E□□100MK20S  |
|             | 22          | 8×12                  | 1.5                                              | 150                                                             | EGXE800E□□220MH12D |             | 22          | 16×25                 | —                                                | 154                                                             | EGXE451E□□220ML25S  |
|             | 33          | 10×12.5               | 0.8                                              | 480                                                             | EGXE800E□□330MJC5S |             | 33          | 16×31.5               | —                                                | 203                                                             | EGXE451E□□330MLN3S  |

□□ : Enter the appropriate lead forming or taping code.

(Note1) Ripple current frequency

10 to 100V = 100kHz

160 to 450V = 120Hz

**◆RATED RIPPLE CURRENT MULTIPLIERS**

●(10 to 100Vdc) Frequency Multipliers

| Capacitance (μF) | Frequency (Hz) | 120  | 1k   | 10k  | 100k |
|------------------|----------------|------|------|------|------|
| 4.7 to 100       |                | 0.40 | 0.75 | 0.90 | 1.00 |
| 220 to 470       |                | 0.50 | 0.85 | 0.94 | 1.00 |
| 1,000            |                | 0.60 | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,300   |                | 0.75 | 0.90 | 0.95 | 1.00 |
| 4,700            |                | 0.85 | 0.95 | 0.98 | 1.00 |

●(160 to 450Vdc) Frequency Multipliers

| Capacitance (μF) | Frequency (Hz) | 50   | 120  | 300  | 1k   | 10k  | 100k |
|------------------|----------------|------|------|------|------|------|------|
| 4.7 to 33        |                | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 |
| 47 to 150        |                | 0.80 | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

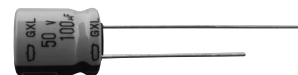
Longer life, 125°C

## GXL Series

- Long-Life version of GXE series
- For automobile modules and other high temperature applications
- Endurance with ripple current : 5,000 hours at 125°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

GXL

↑ Longer life  
GXE

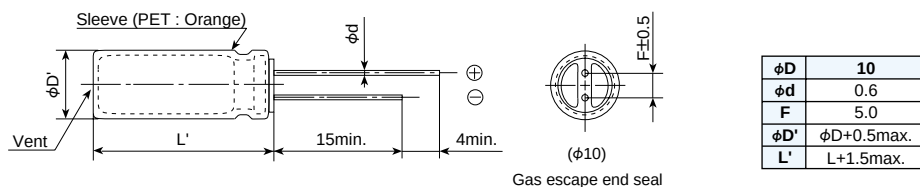


## ◆ SPECIFICATIONS

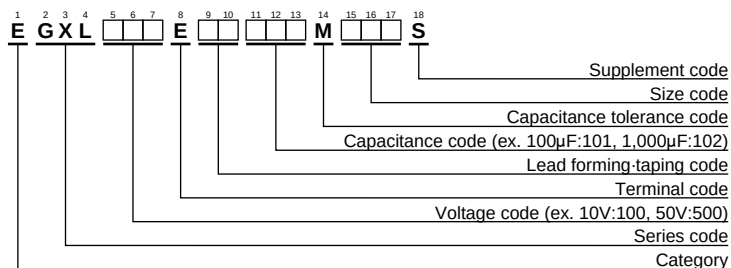
| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |                  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------------------|
| Category                                               |                                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |                  |
| Temperature Range                                      | -40 to +125°C                                                                                                                                                                                                                                                                           |                                      |      |      |      |      |                  |
| Rated Voltage Range                                    | 10 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                                 |                                      |      |      |      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |      |      |      |      |                  |
| Leakage Current                                        | I=0.03CV or 4μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C, 1 minute)                                                                                                                                 |                                      |      |      |      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 10V                                  | 16V  | 25V  | 35V  | 50V  | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.20                                 | 0.16 | 0.14 | 0.12 | 0.10 |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 10V                                  | 16V  | 25V  | 35V  | 50V  | (at 120Hz)       |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 3                                    | 2    | 2    | 2    | 2    |                  |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 6                                    | 4    | 4    | 4    | 4    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 125°C.                                                                                               |                                      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value           |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |      |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 125°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value           |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |      |      |      |                  |

## ◆ DIMENSIONS [mm]

- Terminal Code : E



## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"


**GXL**Series

### ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/20°C, 100kHz) | Rated ripple current<br>(mA <sub>rms</sub> /125°C, 100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------------|------------------------------------------------------------|--------------------|
| 10          | 330         | 10 × 12.5             | 0.17                             | 800                                                        | EGXL100E□□331MJC5S |
|             | 470         | 10 × 12.5             | 0.17                             | 800                                                        | EGXL100E□□471MJC5S |
|             | 1,000       | 10 × 20               | 0.094                            | 1,300                                                      | EGXL100E□□102MJ20S |
| 16          | 220         | 10 × 12.5             | 0.17                             | 800                                                        | EGXL160E□□221MJC5S |
|             | 330         | 10 × 12.5             | 0.17                             | 800                                                        | EGXL160E□□331MJC5S |
|             | 470         | 10 × 16               | 0.12                             | 1,050                                                      | EGXL160E□□471MJ16S |
| 25          | 220         | 10 × 12.5             | 0.17                             | 800                                                        | EGXL250E□□221MJC5S |
|             | 330         | 10 × 16               | 0.12                             | 1,050                                                      | EGXL250E□□331MJ16S |
|             | 470         | 10 × 20               | 0.094                            | 1,300                                                      | EGXL250E□□471MJ20S |
| 35          | 100         | 10 × 12.5             | 0.17                             | 800                                                        | EGXL350E□□101MJC5S |
|             | 220         | 10 × 16               | 0.12                             | 1,050                                                      | EGXL350E□□221MJ16S |
|             | 330         | 10 × 20               | 0.094                            | 1,300                                                      | EGXL350E□□331MJ20S |
| 50          | 100         | 10 × 12.5             | 0.30                             | 590                                                        | EGXL500E□□101MJC5S |
|             | 220         | 10 × 20               | 0.19                             | 970                                                        | EGXL500E□□221MJ20S |

□□ : Enter the appropriate lead forming or taping code.

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Capacitance(μF) \ Frequency(Hz) | 120  | 1k   | 10k  | 100k |
|---------------------------------|------|------|------|------|
| 100                             | 0.40 | 0.75 | 0.90 | 1.00 |
| 220 to 470                      | 0.50 | 0.85 | 0.94 | 1.00 |
| 1,000                           | 0.60 | 0.87 | 0.95 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Long Life, 135°C

New!

GXH Series

- For automobile modules and other high temperature applications
- Endurance with ripple current : 1,500 to 2,000 hours at 135°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant

Higher temperature  
GXE → GXH

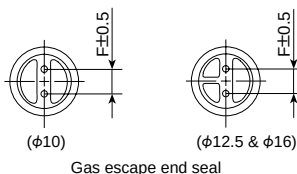
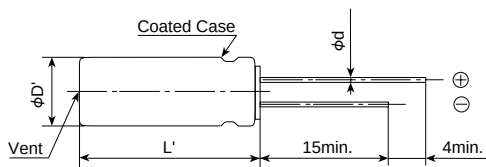


## ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                             |      |      |      |      |                  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------|------|------|------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                       |                                             |      |      |      |      |                  |
| Rated Voltage Range                                    | 10 to 50V <sub>dc</sub>                                                                                                                                                                                                                                                                 |                                             |      |      |      |      |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                             |      |      |      |      |                  |
| Leakage Current                                        | I=0.03CV or 4μA, whichever is greater.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C, 1 minute)                                                                                                                                 |                                             |      |      |      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 10V                                         | 16V  | 25V  | 35V  | 50V  | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.20                                        | 0.16 | 0.14 | 0.12 | 0.10 |                  |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the above value for each 1,000μF increase.                                                                                                                                                                                        |                                             |      |      |      |      |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 10V                                         | 16V  | 25V  | 35V  | 50V  | (at 120Hz)       |
|                                                        | Z(−25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 3                                           | 2    | 2    | 2    | 2    |                  |
|                                                        | Z(−40°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 6                                           | 4    | 4    | 4    | 4    |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for the specified time at 135°C.                                                                                        |                                             |      |      |      |      |                  |
|                                                        | Time                                                                                                                                                                                                                                                                                    | φ10 : 1,500hours   φ12.5 & φ16 : 2,000hours |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value                  |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value        |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                |      |      |      |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 135°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                             |      |      |      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±30% of the initial value                  |      |      |      |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤300% of the initial specified value        |      |      |      |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                |      |      |      |      |                  |

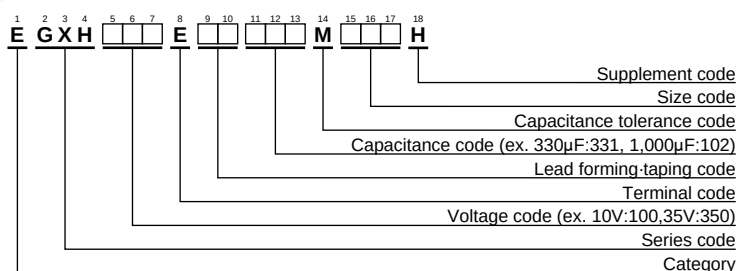
## ◆ DIMENSIONS [mm]

- Terminal Code : E



| φD  | 10         | 12.5 | 16  |
|-----|------------|------|-----|
| φd  | 0.6        | 0.6  | 0.8 |
| F   | 5.0        | 5.0  | 7.5 |
| φD' | φD+0.5max. |      |     |
| L'  | L+2.0max.  |      |     |

## ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

## ◆ MARKING

EX) 35V470μF





## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

Long Life, 135°C

New!  
**GXH** Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance<br>(Ωmax/20°C, 100kHz) | Rated ripple current<br>(mA <sub>rms</sub> /135°C, 100kHz) | Part No.           |
|-------------|-------------|-----------------------|----------------------------------|------------------------------------------------------------|--------------------|
| 10          | 330         | 10 × 12.5             | 0.15                             | 620                                                        | EGXH100E□□331MJC5H |
|             | 470         | 10 × 12.5             | 0.15                             | 620                                                        | EGXH100E□□471MJC5H |
|             | 1,000       | 10 × 20               | 0.075                            | 950                                                        | EGXH100E□□102MJ20H |
|             | 2,200       | 12.5 × 25             | 0.040                            | 1,350                                                      | EGXH100E□□222MK25H |
|             | 3,300       | 16 × 25               | 0.031                            | 1,620                                                      | EGXH100E□□332ML25H |
|             | 4,700       | 16 × 31.5             | 0.025                            | 1,860                                                      | EGXH100E□□472MLN3H |
| 16          | 220         | 10 × 12.5             | 0.15                             | 620                                                        | EGXH160E□□221MJC5H |
|             | 330         | 10 × 12.5             | 0.15                             | 620                                                        | EGXH160E□□331MJC5H |
|             | 470         | 10 × 16               | 0.094                            | 790                                                        | EGXH160E□□471MJ16H |
|             | 1,000       | 12.5 × 20             | 0.058                            | 1,080                                                      | EGXH160E□□102MK20H |
|             | 2,200       | 16 × 25               | 0.031                            | 1,620                                                      | EGXH160E□□222ML25H |
|             | 3,300       | 16 × 31.5             | 0.025                            | 1,860                                                      | EGXH160E□□332MLN3H |
| 25          | 220         | 10 × 12.5             | 0.15                             | 620                                                        | EGXH250E□□221MJC5H |
|             | 330         | 10 × 16               | 0.094                            | 790                                                        | EGXH250E□□331MJ16H |
|             | 470         | 10 × 20               | 0.075                            | 950                                                        | EGXH250E□□471MJ20H |
|             | 1,000       | 12.5 × 25             | 0.040                            | 1,350                                                      | EGXH250E□□102MK25H |
|             | 2,200       | 16 × 31.5             | 0.025                            | 1,860                                                      | EGXH250E□□222MLN3H |
|             |             |                       |                                  |                                                            |                    |
| 35          | 100         | 10 × 12.5             | 0.15                             | 620                                                        | EGXH350E□□101MJC5H |
|             | 220         | 10 × 16               | 0.094                            | 790                                                        | EGXH350E□□221MJ16H |
|             | 330         | 10 × 20               | 0.075                            | 950                                                        | EGXH350E□□331MJ20H |
|             | 470         | 12.5 × 20             | 0.058                            | 1,080                                                      | EGXH350E□□471MK20H |
|             | 1,000       | 16 × 25               | 0.031                            | 1,620                                                      | EGXH350E□□102ML25H |
|             |             |                       |                                  |                                                            |                    |
| 50          | 100         | 10 × 12.5             | 0.20                             | 520                                                        | EGXH500E□□101MJC5H |
|             | 220         | 10 × 20               | 0.098                            | 880                                                        | EGXH500E□□221MJ20H |
|             | 330         | 12.5 × 20             | 0.081                            | 990                                                        | EGXH500E□□331MK20H |
|             | 470         | 12.5 × 25             | 0.059                            | 1,150                                                      | EGXH500E□□471MK25H |
|             | 1,000       | 16 × 31.5             | 0.032                            | 1,590                                                      | EGXH500E□□102MLN3H |
|             |             |                       |                                  |                                                            |                    |

□□ : Enter the appropriate lead forming or taping code.

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

| Capacitance (μF) \ Frequency (Hz) | 120  | 1k   | 10k  | 100k |
|-----------------------------------|------|------|------|------|
| 100                               | 0.40 | 0.75 | 0.90 | 1.00 |
| 220 to 470                        | 0.50 | 0.85 | 0.94 | 1.00 |
| 1,000                             | 0.60 | 0.87 | 0.95 | 1.00 |
| 2,200 to 3,300                    | 0.75 | 0.90 | 0.95 | 1.00 |
| 4,700                             | 0.85 | 0.95 | 0.98 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

For airbag module, 105°C

# LBG Series

- For airbag application
- High capacitance, low impedance, and good low temperature behavior
- Endurance with ripple current : 5,000 hours at 105°C
- Solvent resistant type (see PRECAUTIONS AND GUIDELINES)
- RoHS Compliant



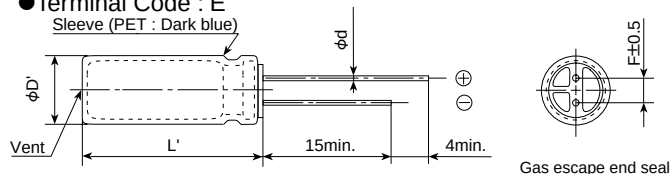
## SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |      |                  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                       |                                      |      |                  |
| Temperature Range                                      | -55 to +105°C                                                                                                                                                                                                                                                                           |                                      |      |                  |
| Rated Voltage Range                                    | 25 & 35V <sub>dc</sub>                                                                                                                                                                                                                                                                  |                                      |      |                  |
| Capacitance Range                                      | 1,000 to 11,000μF                                                                                                                                                                                                                                                                       |                                      |      | (at 20°C, 120Hz) |
| Capacitance Tolerance                                  | 0 to +30% (A)                                                                                                                                                                                                                                                                           |                                      |      | (at 20°C, 120Hz) |
| Leakage Current                                        | I=0.01CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)                                                                                                                                                         |                                      |      |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 25V                                  | 35V  |                  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.20                                 | 0.16 |                  |
|                                                        | When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)                                                                                                                                                                       |                                      |      |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 25V                                  | 35V  |                  |
|                                                        | Z(-55°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 3                                    | 3    |                  |
|                                                        | Impedance at -40°C and 20°C 100kHz in the STANDARD RATINGS (at 120Hz)                                                                                                                                                                                                                   |                                      |      |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 105°C.                                                                                               |                                      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |      |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |      |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |      |                  |

## DIMENSIONS [mm]

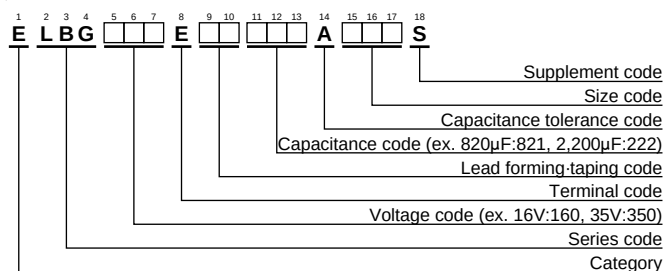
### Terminal Code : E

Sleeve (PET : Dark blue)



| φD  | 12.5       | 14.5 | 16  | 18  |
|-----|------------|------|-----|-----|
| φd  | 0.6        | 0.8  | 0.8 | 0.8 |
| F   | 5.0        | 7.5  | 7.5 | 7.5 |
| φD' | φD+0.5max. |      |     |     |
| L'  | L+1.5max.  |      |     |     |

## PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"


**LBG** Series

**◆STANDARD RATINGS**

| VV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | Impedance (Ωmax/100kHz) |       | Rated ripple current<br>(mA <sub>rms</sub> /105°C, 100kHz) | Part No.           |
|-------------|-------------|-----------------------|-------------------------|-------|------------------------------------------------------------|--------------------|
|             |             |                       | 20°C                    | -40°C |                                                            |                    |
| 25          | 1,700       | 12.5 × 20             | 0.057                   | 0.29  | 1,700                                                      | ELBG250E□□172AK20S |
|             | 2,400       | 12.5 × 25             | 0.045                   | 0.23  | 2,000                                                      | ELBG250E□□242AK25S |
|             | 2,400       | 14.5 × 20             | 0.051                   | 0.26  | 2,000                                                      | ELBG250E□□242AU20S |
|             | 2,800       | 12.5 × 30             | 0.039                   | 0.20  | 2,300                                                      | ELBG250E□□282AK30S |
|             | 3,000       | 16 × 20               | 0.044                   | 0.22  | 2,250                                                      | ELBG250E□□302AL20S |
|             | 3,400       | 14.5 × 25             | 0.041                   | 0.21  | 2,400                                                      | ELBG250E□□342AU25S |
|             | 3,500       | 12.5 × 35             | 0.033                   | 0.17  | 2,700                                                      | ELBG250E□□352AK35S |
|             | 4,200       | 16 × 25               | 0.033                   | 0.17  | 2,600                                                      | ELBG250E□□422AL25S |
|             | 4,200       | 18 × 20               | 0.042                   | 0.21  | 2,500                                                      | ELBG250E□□422AM20S |
|             | 4,500       | 12.5 × 40             | 0.027                   | 0.14  | 3,100                                                      | ELBG250E□□452AK40S |
|             | 4,600       | 14.5 × 31.5           | 0.032                   | 0.16  | 2,700                                                      | ELBG250E□□462AUN3S |
|             | 5,400       | 14.5 × 35.5           | 0.028                   | 0.14  | 3,100                                                      | ELBG250E□□542AUP1S |
|             | 5,600       | 16 × 31.5             | 0.026                   | 0.13  | 3,200                                                      | ELBG250E□□562ALN3S |
|             | 6,000       | 18 × 25               | 0.030                   | 0.15  | 2,800                                                      | ELBG250E□□602AM25S |
|             | 6,400       | 14.5 × 40             | 0.025                   | 0.13  | 3,400                                                      | ELBG250E□□642AU40S |
|             | 6,600       | 16 × 35.5             | 0.023                   | 0.12  | 3,500                                                      | ELBG250E□□662ALP1S |
|             | 7,800       | 16 × 40               | 0.021                   | 0.11  | 3,800                                                      | ELBG250E□□782AL40S |
|             | 7,900       | 18 × 31.5             | 0.024                   | 0.12  | 3,500                                                      | ELBG250E□□792AMN3S |
| 35          | 9,200       | 18 × 35.5             | 0.022                   | 0.11  | 3,700                                                      | ELBG250E□□922AMP1S |
|             | 11,000      | 18 × 40               | 0.020                   | 0.10  | 4,000                                                      | ELBG250E□□113AM40S |
|             | 1,000       | 12.5 × 20             | 0.057                   | 0.29  | 1,700                                                      | ELBG350E□□102AK20S |
|             | 1,400       | 12.5 × 25             | 0.045                   | 0.23  | 2,000                                                      | ELBG350E□□142AK25S |
|             | 1,400       | 14.5 × 20             | 0.051                   | 0.26  | 2,000                                                      | ELBG350E□□142AU20S |
|             | 1,600       | 12.5 × 30             | 0.039                   | 0.20  | 2,300                                                      | ELBG350E□□162AK30S |
|             | 1,800       | 16 × 20               | 0.044                   | 0.22  | 2,250                                                      | ELBG350E□□182AL20S |
|             | 2,000       | 14.5 × 25             | 0.041                   | 0.21  | 2,400                                                      | ELBG350E□□202AU25S |
|             | 2,100       | 12.5 × 35             | 0.033                   | 0.17  | 2,700                                                      | ELBG350E□□212AK35S |
|             | 2,500       | 16 × 25               | 0.033                   | 0.17  | 2,600                                                      | ELBG350E□□252AL25S |
|             | 2,500       | 18 × 20               | 0.042                   | 0.21  | 2,500                                                      | ELBG350E□□252AM20S |
|             | 2,700       | 12.5 × 40             | 0.027                   | 0.14  | 3,100                                                      | ELBG350E□□272AK40S |
|             | 2,800       | 14.5 × 31.5           | 0.032                   | 0.16  | 2,700                                                      | ELBG350E□□282AUN3S |
|             | 3,200       | 14.5 × 35.5           | 0.028                   | 0.14  | 3,100                                                      | ELBG350E□□322AUP1S |
|             | 3,400       | 16 × 31.5             | 0.026                   | 0.13  | 3,200                                                      | ELBG350E□□342ALN3S |
|             | 3,600       | 18 × 25               | 0.030                   | 0.15  | 2,800                                                      | ELBG350E□□362AM25S |
|             | 3,800       | 14.5 × 40             | 0.025                   | 0.13  | 3,400                                                      | ELBG350E□□382AU40S |
|             | 4,000       | 16 × 35.5             | 0.023                   | 0.12  | 3,500                                                      | ELBG350E□□402ALP1S |
|             | 4,700       | 16 × 40               | 0.021                   | 0.11  | 3,800                                                      | ELBG350E□□472AL40S |
|             | 4,800       | 18 × 31.5             | 0.024                   | 0.12  | 3,500                                                      | ELBG350E□□482AMN3S |
|             | 5,600       | 18 × 35.5             | 0.022                   | 0.11  | 3,700                                                      | ELBG350E□□562AMP1S |
|             | 6,700       | 18 × 40               | 0.020                   | 0.10  | 4,000                                                      | ELBG350E□□672AM40S |

□□ : Enter the appropriate lead forming or taping code.

**◆RATED RIPPLE CURRENT MULTIPLIERS**
**●Frequency Multipliers**

| Capacitance (μF) | Frequency (Hz) |      |      |      |
|------------------|----------------|------|------|------|
|                  | 120            | 1k   | 10k  | 100k |
| 1,000 to 2,000   | 0.60           | 0.87 | 0.95 | 1.00 |
| 2,100 to 3,800   | 0.75           | 0.90 | 0.95 | 1.00 |
| 4,000 to 11,000  | 0.85           | 0.95 | 0.98 | 1.00 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

For photo flash

# PH Series

●RoHS Compliant

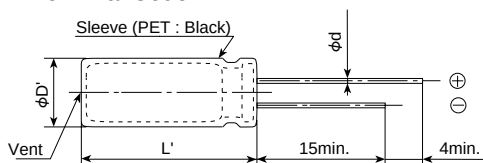


## ◆SPECIFICATIONS

| Items                                | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                            |             |                                      |                 |                                      |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-------------|--------------------------------------|-----------------|--------------------------------------|
| Category                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                            |             |                                      |                 |                                      |
| Temperature Range                    | -20 to +55°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                                      |
| Rated Voltage Range                  | 300, 315, 330V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                                      |
| Capacitance Tolerance                | -10 to +20% (V) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                            |             |                                      |                 |                                      |
| Leakage Current                      | I=1XC<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF) (at 20°C after 5 minutes)                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                                      |
| Dissipation Factor (tanδ)            | 0.06max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                                      |
| Charge and Discharge Characteristics | The following specifications shall be satisfied when the capacitors are restored to 20°C after charge and discharge are repeated 5,000 times at room temperature (5 to 35°C). Discharge resistance or Xenon tube : 0.7 to 1.0Ω.<br><table border="1"> <tr> <td>Capacitance change</td><td>≤±10% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤150% of the initial specified value</td></tr> </table>                                                        | Capacitance change | ≤±10% of the initial value | D.F. (tanδ) | ≤150% of the initial specified value | Leakage current | ≤150% of the initial specified value |
| Capacitance change                   | ≤±10% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                            |             |                                      |                 |                                      |
| D.F. (tanδ)                          | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                            |             |                                      |                 |                                      |
| Leakage current                      | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                            |             |                                      |                 |                                      |
| Shelf Life                           | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 55°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.<br><table border="1"> <tr> <td>Capacitance change</td><td>≤±10% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤150% of the initial specified value</td></tr> </table> | Capacitance change | ≤±10% of the initial value | D.F. (tanδ) | ≤150% of the initial specified value | Leakage current | ≤150% of the initial specified value |
| Capacitance change                   | ≤±10% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                            |             |                                      |                 |                                      |
| D.F. (tanδ)                          | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                            |             |                                      |                 |                                      |
| Leakage current                      | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                            |             |                                      |                 |                                      |

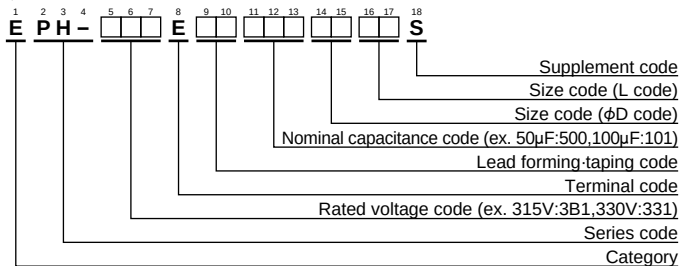
## ◆DIMENSIONS [mm]

●Terminal Code : E



| φD  | 6.0 to 7.5 | 8.0 to 8.5 | 9.0 to 9.5 | 10.0 to 14.0 | 14.5 to 18.0 |
|-----|------------|------------|------------|--------------|--------------|
| φd  | 0.5        | 0.6        | 0.6        | 0.6          | 0.8          |
| F   | 2.5        | 3.5        | 4          | 5            | 7.5          |
| φD' | φD+0.5max. |            |            |              |              |
| L'  | L+1.0max.  |            |            |              |              |

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (radial lead type)"

## ●Size Code

φD code (14th, 15th)

| φD (mm) | φD code | 14th | 15th |
|---------|---------|------|------|
| 6.0     | 6       | 0    |      |
| 6.5     | 6       | 5    |      |
| 7.0     | 7       | 0    |      |
| 7.5     | 7       | 5    |      |
| 8.0     | 8       | 0    |      |
| 8.5     | 8       | 5    |      |
| 9.0     | 9       | 0    |      |
| 9.5     | 9       | 5    |      |
| 10.0    | A       | 0    |      |
| 10.5    | A       | 5    |      |
| 11.0    | B       | 0    |      |
| 11.5    | B       | 5    |      |
| 12.0    | C       | 0    |      |
| 12.5    | C       | 5    |      |
| 13.0    | D       | 0    |      |
| 13.5    | D       | 5    |      |
| 14.0    | E       | 0    |      |
| 14.5    | E       | 5    |      |
| 15.0    | F       | 0    |      |
| 15.5    | F       | 5    |      |
| 16.0    | G       | 0    |      |
| 16.5    | G       | 5    |      |
| 17.0    | H       | 0    |      |
| 17.5    | H       | 5    |      |
| 18.0    | J       | 0    |      |

L code (16th, 17th)

| L (mm) | L code | 16th | 17th |
|--------|--------|------|------|
| 15.0   | 1      | 5    |      |
| 16.0   | 1      | 6    |      |
| 17.0   | 1      | 7    |      |
| 18.0   | 1      | 8    |      |
| 19.0   | 1      | 9    |      |
| 20.0   | 2      | 0    |      |
| 21.0   | 2      | 1    |      |
| 22.0   | 2      | 2    |      |
| 23.0   | 2      | 3    |      |
| 24.0   | 2      | 4    |      |
| 25.0   | 2      | 5    |      |
| 26.0   | 2      | 6    |      |
| 27.0   | 2      | 7    |      |
| 28.0   | 2      | 8    |      |
| 29.0   | 2      | 9    |      |
| 30.0   | 3      | 0    |      |
| 31.0   | 3      | 1    |      |
| 32.0   | 3      | 2    |      |
| 33.0   | 3      | 3    |      |
| 34.0   | 3      | 4    |      |
| 35.0   | 3      | 5    |      |
| 36.0   | 3      | 6    |      |
| 37.0   | 3      | 7    |      |
| 38.0   | 3      | 8    |      |
| 39.0   | 3      | 9    |      |
| 40.0   | 4      | 0    |      |
| 41.0   | 4      | 1    |      |
| 42.0   | 4      | 2    |      |
| 43.0   | 4      | 3    |      |
| 44.0   | 4      | 4    |      |
| 45.0   | 4      | 5    |      |


**PH**Series

**◆RATINGS (REFERENCE)**

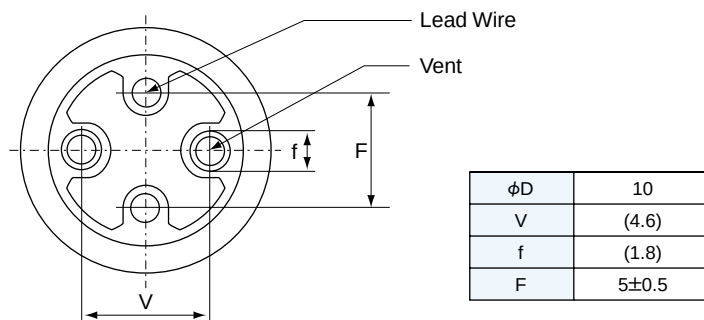
| WV<br>(Vdc) | Cap<br>( $\mu$ F) | Case size<br>$\phi$ DXL(mm) | $\tan\delta$ | Part No.           |
|-------------|-------------------|-----------------------------|--------------|--------------------|
| 315         | 86                | 10×30                       | 0.06         | EPH-3B1E□□860A030S |
|             | 122               | 10×40                       | 0.06         | EPH-3B1E□□121A040S |
|             | 144               | 12.5×30                     | 0.06         | EPH-3B1E□□1E1C530S |
|             | 209               | 12.5×40                     | 0.06         | EPH-3B1E□□211C540S |
| 330         | 80                | 10×30                       | 0.06         | EPH-331E□□800A030S |
|             | 114               | 10×40                       | 0.06         | EPH-331E□□1B1A040S |
|             | 137               | 12.5×30                     | 0.06         | EPH-331E□□1D1C530S |
|             | 194               | 12.5×40                     | 0.06         | EPH-331E□□1K1C540S |

□□ : Enter the appropriate lead forming or taping code.

**●Products of vents on the sealing rubber**

DIMENSIONS[mm]

&lt;In the case of diameter 10mm&gt;



Products of vent on rubber type, please make clearance about 1mm minimum between rubber and board. If it is difficult to make clearance 1mm minimum between rubber and board, please arrange gas escaping hole on the board (same position and 40% minimum diameter from the vent).

The products of dual vents on rubber, requires placement one or two gas escaping hole on the board.

**●Products of a vent on the case**

Please make the following open space over the vent so that the vent can operate correctly.

| Case diameter        | Clearance   |
|----------------------|-------------|
| $\phi$ 6 to 16mm     | 2mm minimum |
| $\phi$ 16.5mm and up | 3mm minimum |

Above part numbers are only reference.

Please consult with us about detail specifications (rated voltage, capacitance, case size, type of rubber, etc...).



## Snap-in Aluminum Electrolytic Capacitors

### (Large Capacitors)



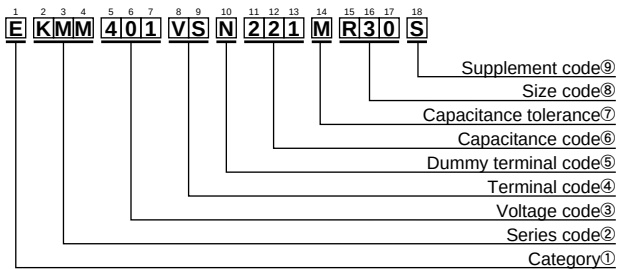


## PART NUMBERING SYSTEM

## Product code guide (Snap-in type)

(Example : KMM series, 400V-220μF, φ30×30L)

Please refer to the following table



## ①Category

| Type  | Code |
|-------|------|
| Polar | E    |

## ②Series code

| Series name    | Code |     |     |
|----------------|------|-----|-----|
|                | 2nd  | 3rd | 4th |
| KMM            | K    | M   | M   |
| No series name | C    | S   | T   |

## ③Voltage code

| Voltage (V) | Code |     |     |
|-------------|------|-----|-----|
|             | 5th  | 6th | 7th |
| 6.3         | 6    | R   | 3   |
| 10          | 1    | 0   | 0   |
| 16          | 1    | 6   | 0   |
| 25          | 2    | 5   | 0   |
| 35          | 3    | 5   | 0   |
| 50          | 5    | 0   | 0   |
| 63          | 6    | 3   | 0   |
| 80          | 8    | 0   | 0   |
| 100         | 1    | 0   | 1   |
| 160         | 1    | 6   | 1   |
| 180         | 1    | 8   | 1   |
| 200         | 2    | 0   | 1   |
| 220         | 2    | 2   | 1   |
| 250         | 2    | 5   | 1   |
| 315         | 3    | B   | 1   |
| 350         | 3    | 5   | 1   |
| 400         | 4    | 0   | 1   |
| 420         | 4    | 2   | 1   |
| 450         | 4    | 5   | 1   |
| 500         | 5    | 0   | 1   |

## ④Terminal code

| Type | Code |     |
|------|------|-----|
|      | 8th  | 9th |
| VS   | V    | S   |
| LI   | L    | I   |
| LR   | L    | R   |
| LC   | L    | C   |
| VR   | V    | R   |

## ⑤Dummy terminal code

| Terminal # | Code |
|------------|------|
| 10th       |      |
| 0          | N    |
| 1          | S    |
| 2          | D    |
| 3          | T    |

## ⑥Capacitance code

| Cap. (μF) | Code |      |      |
|-----------|------|------|------|
|           | 11th | 12th | 13th |
| 10        | 1    | 0    | 0    |
| 22        | 2    | 2    | 0    |
| 33        | 3    | 3    | 0    |
| 47        | 4    | 7    | 0    |
| 68        | 6    | 8    | 0    |
| 100       | 1    | 0    | 1    |
| 220       | 2    | 2    | 1    |
| 330       | 3    | 3    | 1    |
| 470       | 4    | 7    | 1    |
| 680       | 6    | 8    | 1    |
| 1,000     | 1    | 0    | 2    |
| 2,200     | 2    | 2    | 2    |
| 3,300     | 3    | 3    | 2    |
| 4,700     | 4    | 7    | 2    |
| 6,800     | 6    | 8    | 2    |
| 10,000    | 1    | 0    | 3    |
| 22,000    | 2    | 2    | 3    |
| 33,000    | 3    | 3    | 3    |
| 47,000    | 4    | 7    | 3    |
| 68,000    | 6    | 8    | 3    |
| 100,000   | 1    | 0    | 4    |
| 220,000   | 2    | 2    | 4    |
| 330,000   | 3    | 3    | 4    |
| 470,000   | 4    | 7    | 4    |
| 680,000   | 6    | 8    | 4    |

## ⑦Capacitance tolerance

| Tol. (%) | Code |
|----------|------|
| 14th     |      |
| ±20      | M    |

## ⑧Size code

| φD     | Code |
|--------|------|
| 15th   |      |
| 20     | N    |
| 22     | P    |
| 25.4   | Q    |
| 30     | R    |
| 35     | A    |
| Others | S    |

| L  | Code |      |
|----|------|------|
|    | 16th | 17th |
| 15 | 1    | 5    |
| 20 | 2    | 0    |
| 25 | 2    | 5    |
| 30 | 3    | 0    |
| 35 | 3    | 5    |
| 40 | 4    | 0    |
| 45 | 4    | 5    |
| 50 | 5    | 0    |
| 55 | 5    | 5    |
| 60 | 6    | 0    |

## ⑨Supplement code

| Sleeve material | Terminal plating material | Code |
|-----------------|---------------------------|------|
|                 |                           | 18th |
| PET             | Sn                        | S    |
| Pb-free PVC     |                           | M    |

\* Refer to the appendix (Part number) for codes not listed here.

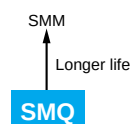


## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 85°C

# SMQ<sub>Series</sub>

- Endurance with ripple current : 2,000 hours at 85°C
- Non solvent resistant type
- RoHS Compliant

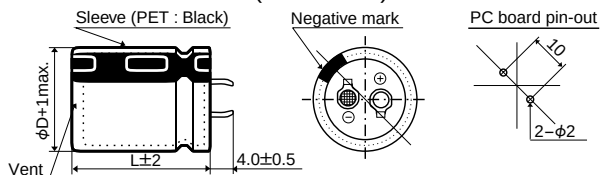


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                        |                                      |             |            |                  |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------|------------|------------------|
| Category                                               | –25 to +85°C                                                                                                                                                                                                                                                                           |                                      |             |            |                  |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                        |                                      |             |            |                  |
| Rated Voltage Range                                    | 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                      |             |            |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                              |                                      |             |            |                  |
| Leakage Current                                        | I≤3√CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                          |                                      |             |            |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 160 to 250V                          | 315 to 400V | 420 & 450V | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                            | 0.15                                 | 0.15        | 0.20       |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 160 to 250V                          | 315 to 400V | 420 & 450V | (at 120Hz)       |
|                                                        | Z(–25°C)/Z(+20°C)                                                                                                                                                                                                                                                                      | 4                                    | 8           | 8          |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 85°C.                                                                                               |                                      |             |            |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±20% of the initial value           |             |            |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤200% of the initial specified value |             |            |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |             |            |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |             |            |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±15% of the initial value           |             |            |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤150% of the initial specified value |             |            |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |             |            |                  |

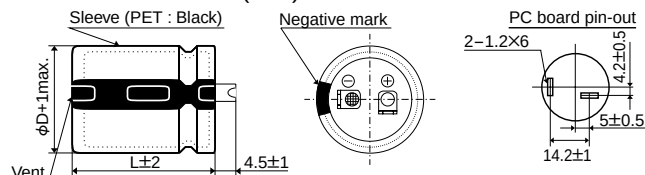
## ◆DIMENSIONS [mm]

- Terminal Code : VS (φ22 to φ35) : Standard

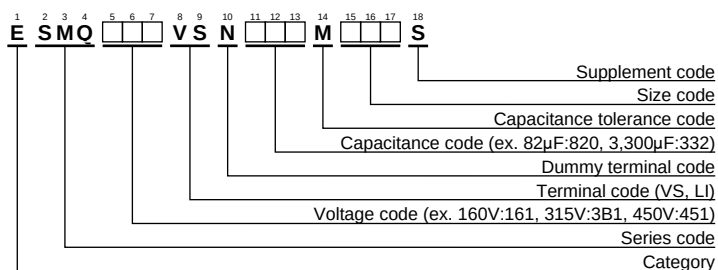


The standard design has no plastic disc.

- Terminal Code : LI (φ35)



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"


**SMQ** Series

**◆STANDARD RATINGS**

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/85°C,120Hz) | Part No.           |
|----------|----------|--------------------|------|----------------------------------------|--------------------|
| 160      | 560      | 22×25              | 0.15 | 2.25                                   | ESMQ161VSN561MP25S |
|          | 680      | 22×30              | 0.15 | 2.50                                   | ESMQ161VSN681MP30S |
|          | 820      | 22×35              | 0.15 | 2.75                                   | ESMQ161VSN821MP35S |
|          | 1,000    | 22×40              | 0.15 | 3.00                                   | ESMQ161VSN102MP40S |
|          | 1,000    | 25.4×30            | 0.15 | 3.00                                   | ESMQ161VSN102MQ30S |
|          | 1,200    | 22×45              | 0.15 | 3.25                                   | ESMQ161VSN122MP45S |
|          | 1,200    | 25.4×35            | 0.15 | 3.25                                   | ESMQ161VSN122MQ35S |
|          | 1,200    | 30×25              | 0.15 | 3.25                                   | ESMQ161VSN122MR25S |
|          | 1,500    | 22×50              | 0.15 | 3.73                                   | ESMQ161VSN152MP50S |
|          | 1,500    | 25.4×40            | 0.15 | 3.73                                   | ESMQ161VSN152MQ40S |
|          | 1,500    | 30×30              | 0.15 | 3.73                                   | ESMQ161VSN152MR30S |
|          | 1,500    | 35×25              | 0.15 | 3.73                                   | ESMQ161VSN152MA25S |
|          | 1,800    | 25.4×45            | 0.15 | 4.20                                   | ESMQ161VSN182MP45S |
|          | 1,800    | 30×35              | 0.15 | 4.20                                   | ESMQ161VSN182MR35S |
|          | 1,800    | 35×30              | 0.15 | 4.20                                   | ESMQ161VSN182MA30S |
|          | 2,200    | 30×40              | 0.15 | 4.78                                   | ESMQ161VSN222MR40S |
|          | 2,200    | 35×35              | 0.15 | 4.78                                   | ESMQ161VSN222MA35S |
|          | 2,700    | 35×40              | 0.15 | 5.45                                   | ESMQ161VSN272MA40S |
|          | 3,300    | 35×45              | 0.15 | 5.75                                   | ESMQ161VSN332MA45S |
|          | 3,900    | 35×50              | 0.15 | 6.00                                   | ESMQ161VSN392MA50S |
| 180      | 470      | 22×25              | 0.15 | 2.08                                   | ESMQ181VSN471MP25S |
|          | 560      | 22×30              | 0.15 | 2.25                                   | ESMQ181VSN561MP30S |
|          | 680      | 22×30              | 0.15 | 2.50                                   | ESMQ181VSN681MP30S |
|          | 680      | 25.4×25            | 0.15 | 2.50                                   | ESMQ181VSN681MQ25S |
|          | 820      | 22×35              | 0.15 | 2.75                                   | ESMQ181VSN821MP35S |
|          | 820      | 25.4×30            | 0.15 | 2.75                                   | ESMQ181VSN821MQ30S |
|          | 1,000    | 22×45              | 0.15 | 3.00                                   | ESMQ181VSN102MP45S |
|          | 1,000    | 25.4×35            | 0.15 | 3.00                                   | ESMQ181VSN102MQ35S |
|          | 1,000    | 30×25              | 0.15 | 3.00                                   | ESMQ181VSN102MR25S |
|          | 1,200    | 22×50              | 0.15 | 3.31                                   | ESMQ181VSN122MP50S |
|          | 1,200    | 25.4×40            | 0.15 | 3.31                                   | ESMQ181VSN122MQ40S |
|          | 1,200    | 30×30              | 0.15 | 3.31                                   | ESMQ181VSN122MR30S |
|          | 1,200    | 35×25              | 0.15 | 3.31                                   | ESMQ181VSN122MA25S |
|          | 1,500    | 25.4×45            | 0.15 | 3.83                                   | ESMQ181VSN152MP45S |
|          | 1,500    | 30×35              | 0.15 | 3.83                                   | ESMQ181VSN152MR35S |
|          | 1,500    | 35×30              | 0.15 | 3.83                                   | ESMQ181VSN152MA30S |
|          | 1,800    | 25.4×50            | 0.15 | 4.32                                   | ESMQ181VSN182MQ50S |
|          | 1,800    | 30×40              | 0.15 | 4.32                                   | ESMQ181VSN182MR40S |
|          | 1,800    | 35×30              | 0.15 | 4.32                                   | ESMQ181VSN182MA30S |
| 200      | 2,200    | 30×45              | 0.15 | 4.92                                   | ESMQ181VSN222MR45S |
|          | 2,200    | 35×40              | 0.15 | 4.92                                   | ESMQ181VSN222MA40S |
|          | 2,700    | 35×45              | 0.15 | 5.52                                   | ESMQ181VSN272MA45S |
|          | 3,300    | 35×50              | 0.15 | 5.75                                   | ESMQ181VSN332MA50S |
|          | 390      | 22×25              | 0.15 | 1.68                                   | ESMQ201VSN391MP25S |
|          | 470      | 22×30              | 0.15 | 1.85                                   | ESMQ201VSN471MP30S |
|          | 560      | 22×30              | 0.15 | 2.43                                   | ESMQ201VSN561MP30S |
|          | 560      | 25.4×25            | 0.15 | 2.43                                   | ESMQ201VSN561MQ25S |
|          | 680      | 22×35              | 0.15 | 2.68                                   | ESMQ201VSN681MP35S |
|          | 680      | 25.4×30            | 0.15 | 2.68                                   | ESMQ201VSN681MQ30S |
|          | 820      | 22×40              | 0.15 | 2.93                                   | ESMQ201VSN821MP40S |
|          | 820      | 25.4×30            | 0.15 | 2.93                                   | ESMQ201VSN821MQ30S |
|          | 820      | 30×25              | 0.15 | 2.93                                   | ESMQ201VSN821MR25S |
|          | 1,000    | 22×45              | 0.15 | 3.25                                   | ESMQ201VSN102MP45S |
|          | 1,000    | 25.4×35            | 0.15 | 3.25                                   | ESMQ201VSN102MQ35S |
|          | 1,000    | 30×30              | 0.15 | 3.25                                   | ESMQ201VSN102MR30S |
|          | 1,000    | 35×25              | 0.15 | 3.25                                   | ESMQ201VSN102MA25S |
|          | 1,200    | 25.4×40            | 0.15 | 3.50                                   | ESMQ201VSN122MQ40S |
|          | 1,200    | 30×30              | 0.15 | 3.50                                   | ESMQ201VSN122MR30S |
|          | 1,200    | 35×30              | 0.15 | 3.50                                   | ESMQ201VSN122MA30S |
| 250      | 1,500    | 25.4×50            | 0.15 | 3.87                                   | ESMQ201VSN152MQ50S |
|          | 1,500    | 30×35              | 0.15 | 3.87                                   | ESMQ201VSN152MR35S |
|          | 1,500    | 35×30              | 0.15 | 3.87                                   | ESMQ201VSN152MA30S |
|          | 1,800    | 30×45              | 0.15 | 4.32                                   | ESMQ201VSN182MR45S |
|          | 1,800    | 35×35              | 0.15 | 4.32                                   | ESMQ201VSN182MA35S |
|          | 2,200    | 30×50              | 0.15 | 4.92                                   | ESMQ201VSN222MR50S |
|          | 2,200    | 35×40              | 0.15 | 4.92                                   | ESMQ201VSN222MA40S |
|          | 2,700    | 35×50              | 0.15 | 5.45                                   | ESMQ201VSN272MA50S |
|          | 270      | 22×25              | 0.15 | 1.31                                   | ESMQ251VSN271MP25S |
|          | 330      | 22×30              | 0.15 | 1.75                                   | ESMQ251VSN331MP30S |
|          | 390      | 22×30              | 0.15 | 1.91                                   | ESMQ251VSN391MP30S |
|          | 390      | 25.4×25            | 0.15 | 1.91                                   | ESMQ251VSN391MQ25S |
|          | 470      | 22×35              | 0.15 | 2.11                                   | ESMQ251VSN471MP35S |
|          | 470      | 25.4×30            | 0.15 | 2.11                                   | ESMQ251VSN471MQ30S |
|          | 560      | 22×40              | 0.15 | 2.25                                   | ESMQ251VSN561MP40S |
|          | 560      | 25.4×30            | 0.15 | 2.25                                   | ESMQ251VSN561MQ30S |
|          | 560      | 30×25              | 0.15 | 2.25                                   | ESMQ251VSN561MR25S |
|          | 680      | 22×45              | 0.15 | 2.50                                   | ESMQ251VSN681MP45S |
|          | 680      | 25.4×35            | 0.15 | 2.50                                   | ESMQ251VSN681MQ35S |
|          | 680      | 30×30              | 0.15 | 2.50                                   | ESMQ251VSN681MR30S |
| 315      | 820      | 22×50              | 0.15 | 2.77                                   | ESMQ251VSN821MP50S |
|          | 820      | 25.4×40            | 0.15 | 2.77                                   | ESMQ251VSN821MQ40S |
|          | 820      | 30×30              | 0.15 | 2.77                                   | ESMQ251VSN821MR30S |
|          | 820      | 35×25              | 0.15 | 2.77                                   | ESMQ251VSN821MA25S |
|          | 1,000    | 25.4×45            | 0.15 | 3.32                                   | ESMQ251VSN102MQ45S |
|          | 1,000    | 30×35              | 0.15 | 3.32                                   | ESMQ251VSN102MR35S |
|          | 1,000    | 35×30              | 0.15 | 3.32                                   | ESMQ251VSN102MA30S |
|          | 1,200    | 30×40              | 0.15 | 3.53                                   | ESMQ251VSN122MR40S |
|          | 1,200    | 35×35              | 0.15 | 3.53                                   | ESMQ251VSN122MA35S |
|          | 1,500    | 30×50              | 0.15 | 4.04                                   | ESMQ251VSN152MR50S |
|          | 1,500    | 35×40              | 0.15 | 4.04                                   | ESMQ251VSN152MA40S |
|          | 1,800    | 35×45              | 0.15 | 4.55                                   | ESMQ251VSN182MA45S |
|          | 180      | 22×25              | 0.15 | 1.21                                   | ESMQ3B1VSN181MP25S |
|          | 220      | 22×30              | 0.15 | 1.41                                   | ESMQ3B1VSN221MP30S |
|          | 270      | 22×30              | 0.15 | 1.60                                   | ESMQ3B1VSN271MP30S |
|          | 330      | 22×40              | 0.15 | 1.82                                   | ESMQ3B1VSN331MP40S |
|          | 330      | 25.4×30            | 0.15 | 1.82                                   | ESMQ3B1VSN331MQ30S |
|          | 330      | 30×25              | 0.15 | 1.82                                   | ESMQ3B1VSN331MR25S |
|          | 390      | 22×45              | 0.15 | 2.01                                   | ESMQ3B1VSN391MP45S |
|          | 390      | 25.4×35            | 0.15 | 2.01                                   | ESMQ3B1VSN391MQ35S |
|          | 390      | 30×30              | 0.15 | 2.01                                   | ESMQ3B1VSN391MR30S |
| 350      | 470      | 22×50              | 0.15 | 2.27                                   | ESMQ3B1VSN471MP50S |
|          | 470      | 25.4×40            | 0.15 | 2.27                                   | ESMQ3B1VSN471MQ40S |
|          | 470      | 30×30              | 0.15 | 2.27                                   | ESMQ3B1VSN471MR30S |
|          | 470      | 35×25              | 0.15 | 2.27                                   | ESMQ3B1VSN471MA25S |
|          | 560      | 25.4×45            | 0.15 | 2.56                                   | ESMQ3B1VSN561MQ45S |
|          | 560      | 30×35              | 0.15 | 2.56                                   | ESMQ3B1VSN561MR35S |
|          | 560      | 35×30              | 0.15 | 2.56                                   | ESMQ3B1VSN561MA30S |
|          | 680      | 30×40              | 0.15 | 2.87                                   | ESMQ3B1VSN681MR40S |
|          | 680      | 35×35              | 0.15 | 2.87                                   | ESMQ3B1VSN681MA35S |
|          | 820      | 30×45              | 0.15 | 3.25                                   | ESMQ3B1VSN821MR45S |
|          | 820      | 35×40              | 0.15 | 3.25                                   | ESMQ3B1VSN821MA40S |
|          | 1,000    | 30×50              | 0.15 | 3.63                                   | ESMQ3B1VSN102MR50S |
|          | 1,000    | 35×45              | 0.15 | 3.63                                   | ESMQ3B1VSN102MA45S |
|          | 150      | 22×25              | 0.15 | 1.12                                   | ESMQ351VSN151MP25S |
|          | 180      | 22×30              | 0.15 | 1.22                                   | ESMQ351VSN181MP30S |
|          | 220      | 22×35              | 0.15 | 1.44                                   | ESMQ351VSN221MP35S |
|          | 270      | 22×40              | 0.15 | 1.66                                   | ESMQ351VSN271MP40S |
|          | 270      | 25.4×30            | 0.15 | 1.66                                   | ESMQ351VSN271MQ30S |
|          | 330      | 22×45              | 0.15 | 1.88                                   | ESMQ351VSN331MP45S |
|          | 330      | 25.4×35            | 0.15 | 1.88                                   | ESMQ351VSN331MQ35S |
|          | 390      | 22×50              | 0.15 | 2.06                                   | ESMQ351VSN391MP50S |
|          | 390      | 25.4×40            | 0.15 | 2.06                                   | ESMQ351VSN391MQ40S |
| 350      | 390      | 30×30              | 0.15 | 2.06                                   | ESMQ351VSN391MR30S |
|          | 390      | 35×25              | 0.15 | 2.06                                   | ESMQ351VSN391MA25S |
|          | 470      | 25.4×45            | 0.15 | 2.40                                   | ESMQ351VSN471MQ45S |
|          | 470      | 30×35              | 0.15 | 2.40                                   | ESMQ351VSN471MR35S |
|          | 470      | 35×30              | 0.15 | 2.40                                   | ESMQ351VSN471MA30S |
|          | 560      | 25.4×50            | 0.15 | 2.60                                   | ESMQ351VSN561MQ50S |
|          | 560      | 30×40              | 0.15 | 2.60                                   | ESMQ351VSN561MR40S |
|          | 560      | 35×30              | 0.15 | 2.60                                   | ESMQ351VSN561MA30S |
|          | 680      | 30×45              | 0.15 | 2.96                                   | ESMQ351VSN681MR45S |
|          | 680      | 35×35              | 0.15 | 2.96                                   | ESMQ351VSN681MA35S |
|          | 820      | 30×50              | 0.15 | 3.25                                   | ESMQ351VSN821MR50S |
|          | 820      | 35×45              | 0.15 | 3.25                                   | ESMQ351VSN821MA45S |


**SMQ**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|
| 350         | 1,000       | 35×50                 | 0.15 | 3.54                                             | ESMQ351VSN102MA50S | 420         | 270         | 30×30                 | 0.20 | 1.94                                             | ESMQ421VSN271MR30S |
| 400         | 120         | 22×25                 | 0.15 | 1.02                                             | ESMQ401VSN121MP25S |             | 330         | 25.4×45               | 0.20 | 2.17                                             | ESMQ421VSN331MQ45S |
|             | 150         | 22×30                 | 0.15 | 1.16                                             | ESMQ401VSN151MP30S |             | 330         | 30×35                 | 0.20 | 2.17                                             | ESMQ421VSN331MR35S |
|             | 180         | 22×35                 | 0.15 | 1.44                                             | ESMQ401VSN181MP35S |             | 330         | 35×30                 | 0.20 | 2.17                                             | ESMQ421VSN331MA30S |
|             | 220         | 22×40                 | 0.15 | 1.49                                             | ESMQ401VSN221MP40S |             | 390         | 25.4×50               | 0.20 | 2.27                                             | ESMQ421VSN391MQ50S |
|             | 220         | 25.4×30               | 0.15 | 1.49                                             | ESMQ401VSN221MQ30S |             | 390         | 30×35                 | 0.20 | 2.27                                             | ESMQ421VSN391MR35S |
|             | 270         | 22×45                 | 0.15 | 1.67                                             | ESMQ401VSN271MP45S |             | 390         | 35×30                 | 0.20 | 2.27                                             | ESMQ421VSN391MA30S |
|             | 270         | 25.4×35               | 0.15 | 1.67                                             | ESMQ401VSN271MQ35S |             | 470         | 30×40                 | 0.20 | 2.61                                             | ESMQ421VSN471MR40S |
|             | 270         | 30×25                 | 0.15 | 1.67                                             | ESMQ401VSN271MP25S |             | 470         | 35×35                 | 0.20 | 2.61                                             | ESMQ421VSN471MA35S |
|             | 330         | 22×50                 | 0.15 | 1.90                                             | ESMQ401VSN331MP50S |             | 560         | 30×50                 | 0.20 | 2.82                                             | ESMQ421VSN561MR50S |
|             | 330         | 25.4×40               | 0.15 | 1.90                                             | ESMQ401VSN331MQ40S |             | 560         | 35×40                 | 0.20 | 2.82                                             | ESMQ421VSN561MA40S |
|             | 330         | 30×30                 | 0.15 | 1.90                                             | ESMQ401VSN331MR30S |             | 680         | 35×45                 | 0.20 | 3.11                                             | ESMQ421VSN681MA45S |
|             | 330         | 35×25                 | 0.15 | 1.90                                             | ESMQ401VSN331MA25S | 450         | 82          | 22×25                 | 0.20 | 0.83                                             | ESMQ451VSN820MP25S |
|             | 390         | 25.4×45               | 0.15 | 2.13                                             | ESMQ401VSN391MQ45S |             | 100         | 22×25                 | 0.20 | 0.93                                             | ESMQ451VSN101MP25S |
|             | 390         | 30×35                 | 0.15 | 2.13                                             | ESMQ401VSN391MR35S |             | 120         | 22×30                 | 0.20 | 1.04                                             | ESMQ451VSN121MP30S |
|             | 390         | 35×30                 | 0.15 | 2.13                                             | ESMQ401VSN391MA30S |             | 150         | 22×35                 | 0.20 | 1.19                                             | ESMQ451VSN151MP35S |
|             | 470         | 25.4×50               | 0.15 | 2.39                                             | ESMQ401VSN471MQ50S |             | 150         | 25.4×25               | 0.20 | 1.19                                             | ESMQ451VSN151MQ25S |
|             | 470         | 30×40                 | 0.15 | 2.39                                             | ESMQ401VSN471MR40S |             | 180         | 22×40                 | 0.20 | 1.35                                             | ESMQ451VSN181MP40S |
|             | 470         | 35×30                 | 0.15 | 2.39                                             | ESMQ401VSN471MA30S |             | 180         | 25.4×30               | 0.20 | 1.35                                             | ESMQ451VSN181MQ30S |
|             | 560         | 30×45                 | 0.15 | 2.69                                             | ESMQ401VSN561MR45S |             | 220         | 22×45                 | 0.20 | 1.55                                             | ESMQ451VSN221MP45S |
|             | 560         | 35×35                 | 0.15 | 2.69                                             | ESMQ401VSN561MA35S |             | 220         | 25.4×40               | 0.20 | 1.55                                             | ESMQ451VSN221MQ40S |
|             | 680         | 30×50                 | 0.15 | 2.96                                             | ESMQ401VSN681MR50S |             | 220         | 30×30                 | 0.20 | 1.55                                             | ESMQ451VSN221MR30S |
|             | 680         | 35×40                 | 0.15 | 2.96                                             | ESMQ401VSN681MA40S |             | 220         | 35×25                 | 0.20 | 1.55                                             | ESMQ451VSN221MA25S |
|             | 820         | 35×45                 | 0.15 | 3.25                                             | ESMQ401VSN821MA45S |             | 270         | 22×50                 | 0.20 | 1.78                                             | ESMQ451VSN271MP50S |
| 420         | 100         | 22×25                 | 0.20 | 0.97                                             | ESMQ421VSN101MP25S |             | 270         | 25.4×40               | 0.20 | 1.78                                             | ESMQ451VSN271MQ40S |
|             | 120         | 22×25                 | 0.20 | 1.08                                             | ESMQ421VSN121MP25S |             | 270         | 30×30                 | 0.20 | 1.78                                             | ESMQ451VSN271MR30S |
|             | 150         | 22×30                 | 0.20 | 1.30                                             | ESMQ421VSN151MP30S |             | 330         | 25.4×50               | 0.20 | 2.01                                             | ESMQ451VSN331MQ50S |
|             | 150         | 25.4×25               | 0.20 | 1.30                                             | ESMQ421VSN151MQ25S |             | 330         | 30×40                 | 0.20 | 2.01                                             | ESMQ451VSN331MR40S |
|             | 180         | 22×35                 | 0.20 | 1.48                                             | ESMQ421VSN181MP35S |             | 330         | 35×30                 | 0.20 | 2.01                                             | ESMQ451VSN331MA30S |
|             | 180         | 25.4×30               | 0.20 | 1.48                                             | ESMQ421VSN181MQ30S |             | 390         | 30×40                 | 0.20 | 2.24                                             | ESMQ451VSN391MR40S |
|             | 220         | 22×40                 | 0.20 | 1.65                                             | ESMQ421VSN221MP40S |             | 390         | 35×35                 | 0.20 | 2.24                                             | ESMQ451VSN391MA35S |
|             | 220         | 25.4×35               | 0.20 | 1.65                                             | ESMQ421VSN221MQ35S |             | 470         | 30×45                 | 0.20 | 2.53                                             | ESMQ451VSN471MR45S |
|             | 220         | 30×25                 | 0.20 | 1.65                                             | ESMQ421VSN221MR25S |             | 470         | 35×40                 | 0.20 | 2.53                                             | ESMQ451VSN471MA40S |
|             | 270         | 22×50                 | 0.20 | 1.94                                             | ESMQ421VSN271MP50S |             | 560         | 30×50                 | 0.20 | 2.82                                             | ESMQ451VSN561MR50S |
|             | 270         | 25.4×35               | 0.20 | 1.94                                             | ESMQ421VSN271MQ35S |             | 560         | 35×45                 | 0.20 | 2.82                                             | ESMQ451VSN561MA45S |

**◆RATED RIPPLE CURRENT MULTIPLIERS**
**●Frequency Multipliers**

| Frequency(Hz)             | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 160 to 250V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 315 to 450V <sub>dc</sub> | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

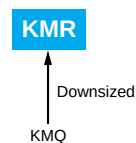


## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105°C

## KMR Series

- Downsized 5mm in height from current snap-ins KMQ series
- Max. 50% up ripple current than same case size of KMQ series
- Endurance with ripple current : 2,000 hours at 105°C
- Rated voltage range : 160 to 450V<sub>dc</sub>, Capacitance range : 100 to 3,300μF
- For inverter control, switching power supplies
- Non solvent resistant type
- RoHS Compliant

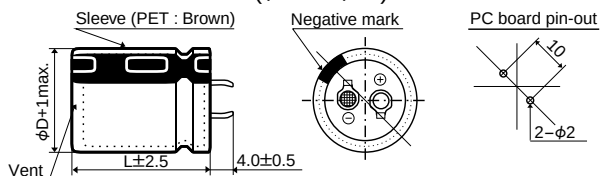


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |             |            |                  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------|------------|------------------|
| Category                                               | -25 to +105°C                                                                                                                                                                                                                                                                           |                                      |             |            |                  |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                         |                                      |             |            |                  |
| Rated Voltage Range                                    | 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                      |             |            |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |             |            |                  |
| Leakage Current                                        | $I \leq 3\sqrt{CV}$<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                              |                                      |             |            |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 250V                          | 315 to 400V | 420 & 450V | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.15                                 | 0.15        | 0.20       |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 250V                          | 315 to 400V | 420 & 450V | (at 120Hz)       |
|                                                        | Z(−25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 8           | 8          |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105°C.                                                                                               |                                      |             |            |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |             |            |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |             |            |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |             |            |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |             |            |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±15% of the initial value           |             |            |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤150% of the initial specified value |             |            |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |             |            |                  |

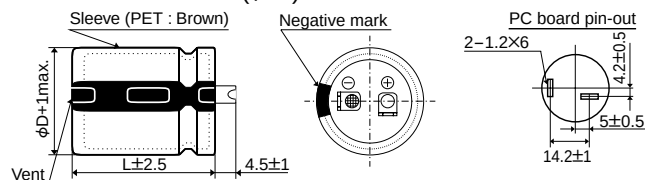
## ◆DIMENSIONS [mm]

- Terminal Code : VS (φ22 to φ35) : Standard

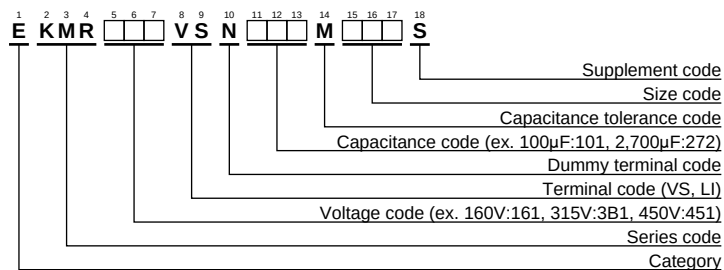


The standard design has no plastic disc.

- Terminal Code : LI (φ35)



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"


**KMR**Series

**◆STANDARD RATINGS**

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | Rated ripple current (Arms/105°C,120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case size φD×L(mm) | Rated ripple current (Arms/105°C,120Hz) | Part No.           |
|----------|----------|--------------------|-----------------------------------------|--------------------|----------|----------|--------------------|-----------------------------------------|--------------------|
| 160      | 560      | 22×25              | 1.58                                    | EKMR161VSN561MP25S | 250      | 330      | 22×25              | 1.21                                    | EKMR251VSN331MP25S |
|          | 680      | 22×30              | 1.83                                    | EKMR161VSN681MP30S |          | 390      | 22×30              | 1.38                                    | EKMR251VSN391MP30S |
|          | 820      | 22×35              | 2.06                                    | EKMR161VSN821MP35S |          | 470      | 22×35              | 1.56                                    | EKMR251VSN471MP35S |
|          | 820      | 25.4×25            | 1.89                                    | EKMR161VSN821MQ25S |          | 560      | 22×40              | 1.74                                    | EKMR251VSN561MP40S |
|          | 1,000    | 22×40              | 2.33                                    | EKMR161VSN102MP40S |          | 560      | 25.4×30            | 1.61                                    | EKMR251VSN561MQ30S |
|          | 1,000    | 25.4×30            | 2.15                                    | EKMR161VSN102MQ30S |          | 560      | 30×25              | 1.42                                    | EKMR251VSN561MR25S |
|          | 1,000    | 30×25              | 1.90                                    | EKMR161VSN102MR25S |          | 680      | 22×45              | 1.97                                    | EKMR251VSN681MP45S |
|          | 1,200    | 22×45              | 2.61                                    | EKMR161VSN122MP45S |          | 680      | 25.4×35            | 1.85                                    | EKMR251VSN681MQ35S |
|          | 1,200    | 22×50              | 2.69                                    | EKMR161VSN122MP50S |          | 820      | 25.4×40            | 2.08                                    | EKMR251VSN821MQ40S |
|          | 1,200    | 25.4×35            | 2.45                                    | EKMR161VSN122MQ35S |          | 820      | 25.4×45            | 2.13                                    | EKMR251VSN821MQ45S |
|          | 1,500    | 25.4×40            | 2.82                                    | EKMR161VSN152MP40S |          | 820      | 30×30              | 1.77                                    | EKMR251VSN152MR30S |
|          | 1,500    | 25.4×45            | 2.88                                    | EKMR161VSN152MQ45S |          | 820      | 35×25              | 1.60                                    | EKMR251VSN821MA25S |
|          | 1,500    | 30×30              | 2.39                                    | EKMR161VSN152MR30S |          | 1,000    | 25.4×50            | 2.40                                    | EKMR251VSN102MQ50S |
|          | 1,500    | 35×25              | 2.17                                    | EKMR161VSN152MA25S |          | 1,000    | 30×35              | 2.03                                    | EKMR251VSN102MR35S |
|          | 1,800    | 25.4×50            | 3.22                                    | EKMR161VSN182MP50S |          | 1,200    | 30×40              | 2.31                                    | EKMR251VSN122MR40S |
|          | 1,800    | 30×35              | 2.73                                    | EKMR161VSN182MR35S |          | 1,200    | 30×45              | 2.38                                    | EKMR251VSN122MR45S |
|          | 1,800    | 30×40              | 2.82                                    | EKMR161VSN182MR40S |          | 1,200    | 35×35              | 2.06                                    | EKMR251VSN122MA35S |
|          | 1,800    | 35×30              | 2.47                                    | EKMR161VSN182MA30S |          | 1,500    | 30×50              | 2.73                                    | EKMR251VSN152MR50S |
|          | 2,200    | 30×45              | 3.23                                    | EKMR161VSN222MR45S |          | 1,500    | 35×40              | 2.41                                    | EKMR251VSN152MA40S |
|          | 2,200    | 35×35              | 2.79                                    | EKMR161VSN222MA35S |          | 1,800    | 35×45              | 2.72                                    | EKMR251VSN182MA45S |
| 180      | 2,700    | 30×50              | 3.66                                    | EKMR161VSN272MR50S | 315      | 2,200    | 35×50              | 3.10                                    | EKMR251VSN222MA50S |
|          | 2,700    | 35×40              | 3.23                                    | EKMR161VSN272MA40S |          | 180      | 22×25              | 0.91                                    | EKMR3B1VSN181MP25S |
|          | 3,300    | 35×45              | 3.68                                    | EKMR161VSN332MA45S |          | 220      | 22×30              | 1.06                                    | EKMR3B1VSN221MP30S |
|          | 470      | 22×25              | 1.45                                    | EKMR181VSN471MP25S |          | 270      | 22×35              | 1.20                                    | EKMR3B1VSN271MP35S |
|          | 560      | 22×30              | 1.66                                    | EKMR181VSN561MP30S |          | 270      | 25.4×25            | 1.15                                    | EKMR3B1VSN271MQ25S |
|          | 680      | 22×35              | 1.87                                    | EKMR181VSN681MP35S |          | 330      | 22×40              | 1.37                                    | EKMR3B1VSN331MP40S |
|          | 680      | 25.4×25            | 1.72                                    | EKMR181VSN681MQ25S |          | 330      | 25.4×30            | 1.30                                    | EKMR3B1VSN331MQ30S |
|          | 820      | 22×40              | 2.11                                    | EKMR181VSN821MP40S |          | 390      | 22×45              | 1.52                                    | EKMR3B1VSN391MP45S |
|          | 820      | 25.4×30            | 1.94                                    | EKMR181VSN821MQ30S |          | 390      | 25.4×35            | 1.48                                    | EKMR3B1VSN391MQ35S |
|          | 1,000    | 22×45              | 2.38                                    | EKMR181VSN102MP45S |          | 390      | 30×25              | 1.39                                    | EKMR3B1VSN391MR25S |
|          | 1,000    | 25.4×35            | 2.24                                    | EKMR181VSN102MQ35S |          | 470      | 22×50              | 1.72                                    | EKMR3B1VSN471MP50S |
|          | 1,000    | 30×25              | 1.90                                    | EKMR181VSN102MR25S |          | 470      | 25.4×40            | 1.67                                    | EKMR3B1VSN471MQ40S |
|          | 1,200    | 22×50              | 2.69                                    | EKMR181VSN122MP50S |          | 470      | 30×30              | 1.57                                    | EKMR3B1VSN471MR30S |
|          | 1,200    | 25.4×40            | 2.52                                    | EKMR181VSN122MQ40S |          | 470      | 35×25              | 1.52                                    | EKMR3B1VSN471MA25S |
|          | 1,200    | 30×30              | 2.14                                    | EKMR181VSN122MR30S |          | 560      | 25.4×45            | 1.86                                    | EKMR3B1VSN561MQ45S |
|          | 1,200    | 35×25              | 1.94                                    | EKMR181VSN122MA25S |          | 560      | 30×35              | 1.78                                    | EKMR3B1VSN561MR35S |
|          | 1,500    | 25.4×45            | 2.88                                    | EKMR181VSN152MQ45S |          | 680      | 25.4×50            | 2.10                                    | EKMR3B1VSN681MQ50S |
|          | 1,500    | 25.4×50            | 2.94                                    | EKMR181VSN152MQ50S |          | 680      | 30×40              | 2.03                                    | EKMR3B1VSN681MR40S |
|          | 1,500    | 30×35              | 2.49                                    | EKMR181VSN152MR35S |          | 680      | 35×30              | 1.90                                    | EKMR3B1VSN681MA30S |
|          | 1,800    | 30×40              | 2.82                                    | EKMR181VSN182MR40S |          | 820      | 30×45              | 2.31                                    | EKMR3B1VSN821MR45S |
| 200      | 1,800    | 35×30              | 2.47                                    | EKMR181VSN182MA30S | 350      | 820      | 35×35              | 2.13                                    | EKMR3B1VSN821MA35S |
|          | 2,200    | 30×45              | 3.23                                    | EKMR181VSN222MR45S |          | 1,000    | 30×50              | 2.61                                    | EKMR3B1VSN102MR50S |
|          | 2,200    | 30×50              | 3.31                                    | EKMR181VSN222MR50S |          | 1,000    | 35×40              | 2.46                                    | EKMR3B1VSN102MA40S |
|          | 2,200    | 35×35              | 2.79                                    | EKMR181VSN222MA35S |          | 1,200    | 35×45              | 2.78                                    | EKMR3B1VSN122MA45S |
|          | 2,200    | 35×40              | 2.92                                    | EKMR181VSN222MA40S |          | 1,200    | 35×50              | 2.86                                    | EKMR3B1VSN122MA50S |
|          | 2,700    | 35×45              | 3.33                                    | EKMR181VSN272MA45S |          | 150      | 22×25              | 0.84                                    | EKMR351VSN151MP25S |
|          | 560      | 22×30              | 1.66                                    | EKMR201VSN561MP30S |          | 220      | 22×30              | 1.06                                    | EKMR351VSN221MP30S |
|          | 560      | 25.4×25            | 1.56                                    | EKMR201VSN561MQ25S |          | 220      | 25.4×25            | 1.04                                    | EKMR351VSN221MQ25S |
|          | 680      | 22×35              | 1.87                                    | EKMR201VSN681MP35S |          | 270      | 22×35              | 1.20                                    | EKMR351VSN271MP35S |
|          | 680      | 25.4×30            | 1.77                                    | EKMR201VSN681MQ30S |          | 270      | 25.4×30            | 1.18                                    | EKMR351VSN271MQ30S |
|          | 820      | 22×40              | 2.11                                    | EKMR201VSN821MP40S |          | 330      | 22×40              | 1.37                                    | EKMR351VSN331MP40S |
|          | 820      | 25.4×35            | 2.03                                    | EKMR201VSN821MQ35S |          | 330      | 22×45              | 1.40                                    | EKMR351VSN331MR45S |
|          | 820      | 30×25              | 1.72                                    | EKMR201VSN821MR25S |          | 330      | 25.4×35            | 1.36                                    | EKMR351VSN331MQ35S |
|          | 1,000    | 22×50              | 2.45                                    | EKMR201VSN102MP50S |          | 330      | 30×25              | 1.28                                    | EKMR351VSN331MR25S |
|          | 1,000    | 25.4×40            | 2.30                                    | EKMR201VSN102MQ40S |          | 390      | 22×50              | 1.56                                    | EKMR351VSN391MP50S |
|          | 1,000    | 30×30              | 1.95                                    | EKMR201VSN102MR30S |          | 390      | 25.4×40            | 1.52                                    | EKMR351VSN391MQ40S |
|          | 1,200    | 25.4×45            | 2.58                                    | EKMR201VSN122MQ45S |          | 390      | 30×30              | 1.43                                    | EKMR351VSN391MR30S |
|          | 1,200    | 30×35              | 2.23                                    | EKMR201VSN122MR35S |          | 390      | 35×25              | 1.38                                    | EKMR351VSN391MA25S |
|          | 1,200    | 35×25              | 1.94                                    | EKMR201VSN122MA25S |          | 470      | 25.4×45            | 1.71                                    | EKMR351VSN471MQ45S |
|          | 1,500    | 25.4×50            | 2.94                                    | EKMR201VSN152MQ50S |          | 560      | 25.4×50            | 1.90                                    | EKMR351VSN561MQ50S |
|          | 1,500    | 30×40              | 2.58                                    | EKMR201VSN152MR40S |          | 560      | 30×35              | 1.78                                    | EKMR351VSN561MR35S |
|          | 1,500    | 35×30              | 2.25                                    | EKMR201VSN152MA30S |          | 560      | 30×40              | 1.84                                    | EKMR351VSN561MR40S |
|          | 1,800    | 30×45              | 2.92                                    | EKMR201VSN182MR45S |          | 560      | 35×30              | 1.72                                    | EKMR351VSN561MA30S |
|          | 1,800    | 35×35              | 2.53                                    | EKMR201VSN182MA35S |          | 680      | 30×45              | 2.10                                    | EKMR351VSN681MR45S |
|          | 2,200    | 30×50              | 3.31                                    | EKMR201VSN222MR50S |          | 680      | 35×35              | 1.94                                    | EKMR351VSN681MA35S |
|          | 2,200    | 35×40              | 2.92                                    | EKMR201VSN222MA40S |          | 820      | 30×50              | 2.36                                    | EKMR351VSN821MR50S |
|          | 2,700    | 35×45              | 3.33                                    | EKMR201VSN272MA45S |          |          |                    |                                         |                    |


**KMR**Series

### ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | Rated ripple current (Arms/105°C,120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case size φD×L(mm) | Rated ripple current (Arms/105°C,120Hz) | Part No.           |
|----------|----------|--------------------|-----------------------------------------|--------------------|----------|----------|--------------------|-----------------------------------------|--------------------|
| 350      | 820      | 35×40              | 2.23                                    | EKMR351VSN821MA40S | 420      | 270      | 30×30              | 1.26                                    | EKMR421VSN271MR30S |
|          | 1,000    | 35×45              | 2.54                                    | EKMR351VSN102MA45S |          | 270      | 35×25              | 1.26                                    | EKMR421VSN271MA25S |
|          | 1,200    | 35×50              | 2.86                                    | EKMR351VSN122MA50S |          | 330      | 25.4×45            | 1.49                                    | EKMR421VSN331MQ45S |
| 400      | 120      | 22×25              | 0.75                                    | EKMR401VSN121MP25S |          | 330      | 30×35              | 1.45                                    | EKMR421VSN331MR35S |
|          | 180      | 22×30              | 0.96                                    | EKMR401VSN181MP30S |          | 390      | 25.4×50            | 1.66                                    | EKMR421VSN391MQ50S |
|          | 180      | 25.4×25            | 0.94                                    | EKMR401VSN181MQ25S |          | 390      | 30×40              | 1.63                                    | EKMR421VSN391MR40S |
|          | 220      | 22×35              | 1.09                                    | EKMR401VSN221MP35S |          | 390      | 35×30              | 1.58                                    | EKMR421VSN391MA30S |
|          | 220      | 25.4×30            | 1.07                                    | EKMR401VSN221MQ30S |          | 470      | 30×45              | 1.85                                    | EKMR421VSN471MR45S |
|          | 270      | 22×40              | 1.24                                    | EKMR401VSN271MP40S |          | 470      | 35×35              | 1.77                                    | EKMR421VSN471MA35S |
|          | 270      | 22×45              | 1.26                                    | EKMR401VSN271MP45S |          | 560      | 30×50              | 2.07                                    | EKMR421VSN561MR50S |
|          | 270      | 25.4×35            | 1.23                                    | EKMR401VSN271MQ35S |          | 560      | 35×40              | 2.02                                    | EKMR421VSN561MA40S |
|          | 270      | 30×25              | 1.16                                    | EKMR401VSN271MR25S |          | 680      | 35×45              | 2.29                                    | EKMR421VSN681MA45S |
|          | 330      | 22×50              | 1.44                                    | EKMR401VSN331MP50S |          | 820      | 35×50              | 2.59                                    | EKMR421VSN821MA50S |
|          | 330      | 25.4×40            | 1.40                                    | EKMR401VSN331MQ40S | 450      | 100      | 22×25              | 0.71                                    | EKMR451VSN101MP25S |
|          | 330      | 30×30              | 1.31                                    | EKMR401VSN331MP30S |          | 120      | 22×30              | 0.82                                    | EKMR451VSN121MP30S |
|          | 330      | 35×25              | 1.27                                    | EKMR401VSN331MA25S |          | 150      | 22×35              | 0.94                                    | EKMR451VSN151MP35S |
|          | 390      | 25.4×45            | 1.55                                    | EKMR401VSN391MQ45S |          | 150      | 25.4×25            | 0.89                                    | EKMR451VSN151MQ25S |
|          | 390      | 30×35              | 1.49                                    | EKMR401VSN391MR35S |          | 180      | 22×40              | 1.05                                    | EKMR451VSN181MP40S |
|          | 470      | 25.4×50            | 1.74                                    | EKMR401VSN471MQ50S |          | 180      | 25.4×30            | 1.00                                    | EKMR451VSN181MQ30S |
|          | 470      | 30×40              | 1.69                                    | EKMR401VSN471MR40S |          | 220      | 22×45              | 1.19                                    | EKMR451VSN221MP45S |
|          | 470      | 35×30              | 1.58                                    | EKMR401VSN471MA30S |          | 220      | 25.4×35            | 1.16                                    | EKMR451VSN221MQ35S |
|          | 560      | 30×45              | 1.91                                    | EKMR401VSN561MR45S |          | 220      | 30×25              | 1.11                                    | EKMR451VSN221MR25S |
|          | 560      | 35×35              | 1.76                                    | EKMR401VSN561MA35S |          | 270      | 22×50              | 1.36                                    | EKMR451VSN271MP50S |
|          | 680      | 30×50              | 2.15                                    | EKMR401VSN681MR50S |          | 270      | 25.4×40            | 1.32                                    | EKMR451VSN271MQ40S |
|          | 680      | 35×40              | 2.03                                    | EKMR401VSN681MA40S |          | 270      | 25.4×45            | 1.35                                    | EKMR451VSN271MQ45S |
|          | 820      | 35×45              | 2.30                                    | EKMR401VSN821MA45S |          | 270      | 30×30              | 1.26                                    | EKMR451VSN271MR30S |
|          | 820      | 35×50              | 2.37                                    | EKMR401VSN821MA50S |          | 270      | 35×25              | 1.26                                    | EKMR451VSN271MA25S |
| 420      | 120      | 22×25              | 0.78                                    | EKMR421VSN121MP25S |          | 330      | 25.4×50            | 1.52                                    | EKMR451VSN331MQ50S |
|          | 150      | 22×30              | 0.91                                    | EKMR421VSN151MP30S |          | 330      | 30×35              | 1.45                                    | EKMR451VSN331MR35S |
|          | 150      | 25.4×25            | 0.89                                    | EKMR421VSN151MQ25S |          | 330      | 35×30              | 1.45                                    | EKMR451VSN331MA30S |
|          | 180      | 22×35              | 1.03                                    | EKMR421VSN181MP35S |          | 390      | 30×40              | 1.63                                    | EKMR451VSN391MR40S |
|          | 180      | 25.4×30            | 1.00                                    | EKMR421VSN181MQ30S |          | 470      | 30×45              | 1.85                                    | EKMR451VSN471MR45S |
|          | 220      | 22×40              | 1.16                                    | EKMR421VSN221MP40S |          | 470      | 30×50              | 1.90                                    | EKMR451VSN471MR50S |
|          | 220      | 22×45              | 1.19                                    | EKMR421VSN221MP45S |          | 470      | 35×35              | 1.77                                    | EKMR451VSN471MA35S |
|          | 220      | 25.4×35            | 1.16                                    | EKMR421VSN221MQ35S |          | 560      | 35×40              | 2.02                                    | EKMR451VSN561MA40S |
|          | 220      | 30×25              | 1.11                                    | EKMR421VSN221MR25S |          | 560      | 35×45              | 2.08                                    | EKMR451VSN561MA45S |
|          | 270      | 22×50              | 1.36                                    | EKMR421VSN271MP50S |          | 680      | 35×50              | 2.36                                    | EKMR451VSN681MA50S |
|          | 270      | 25.4×40            | 1.32                                    | EKMR421VSN271MQ40S |          |          |                    |                                         |                    |

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency(Hz)             | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 160 to 250V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 315 to 450V <sub>dc</sub> | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

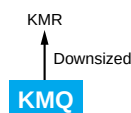


## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105°C

# KMQ Series

- Endurance with ripple current : 2,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

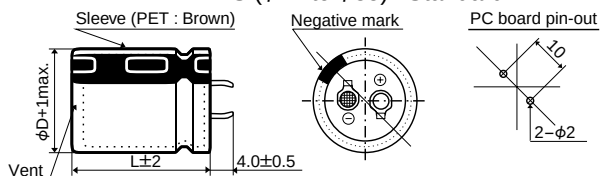


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |             |             |            |             |             |            |                  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------|-------------|------------|-------------|-------------|------------|------------------|
| Category                                               |                                                                                                                                                                                                                                                                                         |                                      |             |             |            |             |             |            |                  |
| Temperature Range                                      | −40 to +105°C (35&50V <sub>dc</sub> ), −25 to +105°C (160 to 450V <sub>dc</sub> )                                                                                                                                                                                                       |                                      |             |             |            |             |             |            |                  |
| Rated Voltage Range                                    | 35&50V <sub>dc</sub> , 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                        |                                      |             |             |            |             |             |            |                  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |             |             |            |             |             |            |                  |
| Leakage Current                                        | I≤3√CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                           |                                      |             |             |            |             |             |            |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 35V                                  |             | 50V         |            | 160 to 250V | 315 to 400V | 420 & 450V | (at 20°C, 120Hz) |
|                                                        | Nominal capacitance (μF)                                                                                                                                                                                                                                                                | 10,000>C                             | C≥10,000    | 10,000>C    | C≥10,000   | —           | —           | —          |                  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.30                                 | 0.35        | 0.25        | 0.30       | 0.15        | 0.15        | 0.20       |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 35&50V                               | 160 to 250V | 315 to 450V |            |             |             |            |                  |
|                                                        | Z(−25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 4           | 8           |            |             |             |            |                  |
|                                                        | Z(−40°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 10                                   | —           | —           | (at 120Hz) |             |             |            |                  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105°C.                                                                                               |                                      |             |             |            |             |             |            |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |             |             |            |             |             |            |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |             |             |            |             |             |            |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |             |             |            |             |             |            |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |             |             |            |             |             |            |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±15% of the initial value           |             |             |            |             |             |            |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤150% of the initial specified value |             |             |            |             |             |            |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |             |             |            |             |             |            |                  |

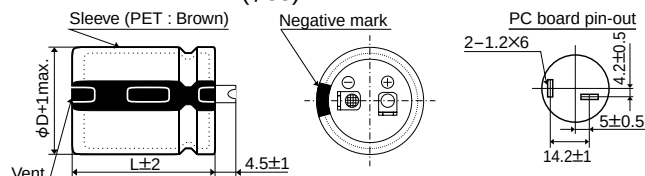
## ◆DIMENSIONS [mm]

- Terminal Code : VS (φ22 to φ35) : Standard

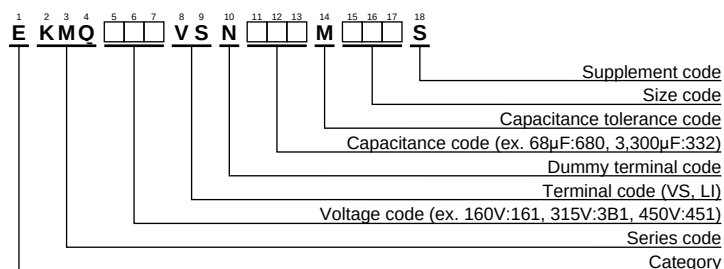


The standard design has no plastic disc.

- Terminal Code : LI (φ35)



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"


**KMQ** Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 35          | 4,700       | 22×25                 | 0.30 | 1.87                                              | EKMQ350VSN472MP25S | 160         | 1,800       | 30×40                 | 0.15 | 2.70                                              | EKMQ161VSN182MR40S |
|             | 5,600       | 22×25                 | 0.30 | 2.04                                              | EKMQ350VSN562MP25S |             | 1,800       | 35×30                 | 0.15 | 2.70                                              | EKMQ161VSN182MA30S |
|             | 5,600       | 25.4×25               | 0.30 | 2.00                                              | EKMQ350VSN562MQ25S |             | 2,200       | 30×45                 | 0.15 | 2.90                                              | EKMQ161VSN222MR45S |
|             | 6,800       | 22×30                 | 0.30 | 2.36                                              | EKMQ350VSN682MP30S |             | 2,200       | 35×35                 | 0.15 | 2.90                                              | EKMQ161VSN222MA35S |
|             | 6,800       | 25.4×25               | 0.30 | 2.21                                              | EKMQ350VSN682MQ25S |             | 2,700       | 30×50                 | 0.15 | 3.10                                              | EKMQ161VSN272MR50S |
|             | 8,200       | 22×35                 | 0.30 | 2.65                                              | EKMQ350VSN822MP35S |             | 2,700       | 35×40                 | 0.15 | 3.10                                              | EKMQ161VSN272MA40S |
|             | 8,200       | 25.4×30               | 0.30 | 2.49                                              | EKMQ350VSN822MQ30S |             | 3,300       | 35×50                 | 0.15 | 3.30                                              | EKMQ161VSN332MA50S |
|             | 8,200       | 30×25                 | 0.30 | 2.62                                              | EKMQ350VSN822MR25S |             | 390         | 22×25                 | 0.15 | 1.30                                              | EKMQ181VSN391MP25S |
|             | 10,000      | 22×40                 | 0.35 | 3.00                                              | EKMQ350VSN103MP40S |             | 470         | 22×30                 | 0.15 | 1.40                                              | EKMQ181VSN471MP30S |
|             | 10,000      | 25.4×35               | 0.35 | 2.88                                              | EKMQ350VSN103MQ35S | 180         | 560         | 22×30                 | 0.15 | 1.50                                              | EKMQ181VSN561MP30S |
|             | 10,000      | 30×25                 | 0.35 | 2.90                                              | EKMQ350VSN103MR25S |             | 560         | 25.4×25               | 0.15 | 1.50                                              | EKMQ181VSN561MQ25S |
|             | 12,000      | 22×50                 | 0.35 | 3.47                                              | EKMQ350VSN123MP50S |             | 680         | 22×35                 | 0.15 | 1.70                                              | EKMQ181VSN681MP35S |
|             | 12,000      | 25.4×35               | 0.35 | 3.15                                              | EKMQ350VSN123MQ35S |             | 680         | 25.4×30               | 0.15 | 1.70                                              | EKMQ181VSN681MQ30S |
|             | 12,000      | 30×30                 | 0.35 | 3.25                                              | EKMQ350VSN123MR30S |             | 820         | 22×40                 | 0.15 | 2.00                                              | EKMQ181VSN821MP40S |
|             | 12,000      | 35×25                 | 0.35 | 3.20                                              | EKMQ350VSN123MA25S |             | 820         | 25.4×30               | 0.15 | 2.00                                              | EKMQ181VSN821MQ30S |
|             | 15,000      | 25.4×40               | 0.35 | 3.61                                              | EKMQ350VSN153MQ40S |             | 820         | 30×25                 | 0.15 | 2.00                                              | EKMQ181VSN821MR25S |
|             | 15,000      | 30×35                 | 0.35 | 3.78                                              | EKMQ350VSN153MR35S |             | 1,000       | 22×45                 | 0.15 | 2.20                                              | EKMQ181VSN102MP45S |
|             | 15,000      | 35×25                 | 0.35 | 3.60                                              | EKMQ350VSN153MA25S |             | 1,000       | 25.4×40               | 0.15 | 2.20                                              | EKMQ181VSN102MQ40S |
|             | 18,000      | 25.4×50               | 0.35 | 4.14                                              | EKMQ350VSN183MQ50S |             | 1,000       | 30×30                 | 0.15 | 2.20                                              | EKMQ181VSN102MR30S |
|             | 18,000      | 30×40                 | 0.35 | 4.30                                              | EKMQ350VSN183MR40S |             | 1,000       | 35×25                 | 0.15 | 2.20                                              | EKMQ181VSN102MA25S |
|             | 18,000      | 35×30                 | 0.35 | 4.10                                              | EKMQ350VSN183MA30S |             | 1,200       | 25.4×45               | 0.15 | 2.30                                              | EKMQ181VSN122MQ45S |
|             | 22,000      | 30×50                 | 0.35 | 5.00                                              | EKMQ350VSN223MR50S |             | 1,200       | 30×35                 | 0.15 | 2.30                                              | EKMQ181VSN122MR35S |
|             | 22,000      | 35×35                 | 0.35 | 4.64                                              | EKMQ350VSN223MA35S |             | 1,200       | 35×30                 | 0.15 | 2.30                                              | EKMQ181VSN122MA30S |
|             | 27,000      | 35×40                 | 0.35 | 5.37                                              | EKMQ350VSN273MA40S |             | 1,500       | 25.4×50               | 0.15 | 2.50                                              | EKMQ181VSN152MQ50S |
|             | 33,000      | 35×50                 | 0.35 | 6.00                                              | EKMQ350VSN333MA50S |             | 1,500       | 30×40                 | 0.15 | 2.50                                              | EKMQ181VSN152MR40S |
| 50          | 2,700       | 22×25                 | 0.25 | 1.65                                              | EKMQ500VSN272MP25S |             | 1,500       | 35×30                 | 0.15 | 2.50                                              | EKMQ181VSN152MA30S |
|             | 3,300       | 22×30                 | 0.25 | 1.92                                              | EKMQ500VSN332MP30S | 200         | 1,800       | 30×45                 | 0.15 | 2.70                                              | EKMQ181VSN182MR45S |
|             | 3,300       | 25.4×25               | 0.25 | 1.76                                              | EKMQ500VSN332MQ25S |             | 1,800       | 35×35                 | 0.15 | 2.70                                              | EKMQ181VSN182MA35S |
|             | 3,900       | 22×30                 | 0.25 | 2.08                                              | EKMQ500VSN392MP30S |             | 2,200       | 30×50                 | 0.15 | 2.90                                              | EKMQ181VSN222MR50S |
|             | 3,900       | 25.4×25               | 0.25 | 2.04                                              | EKMQ500VSN392MQ25S |             | 2,200       | 35×40                 | 0.15 | 2.90                                              | EKMQ181VSN222MA40S |
|             | 4,700       | 22×35                 | 0.25 | 2.43                                              | EKMQ500VSN472MP35S |             | 2,700       | 35×50                 | 0.15 | 3.10                                              | EKMQ181VSN272MA50S |
|             | 4,700       | 25.4×30               | 0.25 | 2.50                                              | EKMQ500VSN472MQ30S | 250         | 390         | 22×25                 | 0.15 | 1.31                                              | EKMQ201VSN391MP25S |
|             | 4,700       | 30×25                 | 0.25 | 2.29                                              | EKMQ500VSN472MR25S |             | 470         | 22×30                 | 0.15 | 1.45                                              | EKMQ201VSN471MP30S |
|             | 5,600       | 22×40                 | 0.25 | 2.63                                              | EKMQ500VSN562MP40S |             | 560         | 22×30                 | 0.15 | 1.67                                              | EKMQ201VSN561MP30S |
|             | 5,600       | 25.4×35               | 0.25 | 2.61                                              | EKMQ500VSN562MQ35S |             | 560         | 25.4×25               | 0.15 | 1.67                                              | EKMQ201VSN561MQ25S |
|             | 5,600       | 30×25                 | 0.25 | 2.80                                              | EKMQ500VSN562MR25S |             | 680         | 22×40                 | 0.15 | 1.75                                              | EKMQ201VSN681MP40S |
|             | 6,800       | 22×50                 | 0.25 | 3.05                                              | EKMQ500VSN682MP50S |             | 680         | 25.4×30               | 0.15 | 1.75                                              | EKMQ201VSN681MQ30S |
|             | 6,800       | 25.4×40               | 0.25 | 2.94                                              | EKMQ500VSN682MQ40S |             | 820         | 22×45                 | 0.15 | 2.04                                              | EKMQ201VSN821MP45S |
|             | 6,800       | 30×30                 | 0.25 | 3.30                                              | EKMQ500VSN682MR30S |             | 820         | 25.4×35               | 0.15 | 2.04                                              | EKMQ201VSN821MQ35S |
|             | 6,800       | 35×25                 | 0.25 | 2.77                                              | EKMQ500VSN682MA25S |             | 820         | 30×25                 | 0.15 | 2.04                                              | EKMQ201VSN821MR25S |
|             | 8,200       | 25.4×45               | 0.25 | 3.60                                              | EKMQ500VSN822MQ45S |             | 1,000       | 22×50                 | 0.15 | 2.30                                              | EKMQ201VSN102MP50S |
|             | 8,200       | 30×35                 | 0.25 | 3.60                                              | EKMQ500VSN822MR35S |             | 1,000       | 25.4×45               | 0.15 | 2.30                                              | EKMQ201VSN102MQ45S |
|             | 8,200       | 35×30                 | 0.25 | 3.60                                              | EKMQ500VSN822MA30S |             | 1,000       | 30×30                 | 0.15 | 2.30                                              | EKMQ201VSN102MR30S |
|             | 10,000      | 25.4×50               | 0.30 | 4.00                                              | EKMQ500VSN103MQ50S |             | 1,000       | 35×25                 | 0.15 | 2.30                                              | EKMQ201VSN102MA25S |
|             | 10,000      | 30×40                 | 0.30 | 4.00                                              | EKMQ500VSN103MR40S |             | 1,200       | 25.4×50               | 0.15 | 2.65                                              | EKMQ201VSN122MQ50S |
|             | 10,000      | 35×30                 | 0.30 | 4.00                                              | EKMQ500VSN103MA30S |             | 1,200       | 30×35                 | 0.15 | 2.65                                              | EKMQ201VSN122MR35S |
|             | 12,000      | 30×50                 | 0.30 | 4.29                                              | EKMQ500VSN123MR50S |             | 1,200       | 35×30                 | 0.15 | 2.65                                              | EKMQ201VSN122MA30S |
|             | 12,000      | 35×35                 | 0.30 | 4.37                                              | EKMQ500VSN123MA35S |             | 1,500       | 30×40                 | 0.15 | 2.80                                              | EKMQ201VSN152MR40S |
|             | 15,000      | 35×40                 | 0.30 | 4.50                                              | EKMQ500VSN153MA40S |             | 1,500       | 35×30                 | 0.15 | 2.80                                              | EKMQ201VSN152MA30S |
|             | 18,000      | 35×50                 | 0.30 | 5.30                                              | EKMQ500VSN183MA50S |             | 1,800       | 30×45                 | 0.15 | 3.08                                              | EKMQ201VSN182MR45S |
| 160         | 470         | 22×25                 | 0.15 | 1.40                                              | EKMQ161VSN471MP25S |             | 1,800       | 35×40                 | 0.15 | 3.08                                              | EKMQ201VSN182MA40S |
|             | 560         | 22×30                 | 0.15 | 1.50                                              | EKMQ161VSN561MP30S |             | 2,200       | 35×45                 | 0.15 | 3.48                                              | EKMQ201VSN222MA45S |
|             | 680         | 22×30                 | 0.15 | 1.70                                              | EKMQ161VSN681MP30S | 250         | 220         | 22×25                 | 0.15 | 1.00                                              | EKMQ251VSN221MP25S |
|             | 680         | 25.4×25               | 0.15 | 1.70                                              | EKMQ161VSN681MQ25S |             | 270         | 22×25                 | 0.15 | 1.10                                              | EKMQ251VSN271MP25S |
|             | 820         | 22×35                 | 0.15 | 2.00                                              | EKMQ161VSN821MP35S |             | 330         | 22×30                 | 0.15 | 1.20                                              | EKMQ251VSN331MP30S |
|             | 820         | 25.4×30               | 0.15 | 2.00                                              | EKMQ161VSN821MQ30S |             | 330         | 25.4×25               | 0.15 | 1.20                                              | EKMQ251VSN331MQ25S |
|             | 820         | 30×25                 | 0.15 | 2.00                                              | EKMQ161VSN821MR25S |             | 390         | 22×35                 | 0.15 | 1.30                                              | EKMQ251VSN391MP35S |
|             | 1,000       | 22×40                 | 0.15 | 2.20                                              | EKMQ161VSN102MP40S |             | 390         | 25.4×25               | 0.15 | 1.30                                              | EKMQ251VSN391MQ25S |
|             | 1,000       | 25.4×35               | 0.15 | 2.20                                              | EKMQ161VSN102MQ35S |             | 470         | 22×40                 | 0.15 | 1.40                                              | EKMQ251VSN471MP40S |
|             | 1,000       | 30×25                 | 0.15 | 2.20                                              | EKMQ161VSN102MR25S |             | 470         | 25.4×30               | 0.15 | 1.40                                              | EKMQ251VSN471MQ30S |
|             | 1,200       | 25.4×40               | 0.15 | 2.30                                              | EKMQ161VSN122MQ40S |             | 470         | 30×25                 | 0.15 | 1.40                                              | EKMQ251VSN471MR25S |
|             | 1,200       | 30×30                 | 0.15 | 2.30                                              | EKMQ161VSN122MR30S |             | 560         | 22×45                 | 0.15 | 1.50                                              | EKMQ251VSN561MP45S |
|             | 1,200       | 35×25                 | 0.15 | 2.30                                              | EKMQ161VSN122MA25S |             | 560         | 25.4×35               | 0.15 | 1.50                                              | EKMQ251VSN561MQ35S |
|             | 1,500       | 25.4×45               | 0.15 | 2.50                                              | EKMQ161VSN152MQ45S |             | 560         | 30×25                 | 0.15 | 1.50                                              | EKMQ251VSN561MR25S |
|             | 1,500       | 30×35                 | 0.15 | 2.50                                              | EKMQ161VSN152MR35S |             | 680         | 22×50                 | 0.15 | 1.70                                              | EKMQ251VSN681MP50S |
|             | 1,500       | 35×30                 | 0.15 | 2.50                                              | EKMQ161VSN152MA30S |             | 680         | 25.4×40               | 0.15 | 1.70                                              | EKMQ251VSN681MQ40S |
|             | 1,800       | 25.4×50               | 0.15 | 2.70                                              | EKMQ161VSN182MQ50S |             | 680         | 30×30                 | 0.15 | 1.70                                              | EKMQ251VSN681MR30S |


**KMQ** Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 250         | 680         | 35×25                 | 0.15 | 1.70                                              | EKMQ251VSN681MA25S | 400         | 270         | 25.4×40               | 0.15 | 1.22                                              | EKMQ401VSN271MQ40S |
|             | 820         | 25.4×45               | 0.15 | 2.00                                              | EKMQ251VSN821MQ45S |             | 270         | 30×30                 | 0.15 | 1.22                                              | EKMQ401VSN271MR30S |
|             | 820         | 30×35                 | 0.15 | 2.00                                              | EKMQ251VSN821MR35S |             | 270         | 35×25                 | 0.15 | 1.22                                              | EKMQ401VSN271MA25S |
|             | 820         | 35×30                 | 0.15 | 2.00                                              | EKMQ251VSN821MA30S |             | 330         | 25.4×45               | 0.15 | 1.44                                              | EKMQ401VSN331MQ45S |
|             | 1,000       | 30×40                 | 0.15 | 2.20                                              | EKMQ251VSN102MR40S |             | 330         | 30×35                 | 0.15 | 1.44                                              | EKMQ401VSN331MR35S |
|             | 1,000       | 35×30                 | 0.15 | 2.20                                              | EKMQ251VSN102MA30S |             | 330         | 35×30                 | 0.15 | 1.44                                              | EKMQ401VSN331MA30S |
|             | 1,200       | 30×45                 | 0.15 | 2.30                                              | EKMQ251VSN122MR45S |             | 390         | 25.4×50               | 0.15 | 1.55                                              | EKMQ401VSN391MQ50S |
|             | 1,200       | 35×35                 | 0.15 | 2.30                                              | EKMQ251VSN122MA35S |             | 390         | 30×40                 | 0.15 | 1.55                                              | EKMQ401VSN391MR40S |
|             | 1,500       | 35×45                 | 0.15 | 2.50                                              | EKMQ251VSN152MA45S |             | 390         | 35×30                 | 0.15 | 1.55                                              | EKMQ401VSN391MA30S |
|             | 1,800       | 35×50                 | 0.15 | 2.70                                              | EKMQ251VSN182MA50S |             | 470         | 30×45                 | 0.15 | 1.68                                              | EKMQ401VSN471MR45S |
| 315         | 150         | 22×25                 | 0.15 | 0.82                                              | EKMQ3B1VSN151MP25S | 420         | 470         | 35×35                 | 0.15 | 1.68                                              | EKMQ401VSN471MA35S |
|             | 180         | 22×30                 | 0.15 | 0.90                                              | EKMQ3B1VSN181MP30S |             | 560         | 30×50                 | 0.15 | 1.90                                              | EKMQ401VSN561MR50S |
|             | 220         | 22×30                 | 0.15 | 1.00                                              | EKMQ3B1VSN221MP30S |             | 560         | 35×40                 | 0.15 | 1.90                                              | EKMQ401VSN561MA40S |
|             | 220         | 25.4×25               | 0.15 | 1.00                                              | EKMQ3B1VSN221MQ25S |             | 680         | 35×45                 | 0.15 | 2.12                                              | EKMQ401VSN681MA45S |
|             | 270         | 22×35                 | 0.15 | 1.10                                              | EKMQ3B1VSN271MP35S |             | 82          | 22×25                 | 0.20 | 0.64                                              | EKMQ421VSN820MP25S |
|             | 270         | 25.4×30               | 0.15 | 1.10                                              | EKMQ3B1VSN271MQ30S |             | 100         | 22×25                 | 0.20 | 0.66                                              | EKMQ421VSN101MP25S |
|             | 330         | 22×45                 | 0.15 | 1.20                                              | EKMQ3B1VSN331MP45S |             | 100         | 25.4×25               | 0.20 | 0.66                                              | EKMQ421VSN101MQ25S |
|             | 330         | 25.4×35               | 0.15 | 1.20                                              | EKMQ3B1VSN331MQ35S |             | 120         | 22×30                 | 0.20 | 0.81                                              | EKMQ421VSN121MP30S |
|             | 330         | 30×25                 | 0.15 | 1.20                                              | EKMQ3B1VSN331MR25S |             | 120         | 25.4×25               | 0.20 | 0.81                                              | EKMQ421VSN121MQ25S |
|             | 390         | 22×45                 | 0.15 | 1.30                                              | EKMQ3B1VSN391MP45S |             | 150         | 22×35                 | 0.20 | 0.84                                              | EKMQ421VSN151MP35S |
|             | 390         | 25.4×40               | 0.15 | 1.30                                              | EKMQ3B1VSN391MQ40S |             | 150         | 25.4×30               | 0.20 | 0.84                                              | EKMQ421VSN151MQ30S |
|             | 390         | 30×30                 | 0.15 | 1.30                                              | EKMQ3B1VSN391MR30S |             | 150         | 30×25                 | 0.20 | 0.84                                              | EKMQ421VSN151MR25S |
|             | 390         | 35×25                 | 0.15 | 1.30                                              | EKMQ3B1VSN391MA25S |             | 180         | 22×40                 | 0.20 | 0.91                                              | EKMQ421VSN181MP40S |
|             | 470         | 25.4×45               | 0.15 | 1.40                                              | EKMQ3B1VSN471MQ45S |             | 180         | 25.4×30               | 0.20 | 0.91                                              | EKMQ421VSN181MQ30S |
|             | 470         | 30×35                 | 0.15 | 1.40                                              | EKMQ3B1VSN471MR35S |             | 180         | 30×25                 | 0.20 | 0.91                                              | EKMQ421VSN181MR25S |
|             | 470         | 35×25                 | 0.15 | 1.40                                              | EKMQ3B1VSN471MA25S |             | 220         | 22×45                 | 0.20 | 1.05                                              | EKMQ421VSN221MP45S |
|             | 560         | 25.4×50               | 0.15 | 1.50                                              | EKMQ3B1VSN561MQ50S |             | 220         | 25.4×35               | 0.20 | 1.05                                              | EKMQ421VSN221MQ35S |
|             | 560         | 30×40                 | 0.15 | 1.50                                              | EKMQ3B1VSN561MR40S |             | 220         | 30×30                 | 0.20 | 1.05                                              | EKMQ421VSN221MR30S |
| 350         | 560         | 35×30                 | 0.15 | 1.50                                              | EKMQ3B1VSN561MA30S | 450         | 220         | 35×25                 | 0.20 | 1.05                                              | EKMQ421VSN221MA25S |
|             | 680         | 30×45                 | 0.15 | 1.70                                              | EKMQ3B1VSN681MR45S |             | 270         | 25.4×40               | 0.20 | 1.25                                              | EKMQ421VSN271MQ40S |
|             | 680         | 35×35                 | 0.15 | 1.70                                              | EKMQ3B1VSN681MA35S |             | 270         | 30×30                 | 0.20 | 1.25                                              | EKMQ421VSN271MR30S |
|             | 820         | 30×50                 | 0.15 | 2.00                                              | EKMQ3B1VSN821MR50S |             | 270         | 35×25                 | 0.20 | 1.25                                              | EKMQ421VSN271MA25S |
|             | 820         | 35×40                 | 0.15 | 2.00                                              | EKMQ3B1VSN821MA40S |             | 330         | 25.4×50               | 0.20 | 1.42                                              | EKMQ421VSN331MQ50S |
|             | 1,000       | 35×45                 | 0.15 | 2.30                                              | EKMQ3B1VSN102MA45S |             | 330         | 30×35                 | 0.20 | 1.42                                              | EKMQ421VSN331MR35S |
|             | 120         | 22×25                 | 0.15 | 0.75                                              | EKMQ351VSN121MP25S |             | 330         | 35×30                 | 0.20 | 1.42                                              | EKMQ421VSN331MA30S |
|             | 150         | 22×30                 | 0.15 | 0.82                                              | EKMQ351VSN151MP30S |             | 390         | 30×40                 | 0.20 | 1.61                                              | EKMQ421VSN391MR40S |
|             | 180         | 22×30                 | 0.15 | 0.90                                              | EKMQ351VSN181MP30S |             | 390         | 35×35                 | 0.20 | 1.61                                              | EKMQ421VSN391MA35S |
|             | 180         | 25.4×25               | 0.15 | 0.90                                              | EKMQ351VSN181MQ25S |             | 470         | 30×45                 | 0.20 | 1.86                                              | EKMQ421VSN471MR45S |
|             | 220         | 22×35                 | 0.15 | 1.00                                              | EKMQ351VSN221MP35S |             | 470         | 35×40                 | 0.20 | 1.86                                              | EKMQ421VSN471MA40S |
|             | 220         | 25.4×30               | 0.15 | 1.00                                              | EKMQ351VSN221MQ30S |             | 560         | 35×45                 | 0.20 | 2.10                                              | EKMQ421VSN561MA45S |
| 400         | 270         | 22×40                 | 0.15 | 1.10                                              | EKMQ351VSN271MP40S |             | 680         | 35×50                 | 0.20 | 2.20                                              | EKMQ421VSN681MA50S |
|             | 270         | 25.4×30               | 0.15 | 1.10                                              | EKMQ351VSN271MQ30S | 450         | 68          | 22×25                 | 0.20 | 0.50                                              | EKMQ451VSN680MP25S |
|             | 270         | 30×25                 | 0.15 | 1.10                                              | EKMQ351VSN271MR25S |             | 82          | 22×30                 | 0.20 | 0.56                                              | EKMQ451VSN820MP30S |
|             | 330         | 22×45                 | 0.15 | 1.20                                              | EKMQ351VSN331MP45S |             | 100         | 22×30                 | 0.20 | 0.64                                              | EKMQ451VSN101MP30S |
|             | 330         | 25.4×40               | 0.15 | 1.20                                              | EKMQ351VSN331MQ40S |             | 100         | 25.4×25               | 0.20 | 0.64                                              | EKMQ451VSN101MQ25S |
|             | 330         | 30×30                 | 0.15 | 1.20                                              | EKMQ351VSN331MR30S |             | 120         | 22×35                 | 0.20 | 0.72                                              | EKMQ451VSN121MP35S |
|             | 390         | 25.4×45               | 0.15 | 1.30                                              | EKMQ351VSN391MQ45S |             | 120         | 25.4×30               | 0.20 | 0.72                                              | EKMQ451VSN121MQ30S |
|             | 390         | 30×35                 | 0.15 | 1.30                                              | EKMQ351VSN391MR35S |             | 150         | 22×40                 | 0.20 | 0.79                                              | EKMQ451VSN151MP40S |
|             | 470         | 25.4×50               | 0.15 | 1.40                                              | EKMQ351VSN471MQ50S |             | 150         | 25.4×30               | 0.20 | 0.79                                              | EKMQ451VSN151MQ30S |
|             | 470         | 30×35                 | 0.15 | 1.40                                              | EKMQ351VSN471MR35S |             | 150         | 30×25                 | 0.20 | 0.79                                              | EKMQ451VSN151MR25S |
|             | 470         | 35×30                 | 0.15 | 1.40                                              | EKMQ351VSN471MA30S |             | 180         | 22×45                 | 0.20 | 0.87                                              | EKMQ451VSN181MP45S |
|             | 560         | 30×45                 | 0.15 | 1.50                                              | EKMQ351VSN561MR45S |             | 180         | 25.4×40               | 0.20 | 0.87                                              | EKMQ451VSN181MQ40S |
|             | 560         | 35×35                 | 0.15 | 1.50                                              | EKMQ351VSN561MA35S |             | 180         | 30×30                 | 0.20 | 0.87                                              | EKMQ451VSN181MR30S |
|             | 680         | 30×50                 | 0.15 | 1.70                                              | EKMQ351VSN681MR50S |             | 220         | 25.4×45               | 0.20 | 1.00                                              | EKMQ451VSN221MQ45S |
|             | 680         | 35×40                 | 0.15 | 1.70                                              | EKMQ351VSN681MA40S |             | 220         | 30×30                 | 0.20 | 1.00                                              | EKMQ451VSN221MR30S |
|             | 820         | 35×45                 | 0.15 | 1.90                                              | EKMQ351VSN821MA45S |             | 220         | 35×25                 | 0.20 | 1.00                                              | EKMQ451VSN221MA25S |
|             | 100         | 22×25                 | 0.15 | 0.70                                              | EKMQ401VSN101MP25S |             | 270         | 25.4×50               | 0.20 | 1.19                                              | EKMQ451VSN271MQ50S |
|             | 120         | 22×30                 | 0.15 | 0.75                                              | EKMQ401VSN121MP30S |             | 270         | 30×40                 | 0.20 | 1.19                                              | EKMQ451VSN271MR40S |
|             | 150         | 22×30                 | 0.15 | 0.88                                              | EKMQ401VSN151MP30S |             | 270         | 35×30                 | 0.20 | 1.19                                              | EKMQ451VSN271MA30S |
|             | 150         | 25.4×25               | 0.15 | 0.88                                              | EKMQ401VSN151MQ25S |             | 330         | 30×45                 | 0.20 | 1.38                                              | EKMQ451VSN331MR45S |
|             | 180         | 22×35                 | 0.15 | 0.95                                              | EKMQ401VSN181MP35S |             | 330         | 35×35                 | 0.20 | 1.38                                              | EKMQ451VSN331MA35S |
|             | 180         | 25.4×30               | 0.15 | 0.95                                              | EKMQ401VSN181MQ30S |             | 390         | 30×50                 | 0.20 | 1.55                                              | EKMQ451VSN391MR50S |
|             | 220         | 22×45                 | 0.15 | 1.10                                              | EKMQ401VSN221MP45S |             | 390         | 35×40                 | 0.20 | 1.55                                              | EKMQ451VSN391MA40S |
|             | 220         | 25.4×35               | 0.15 | 1.10                                              | EKMQ401VSN221MQ35S |             | 470         | 35×45                 | 0.20 | 1.74                                              | EKMQ451VSN471MA45S |
|             | 220         | 30×25                 | 0.15 | 1.10                                              | EKMQ401VSN221MR25S |             | 560         | 35×50                 | 0.20 | 1.90                                              | EKMQ451VSN561MA50S |
|             | 270         | 22×50                 | 0.15 | 1.22                                              | EKMQ401VSN271MP50S |             |             |                       |      |                                                   |                    |


**KMQ**Series

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency(Hz)             | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 35, 50V <sub>dc</sub>     | 0.95 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |
| 160 to 250V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 315 to 450V <sub>dc</sub> | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 85°C

# SMM Series

- Downsized and longer life from SMQ series
- Endurance with ripple current : 3,000 hours at 85°C
- Non solvent resistant type
- RoHS Compliant

SMM

↓  
Downsized  
Longer life  
SMQ

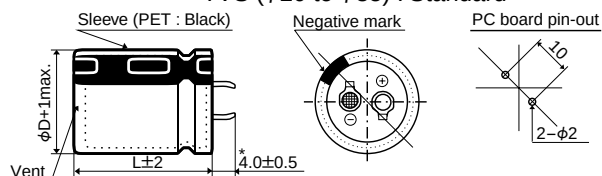


## SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                      |                                      |                         |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                    |                                      |                         |
| Temperature Range                                      | -25 to +85℃                                                                                                                                                                                                                                                                          |                                      |                         |
| Rated Voltage Range                                    | 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                            |                                      |                         |
| Capacitance Tolerance                                  | ±20% (M)                                                                                                                                                                                                                                                                             |                                      | (at 20℃, 120Hz)         |
| Leakage Current                                        | I≤3√CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)<br>(at 20℃ after 5 minutes)                                                                                                                                                      |                                      |                         |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                     | 160 to 400V                          | 420 & 450V              |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                          | 0.15                                 | 0.20<br>(at 20℃, 120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                     | 160 to 400V                          | 420 & 450V              |
|                                                        | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                      | 4                                    | 8<br>(at 120Hz)         |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 3,000 hours at 85℃.                                                                                               |                                      |                         |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤±20% of the initial value           |                         |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                          | ≤200% of the initial specified value |                         |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤The initial specified value         |                         |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |                         |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤±15% of the initial value           |                         |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                          | ≤150% of the initial specified value |                         |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤The initial specified value         |                         |

## DIMENSIONS [mm]

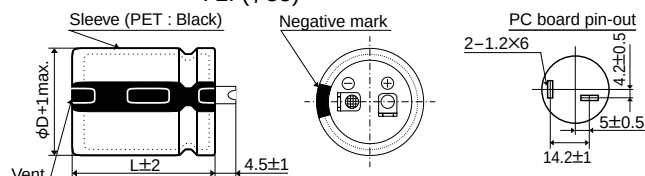
- Terminal Code : VS (φ20 to φ35) : Standard



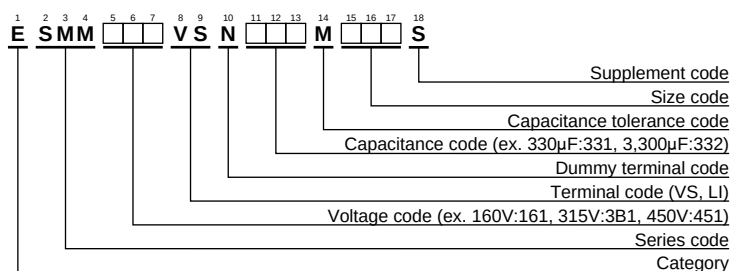
\*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

- Terminal Code : LI (φ35)



## PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

## RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Frequency(Hz)             | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 160 to 250V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 315 to 450V <sub>dc</sub> | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.


**SMM**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|
| 160         | 270         | 20×25                 | 0.15 | 1.28                                             | ESMM161VSN271MN25S | 180         | 1,200       | 25.4×45               | 0.15 | 3.63                                             | ESMM181VSN122MQ45S |
|             | 270         | 22×20                 | 0.15 | 1.30                                             | ESMM161VSN271MP20S |             | 1,200       | 30×35                 | 0.15 | 3.55                                             | ESMM181VSN122MR35S |
|             | 330         | 20×25                 | 0.15 | 1.55                                             | ESMM161VSN331MN25S |             | 1,200       | 35×30                 | 0.15 | 3.49                                             | ESMM181VSN122MA30S |
|             | 390         | 20×30                 | 0.15 | 1.63                                             | ESMM161VSN391MN30S |             | 1,500       | 30×40                 | 0.15 | 4.10                                             | ESMM181VSN152MR40S |
|             | 390         | 22×25                 | 0.15 | 1.63                                             | ESMM161VSN391MP25S |             | 1,500       | 35×35                 | 0.15 | 4.02                                             | ESMM181VSN152MA35S |
|             | 390         | 25.4×20               | 0.15 | 1.62                                             | ESMM161VSN391MQ20S |             | 1,800       | 30×45                 | 0.15 | 4.55                                             | ESMM181VSN182MR45S |
|             | 470         | 20×30                 | 0.15 | 1.90                                             | ESMM161VSN471MN30S |             | 1,800       | 35×35                 | 0.15 | 4.54                                             | ESMM181VSN182MA35S |
|             | 470         | 22×30                 | 0.15 | 1.86                                             | ESMM161VSN471MP30S |             | 2,200       | 35×40                 | 0.15 | 4.83                                             | ESMM181VSN222MA40S |
|             | 470         | 25.4×25               | 0.15 | 1.86                                             | ESMM161VSN471MQ25S |             | 2,700       | 35×50                 | 0.15 | 5.30                                             | ESMM181VSN272MA50S |
|             | 560         | 20×35                 | 0.15 | 2.14                                             | ESMM161VSN561MN35S | 200         | 220         | 20×25                 | 0.15 | 1.19                                             | ESMM201VSN221MN25S |
|             | 560         | 22×30                 | 0.15 | 2.15                                             | ESMM161VSN561MP30S |             | 220         | 22×20                 | 0.15 | 1.18                                             | ESMM201VSN221MP20S |
|             | 560         | 25.4×25               | 0.15 | 2.15                                             | ESMM161VSN561MQ25S |             | 270         | 20×25                 | 0.15 | 1.39                                             | ESMM201VSN271MN25S |
|             | 560         | 30×20                 | 0.15 | 2.05                                             | ESMM161VSN561MP20S |             | 270         | 22×25                 | 0.15 | 1.37                                             | ESMM201VSN271MP25S |
|             | 680         | 20×40                 | 0.15 | 2.35                                             | ESMM161VSN681MN40S |             | 270         | 25.4×20               | 0.15 | 1.35                                             | ESMM201VSN271MQ20S |
|             | 680         | 22×35                 | 0.15 | 2.35                                             | ESMM161VSN681MP35S |             | 330         | 20×30                 | 0.15 | 1.56                                             | ESMM201VSN331MN30S |
|             | 680         | 25.4×30               | 0.15 | 2.33                                             | ESMM161VSN681MQ30S |             | 330         | 22×25                 | 0.15 | 1.51                                             | ESMM201VSN331MP25S |
|             | 680         | 30×25                 | 0.15 | 2.33                                             | ESMM161VSN681MR25S |             | 330         | 25.4×20               | 0.15 | 1.49                                             | ESMM201VSN331MQ20S |
|             | 680         | 35×20                 | 0.15 | 2.26                                             | ESMM161VSN681MA20S |             | 390         | 20×35                 | 0.15 | 1.74                                             | ESMM201VSN391MN35S |
|             | 820         | 20×45                 | 0.15 | 2.64                                             | ESMM161VSN821MN45S |             | 390         | 22×30                 | 0.15 | 1.73                                             | ESMM201VSN391MP30S |
|             | 820         | 22×40                 | 0.15 | 2.68                                             | ESMM161VSN821MP40S |             | 390         | 25.4×25               | 0.15 | 1.71                                             | ESMM201VSN391MQ25S |
|             | 820         | 25.4×30               | 0.15 | 2.65                                             | ESMM161VSN821MQ30S |             | 390         | 30×20                 | 0.15 | 1.71                                             | ESMM201VSN391MR20S |
|             | 820         | 30×25                 | 0.15 | 2.64                                             | ESMM161VSN821MR25S |             | 470         | 20×35                 | 0.15 | 2.03                                             | ESMM201VSN471MN35S |
|             | 820         | 35×20                 | 0.15 | 2.49                                             | ESMM161VSN821MA20S |             | 470         | 22×30                 | 0.15 | 1.97                                             | ESMM201VSN471MP30S |
|             | 1,000       | 22×45                 | 0.15 | 3.02                                             | ESMM161VSN102MP45S |             | 470         | 25.4×25               | 0.15 | 1.95                                             | ESMM201VSN471MQ25S |
|             | 1,000       | 25.4×35               | 0.15 | 3.00                                             | ESMM161VSN102MQ35S |             | 470         | 30×20                 | 0.15 | 1.88                                             | ESMM201VSN471MR20S |
|             | 1,000       | 30×30                 | 0.15 | 2.96                                             | ESMM161VSN102MR30S |             | 560         | 20×40                 | 0.15 | 2.18                                             | ESMM201VSN561MN40S |
|             | 1,000       | 35×25                 | 0.15 | 3.13                                             | ESMM161VSN102MA25S |             | 560         | 22×35                 | 0.15 | 2.18                                             | ESMM201VSN561MP35S |
|             | 1,200       | 22×50                 | 0.15 | 3.47                                             | ESMM161VSN122MP50S |             | 560         | 25.4×30               | 0.15 | 2.15                                             | ESMM201VSN561MQ30S |
|             | 1,200       | 25.4×40               | 0.15 | 3.43                                             | ESMM161VSN122MQ40S |             | 560         | 30×25                 | 0.15 | 2.15                                             | ESMM201VSN561MR25S |
|             | 1,200       | 30×30                 | 0.15 | 3.41                                             | ESMM161VSN122MR30S |             | 560         | 35×20                 | 0.15 | 2.05                                             | ESMM201VSN561MA20S |
|             | 1,200       | 35×25                 | 0.15 | 3.40                                             | ESMM161VSN122MA25S |             | 680         | 20×50                 | 0.15 | 2.48                                             | ESMM201VSN681MN50S |
|             | 1,500       | 25.4×50               | 0.15 | 3.96                                             | ESMM161VSN152MQ50S |             | 680         | 22×40                 | 0.15 | 2.48                                             | ESMM201VSN681MP40S |
|             | 1,500       | 30×35                 | 0.15 | 3.96                                             | ESMM161VSN152MR35S |             | 680         | 25.4×30               | 0.15 | 2.48                                             | ESMM201VSN681MQ30S |
|             | 1,500       | 35×30                 | 0.15 | 3.94                                             | ESMM161VSN152MA30S |             | 680         | 30×25                 | 0.15 | 2.48                                             | ESMM201VSN681MR25S |
|             | 1,800       | 30×40                 | 0.15 | 4.31                                             | ESMM161VSN182MR40S |             | 680         | 35×20                 | 0.15 | 2.36                                             | ESMM201VSN681MA20S |
|             | 1,800       | 35×35                 | 0.15 | 4.28                                             | ESMM161VSN182MA35S |             | 820         | 22×45                 | 0.15 | 2.81                                             | ESMM201VSN821MP45S |
|             | 2,200       | 30×50                 | 0.15 | 4.96                                             | ESMM161VSN222MR50S |             | 820         | 25.4×35               | 0.15 | 2.79                                             | ESMM201VSN821MQ35S |
|             | 2,200       | 35×40                 | 0.15 | 4.96                                             | ESMM161VSN222MA40S |             | 820         | 30×30                 | 0.15 | 2.80                                             | ESMM201VSN821MR30S |
|             | 2,700       | 35×45                 | 0.15 | 5.57                                             | ESMM161VSN272MA45S |             | 820         | 35×25                 | 0.15 | 2.83                                             | ESMM201VSN821MA25S |
|             | 3,300       | 35×50                 | 0.15 | 6.21                                             | ESMM161VSN332MA50S |             | 1,000       | 22×50                 | 0.15 | 3.28                                             | ESMM201VSN102MP50S |
| 180         | 220         | 22×20                 | 0.15 | 1.18                                             | ESMM181VSN221MP20S |             | 1,000       | 25.4×40               | 0.15 | 3.28                                             | ESMM201VSN102MQ40S |
|             | 270         | 20×25                 | 0.15 | 1.29                                             | ESMM181VSN271MN25S |             | 1,000       | 30×35                 | 0.15 | 3.15                                             | ESMM201VSN102MR35S |
|             | 330         | 20×30                 | 0.15 | 1.77                                             | ESMM181VSN331MN30S |             | 1,000       | 35×30                 | 0.15 | 3.26                                             | ESMM201VSN102MA30S |
|             | 330         | 22×25                 | 0.15 | 1.77                                             | ESMM181VSN331MP25S |             | 1,200       | 25.4×45               | 0.15 | 3.61                                             | ESMM201VSN122MQ45S |
|             | 330         | 25.4×20               | 0.15 | 1.49                                             | ESMM181VSN331MQ20S |             | 1,200       | 30×35                 | 0.15 | 3.61                                             | ESMM201VSN122MR35S |
|             | 390         | 20×30                 | 0.15 | 1.84                                             | ESMM181VSN391MN30S |             | 1,200       | 35×30                 | 0.15 | 3.57                                             | ESMM201VSN122MA30S |
|             | 390         | 22×25                 | 0.15 | 1.84                                             | ESMM181VSN391MP25S |             | 1,500       | 30×45                 | 0.15 | 4.13                                             | ESMM201VSN152MR45S |
|             | 470         | 20×35                 | 0.15 | 1.91                                             | ESMM181VSN471MN35S |             | 1,500       | 35×35                 | 0.15 | 4.06                                             | ESMM201VSN152MA35S |
|             | 470         | 22×30                 | 0.15 | 1.91                                             | ESMM181VSN471MP30S |             | 1,800       | 30×50                 | 0.15 | 4.60                                             | ESMM201VSN182MR50S |
|             | 470         | 25.4×25               | 0.15 | 2.08                                             | ESMM181VSN471MQ25S |             | 1,800       | 35×40                 | 0.15 | 4.59                                             | ESMM201VSN182MA40S |
|             | 470         | 30×20                 | 0.15 | 1.88                                             | ESMM181VSN471MR20S |             | 2,200       | 35×45                 | 0.15 | 5.25                                             | ESMM201VSN222MA45S |
|             | 560         | 20×40                 | 0.15 | 2.15                                             | ESMM181VSN561MN40S | 220         | 180         | 22×20                 | 0.15 | 1.06                                             | ESMM221VSN181MP20S |
|             | 560         | 22×35                 | 0.15 | 2.25                                             | ESMM181VSN561MP35S |             | 220         | 20×25                 | 0.15 | 1.25                                             | ESMM221VSN221MN25S |
|             | 560         | 25.4×25               | 0.15 | 2.25                                             | ESMM181VSN561MQ25S |             | 270         | 20×30                 | 0.15 | 1.46                                             | ESMM221VSN271MN30S |
|             | 680         | 20×45                 | 0.15 | 2.41                                             | ESMM181VSN681MN45S |             | 270         | 22×25                 | 0.15 | 1.47                                             | ESMM221VSN271MP25S |
|             | 680         | 22×35                 | 0.15 | 2.48                                             | ESMM181VSN681MP35S |             | 270         | 25.4×20               | 0.15 | 1.35                                             | ESMM221VSN271MQ20S |
|             | 680         | 25.4×30               | 0.15 | 2.50                                             | ESMM181VSN681MQ30S |             | 330         | 20×35                 | 0.15 | 1.64                                             | ESMM221VSN331MN35S |
|             | 680         | 30×25                 | 0.15 | 2.46                                             | ESMM181VSN681MR25S |             | 330         | 22×30                 | 0.15 | 1.70                                             | ESMM221VSN331MP30S |
|             | 680         | 35×20                 | 0.15 | 2.26                                             | ESMM181VSN681MA20S |             | 330         | 25.4×25               | 0.15 | 1.69                                             | ESMM221VSN331MQ25S |
|             | 820         | 20×50                 | 0.15 | 2.72                                             | ESMM181VSN821MN50S |             | 330         | 30×20                 | 0.15 | 1.58                                             | ESMM221VSN331MR20S |
|             | 820         | 22×40                 | 0.15 | 2.86                                             | ESMM181VSN821MP40S |             | 390         | 20×35                 | 0.15 | 1.84                                             | ESMM221VSN391MN35S |
|             | 820         | 25.4×35               | 0.15 | 2.75                                             | ESMM181VSN821MQ35S |             | 390         | 22×30                 | 0.15 | 1.89                                             | ESMM221VSN391MP30S |
|             | 820         | 30×25                 | 0.15 | 2.69                                             | ESMM181VSN821MR25S |             | 390         | 25.4×25               | 0.15 | 1.84                                             | ESMM221VSN391MQ25S |
|             | 1,000       | 22×50                 | 0.15 | 3.10                                             | ESMM181VSN102MP50S |             | 390         | 30×20                 | 0.15 | 1.71                                             | ESMM221VSN391MR20S |
|             | 1,000       | 25.4×40               | 0.15 | 3.06                                             | ESMM181VSN102MQ40S |             | 470         | 20×40                 | 0.15 | 2.12                                             | ESMM221VSN471MN40S |
|             | 1,000       | 30×30                 | 0.15 | 3.10                                             | ESMM181VSN102MR30S |             | 470         | 22×35                 | 0.15 | 2.08                                             | ESMM221VSN471MP35S |
|             | 1,000       | 35×25                 | 0.15 | 2.98                                             | ESMM181VSN102MA25S |             | 470         | 25.4×30               | 0.15 | 2.08                                             | ESMM221VSN471MQ30S |


**SMM**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|
| 220         | 470         | 30×25                 | 0.15 | 2.12                                             | ESMM221VSN471MR25S | 315         | 180         | 22×30                 | 0.15 | 1.29                                             | ESMM3B1VSN181MP30S |
|             | 470         | 35×20                 | 0.15 | 1.88                                             | ESMM221VSN471MA20S |             | 180         | 25.4×25               | 0.15 | 1.38                                             | ESMM3B1VSN181MQ25S |
|             | 560         | 20×50                 | 0.15 | 2.33                                             | ESMM221VSN561MN50S |             | 180         | 30×20                 | 0.15 | 1.16                                             | ESMM3B1VSN181MR20S |
|             | 560         | 22×40                 | 0.15 | 2.33                                             | ESMM221VSN561MP40S |             | 220         | 20×35                 | 0.15 | 1.30                                             | ESMM3B1VSN221MN35S |
|             | 560         | 25.4×35               | 0.15 | 2.38                                             | ESMM221VSN561MQ35S |             | 220         | 22×30                 | 0.15 | 1.41                                             | ESMM3B1VSN221MP30S |
|             | 560         | 30×25                 | 0.15 | 2.31                                             | ESMM221VSN561MR25S |             | 220         | 25.4×25               | 0.15 | 1.47                                             | ESMM3B1VSN221MQ25S |
|             | 560         | 35×20                 | 0.15 | 2.14                                             | ESMM221VSN561MA20S |             | 220         | 30×20                 | 0.15 | 1.28                                             | ESMM3B1VSN221MR20S |
|             | 680         | 22×45                 | 0.15 | 2.63                                             | ESMM221VSN681MP45S |             | 270         | 20×45                 | 0.15 | 1.52                                             | ESMM3B1VSN271MN45S |
|             | 680         | 25.4×35               | 0.15 | 2.68                                             | ESMM221VSN681MQ35S |             | 270         | 22×35                 | 0.15 | 1.68                                             | ESMM3B1VSN271MP35S |
|             | 680         | 30×30                 | 0.15 | 2.62                                             | ESMM221VSN681MR30S |             | 270         | 25.4×30               | 0.15 | 1.70                                             | ESMM3B1VSN271MQ30S |
|             | 680         | 35×25                 | 0.15 | 2.58                                             | ESMM221VSN681MA25S |             | 270         | 30×25                 | 0.15 | 1.55                                             | ESMM3B1VSN271MR25S |
|             | 820         | 25.4×45               | 0.15 | 3.01                                             | ESMM221VSN821MQ45S |             | 270         | 35×20                 | 0.15 | 1.43                                             | ESMM3B1VSN271MA20S |
|             | 820         | 30×35                 | 0.15 | 2.99                                             | ESMM221VSN821MR35S |             | 330         | 20×50                 | 0.15 | 1.73                                             | ESMM3B1VSN271MP30S |
|             | 820         | 35×30                 | 0.15 | 2.79                                             | ESMM221VSN821MA30S |             | 330         | 22×40                 | 0.15 | 1.91                                             | ESMM3B1VSN331MP40S |
|             | 1,000       | 25.4×50               | 0.15 | 3.40                                             | ESMM221VSN102MQ50S |             | 330         | 25.4×35               | 0.15 | 1.94                                             | ESMM3B1VSN331MQ35S |
|             | 1,000       | 30×35                 | 0.15 | 3.42                                             | ESMM221VSN102MR35S |             | 330         | 30×25                 | 0.15 | 1.98                                             | ESMM3B1VSN331MR25S |
|             | 1,000       | 35×30                 | 0.15 | 3.29                                             | ESMM221VSN102MA30S |             | 390         | 22×45                 | 0.15 | 2.07                                             | ESMM3B1VSN391MP45S |
|             | 1,200       | 30×40                 | 0.15 | 3.88                                             | ESMM221VSN122MR40S |             | 390         | 25.4×40               | 0.15 | 2.11                                             | ESMM3B1VSN391MQ40S |
|             | 1,200       | 35×35                 | 0.15 | 3.68                                             | ESMM221VSN122MA35S |             | 390         | 30×30                 | 0.15 | 2.15                                             | ESMM3B1VSN391MR30S |
|             | 1,500       | 30×50                 | 0.15 | 4.44                                             | ESMM221VSN152MR50S |             | 390         | 35×25                 | 0.15 | 1.95                                             | ESMM3B1VSN391MA25S |
|             | 1,500       | 35×40                 | 0.15 | 4.10                                             | ESMM221VSN152MA40S |             | 470         | 25.4×45               | 0.15 | 2.31                                             | ESMM3B1VSN471MQ45S |
|             | 1,800       | 35×45                 | 0.15 | 4.52                                             | ESMM221VSN182MA45S |             | 470         | 30×35                 | 0.15 | 2.38                                             | ESMM3B1VSN471MR35S |
| 250         | 150         | 22×20                 | 0.15 | 0.97                                             | ESMM251VSN151MP20S | 350         | 470         | 35×30                 | 0.15 | 2.46                                             | ESMM3B1VSN471MA30S |
|             | 180         | 20×25                 | 0.15 | 1.20                                             | ESMM251VSN181MN25S |             | 560         | 25.4×50               | 0.15 | 2.46                                             | ESMM3B1VSN561MQ50S |
|             | 180         | 22×20                 | 0.15 | 1.06                                             | ESMM251VSN181MP20S |             | 560         | 30×35                 | 0.15 | 2.63                                             | ESMM3B1VSN561MR35S |
|             | 220         | 20×25                 | 0.15 | 1.26                                             | ESMM251VSN221MN25S |             | 560         | 35×30                 | 0.15 | 2.69                                             | ESMM3B1VSN561MA30S |
|             | 220         | 22×25                 | 0.15 | 1.24                                             | ESMM251VSN221MP25S |             | 680         | 30×45                 | 0.15 | 2.82                                             | ESMM3B1VSN681MR45S |
|             | 220         | 25.4×20               | 0.15 | 1.22                                             | ESMM251VSN221MQ20S |             | 680         | 35×35                 | 0.15 | 3.05                                             | ESMM3B1VSN681MA35S |
|             | 270         | 20×30                 | 0.15 | 1.42                                             | ESMM251VSN271MN30S |             | 820         | 30×50                 | 0.15 | 3.28                                             | ESMM3B1VSN821MR50S |
|             | 270         | 22×25                 | 0.15 | 1.50                                             | ESMM251VSN271MP25S |             | 820         | 35×40                 | 0.15 | 3.45                                             | ESMM3B1VSN821MA40S |
|             | 330         | 20×35                 | 0.15 | 1.68                                             | ESMM251VSN331MN35S |             | 1,000       | 35×45                 | 0.15 | 3.59                                             | ESMM3B1VSN102MA45S |
|             | 330         | 22×30                 | 0.15 | 1.66                                             | ESMM251VSN331MP30S |             | 82          | 22×20                 | 0.15 | 0.72                                             | ESMM351VSN820MP20S |
|             | 330         | 25.4×25               | 0.15 | 1.61                                             | ESMM251VSN331MQ25S |             | 100         | 20×25                 | 0.15 | 0.81                                             | ESMM351VSN101MN25S |
|             | 330         | 30×20                 | 0.15 | 1.58                                             | ESMM251VSN331MR20S |             | 120         | 20×30                 | 0.15 | 0.96                                             | ESMM351VSN121MN30S |
|             | 390         | 20×40                 | 0.15 | 1.92                                             | ESMM251VSN391MN40S |             | 120         | 22×25                 | 0.15 | 1.04                                             | ESMM351VSN121MP25S |
|             | 390         | 22×35                 | 0.15 | 1.88                                             | ESMM251VSN391MP35S |             | 120         | 25.4×20               | 0.15 | 0.90                                             | ESMM351VSN121MQ20S |
|             | 390         | 25.4×30               | 0.15 | 1.88                                             | ESMM251VSN391MQ30S |             | 150         | 20×30                 | 0.15 | 1.10                                             | ESMM351VSN151MN30S |
|             | 390         | 30×25                 | 0.15 | 1.86                                             | ESMM251VSN391MR25S |             | 150         | 22×30                 | 0.15 | 1.20                                             | ESMM351VSN151MP30S |
|             | 390         | 35×20                 | 0.15 | 1.71                                             | ESMM251VSN391MA20S |             | 150         | 25.4×25               | 0.15 | 1.22                                             | ESMM351VSN151MQ25S |
|             | 470         | 20×50                 | 0.15 | 2.06                                             | ESMM251VSN471MN50S |             | 150         | 30×20                 | 0.15 | 1.06                                             | ESMM351VSN151MR20S |
|             | 470         | 22×35                 | 0.15 | 2.15                                             | ESMM251VSN471MP35S |             | 180         | 20×35                 | 0.15 | 1.24                                             | ESMM351VSN181MN35S |
|             | 470         | 25.4×35               | 0.15 | 2.15                                             | ESMM251VSN471MQ35S |             | 180         | 22×30                 | 0.15 | 1.34                                             | ESMM351VSN181MP30S |
|             | 470         | 30×25                 | 0.15 | 2.05                                             | ESMM251VSN471MR25S |             | 180         | 25.4×25               | 0.15 | 1.37                                             | ESMM351VSN181MQ25S |
|             | 470         | 35×20                 | 0.15 | 1.88                                             | ESMM251VSN471MA20S |             | 180         | 30×20                 | 0.15 | 1.16                                             | ESMM351VSN181MR20S |
| 315         | 560         | 22×40                 | 0.15 | 2.48                                             | ESMM251VSN561MP40S | 350         | 220         | 20×45                 | 0.15 | 1.37                                             | ESMM351VSN221MN45S |
|             | 560         | 25.4×35               | 0.15 | 2.35                                             | ESMM251VSN561MQ35S |             | 220         | 22×35                 | 0.15 | 1.47                                             | ESMM351VSN221MP35S |
|             | 560         | 30×25                 | 0.15 | 2.35                                             | ESMM251VSN561MR25S |             | 220         | 25.4×30               | 0.15 | 1.53                                             | ESMM351VSN221MQ30S |
|             | 680         | 22×50                 | 0.15 | 2.61                                             | ESMM251VSN681MP50S |             | 220         | 30×25                 | 0.15 | 1.54                                             | ESMM351VSN221MR25S |
|             | 680         | 25.4×40               | 0.15 | 2.67                                             | ESMM251VSN681MQ40S |             | 220         | 35×20                 | 0.15 | 1.29                                             | ESMM351VSN221MA20S |
|             | 680         | 30×30                 | 0.15 | 2.71                                             | ESMM251VSN681MR30S |             | 270         | 20×50                 | 0.15 | 1.56                                             | ESMM351VSN271MN50S |
|             | 680         | 35×25                 | 0.15 | 2.58                                             | ESMM251VSN681MA25S |             | 270         | 22×40                 | 0.15 | 1.70                                             | ESMM351VSN271MP40S |
|             | 820         | 25.4×45               | 0.15 | 3.01                                             | ESMM251VSN821MQ45S |             | 270         | 25.4×35               | 0.15 | 1.73                                             | ESMM351VSN271MQ35S |
|             | 820         | 30×35                 | 0.15 | 2.98                                             | ESMM251VSN821MR35S |             | 270         | 30×25                 | 0.15 | 1.80                                             | ESMM351VSN271MR25S |
|             | 820         | 35×30                 | 0.15 | 2.96                                             | ESMM251VSN821MA30S |             | 270         | 35×20                 | 0.15 | 1.49                                             | ESMM351VSN271MA20S |
|             | 1,000       | 30×40                 | 0.15 | 3.56                                             | ESMM251VSN102MR40S |             | 330         | 22×45                 | 0.15 | 1.87                                             | ESMM351VSN331MP45S |
|             | 1,000       | 35×35                 | 0.15 | 3.48                                             | ESMM251VSN102MA35S |             | 330         | 25.4×35               | 0.15 | 1.97                                             | ESMM351VSN331MQ35S |
|             | 1,200       | 30×45                 | 0.15 | 3.99                                             | ESMM251VSN122MR45S |             | 330         | 30×30                 | 0.15 | 2.03                                             | ESMM351VSN331MR30S |
|             | 1,200       | 35×35                 | 0.15 | 3.84                                             | ESMM251VSN122MA35S |             | 330         | 35×25                 | 0.15 | 1.80                                             | ESMM351VSN331MA25S |
|             | 1,500       | 35×40                 | 0.15 | 4.33                                             | ESMM251VSN152MA40S |             | 390         | 25.4×40               | 0.15 | 2.14                                             | ESMM351VSN391MQ40S |
|             | 1,800       | 35×50                 | 0.15 | 4.54                                             | ESMM251VSN182MA50S |             | 390         | 30×35                 | 0.15 | 2.23                                             | ESMM351VSN391MR35S |
|             | 100         | 22×20                 | 0.15 | 0.79                                             | ESMM3B1VSN101MP20S |             | 390         | 35×30                 | 0.15 | 2.30                                             | ESMM351VSN391MA30S |
|             | 120         | 20×25                 | 0.15 | 0.89                                             | ESMM3B1VSN121MN25S |             | 470         | 25.4×50               | 0.15 | 2.55                                             | ESMM351VSN471MQ50S |
|             | 120         | 25.4×20               | 0.15 | 0.90                                             | ESMM3B1VSN121MQ20S |             | 470         | 30×35                 | 0.15 | 2.53                                             | ESMM351VSN471MR35S |
|             | 150         | 20×30                 | 0.15 | 1.05                                             | ESMM3B1VSN151MN30S |             | 470         | 35×30                 | 0.15 | 2.55                                             | ESMM351VSN471MA30S |
|             | 150         | 22×25                 | 0.15 | 1.06                                             | ESMM3B1VSN151MP25S |             | 560         | 30×40                 | 0.15 | 2.73                                             | ESMM351VSN561MR40S |
|             | 150         | 25.4×20               | 0.15 | 1.00                                             | ESMM3B1VSN151MQ20S |             | 560         | 35×35                 | 0.15 | 2.75                                             | ESMM351VSN561MA35S |
|             | 180         | 20×35                 | 0.15 | 1.18                                             | ESMM3B1VSN181MN35S |             | 680         | 30×50                 | 0.15 | 3.15                                             | ESMM351VSN681MR50S |


**SMM**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|
| 350         | 680         | 35 × 40               | 0.15 | 3.15                                             | ESMM351VSN681MA40S | 420         | 180         | 20 × 50               | 0.20 | 1.27                                             | ESMM421VSN181MN50S |
|             | 820         | 35 × 45               | 0.15 | 3.47                                             | ESMM351VSN821MA45S |             | 180         | 22 × 40               | 0.20 | 1.33                                             | ESMM421VSN181MP40S |
|             | 1,000       | 35 × 50               | 0.15 | 3.60                                             | ESMM351VSN102MA50S |             | 180         | 25.4 × 35             | 0.20 | 1.42                                             | ESMM421VSN181MQ35S |
| 400         | 68          | 20 × 25               | 0.15 | 0.75                                             | ESMM401VSN680MN25S |             | 180         | 30 × 25               | 0.20 | 1.48                                             | ESMM421VSN181MR25S |
|             | 68          | 22 × 20               | 0.15 | 0.65                                             | ESMM401VSN680MP20S |             | 180         | 35 × 20               | 0.20 | 1.16                                             | ESMM421VSN181MA20S |
|             | 82          | 20 × 25               | 0.15 | 0.82                                             | ESMM401VSN820MN25S |             | 220         | 22 × 45               | 0.20 | 1.55                                             | ESMM421VSN221MP45S |
|             | 82          | 22 × 25               | 0.15 | 0.84                                             | ESMM401VSN820MP25S |             | 220         | 25.4 × 35             | 0.20 | 1.58                                             | ESMM421VSN221MQ35S |
|             | 82          | 25.4 × 20             | 0.15 | 0.74                                             | ESMM401VSN820MQ20S |             | 220         | 30 × 30               | 0.20 | 1.65                                             | ESMM421VSN221MR30S |
|             | 100         | 20 × 30               | 0.15 | 0.95                                             | ESMM401VSN101MP30S |             | 220         | 35 × 25               | 0.20 | 1.47                                             | ESMM421VSN221MA25S |
|             | 100         | 22 × 25               | 0.15 | 0.99                                             | ESMM401VSN101MP25S |             | 270         | 25.4 × 40             | 0.20 | 1.74                                             | ESMM421VSN271MQ40S |
|             | 100         | 25.4 × 20             | 0.15 | 0.82                                             | ESMM401VSN101MQ20S |             | 270         | 30 × 35               | 0.20 | 1.90                                             | ESMM421VSN271MR35S |
|             | 120         | 20 × 35               | 0.15 | 1.07                                             | ESMM401VSN121MN35S |             | 270         | 35 × 30               | 0.20 | 1.94                                             | ESMM421VSN271MA30S |
|             | 120         | 22 × 30               | 0.15 | 1.09                                             | ESMM401VSN121MP30S |             | 330         | 25.4 × 50             | 0.20 | 2.20                                             | ESMM421VSN331MQ50S |
|             | 120         | 25.4 × 25             | 0.15 | 1.13                                             | ESMM401VSN121MQ25S |             | 330         | 30 × 35               | 0.20 | 1.98                                             | ESMM421VSN331MR35S |
|             | 120         | 30 × 20               | 0.15 | 0.95                                             | ESMM401VSN121MR20S |             | 330         | 35 × 35               | 0.20 | 2.17                                             | ESMM421VSN331MA35S |
|             | 150         | 20 × 40               | 0.15 | 1.22                                             | ESMM401VSN151MN40S |             | 390         | 30 × 40               | 0.20 | 2.22                                             | ESMM421VSN391MR40S |
|             | 150         | 22 × 35               | 0.15 | 1.24                                             | ESMM401VSN151MP35S |             | 390         | 35 × 35               | 0.20 | 2.27                                             | ESMM421VSN391MA35S |
|             | 150         | 25.4 × 30             | 0.15 | 1.27                                             | ESMM401VSN151MQ30S |             | 470         | 30 × 45               | 0.20 | 2.50                                             | ESMM421VSN471MR45S |
|             | 150         | 30 × 25               | 0.15 | 1.20                                             | ESMM401VSN151MR25S |             | 470         | 35 × 40               | 0.20 | 2.61                                             | ESMM421VSN471MA40S |
|             | 180         | 20 × 45               | 0.15 | 1.28                                             | ESMM401VSN181MN45S |             | 560         | 35 × 45               | 0.20 | 2.95                                             | ESMM421VSN561MA45S |
|             | 180         | 22 × 40               | 0.15 | 1.41                                             | ESMM401VSN181MP40S |             | 680         | 35 × 50               | 0.20 | 3.15                                             | ESMM421VSN681MA50S |
|             | 180         | 25.4 × 30             | 0.15 | 1.44                                             | ESMM401VSN181MQ30S | 450         | 47          | 22 × 20               | 0.20 | 0.54                                             | ESMM451VSN470MP20S |
|             | 180         | 30 × 25               | 0.15 | 1.52                                             | ESMM401VSN181MR25S |             | 56          | 20 × 25               | 0.20 | 0.61                                             | ESMM451VSN560MN25S |
|             | 180         | 35 × 20               | 0.15 | 1.16                                             | ESMM401VSN181MA20S |             | 56          | 22 × 20               | 0.20 | 0.59                                             | ESMM451VSN560MP20S |
|             | 220         | 20 × 50               | 0.15 | 1.41                                             | ESMM401VSN221MN50S |             | 68          | 20 × 30               | 0.20 | 0.71                                             | ESMM451VSN680MN30S |
|             | 220         | 22 × 45               | 0.15 | 1.58                                             | ESMM401VSN221MP45S |             | 68          | 22 × 25               | 0.20 | 0.71                                             | ESMM451VSN680MP25S |
|             | 220         | 25.4 × 35             | 0.15 | 1.64                                             | ESMM401VSN221MQ35S |             | 68          | 25.4 × 20             | 0.20 | 0.68                                             | ESMM451VSN680MQ20S |
|             | 220         | 30 × 30               | 0.15 | 1.66                                             | ESMM401VSN221MR30S |             | 82          | 20 × 35               | 0.20 | 0.80                                             | ESMM451VSN820MN35S |
|             | 220         | 35 × 25               | 0.15 | 1.47                                             | ESMM401VSN221MA25S |             | 82          | 22 × 25               | 0.20 | 0.86                                             | ESMM451VSN820MP25S |
|             | 270         | 22 × 50               | 0.15 | 1.65                                             | ESMM401VSN271MP50S |             | 82          | 25.4 × 20             | 0.20 | 0.74                                             | ESMM451VSN820MQ20S |
|             | 270         | 25.4 × 40             | 0.15 | 1.79                                             | ESMM401VSN271MQ40S |             | 82          | 30 × 20               | 0.20 | 0.79                                             | ESMM451VSN820MR20S |
|             | 270         | 30 × 30               | 0.15 | 1.82                                             | ESMM401VSN271MR30S |             | 100         | 20 × 35               | 0.20 | 0.88                                             | ESMM451VSN101MN35S |
|             | 270         | 35 × 25               | 0.15 | 1.63                                             | ESMM401VSN271MA25S |             | 100         | 22 × 30               | 0.20 | 0.95                                             | ESMM451VSN101MP30S |
|             | 330         | 25.4 × 45             | 0.15 | 2.00                                             | ESMM401VSN331MQ45S |             | 100         | 25.4 × 25             | 0.20 | 0.97                                             | ESMM451VSN101MQ25S |
|             | 330         | 30 × 35               | 0.15 | 2.05                                             | ESMM401VSN331MR35S |             | 100         | 30 × 20               | 0.20 | 0.87                                             | ESMM451VSN101MR20S |
|             | 330         | 35 × 30               | 0.15 | 2.05                                             | ESMM401VSN331MA30S |             | 120         | 20 × 40               | 0.20 | 0.99                                             | ESMM451VSN121MN40S |
|             | 390         | 25.4 × 50             | 0.15 | 2.12                                             | ESMM401VSN391MQ50S |             | 120         | 22 × 35               | 0.20 | 1.07                                             | ESMM451VSN121MP35S |
|             | 390         | 30 × 40               | 0.15 | 2.26                                             | ESMM401VSN391MR40S |             | 120         | 25.4 × 30             | 0.20 | 1.09                                             | ESMM451VSN121MQ30S |
|             | 390         | 35 × 35               | 0.15 | 2.28                                             | ESMM401VSN391MA35S |             | 120         | 30 × 25               | 0.20 | 1.12                                             | ESMM451VSN121MR25S |
|             | 470         | 30 × 45               | 0.15 | 2.51                                             | ESMM401VSN471MR45S |             | 120         | 35 × 20               | 0.20 | 0.99                                             | ESMM451VSN121MA20S |
|             | 470         | 35 × 35               | 0.15 | 2.54                                             | ESMM401VSN471MA35S |             | 150         | 20 × 45               | 0.20 | 1.13                                             | ESMM451VSN151MN45S |
|             | 560         | 30 × 50               | 0.15 | 2.85                                             | ESMM401VSN561MR50S |             | 150         | 22 × 40               | 0.20 | 1.18                                             | ESMM451VSN151MP40S |
|             | 560         | 35 × 40               | 0.15 | 2.85                                             | ESMM401VSN561MA40S |             | 150         | 25.4 × 30             | 0.20 | 1.25                                             | ESMM451VSN151MQ30S |
|             | 680         | 35 × 50               | 0.15 | 3.10                                             | ESMM401VSN681MA50S |             | 150         | 30 × 25               | 0.20 | 1.29                                             | ESMM451VSN151MR25S |
| 420         | 47          | 22 × 20               | 0.20 | 0.54                                             | ESMM421VSN470MP20S |             | 150         | 35 × 20               | 0.20 | 1.06                                             | ESMM451VSN151MA20S |
|             | 56          | 20 × 25               | 0.20 | 0.58                                             | ESMM421VSN560MN25S |             | 180         | 22 × 45               | 0.20 | 1.32                                             | ESMM451VSN181MP45S |
|             | 56          | 22 × 20               | 0.20 | 0.59                                             | ESMM421VSN560MP20S |             | 180         | 25.4 × 35             | 0.20 | 1.40                                             | ESMM451VSN181MQ35S |
|             | 68          | 20 × 25               | 0.20 | 0.70                                             | ESMM421VSN680MN25S |             | 180         | 30 × 30               | 0.20 | 1.45                                             | ESMM451VSN181MR30S |
|             | 68          | 25.4 × 20             | 0.20 | 0.68                                             | ESMM421VSN680MQ20S |             | 180         | 35 × 25               | 0.20 | 1.33                                             | ESMM451VSN181MA25S |
|             | 82          | 20 × 30               | 0.20 | 0.80                                             | ESMM421VSN820MN30S |             | 220         | 22 × 50               | 0.20 | 1.48                                             | ESMM451VSN221MP50S |
|             | 82          | 22 × 25               | 0.20 | 0.85                                             | ESMM421VSN820MP25S |             | 220         | 25.4 × 40             | 0.20 | 1.59                                             | ESMM451VSN221MQ40S |
|             | 82          | 25.4 × 20             | 0.20 | 0.74                                             | ESMM421VSN820MQ20S |             | 220         | 30 × 30               | 0.20 | 1.64                                             | ESMM451VSN221MR30S |
|             | 100         | 20 × 35               | 0.20 | 0.90                                             | ESMM421VSN101MN35S |             | 220         | 35 × 25               | 0.20 | 1.66                                             | ESMM451VSN221MA25S |
|             | 100         | 22 × 30               | 0.20 | 0.97                                             | ESMM421VSN101MP30S |             | 270         | 25.4 × 45             | 0.20 | 1.73                                             | ESMM451VSN271MQ45S |
|             | 100         | 25.4 × 25             | 0.20 | 0.98                                             | ESMM421VSN101MQ25S |             | 270         | 30 × 35               | 0.20 | 1.89                                             | ESMM451VSN271MR35S |
|             | 100         | 30 × 20               | 0.20 | 0.87                                             | ESMM421VSN101MR20S |             | 270         | 35 × 30               | 0.20 | 1.90                                             | ESMM451VSN271MA30S |
|             | 120         | 20 × 35               | 0.20 | 1.04                                             | ESMM421VSN121MN35S |             | 330         | 25.4 × 50             | 0.20 | 2.12                                             | ESMM451VSN331MQ50S |
|             | 120         | 22 × 30               | 0.20 | 1.07                                             | ESMM421VSN121MP30S |             | 330         | 30 × 40               | 0.20 | 2.12                                             | ESMM451VSN331MR40S |
|             | 120         | 25.4 × 25             | 0.20 | 1.08                                             | ESMM421VSN121MQ25S |             | 330         | 35 × 35               | 0.20 | 2.15                                             | ESMM451VSN331MA35S |
|             | 120         | 30 × 20               | 0.20 | 0.95                                             | ESMM421VSN121MR20S |             | 390         | 30 × 45               | 0.20 | 2.35                                             | ESMM451VSN391MR45S |
|             | 150         | 20 × 40               | 0.20 | 1.17                                             | ESMM421VSN151MN40S |             | 390         | 35 × 40               | 0.20 | 2.38                                             | ESMM451VSN391MA40S |
|             | 150         | 22 × 35               | 0.20 | 1.21                                             | ESMM421VSN151MP35S |             | 470         | 30 × 50               | 0.20 | 2.65                                             | ESMM451VSN471MR50S |
|             | 150         | 25.4 × 30             | 0.20 | 1.26                                             | ESMM421VSN151MQ30S |             | 470         | 35 × 45               | 0.20 | 2.68                                             | ESMM451VSN471MA45S |
|             | 150         | 30 × 25               | 0.20 | 1.30                                             | ESMM421VSN151MR25S |             | 560         | 35 × 50               | 0.20 | 2.88                                             | ESMM451VSN561MA50S |
|             | 150         | 35 × 20               | 0.20 | 1.11                                             | ESMM421VSN151MA20S |             |             |                       |      |                                                  |                    |

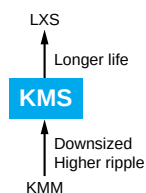


## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105°C

# KMS<sub>Series</sub>

- Longer life than current snap-ins KMQ series
- Downsized from current downsized snap-ins KMM series
- Endurance with ripple current : 105°C 3,000 hours
- Rated voltage range : 160 to 450V
- Capacitance range : 82 to 3,300μF
- Non solvent resistant type
- RoHS Compliant

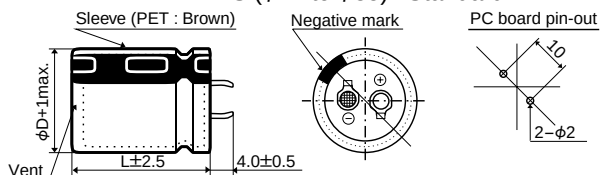


## SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |                       |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------|
| Category                                               | –25 to +105°C                                                                                                                                                                                                                                                                           |                                      |                       |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                         |                                      |                       |
| Rated Voltage Range                                    | 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                      |                       |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |                       |
| Leakage Current                                        | I≤3√CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                           |                                      |                       |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 400V                          | 420 & 450V            |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.15                                 | 0.20 (at 20°C, 120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 400V                          | 420 & 450V            |
|                                                        | Z(–25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 8 (at 120Hz)          |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 3,000 hours at 105°C.                                                                                               |                                      |                       |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |                       |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |                       |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |                       |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |                       |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±15% of the initial value           |                       |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤150% of the initial specified value |                       |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |                       |

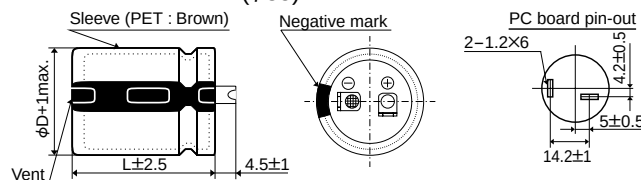
## DIMENSIONS [mm]

- Terminal Code : VS (φ22 to φ35) : Standard

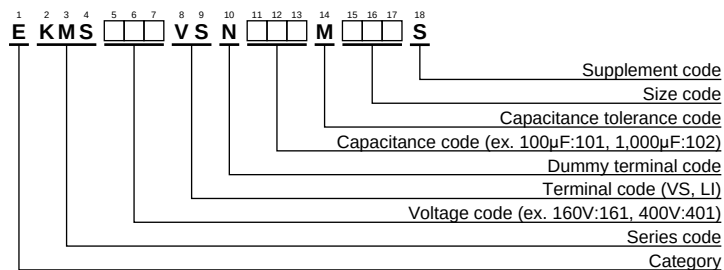


The standard design has no plastic disc.

- Terminal Code : LI (φ35)



## PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"


**KMS** Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 160         | 470         | 22 × 25               | 0.15 | 1.47                                              | EKMS161VSN471MP25S | 200         | 1,800       | 30 × 45               | 0.15 | 3.66                                              | EKMS201VSN182MR45S |
|             | 680         | 22 × 30               | 0.15 | 1.86                                              | EKMS161VSN681MP30S |             | 1,800       | 30 × 50               | 0.15 | 3.72                                              | EKMS201VSN182MR50S |
|             | 680         | 25.4 × 25             | 0.15 | 1.84                                              | EKMS161VSN681MQ25S |             | 1,800       | 35 × 40               | 0.15 | 3.81                                              | EKMS201VSN182MA40S |
|             | 820         | 22 × 35               | 0.15 | 2.09                                              | EKMS161VSN821MP35S |             | 2,200       | 35 × 45               | 0.15 | 4.32                                              | EKMS201VSN222MA45S |
|             | 820         | 25.4 × 30             | 0.15 | 2.08                                              | EKMS161VSN821MQ30S |             | 2,700       | 35 × 50               | 0.15 | 4.88                                              | EKMS201VSN272MA50S |
|             | 1,000       | 22 × 40               | 0.15 | 2.35                                              | EKMS161VSN102MP40S | 250         | 270         | 22 × 25               | 0.15 | 1.11                                              | EKMS251VSN271MP25S |
|             | 1,000       | 22 × 45               | 0.15 | 2.40                                              | EKMS161VSN102MP45S |             | 330         | 22 × 30               | 0.15 | 1.29                                              | EKMS251VSN331MP30S |
|             | 1,000       | 25.4 × 35             | 0.15 | 2.40                                              | EKMS161VSN102MQ35S |             | 390         | 22 × 35               | 0.15 | 1.44                                              | EKMS251VSN391MP35S |
|             | 1,000       | 30 × 25               | 0.15 | 2.50                                              | EKMS161VSN102MR25S |             | 390         | 25.4 × 25             | 0.15 | 1.40                                              | EKMS251VSN391MQ25S |
|             | 1,200       | 22 × 50               | 0.15 | 2.69                                              | EKMS161VSN122MP50S |             | 470         | 22 × 40               | 0.15 | 1.61                                              | EKMS251VSN471MP40S |
|             | 1,200       | 25.4 × 40             | 0.15 | 2.68                                              | EKMS161VSN122MQ40S |             | 470         | 25.4 × 30             | 0.15 | 1.57                                              | EKMS251VSN471MQ30S |
|             | 1,200       | 30 × 30               | 0.15 | 2.77                                              | EKMS161VSN122MR30S |             | 560         | 22 × 45               | 0.15 | 1.79                                              | EKMS251VSN561MP45S |
|             | 1,200       | 35 × 25               | 0.15 | 2.91                                              | EKMS161VSN122MA25S |             | 560         | 25.4 × 35             | 0.15 | 1.79                                              | EKMS251VSN561MQ35S |
|             | 1,500       | 25.4 × 45             | 0.15 | 3.05                                              | EKMS161VSN152MQ45S |             | 560         | 30 × 25               | 0.15 | 1.87                                              | EKMS251VSN561MR25S |
|             | 1,500       | 30 × 35               | 0.15 | 3.17                                              | EKMS161VSN152MR35S |             | 680         | 22 × 50               | 0.15 | 2.02                                              | EKMS251VSN681MP50S |
|             | 1,800       | 25.4 × 50             | 0.15 | 3.40                                              | EKMS161VSN182MQ50S |             | 680         | 25.4 × 40             | 0.15 | 2.02                                              | EKMS251VSN681MQ40S |
|             | 1,800       | 30 × 40               | 0.15 | 3.57                                              | EKMS161VSN182MR40S |             | 680         | 30 × 30               | 0.15 | 2.08                                              | EKMS251VSN681MR30S |
|             | 1,800       | 35 × 30               | 0.15 | 3.62                                              | EKMS161VSN182MA30S |             | 680         | 35 × 25               | 0.15 | 2.19                                              | EKMS251VSN681MA25S |
|             | 2,200       | 30 × 45               | 0.15 | 4.05                                              | EKMS161VSN222MA45S |             | 820         | 25.4 × 45             | 0.15 | 2.26                                              | EKMS251VSN821MQ45S |
|             | 2,200       | 35 × 35               | 0.15 | 4.07                                              | EKMS161VSN222MA35S |             | 820         | 30 × 35               | 0.15 | 2.34                                              | EKMS251VSN821MR35S |
|             | 2,700       | 30 × 50               | 0.15 | 4.56                                              | EKMS161VSN272MR50S |             | 1,000       | 25.4 × 50             | 0.15 | 2.53                                              | EKMS251VSN102MQ50S |
|             | 2,700       | 35 × 40               | 0.15 | 4.67                                              | EKMS161VSN272MA40S |             | 1,000       | 30 × 40               | 0.15 | 2.66                                              | EKMS251VSN102MR40S |
|             | 2,700       | 35 × 45               | 0.15 | 4.78                                              | EKMS161VSN272MA45S |             | 1,000       | 35 × 30               | 0.15 | 2.70                                              | EKMS251VSN102MA30S |
|             | 3,300       | 35 × 50               | 0.15 | 5.40                                              | EKMS161VSN332MA50S |             | 1,200       | 30 × 45               | 0.15 | 2.99                                              | EKMS251VSN122MR45S |
| 180         | 390         | 22 × 25               | 0.15 | 1.34                                              | EKMS181VSN391MP25S | 315         | 1,200       | 30 × 50               | 0.15 | 3.04                                              | EKMS251VSN122MR50S |
|             | 560         | 22 × 30               | 0.15 | 1.68                                              | EKMS181VSN561MP30S |             | 1,200       | 35 × 35               | 0.15 | 3.00                                              | EKMS251VSN122MA35S |
|             | 560         | 25.4 × 25             | 0.15 | 1.67                                              | EKMS181VSN561MQ25S |             | 1,500       | 35 × 40               | 0.15 | 3.48                                              | EKMS251VSN152MA40S |
|             | 680         | 22 × 35               | 0.15 | 1.90                                              | EKMS181VSN681MP35S |             | 1,500       | 35 × 45               | 0.15 | 3.56                                              | EKMS251VSN152MA45S |
|             | 820         | 22 × 40               | 0.15 | 2.13                                              | EKMS181VSN821MP40S |             | 1,800       | 35 × 50               | 0.15 | 3.98                                              | EKMS251VSN182MA50S |
|             | 820         | 25.4 × 30             | 0.15 | 2.08                                              | EKMS181VSN821MQ30S |             | 180         | 22 × 25               | 0.15 | 0.95                                              | EKMS3B1VSN181MP25S |
|             | 820         | 30 × 25               | 0.15 | 2.26                                              | EKMS181VSN821MR25S |             | 220         | 22 × 30               | 0.15 | 1.10                                              | EKMS3B1VSN221MP30S |
|             | 1,000       | 22 × 45               | 0.15 | 2.40                                              | EKMS181VSN102MP45S |             | 220         | 25.4 × 25             | 0.15 | 1.10                                              | EKMS3B1VSN221MQ25S |
|             | 1,000       | 22 × 50               | 0.15 | 2.45                                              | EKMS181VSN102MP50S |             | 270         | 22 × 35               | 0.15 | 1.24                                              | EKMS3B1VSN271MP35S |
|             | 1,000       | 25.4 × 35             | 0.15 | 2.40                                              | EKMS181VSN102MQ35S |             | 330         | 22 × 40               | 0.15 | 1.40                                              | EKMS3B1VSN331MP40S |
|             | 1,000       | 25.4 × 40             | 0.15 | 2.45                                              | EKMS181VSN102MQ40S |             | 330         | 25.4 × 30             | 0.15 | 1.38                                              | EKMS3B1VSN331MQ30S |
|             | 1,000       | 30 × 30               | 0.15 | 2.52                                              | EKMS181VSN102MR30S |             | 330         | 30 × 25               | 0.15 | 1.43                                              | EKMS3B1VSN331MR25S |
|             | 1,200       | 25.4 × 45             | 0.15 | 2.73                                              | EKMS181VSN122MQ45S |             | 390         | 22 × 45               | 0.15 | 1.56                                              | EKMS3B1VSN391MP45S |
|             | 1,200       | 30 × 35               | 0.15 | 2.83                                              | EKMS181VSN122MR35S |             | 390         | 22 × 50               | 0.15 | 1.59                                              | EKMS3B1VSN391MP50S |
|             | 1,200       | 35 × 25               | 0.15 | 2.91                                              | EKMS181VSN122MA25S |             | 390         | 25.4 × 35             | 0.15 | 1.57                                              | EKMS3B1VSN391MQ35S |
|             | 1,500       | 25.4 × 50             | 0.15 | 3.10                                              | EKMS181VSN152MQ50S |             | 470         | 25.4 × 40             | 0.15 | 1.76                                              | EKMS3B1VSN471MQ40S |
|             | 1,500       | 30 × 40               | 0.15 | 3.26                                              | EKMS181VSN152MR40S |             | 470         | 30 × 30               | 0.15 | 1.73                                              | EKMS3B1VSN471MR30S |
|             | 1,500       | 35 × 30               | 0.15 | 3.31                                              | EKMS181VSN152MA30S |             | 470         | 35 × 25               | 0.15 | 1.82                                              | EKMS3B1VSN471MA25S |
|             | 1,800       | 30 × 45               | 0.15 | 3.66                                              | EKMS181VSN182MR45S |             | 560         | 25.4 × 45             | 0.15 | 1.96                                              | EKMS3B1VSN561MQ45S |
|             | 1,800       | 35 × 35               | 0.15 | 3.68                                              | EKMS181VSN182MA35S |             | 560         | 25.4 × 50             | 0.15 | 1.99                                              | EKMS3B1VSN561MQ50S |
| 200         | 2,200       | 30 × 50               | 0.15 | 4.11                                              | EKMS181VSN222MR50S | 400         | 560         | 30 × 35               | 0.15 | 1.93                                              | EKMS3B1VSN561MR35S |
|             | 2,200       | 35 × 40               | 0.15 | 4.22                                              | EKMS181VSN222MA40S |             | 560         | 35 × 30               | 0.15 | 2.02                                              | EKMS3B1VSN561MA30S |
|             | 2,700       | 35 × 45               | 0.15 | 4.78                                              | EKMS181VSN272MA45S |             | 680         | 30 × 40               | 0.15 | 2.19                                              | EKMS3B1VSN681MR40S |
|             | 2,700       | 35 × 50               | 0.15 | 4.88                                              | EKMS181VSN272MA50S |             | 680         | 35 × 35               | 0.15 | 2.26                                              | EKMS3B1VSN681MA35S |
|             | 390         | 22 × 25               | 0.15 | 1.34                                              | EKMS201VSN391MP25S |             | 820         | 30 × 45               | 0.15 | 2.47                                              | EKMS3B1VSN821MR45S |
|             | 470         | 22 × 30               | 0.15 | 1.54                                              | EKMS201VSN471MP30S |             | 820         | 30 × 50               | 0.15 | 2.51                                              | EKMS3B1VSN821MR50S |
|             | 560         | 22 × 35               | 0.15 | 1.72                                              | EKMS201VSN561MP35S |             | 820         | 35 × 40               | 0.15 | 2.57                                              | EKMS3B1VSN821MA40S |
|             | 560         | 25.4 × 25             | 0.15 | 1.67                                              | EKMS201VSN561MQ25S |             | 1,000       | 35 × 45               | 0.15 | 2.91                                              | EKMS3B1VSN102MA45S |
|             | 680         | 22 × 40               | 0.15 | 1.94                                              | EKMS201VSN681MP40S |             | 1,200       | 35 × 50               | 0.15 | 3.25                                              | EKMS3B1VSN122MA50S |
|             | 680         | 25.4 × 30             | 0.15 | 1.89                                              | EKMS201VSN681MQ30S |             | 120         | 22 × 25               | 0.15 | 0.77                                              | EKMS401VSN121MP25S |
|             | 820         | 22 × 45               | 0.15 | 2.17                                              | EKMS201VSN821MP45S |             | 150         | 22 × 30               | 0.15 | 0.90                                              | EKMS401VSN151MP30S |
|             | 820         | 25.4 × 35             | 0.15 | 2.17                                              | EKMS201VSN821MQ35S |             | 180         | 22 × 35               | 0.15 | 1.02                                              | EKMS401VSN181MP35S |
|             | 820         | 30 × 25               | 0.15 | 2.26                                              | EKMS201VSN821MR25S |             | 180         | 25.4 × 25             | 0.15 | 0.99                                              | EKMS401VSN181MQ25S |
|             | 1,000       | 22 × 50               | 0.15 | 2.45                                              | EKMS201VSN102MP50S |             | 220         | 22 × 40               | 0.15 | 1.15                                              | EKMS401VSN221MP40S |
|             | 1,000       | 25.4 × 40             | 0.15 | 2.45                                              | EKMS201VSN102MQ40S |             | 220         | 25.4 × 30             | 0.15 | 1.13                                              | EKMS401VSN221MQ30S |
|             | 1,000       | 30 × 30               | 0.15 | 2.52                                              | EKMS201VSN102MR30S |             | 270         | 22 × 45               | 0.15 | 1.29                                              | EKMS401VSN271MP45S |
|             | 1,000       | 35 × 25               | 0.15 | 2.66                                              | EKMS201VSN102MA25S |             | 270         | 25.4 × 35             | 0.15 | 1.30                                              | EKMS401VSN271MQ35S |
|             | 1,200       | 25.4 × 45             | 0.15 | 2.73                                              | EKMS201VSN122MQ45S |             | 270         | 30 × 25               | 0.15 | 1.29                                              | EKMS401VSN271MR25S |
|             | 1,200       | 25.4 × 50             | 0.15 | 2.78                                              | EKMS201VSN122MQ50S |             | 330         | 22 × 50               | 0.15 | 1.47                                              | EKMS401VSN331MP50S |
|             | 1,200       | 30 × 35               | 0.15 | 2.83                                              | EKMS201VSN122MR35S |             | 330         | 25.4 × 40             | 0.15 | 1.47                                              | EKMS401VSN331MQ40S |
|             | 1,200       | 35 × 30               | 0.15 | 2.96                                              | EKMS201VSN122MA30S |             | 330         | 30 × 30               | 0.15 | 1.45                                              | EKMS401VSN331MR30S |
|             | 1,500       | 30 × 40               | 0.15 | 3.26                                              | EKMS201VSN152MR40S |             | 330         | 35 × 25               | 0.15 | 1.52                                              | EKMS401VSN331MA25S |
|             | 1,500       | 35 × 35               | 0.15 | 3.36                                              | EKMS201VSN152MA35S |             | 390         | 25.4 × 45             | 0.15 | 1.63                                              | EKMS401VSN391MQ45S |


**KMS** Series

### ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 400         | 390         | 25.4 × 50             | 0.15 | 1.66                                              | EKMS401VSN391MQ50S | 420         | 390         | 35 × 35               | 0.20 | 1.71                                              | EKMS421VSN391MA35S |
|             | 390         | 30 × 35               | 0.15 | 1.61                                              | EKMS401VSN391MR35S |             | 470         | 30 × 50               | 0.20 | 1.90                                              | EKMS421VSN471MR50S |
|             | 470         | 30 × 40               | 0.15 | 1.82                                              | EKMS401VSN471MR40S |             | 470         | 35 × 40               | 0.20 | 1.95                                              | EKMS421VSN471MA40S |
|             | 470         | 35 × 30               | 0.15 | 1.85                                              | EKMS401VSN471MA30S |             | 560         | 35 × 45               | 0.20 | 2.17                                              | EKMS421VSN561MA45S |
|             | 560         | 30 × 45               | 0.15 | 2.04                                              | EKMS401VSN561MR45S |             | 680         | 35 × 50               | 0.20 | 2.45                                              | EKMS421VSN681MA50S |
|             | 560         | 30 × 50               | 0.15 | 2.07                                              | EKMS401VSN561MR50S | 450         | 82          | 22 × 25               | 0.20 | 0.64                                              | EKMS451VSN820MP25S |
|             | 560         | 35 × 35               | 0.15 | 2.05                                              | EKMS401VSN561MA35S |             | 120         | 22 × 30               | 0.20 | 0.81                                              | EKMS451VSN121MP30S |
|             | 680         | 35 × 40               | 0.15 | 2.34                                              | EKMS401VSN681MA40S |             | 120         | 22 × 35               | 0.20 | 0.83                                              | EKMS451VSN121MP35S |
|             | 680         | 35 × 45               | 0.15 | 2.40                                              | EKMS401VSN681MA45S |             | 120         | 25.4 × 25             | 0.20 | 0.81                                              | EKMS451VSN121MQ25S |
|             | 820         | 35 × 50               | 0.15 | 2.69                                              | EKMS401VSN821MA50S |             | 150         | 22 × 40               | 0.20 | 0.94                                              | EKMS451VSN151MP40S |
| 420         | 100         | 22 × 25               | 0.20 | 0.70                                              | EKMS421VSN101MP25S |             | 150         | 25.4 × 30             | 0.20 | 0.93                                              | EKMS451VSN151MQ30S |
|             | 120         | 22 × 30               | 0.20 | 0.81                                              | EKMS421VSN121MP30S |             | 180         | 22 × 45               | 0.20 | 1.06                                              | EKMS451VSN181MP45S |
|             | 120         | 25.4 × 25             | 0.20 | 0.81                                              | EKMS421VSN121MQ25S |             | 180         | 25.4 × 35             | 0.20 | 1.06                                              | EKMS451VSN181MQ35S |
|             | 150         | 22 × 35               | 0.20 | 0.93                                              | EKMS421VSN151MP35S |             | 180         | 30 × 25               | 0.20 | 1.06                                              | EKMS451VSN181MR25S |
|             | 180         | 22 × 40               | 0.20 | 1.04                                              | EKMS421VSN181MP40S |             | 220         | 22 × 50               | 0.20 | 1.20                                              | EKMS451VSN221MP50S |
|             | 180         | 25.4 × 30             | 0.20 | 1.02                                              | EKMS421VSN181MQ30S |             | 220         | 25.4 × 40             | 0.20 | 1.20                                              | EKMS451VSN221MQ40S |
|             | 180         | 30 × 25               | 0.20 | 1.06                                              | EKMS421VSN181MR25S |             | 220         | 30 × 30               | 0.20 | 1.18                                              | EKMS451VSN221MR30S |
|             | 220         | 22 × 45               | 0.20 | 1.17                                              | EKMS421VSN221MP45S |             | 220         | 35 × 25               | 0.20 | 1.24                                              | EKMS451VSN221MA25S |
|             | 220         | 22 × 50               | 0.20 | 1.20                                              | EKMS421VSN221MP50S |             | 270         | 25.4 × 45             | 0.20 | 1.36                                              | EKMS451VSN271MQ45S |
|             | 220         | 25.4 × 35             | 0.20 | 1.18                                              | EKMS421VSN221MQ35S |             | 270         | 25.4 × 50             | 0.20 | 1.38                                              | EKMS451VSN271MQ50S |
|             | 220         | 30 × 30               | 0.20 | 1.18                                              | EKMS421VSN221MR30S |             | 270         | 30 × 35               | 0.20 | 1.34                                              | EKMS451VSN271MR35S |
|             | 270         | 25.4 × 40             | 0.20 | 1.33                                              | EKMS421VSN271MQ40S |             | 270         | 35 × 30               | 0.20 | 1.40                                              | EKMS451VSN271MA30S |
|             | 270         | 25.4 × 45             | 0.20 | 1.36                                              | EKMS421VSN271MQ45S |             | 330         | 30 × 40               | 0.20 | 1.52                                              | EKMS451VSN331MR40S |
|             | 270         | 35 × 25               | 0.20 | 1.38                                              | EKMS421VSN271MA25S |             | 390         | 30 × 45               | 0.20 | 1.70                                              | EKMS451VSN391MR45S |
|             | 330         | 25.4 × 50             | 0.20 | 1.52                                              | EKMS421VSN331MQ50S |             | 390         | 30 × 50               | 0.20 | 1.73                                              | EKMS451VSN391MR50S |
|             | 330         | 30 × 35               | 0.20 | 1.48                                              | EKMS421VSN331MR35S |             | 390         | 35 × 35               | 0.20 | 1.71                                              | EKMS451VSN391MA35S |
|             | 330         | 30 × 40               | 0.20 | 1.52                                              | EKMS421VSN331MR40S |             | 470         | 35 × 40               | 0.20 | 1.95                                              | EKMS451VSN471MA40S |
|             | 330         | 35 × 30               | 0.20 | 1.55                                              | EKMS421VSN331MA30S |             | 470         | 35 × 45               | 0.20 | 1.99                                              | EKMS451VSN471MA45S |
|             | 390         | 30 × 45               | 0.20 | 1.70                                              | EKMS421VSN391MR45S |             | 560         | 35 × 50               | 0.20 | 2.22                                              | EKMS451VSN561MA50S |

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency(Hz) | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------|------|------|------|------|------|------|
| 160 to 250Vdc | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 315 to 450Vdc | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

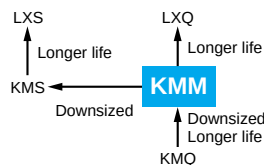


## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Downsized snap-ins, 105°C

## KMM Series

- Downsized and longer life from KMQ series
- Endurance with ripple current : 2,000 to 3,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

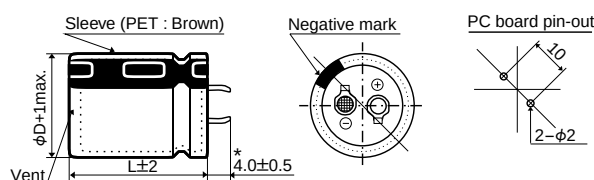


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |                       |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                       |                                      |                       |
| Rated Voltage Range                                    | -25 to +105°C                                                                                                                                                                                                                                                                           |                                      |                       |
| Capacitance Tolerance                                  | 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                      |                       |
| Leakage Current                                        | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |                       |
| Dissipation Factor (tanδ)                              | I≤3√CV                                                                                                                                                                                                                                                                                  |                                      |                       |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                                     |                                      |                       |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 400V                          | 420 & 450V            |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.15                                 | 0.20 (at 20°C, 120Hz) |
| Endurance                                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 400V                          | 420 & 450V            |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 8 (at 120Hz)          |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 3,000 hours (2,000 hours for φ20×20L products) at 105°C.                                                            |                                      |                       |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |                       |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |                       |
| Shelf Life                                             | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |                       |
|                                                        | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |                       |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±15% of the initial value           |                       |
| Shelf Life                                             | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤150% of the initial specified value |                       |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |                       |

## ◆DIMENSIONS [mm]

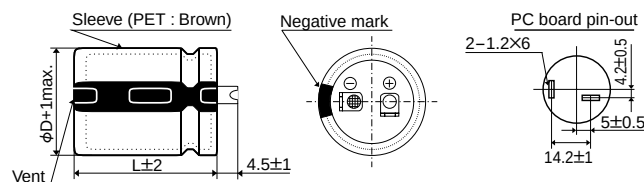
- Terminal Code : VS (φ20 to φ35) : Standard



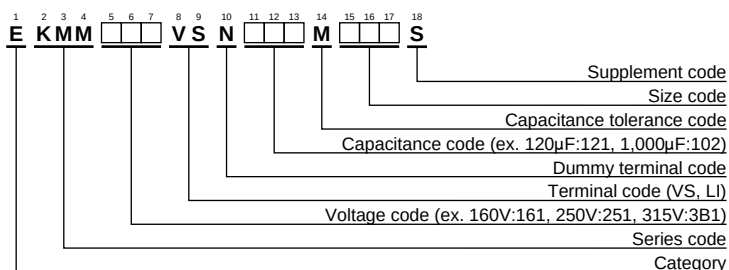
\*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

- Terminal Code : LI (φ35)



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"


**KMM**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 160         | 180         | 20×20                 | 0.15 | 0.68                                              | EKMM161VSN181MN20S | 180         | 560         | 20×45                 | 0.15 | 1.55                                              | EKMM181VSN561MN45S |
|             | 220         | 20×25                 | 0.15 | 0.85                                              | EKMM161VSN221MN25S |             | 560         | 22×40                 | 0.15 | 1.67                                              | EKMM181VSN561MP40S |
|             | 220         | 22×20                 | 0.15 | 0.81                                              | EKMM161VSN221MP20S |             | 560         | 25.4×30               | 0.15 | 1.67                                              | EKMM181VSN561MQ30S |
|             | 270         | 20×25                 | 0.15 | 1.10                                              | EKMM161VSN271MN25S |             | 560         | 30×25                 | 0.15 | 1.67                                              | EKMM181VSN561MR25S |
|             | 270         | 25.4×20               | 0.15 | 0.98                                              | EKMM161VSN271MQ20S |             | 560         | 35×20                 | 0.15 | 1.43                                              | EKMM181VSN561MA20S |
|             | 330         | 20×30                 | 0.15 | 1.20                                              | EKMM161VSN331MN30S |             | 680         | 20×50                 | 0.15 | 1.75                                              | EKMM181VSN681MN50S |
|             | 330         | 22×25                 | 0.15 | 1.20                                              | EKMM161VSN331MP25S |             | 680         | 22×45                 | 0.15 | 1.78                                              | EKMM181VSN681MP45S |
|             | 330         | 25.4×20               | 0.15 | 1.02                                              | EKMM161VSN331MQ20S |             | 680         | 25.4×35               | 0.15 | 1.78                                              | EKMM181VSN681MQ35S |
|             | 390         | 20×30                 | 0.15 | 1.30                                              | EKMM161VSN391MN30S |             | 680         | 30×30                 | 0.15 | 1.78                                              | EKMM181VSN681MR30S |
|             | 390         | 22×25                 | 0.15 | 1.30                                              | EKMM161VSN391MP25S |             | 680         | 35×25                 | 0.15 | 1.83                                              | EKMM181VSN681MA25S |
|             | 390         | 25.4×25               | 0.15 | 1.26                                              | EKMM161VSN391MQ25S |             | 820         | 22×50                 | 0.15 | 2.04                                              | EKMM181VSN821MP50S |
|             | 390         | 30×20                 | 0.15 | 1.25                                              | EKMM161VSN391MR20S |             | 820         | 25.4×40               | 0.15 | 2.04                                              | EKMM181VSN821MQ40S |
|             | 470         | 20×35                 | 0.15 | 1.34                                              | EKMM161VSN471MN35S |             | 820         | 30×30                 | 0.15 | 2.04                                              | EKMM181VSN821MR30S |
|             | 470         | 22×30                 | 0.15 | 1.55                                              | EKMM161VSN471MP30S |             | 820         | 35×25                 | 0.15 | 2.04                                              | EKMM181VSN821MA25S |
|             | 470         | 25.4×25               | 0.15 | 1.55                                              | EKMM161VSN471MQ25S |             | 1,000       | 25.4×45               | 0.15 | 2.30                                              | EKMM181VSN102MQ45S |
|             | 470         | 30×20                 | 0.15 | 1.30                                              | EKMM161VSN471MR20S |             | 1,000       | 30×35                 | 0.15 | 2.30                                              | EKMM181VSN102MR35S |
|             | 560         | 20×40                 | 0.15 | 1.50                                              | EKMM161VSN561MN40S |             | 1,000       | 35×30                 | 0.15 | 2.30                                              | EKMM181VSN102MA30S |
|             | 560         | 22×35                 | 0.15 | 1.67                                              | EKMM161VSN561MP35S |             | 1,200       | 25.4×50               | 0.15 | 2.55                                              | EKMM181VSN122MQ50S |
|             | 560         | 25.4×30               | 0.15 | 1.67                                              | EKMM161VSN561MQ30S |             | 1,200       | 30×40                 | 0.15 | 2.55                                              | EKMM181VSN122MR40S |
|             | 560         | 30×25                 | 0.15 | 1.67                                              | EKMM161VSN561MR25S |             | 1,200       | 35×30                 | 0.15 | 2.55                                              | EKMM181VSN122MA30S |
|             | 560         | 35×20                 | 0.15 | 1.46                                              | EKMM161VSN561MA20S |             | 1,500       | 30×45                 | 0.15 | 2.90                                              | EKMM181VSN152MR45S |
|             | 680         | 20×45                 | 0.15 | 1.70                                              | EKMM161VSN681MN45S |             | 1,500       | 35×35                 | 0.15 | 2.90                                              | EKMM181VSN152MA35S |
|             | 680         | 22×40                 | 0.15 | 1.82                                              | EKMM161VSN681MP40S |             | 1,800       | 30×60                 | 0.15 | 3.49                                              | EKMM181VSN182MR60S |
|             | 680         | 25.4×30               | 0.15 | 1.82                                              | EKMM161VSN681MQ30S |             | 1,800       | 35×40                 | 0.15 | 3.30                                              | EKMM181VSN182MA40S |
|             | 680         | 30×25                 | 0.15 | 1.82                                              | EKMM161VSN681MR25S |             | 2,200       | 35×50                 | 0.15 | 3.65                                              | EKMM181VSN222MA50S |
|             | 680         | 35×20                 | 0.15 | 1.51                                              | EKMM161VSN681MA20S |             | 2,700       | 35×60                 | 0.15 | 4.19                                              | EKMM181VSN272MA60S |
|             | 820         | 22×45                 | 0.15 | 2.04                                              | EKMM161VSN821MP45S | 200         | 120         | 20×20                 | 0.15 | 0.56                                              | EKMM201VSN121MN20S |
|             | 820         | 25.4×35               | 0.15 | 2.04                                              | EKMM161VSN821MQ35S |             | 150         | 20×25                 | 0.15 | 0.71                                              | EKMM201VSN151MN25S |
|             | 820         | 30×30                 | 0.15 | 2.04                                              | EKMM161VSN821MR30S |             | 150         | 22×20                 | 0.15 | 0.73                                              | EKMM201VSN151MP20S |
|             | 820         | 35×25                 | 0.15 | 2.04                                              | EKMM161VSN821MA25S |             | 180         | 20×25                 | 0.15 | 0.77                                              | EKMM201VSN181MN25S |
|             | 1,000       | 22×50                 | 0.15 | 2.25                                              | EKMM161VSN102MP50S |             | 180         | 22×20                 | 0.15 | 0.80                                              | EKMM201VSN181MP20S |
|             | 1,000       | 25.4×40               | 0.15 | 2.25                                              | EKMM161VSN102MQ40S |             | 220         | 20×25                 | 0.15 | 1.00                                              | EKMM201VSN221MN25S |
|             | 1,000       | 30×30                 | 0.15 | 2.25                                              | EKMM161VSN102MR30S |             | 220         | 25.4×20               | 0.15 | 0.85                                              | EKMM201VSN221MQ20S |
|             | 1,000       | 35×25                 | 0.15 | 2.25                                              | EKMM161VSN102MA25S |             | 270         | 20×30                 | 0.15 | 1.10                                              | EKMM201VSN271MN30S |
|             | 1,200       | 25.4×45               | 0.15 | 2.49                                              | EKMM161VSN122MQ45S |             | 270         | 22×25                 | 0.15 | 1.10                                              | EKMM201VSN271MP25S |
|             | 1,200       | 30×35                 | 0.15 | 2.49                                              | EKMM161VSN122MR35S |             | 270         | 30×20                 | 0.15 | 1.05                                              | EKMM201VSN271MR20S |
|             | 1,200       | 35×30                 | 0.15 | 2.49                                              | EKMM161VSN122MA30S |             | 330         | 20×35                 | 0.15 | 1.20                                              | EKMM201VSN331MN35S |
|             | 1,500       | 25.4×60               | 0.15 | 2.97                                              | EKMM161VSN152MQ60S |             | 330         | 22×30                 | 0.15 | 1.25                                              | EKMM201VSN331MP30S |
|             | 1,500       | 30×40                 | 0.15 | 2.84                                              | EKMM161VSN152MR40S |             | 330         | 25.4×25               | 0.15 | 1.25                                              | EKMM201VSN331MQ25S |
|             | 1,500       | 35×30                 | 0.15 | 2.84                                              | EKMM161VSN152MA30S |             | 330         | 30×20                 | 0.15 | 1.10                                              | EKMM201VSN331MR20S |
|             | 1,800       | 30×45                 | 0.15 | 3.32                                              | EKMM161VSN182MR45S |             | 390         | 20×40                 | 0.15 | 1.31                                              | EKMM201VSN391MN40S |
|             | 1,800       | 35×35                 | 0.15 | 3.00                                              | EKMM161VSN182MA35S |             | 390         | 22×30                 | 0.15 | 1.35                                              | EKMM201VSN391MP30S |
|             | 2,200       | 30×60                 | 0.15 | 3.86                                              | EKMM161VSN222MR60S |             | 390         | 25.4×25               | 0.15 | 1.35                                              | EKMM201VSN391MQ25S |
|             | 2,200       | 35×45                 | 0.15 | 3.50                                              | EKMM161VSN222MA45S |             | 390         | 35×20                 | 0.15 | 1.30                                              | EKMM201VSN391MA20S |
|             | 2,700       | 35×50                 | 0.15 | 4.00                                              | EKMM161VSN272MA50S |             | 470         | 20×45                 | 0.15 | 1.45                                              | EKMM201VSN471MN45S |
|             | 3,300       | 35×60                 | 0.15 | 4.63                                              | EKMM161VSN332MA60S |             | 470         | 22×35                 | 0.15 | 1.50                                              | EKMM201VSN471MP35S |
| 180         | 150         | 20×20                 | 0.15 | 0.62                                              | EKMM181VSN151MN20S |             | 470         | 25.4×30               | 0.15 | 1.50                                              | EKMM201VSN471MQ30S |
|             | 180         | 20×25                 | 0.15 | 0.77                                              | EKMM181VSN181MN25S |             | 470         | 30×25                 | 0.15 | 1.50                                              | EKMM201VSN471MR25S |
|             | 180         | 22×20                 | 0.15 | 0.80                                              | EKMM181VSN181MP20S |             | 470         | 35×20                 | 0.15 | 1.41                                              | EKMM201VSN471MA20S |
|             | 220         | 20×25                 | 0.15 | 1.00                                              | EKMM181VSN221MN25S |             | 560         | 20×50                 | 0.15 | 1.58                                              | EKMM201VSN561MN50S |
|             | 220         | 25.4×20               | 0.15 | 0.90                                              | EKMM181VSN221MQ20S |             | 560         | 22×40                 | 0.15 | 1.67                                              | EKMM201VSN561MP40S |
|             | 270         | 20×30                 | 0.15 | 1.10                                              | EKMM181VSN271MN30S |             | 560         | 25.4×30               | 0.15 | 1.67                                              | EKMM201VSN561MQ30S |
|             | 270         | 22×25                 | 0.15 | 1.00                                              | EKMM181VSN271MP25S |             | 560         | 30×25                 | 0.15 | 1.67                                              | EKMM201VSN561MR25S |
|             | 270         | 25.4×20               | 0.15 | 0.95                                              | EKMM181VSN271MQ20S |             | 680         | 22×45                 | 0.15 | 1.78                                              | EKMM201VSN681MP45S |
|             | 330         | 20×30                 | 0.15 | 1.20                                              | EKMM181VSN331MN30S |             | 680         | 25.4×35               | 0.15 | 1.78                                              | EKMM201VSN681MQ35S |
|             | 330         | 22×25                 | 0.15 | 1.20                                              | EKMM181VSN331MP25S |             | 680         | 30×30                 | 0.15 | 1.78                                              | EKMM201VSN681MR30S |
|             | 330         | 25.4×25               | 0.15 | 1.16                                              | EKMM181VSN331MQ25S |             | 680         | 35×25                 | 0.15 | 1.78                                              | EKMM201VSN681MA25S |
|             | 330         | 30×20                 | 0.15 | 1.15                                              | EKMM181VSN331MR20S |             | 820         | 25.4×45               | 0.15 | 2.04                                              | EKMM201VSN821MQ45S |
|             | 390         | 20×35                 | 0.15 | 1.30                                              | EKMM181VSN391MN35S |             | 820         | 30×30                 | 0.15 | 2.04                                              | EKMM201VSN821MR30S |
|             | 390         | 22×30                 | 0.15 | 1.35                                              | EKMM181VSN391MP30S |             | 820         | 35×25                 | 0.15 | 2.04                                              | EKMM201VSN821MA25S |
|             | 390         | 25.4×25               | 0.15 | 1.35                                              | EKMM181VSN391MQ25S |             | 1,000       | 25.4×50               | 0.15 | 2.30                                              | EKMM201VSN102MQ50S |
|             | 390         | 30×20                 | 0.15 | 1.20                                              | EKMM181VSN391MR20S |             | 1,000       | 30×35                 | 0.15 | 2.30                                              | EKMM201VSN102MR35S |
|             | 470         | 20×40                 | 0.15 | 1.40                                              | EKMM181VSN471MN40S |             | 1,000       | 35×30                 | 0.15 | 2.30                                              | EKMM201VSN102MA30S |
|             | 470         | 22×35                 | 0.15 | 1.50                                              | EKMM181VSN471MP35S |             | 1,200       | 25.4×60               | 0.15 | 2.66                                              | EKMM201VSN122MQ60S |
|             | 470         | 25.4×30               | 0.15 | 1.50                                              | EKMM181VSN471MQ30S |             | 1,200       | 30×40                 | 0.15 | 2.65                                              | EKMM201VSN122MR40S |
|             | 470         | 30×25                 | 0.15 | 1.50                                              | EKMM181VSN471MR25S |             | 1,200       | 35×35                 | 0.15 | 2.65                                              | EKMM201VSN122MA35S |
|             | 470         | 35×20                 | 0.15 | 1.36                                              | EKMM181VSN471MA20S |             | 1,500       | 30×50                 | 0.15 | 3.08                                              | EKMM201VSN152MR50S |


**KMM**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 200         | 1,500       | 35×40                 | 0.15 | 3.08                                              | EKMM201VSN152MA40S | 250         | 330         | 30×25                 | 0.15 | 1.30                                              | EKMM251VSN331MR25S |
|             | 1,800       | 30×60                 | 0.15 | 3.49                                              | EKMM201VSN182MR60S |             | 330         | 35×20                 | 0.15 | 1.16                                              | EKMM251VSN331MA20S |
|             | 1,800       | 35×45                 | 0.15 | 3.48                                              | EKMM201VSN182MA45S |             | 390         | 20×50                 | 0.15 | 1.45                                              | EKMM251VSN391MN50S |
|             | 2,200       | 35×50                 | 0.15 | 3.78                                              | EKMM201VSN222MA50S |             | 390         | 22×40                 | 0.15 | 1.49                                              | EKMM251VSN391MP40S |
| 220         | 120         | 20×20                 | 0.15 | 0.56                                              | EKMM221VSN121MN20S |             | 390         | 25.4×35               | 0.15 | 1.49                                              | EKMM251VSN391MQ35S |
|             | 150         | 20×25                 | 0.15 | 0.73                                              | EKMM221VSN151MN25S |             | 390         | 30×25                 | 0.15 | 1.49                                              | EKMM251VSN391MR25S |
|             | 150         | 22×20                 | 0.15 | 0.67                                              | EKMM221VSN151MP20S |             | 470         | 22×45                 | 0.15 | 1.65                                              | EKMM251VSN471MP45S |
|             | 180         | 20×25                 | 0.15 | 0.90                                              | EKMM221VSN181MN25S |             | 470         | 25.4×35               | 0.15 | 1.65                                              | EKMM251VSN471MQ35S |
|             | 180         | 25.4×20               | 0.15 | 0.76                                              | EKMM221VSN181MQ20S |             | 470         | 30×30                 | 0.15 | 1.65                                              | EKMM251VSN471MR30S |
|             | 220         | 20×30                 | 0.15 | 1.00                                              | EKMM221VSN221MN30S |             | 470         | 35×25                 | 0.15 | 1.65                                              | EKMM251VSN471MA25S |
|             | 220         | 22×25                 | 0.15 | 1.00                                              | EKMM221VSN221MP25S |             | 560         | 22×50                 | 0.15 | 1.67                                              | EKMM251VSN561MP50S |
|             | 220         | 25.4×20               | 0.15 | 0.84                                              | EKMM221VSN221MQ20S |             | 560         | 25.4×40               | 0.15 | 1.80                                              | EKMM251VSN561MQ40S |
|             | 270         | 20×35                 | 0.15 | 1.15                                              | EKMM221VSN271MN35S |             | 560         | 30×30                 | 0.15 | 1.80                                              | EKMM251VSN561MR30S |
|             | 270         | 22×30                 | 0.15 | 1.15                                              | EKMM221VSN271MP30S |             | 560         | 35×25                 | 0.15 | 1.80                                              | EKMM251VSN561MA25S |
|             | 270         | 25.4×25               | 0.15 | 1.08                                              | EKMM221VSN271MQ25S |             | 680         | 25.4×50               | 0.15 | 2.00                                              | EKMM251VSN681MQ50S |
|             | 270         | 30×20                 | 0.15 | 0.98                                              | EKMM221VSN271MR20S |             | 680         | 30×35                 | 0.15 | 2.00                                              | EKMM251VSN681MR35S |
|             | 330         | 20×40                 | 0.15 | 1.25                                              | EKMM221VSN331MN40S |             | 680         | 35×30                 | 0.15 | 2.00                                              | EKMM251VSN681MA30S |
|             | 330         | 22×35                 | 0.15 | 1.25                                              | EKMM221VSN331MP35S |             | 820         | 25.4×60               | 0.15 | 2.20                                              | EKMM251VSN821MQ60S |
|             | 330         | 25.4×25               | 0.15 | 1.25                                              | EKMM221VSN331MQ25S |             | 820         | 30×40                 | 0.15 | 2.30                                              | EKMM251VSN821MR40S |
|             | 330         | 35×20                 | 0.15 | 1.13                                              | EKMM221VSN331MA20S |             | 820         | 35×35                 | 0.15 | 2.30                                              | EKMM251VSN821MA35S |
|             | 390         | 20×45                 | 0.15 | 1.40                                              | EKMM221VSN391MN45S |             | 1,000       | 30×50                 | 0.15 | 2.47                                              | EKMM251VSN102MR50S |
|             | 390         | 22×35                 | 0.15 | 1.40                                              | EKMM221VSN391MP35S |             | 1,000       | 35×40                 | 0.15 | 2.47                                              | EKMM251VSN102MA40S |
|             | 390         | 25.4×30               | 0.15 | 1.40                                              | EKMM221VSN391MQ30S |             | 1,200       | 30×60                 | 0.15 | 2.85                                              | EKMM251VSN122MR60S |
|             | 390         | 30×25                 | 0.15 | 1.36                                              | EKMM221VSN391MR25S |             | 1,200       | 35×45                 | 0.15 | 2.60                                              | EKMM251VSN122MA45S |
|             | 390         | 35×20                 | 0.15 | 1.23                                              | EKMM221VSN391MA20S |             | 1,500       | 35×50                 | 0.15 | 3.00                                              | EKMM251VSN152MA50S |
|             | 470         | 20×50                 | 0.15 | 1.51                                              | EKMM221VSN471MN50S |             | 1,800       | 35×60                 | 0.15 | 3.42                                              | EKMM251VSN182MA60S |
|             | 470         | 22×40                 | 0.15 | 1.51                                              | EKMM221VSN471MP40S | 315         | 56          | 20×20                 | 0.15 | 0.38                                              | EKMM3B1VSN560MN20S |
|             | 470         | 25.4×35               | 0.15 | 1.54                                              | EKMM221VSN471MQ35S |             | 68          | 20×25                 | 0.15 | 0.47                                              | EKMM3B1VSN680MN25S |
|             | 470         | 30×25                 | 0.15 | 1.50                                              | EKMM221VSN471MR25S |             | 68          | 22×20                 | 0.15 | 0.45                                              | EKMM3B1VSN680MP20S |
|             | 560         | 22×45                 | 0.15 | 1.70                                              | EKMM221VSN561MP45S |             | 82          | 20×25                 | 0.15 | 0.64                                              | EKMM3B1VSN820MN25S |
|             | 560         | 25.4×40               | 0.15 | 1.72                                              | EKMM221VSN561MQ40S |             | 82          | 22×20                 | 0.15 | 0.47                                              | EKMM3B1VSN820MP20S |
|             | 560         | 30×30                 | 0.15 | 1.70                                              | EKMM221VSN561MR30S |             | 100         | 20×30                 | 0.15 | 0.69                                              | EKMM3B1VSN101MN30S |
|             | 560         | 35×25                 | 0.15 | 1.71                                              | EKMM221VSN561MA25S |             | 100         | 22×25                 | 0.15 | 0.61                                              | EKMM3B1VSN101MP25S |
|             | 680         | 25.4×45               | 0.15 | 1.94                                              | EKMM221VSN681MP45S |             | 100         | 25.4×20               | 0.15 | 0.56                                              | EKMM3B1VSN101MQ20S |
|             | 680         | 30×35                 | 0.15 | 1.93                                              | EKMM221VSN681MR35S |             | 120         | 20×30                 | 0.15 | 0.75                                              | EKMM3B1VSN121MN30S |
|             | 680         | 35×25                 | 0.15 | 1.89                                              | EKMM221VSN681MA25S |             | 120         | 22×25                 | 0.15 | 0.75                                              | EKMM3B1VSN121MP25S |
|             | 820         | 25.4×50               | 0.15 | 2.18                                              | EKMM221VSN821MQ50S |             | 120         | 25.4×20               | 0.15 | 0.62                                              | EKMM3B1VSN121MQ20S |
|             | 820         | 30×40                 | 0.15 | 2.19                                              | EKMM221VSN821MR40S |             | 120         | 30×20                 | 0.15 | 0.65                                              | EKMM3B1VSN121MR20S |
|             | 820         | 35×30                 | 0.15 | 2.16                                              | EKMM221VSN821MA30S |             | 150         | 20×35                 | 0.15 | 0.82                                              | EKMM3B1VSN151MN35S |
|             | 1,000       | 25.4×60               | 0.15 | 2.54                                              | EKMM221VSN102MQ60S |             | 150         | 22×30                 | 0.15 | 0.82                                              | EKMM3B1VSN151MP30S |
|             | 1,000       | 30×45                 | 0.15 | 2.50                                              | EKMM221VSN102MR45S |             | 150         | 25.4×25               | 0.15 | 0.82                                              | EKMM3B1VSN151MQ25S |
|             | 1,000       | 35×35                 | 0.15 | 2.44                                              | EKMM221VSN102MA35S |             | 150         | 30×20                 | 0.15 | 0.70                                              | EKMM3B1VSN151MR20S |
|             | 1,200       | 30×50                 | 0.15 | 2.81                                              | EKMM221VSN122MR50S |             | 150         | 35×20                 | 0.15 | 0.76                                              | EKMM3B1VSN151MA20S |
|             | 1,200       | 35×40                 | 0.15 | 2.79                                              | EKMM221VSN122MA40S |             | 180         | 20×40                 | 0.15 | 0.90                                              | EKMM3B1VSN181MN40S |
|             | 1,500       | 30×60                 | 0.15 | 3.30                                              | EKMM221VSN152MR60S |             | 180         | 22×35                 | 0.15 | 0.92                                              | EKMM3B1VSN181MP35S |
|             | 1,500       | 35×45                 | 0.15 | 3.22                                              | EKMM221VSN152MA45S |             | 180         | 25.4×25               | 0.15 | 0.92                                              | EKMM3B1VSN181MQ25S |
|             | 1,800       | 35×50                 | 0.15 | 3.63                                              | EKMM221VSN182MA50S |             | 180         | 30×25                 | 0.15 | 0.90                                              | EKMM3B1VSN181MR25S |
|             | 2,200       | 35×60                 | 0.15 | 4.23                                              | EKMM221VSN222MA60S |             | 180         | 35×20                 | 0.15 | 0.85                                              | EKMM3B1VSN181MA20S |
| 250         | 100         | 20×20                 | 0.15 | 0.51                                              | EKMM251VSN101MN20S |             | 220         | 20×50                 | 0.15 | 1.00                                              | EKMM3B1VSN221MN50S |
|             | 120         | 20×25                 | 0.15 | 0.58                                              | EKMM251VSN121MN25S |             | 220         | 22×40                 | 0.15 | 1.04                                              | EKMM3B1VSN221MP40S |
|             | 120         | 22×20                 | 0.15 | 0.60                                              | EKMM251VSN121MP20S |             | 220         | 25.4×30               | 0.15 | 1.04                                              | EKMM3B1VSN221MQ30S |
|             | 150         | 20×25                 | 0.15 | 0.79                                              | EKMM251VSN151MN25S |             | 220         | 30×25                 | 0.15 | 1.04                                              | EKMM3B1VSN221MR25S |
|             | 150         | 25.4×20               | 0.15 | 0.74                                              | EKMM251VSN151MQ20S |             | 220         | 35×20                 | 0.15 | 0.90                                              | EKMM3B1VSN221MA20S |
|             | 180         | 20×30                 | 0.15 | 0.90                                              | EKMM251VSN181MN30S |             | 270         | 22×45                 | 0.15 | 1.16                                              | EKMM3B1VSN271MP45S |
|             | 180         | 22×25                 | 0.15 | 0.78                                              | EKMM251VSN181MP25S |             | 270         | 25.4×35               | 0.15 | 1.16                                              | EKMM3B1VSN271MQ35S |
|             | 180         | 25.4×20               | 0.15 | 0.75                                              | EKMM251VSN181MQ20S |             | 270         | 30×25                 | 0.15 | 1.16                                              | EKMM3B1VSN271MR25S |
|             | 220         | 20×30                 | 0.15 | 1.00                                              | EKMM251VSN221MN30S |             | 270         | 35×25                 | 0.15 | 1.15                                              | EKMM3B1VSN271MA25S |
|             | 220         | 22×25                 | 0.15 | 1.00                                              | EKMM251VSN221MP25S |             | 330         | 22×50                 | 0.15 | 1.33                                              | EKMM3B1VSN331MP50S |
|             | 220         | 25.4×25               | 0.15 | 0.95                                              | EKMM251VSN221MQ25S |             | 330         | 25.4×40               | 0.15 | 1.33                                              | EKMM3B1VSN331MQ40S |
|             | 220         | 30×20                 | 0.15 | 0.95                                              | EKMM251VSN221MR20S |             | 330         | 30×30                 | 0.15 | 1.33                                              | EKMM3B1VSN331MR30S |
|             | 270         | 20×35                 | 0.15 | 1.10                                              | EKMM251VSN271MN35S |             | 330         | 35×25                 | 0.15 | 1.33                                              | EKMM3B1VSN331MA25S |
|             | 270         | 22×30                 | 0.15 | 1.18                                              | EKMM251VSN271MP30S |             | 390         | 25.4×45               | 0.15 | 1.47                                              | EKMM3B1VSN391MQ45S |
|             | 270         | 25.4×25               | 0.15 | 1.18                                              | EKMM251VSN271MQ25S |             | 390         | 30×35                 | 0.15 | 1.47                                              | EKMM3B1VSN391MR35S |
|             | 270         | 30×20                 | 0.15 | 1.00                                              | EKMM251VSN271MR20S |             | 390         | 35×30                 | 0.15 | 1.47                                              | EKMM3B1VSN391MA30S |
|             | 330         | 20×40                 | 0.15 | 1.20                                              | EKMM251VSN331MN40S |             | 470         | 25.4×50               | 0.15 | 1.70                                              | EKMM3B1VSN471MQ50S |
|             | 330         | 22×35                 | 0.15 | 1.30                                              | EKMM251VSN331MP35S |             | 470         | 30×40                 | 0.15 | 1.70                                              | EKMM3B1VSN471MR40S |
|             | 330         | 25.4×30               | 0.15 | 1.30                                              | EKMM251VSN331MQ30S |             | 470         | 35×30                 | 0.15 | 1.70                                              | EKMM3B1VSN471MA30S |


**KMM**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 315         | 560         | 30×45                 | 0.15 | 2.05                                              | EKMM3B1VSN561MR45S | 400         | 100         | 30×20                 | 0.15 | 0.60                                              | EKMM401VSN101MR20S |
|             | 560         | 35×35                 | 0.15 | 2.05                                              | EKMM3B1VSN561MA35S |             | 120         | 20×40                 | 0.15 | 0.75                                              | EKMM401VSN121MN40S |
|             | 680         | 30×50                 | 0.15 | 2.17                                              | EKMM3B1VSN681MR50S |             | 120         | 22×35                 | 0.15 | 0.75                                              | EKMM401VSN121MP35S |
|             | 680         | 35×40                 | 0.15 | 2.17                                              | EKMM3B1VSN681MA40S |             | 120         | 25.4×25               | 0.15 | 0.75                                              | EKMM401VSN121MQ25S |
|             | 820         | 35×45                 | 0.15 | 2.20                                              | EKMM3B1VSN821MA45S |             | 120         | 30×25                 | 0.15 | 0.73                                              | EKMM401VSN121MR25S |
|             | 1,000       | 35×60                 | 0.15 | 2.55                                              | EKMM3B1VSN102MA60S |             | 120         | 35×20                 | 0.15 | 0.75                                              | EKMM401VSN121MA20S |
| 350         | 47          | 20×20                 | 0.15 | 0.35                                              | EKMM351VSN470MN20S |             | 150         | 20×45                 | 0.15 | 0.83                                              | EKMM401VSN151MN45S |
|             | 56          | 20×25                 | 0.15 | 0.43                                              | EKMM351VSN560MN25S |             | 150         | 22×40                 | 0.15 | 0.88                                              | EKMM401VSN151MP40S |
|             | 56          | 22×20                 | 0.15 | 0.41                                              | EKMM351VSN560MP20S |             | 150         | 25.4×30               | 0.15 | 0.88                                              | EKMM401VSN151MQ30S |
|             | 68          | 20×25                 | 0.15 | 0.47                                              | EKMM351VSN680MN25S |             | 150         | 30×25                 | 0.15 | 0.88                                              | EKMM401VSN151MR25S |
|             | 68          | 25.4×20               | 0.15 | 0.46                                              | EKMM351VSN680MQ20S |             | 150         | 35×20                 | 0.15 | 0.80                                              | EKMM401VSN151MA20S |
|             | 82          | 20×30                 | 0.15 | 0.54                                              | EKMM351VSN820MN30S |             | 180         | 22×45                 | 0.15 | 0.98                                              | EKMM401VSN181MP45S |
|             | 82          | 22×25                 | 0.15 | 0.55                                              | EKMM351VSN820MP25S |             | 180         | 25.4×35               | 0.15 | 0.98                                              | EKMM401VSN181MQ35S |
|             | 82          | 25.4×20               | 0.15 | 0.51                                              | EKMM351VSN820MQ20S |             | 180         | 30×30                 | 0.15 | 0.98                                              | EKMM401VSN181MR30S |
|             | 100         | 20×30                 | 0.15 | 0.60                                              | EKMM351VSN101MN30S |             | 180         | 35×25                 | 0.15 | 0.98                                              | EKMM401VSN181MA25S |
|             | 100         | 22×25                 | 0.15 | 0.69                                              | EKMM351VSN101MP25S |             | 220         | 22×50                 | 0.15 | 1.10                                              | EKMM401VSN221MP50S |
|             | 100         | 30×20                 | 0.15 | 0.60                                              | EKMM351VSN101MR20S |             | 220         | 25.4×40               | 0.15 | 1.10                                              | EKMM401VSN221MQ40S |
|             | 120         | 20×35                 | 0.15 | 0.68                                              | EKMM351VSN121MN35S |             | 220         | 30×30                 | 0.15 | 1.10                                              | EKMM401VSN221MR30S |
|             | 120         | 22×30                 | 0.15 | 0.75                                              | EKMM351VSN121MP30S |             | 220         | 35×25                 | 0.15 | 1.10                                              | EKMM401VSN221MA25S |
|             | 120         | 25.4×25               | 0.15 | 0.75                                              | EKMM351VSN121MQ25S |             | 270         | 25.4×45               | 0.15 | 1.22                                              | EKMM401VSN271MQ45S |
|             | 120         | 30×20                 | 0.15 | 0.65                                              | EKMM351VSN121MR20S |             | 270         | 30×35                 | 0.15 | 1.22                                              | EKMM401VSN271MR35S |
|             | 150         | 20×40                 | 0.15 | 0.78                                              | EKMM351VSN151MN40S |             | 270         | 35×30                 | 0.15 | 1.22                                              | EKMM401VSN271MA30S |
|             | 150         | 22×35                 | 0.15 | 0.82                                              | EKMM351VSN151MP35S |             | 330         | 25.4×50               | 0.15 | 1.44                                              | EKMM401VSN331MQ50S |
|             | 150         | 25.4×30               | 0.15 | 0.83                                              | EKMM351VSN151MQ30S |             | 330         | 30×40                 | 0.15 | 1.44                                              | EKMM401VSN331MR40S |
|             | 150         | 30×25                 | 0.15 | 0.82                                              | EKMM351VSN151MR25S |             | 330         | 35×30                 | 0.15 | 1.44                                              | EKMM401VSN331MA30S |
|             | 150         | 35×20                 | 0.15 | 0.76                                              | EKMM351VSN151MA20S |             | 390         | 25.4×60               | 0.15 | 1.51                                              | EKMM401VSN391MQ60S |
|             | 180         | 20×45                 | 0.15 | 0.87                                              | EKMM351VSN181MN45S |             | 390         | 30×45                 | 0.15 | 1.60                                              | EKMM401VSN391MR45S |
|             | 180         | 22×40                 | 0.15 | 0.92                                              | EKMM351VSN181MP40S |             | 390         | 35×35                 | 0.15 | 1.60                                              | EKMM401VSN391MA35S |
|             | 180         | 25.4×30               | 0.15 | 0.92                                              | EKMM351VSN181MQ30S |             | 470         | 30×50                 | 0.15 | 1.90                                              | EKMM401VSN471MR50S |
|             | 180         | 30×25                 | 0.15 | 0.90                                              | EKMM351VSN181MR25S |             | 470         | 35×40                 | 0.15 | 1.90                                              | EKMM401VSN471MA40S |
|             | 220         | 20×50                 | 0.15 | 1.00                                              | EKMM351VSN221MN50S | 420         | 560         | 30×60                 | 0.15 | 2.10                                              | EKMM401VSN561MR60S |
|             | 220         | 22×45                 | 0.15 | 1.05                                              | EKMM351VSN221MP45S |             | 560         | 35×45                 | 0.15 | 2.12                                              | EKMM401VSN561MA45S |
|             | 220         | 25.4×35               | 0.15 | 1.04                                              | EKMM351VSN221MQ35S |             | 680         | 35×60                 | 0.15 | 2.27                                              | EKMM401VSN681MA60S |
|             | 220         | 30×30                 | 0.15 | 1.02                                              | EKMM351VSN221MR30S |             | 39          | 20×20                 | 0.20 | 0.32                                              | EKMM421VSN390MN20S |
|             | 220         | 35×25                 | 0.15 | 1.04                                              | EKMM351VSN221MA25S |             | 47          | 20×25                 | 0.20 | 0.39                                              | EKMM421VSN470MN25S |
|             | 270         | 22×50                 | 0.15 | 1.16                                              | EKMM351VSN271MP50S |             | 47          | 22×20                 | 0.20 | 0.37                                              | EKMM421VSN470MP20S |
|             | 270         | 25.4×40               | 0.15 | 1.18                                              | EKMM351VSN271MQ40S |             | 56          | 20×25                 | 0.20 | 0.51                                              | EKMM421VSN560MN25S |
|             | 270         | 30×30                 | 0.15 | 1.17                                              | EKMM351VSN271MR30S |             | 56          | 25.4×20               | 0.20 | 0.42                                              | EKMM421VSN560MQ20S |
|             | 270         | 35×25                 | 0.15 | 1.20                                              | EKMM351VSN271MA25S |             | 68          | 20×30                 | 0.20 | 0.56                                              | EKMM421VSN680MN30S |
|             | 330         | 25.4×45               | 0.15 | 1.29                                              | EKMM351VSN331MQ45S |             | 68          | 22×25                 | 0.20 | 0.50                                              | EKMM421VSN680MP25S |
|             | 330         | 30×35                 | 0.15 | 1.34                                              | EKMM351VSN331MR35S |             | 68          | 25.4×20               | 0.20 | 0.46                                              | EKMM421VSN680MQ20S |
|             | 330         | 35×30                 | 0.15 | 1.22                                              | EKMM351VSN331MA30S |             | 82          | 20×35                 | 0.20 | 0.64                                              | EKMM421VSN820MN35S |
|             | 390         | 25.4×50               | 0.15 | 1.51                                              | EKMM351VSN391MQ50S |             | 82          | 22×25                 | 0.20 | 0.64                                              | EKMM421VSN820MP25S |
|             | 390         | 30×40                 | 0.15 | 1.51                                              | EKMM351VSN391MR40S |             | 82          | 25.4×25               | 0.20 | 0.58                                              | EKMM421VSN820MQ25S |
|             | 390         | 35×35                 | 0.15 | 1.47                                              | EKMM351VSN391MA35S |             | 82          | 30×20                 | 0.20 | 0.53                                              | EKMM421VSN820MR20S |
|             | 470         | 25.4×60               | 0.15 | 1.66                                              | EKMM351VSN471MQ60S |             | 100         | 20×35                 | 0.20 | 0.70                                              | EKMM421VSN101MN35S |
|             | 470         | 30×45                 | 0.15 | 1.65                                              | EKMM351VSN471MR45S |             | 100         | 22×30                 | 0.20 | 0.70                                              | EKMM421VSN101MP30S |
|             | 470         | 35×35                 | 0.15 | 1.69                                              | EKMM351VSN471MA35S |             | 100         | 25.4×25               | 0.20 | 0.70                                              | EKMM421VSN101MQ25S |
|             | 560         | 30×50                 | 0.15 | 1.85                                              | EKMM351VSN561MR50S |             | 100         | 30×20                 | 0.20 | 0.59                                              | EKMM421VSN101MR20S |
|             | 560         | 35×40                 | 0.15 | 1.90                                              | EKMM351VSN561MA40S |             | 120         | 20×40                 | 0.20 | 0.75                                              | EKMM421VSN121MN40S |
|             | 680         | 30×60                 | 0.15 | 2.15                                              | EKMM351VSN681MR60S |             | 120         | 22×35                 | 0.20 | 0.75                                              | EKMM421VSN121MP35S |
|             | 680         | 35×50                 | 0.15 | 1.99                                              | EKMM351VSN681MA50S |             | 120         | 25.4×30               | 0.20 | 0.75                                              | EKMM421VSN121MQ30S |
|             | 820         | 35×60                 | 0.15 | 2.31                                              | EKMM351VSN821MA60S |             | 120         | 30×25                 | 0.20 | 0.73                                              | EKMM421VSN121MR25S |
| 400         | 39          | 20×20                 | 0.15 | 0.32                                              | EKMM401VSN390MN20S |             | 120         | 35×20                 | 0.20 | 0.67                                              | EKMM421VSN121MA20S |
|             | 47          | 20×25                 | 0.15 | 0.39                                              | EKMM401VSN470MN25S |             | 150         | 20×50                 | 0.20 | 0.88                                              | EKMM421VSN151MN50S |
|             | 47          | 22×20                 | 0.15 | 0.37                                              | EKMM401VSN470MP20S |             | 150         | 22×40                 | 0.20 | 0.88                                              | EKMM421VSN151MP40S |
|             | 56          | 20×25                 | 0.15 | 0.51                                              | EKMM401VSN560MN25S |             | 150         | 25.4×35               | 0.20 | 0.88                                              | EKMM421VSN151MQ35S |
|             | 56          | 25.4×20               | 0.15 | 0.42                                              | EKMM401VSN560MQ20S |             | 150         | 30×25                 | 0.20 | 0.88                                              | EKMM421VSN151MR25S |
|             | 68          | 20×30                 | 0.15 | 0.56                                              | EKMM401VSN680MN30S |             | 180         | 22×45                 | 0.20 | 0.95                                              | EKMM421VSN181MP45S |
|             | 68          | 22×25                 | 0.15 | 0.50                                              | EKMM401VSN680MP25S |             | 180         | 25.4×35               | 0.20 | 0.95                                              | EKMM421VSN181MQ35S |
|             | 68          | 25.4×20               | 0.15 | 0.46                                              | EKMM401VSN680MQ20S |             | 180         | 30×30                 | 0.20 | 0.95                                              | EKMM421VSN181MR30S |
|             | 82          | 20×30                 | 0.15 | 0.64                                              | EKMM401VSN820MN30S |             | 180         | 35×25                 | 0.20 | 0.94                                              | EKMM421VSN181MA25S |
|             | 82          | 22×25                 | 0.15 | 0.64                                              | EKMM401VSN820MP25S |             | 220         | 22×50                 | 0.20 | 1.10                                              | EKMM421VSN221MP50S |
|             | 82          | 30×20                 | 0.15 | 0.55                                              | EKMM401VSN820MR20S |             | 220         | 25.4×45               | 0.20 | 1.10                                              | EKMM421VSN221MQ45S |
|             | 100         | 20×35                 | 0.15 | 0.70                                              | EKMM401VSN101MN35S |             | 220         | 30×35                 | 0.20 | 1.10                                              | EKMM421VSN221MR35S |
|             | 100         | 22×30                 | 0.15 | 0.70                                              | EKMM401VSN101MP30S |             | 220         | 35×25                 | 0.20 | 1.10                                              | EKMM421VSN221MA25S |
|             | 100         | 25.4×25               | 0.15 | 0.70                                              | EKMM401VSN101MQ25S |             | 270         | 25.4×50               | 0.20 | 1.22                                              | EKMM421VSN271MQ50S |


**KMM**Series

### ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 420                      | 270         | 30×40                 | 0.20 | 1.22                                              | EKMM421VSN271MR40S |
|                          | 270         | 35×30                 | 0.20 | 1.22                                              | EKMM421VSN271MA30S |
|                          | 330         | 25.4×60               | 0.20 | 1.41                                              | EKMM421VSN331MQ60S |
|                          | 330         | 30×45                 | 0.20 | 1.45                                              | EKMM421VSN331MR45S |
|                          | 330         | 35×35                 | 0.20 | 1.45                                              | EKMM421VSN331MA35S |
|                          | 390         | 30×50                 | 0.20 | 1.55                                              | EKMM421VSN391MR50S |
|                          | 390         | 35×40                 | 0.20 | 1.55                                              | EKMM421VSN391MA40S |
|                          | 470         | 30×60                 | 0.20 | 1.79                                              | EKMM421VSN471MR60S |
|                          | 470         | 35×45                 | 0.20 | 1.90                                              | EKMM421VSN471MA45S |
|                          | 560         | 35×50                 | 0.20 | 2.15                                              | EKMM421VSN561MA50S |
| 450                      | 680         | 35×60                 | 0.20 | 2.27                                              | EKMM421VSN681MA60S |
|                          | 39          | 20×25                 | 0.20 | 0.34                                              | EKMM451VSN390MN25S |
|                          | 47          | 20×25                 | 0.20 | 0.39                                              | EKMM451VSN470MN25S |
|                          | 56          | 20×30                 | 0.20 | 0.51                                              | EKMM451VSN560MN30S |
|                          | 56          | 22×25                 | 0.20 | 0.40                                              | EKMM451VSN560MP25S |
|                          | 68          | 20×35                 | 0.20 | 0.56                                              | EKMM451VSN680MN35S |
|                          | 68          | 22×30                 | 0.20 | 0.53                                              | EKMM451VSN680MP30S |
|                          | 68          | 25.4×25               | 0.20 | 0.50                                              | EKMM451VSN680MQ25S |
|                          | 82          | 20×35                 | 0.20 | 0.64                                              | EKMM451VSN820MN35S |
|                          | 82          | 22×30                 | 0.20 | 0.64                                              | EKMM451VSN820MP30S |
| 450                      | 82          | 25.4×25               | 0.20 | 0.64                                              | EKMM451VSN820MQ25S |
|                          | 100         | 20×45                 | 0.20 | 0.69                                              | EKMM451VSN101MN45S |
|                          | 100         | 22×35                 | 0.20 | 0.69                                              | EKMM451VSN101MP35S |
|                          | 100         | 25.4×30               | 0.20 | 0.69                                              | EKMM451VSN101MQ30S |
|                          | 100         | 30×25                 | 0.20 | 0.64                                              | EKMM451VSN101MR25S |
| 450                      | 120         | 20×50                 | 0.20 | 0.75                                              | EKMM451VSN121MN50S |
|                          | 120         | 22×40                 | 0.20 | 0.80                                              | EKMM451VSN121MP40S |
|                          | 120         | 25.4×30               | 0.20 | 0.80                                              | EKMM451VSN121MQ30S |
|                          | 120         | 30×25                 | 0.20 | 0.80                                              | EKMM451VSN121MR25S |
|                          | 120         | 35×25                 | 0.20 | 0.73                                              | EKMM451VSN121MA25S |
|                          | 150         | 22×45                 | 0.20 | 0.88                                              | EKMM451VSN151MP45S |
|                          | 150         | 25.4×35               | 0.20 | 0.88                                              | EKMM451VSN151MQ35S |
|                          | 150         | 30×30                 | 0.20 | 0.88                                              | EKMM451VSN151MR30S |
|                          | 150         | 35×25                 | 0.20 | 0.75                                              | EKMM451VSN151MA25S |
|                          | 180         | 22×50                 | 0.20 | 1.00                                              | EKMM451VSN181MP50S |
| 450                      | 180         | 25.4×40               | 0.20 | 1.00                                              | EKMM451VSN181MQ40S |
|                          | 180         | 30×30                 | 0.20 | 1.00                                              | EKMM451VSN181MR30S |
|                          | 220         | 25.4×45               | 0.20 | 1.12                                              | EKMM451VSN221MQ45S |
|                          | 220         | 30×35                 | 0.20 | 1.12                                              | EKMM451VSN221MR35S |
|                          | 220         | 35×30                 | 0.20 | 1.12                                              | EKMM451VSN221MA30S |
|                          | 270         | 25.4×60               | 0.20 | 1.18                                              | EKMM451VSN271MQ60S |
|                          | 270         | 30×40                 | 0.20 | 1.28                                              | EKMM451VSN271MR40S |
|                          | 270         | 35×35                 | 0.20 | 1.28                                              | EKMM451VSN271MA35S |
|                          | 330         | 30×50                 | 0.20 | 1.45                                              | EKMM451VSN331MR50S |
|                          | 330         | 35×40                 | 0.20 | 1.45                                              | EKMM451VSN331MA40S |
| 450                      | 390         | 30×60                 | 0.20 | 1.51                                              | EKMM451VSN391MR60S |
|                          | 390         | 35×40                 | 0.20 | 1.55                                              | EKMM451VSN391MA40S |
|                          | 470         | 35×50                 | 0.20 | 1.85                                              | EKMM451VSN471MA50S |
|                          | 560         | 35×60                 | 0.20 | 1.91                                              | EKMM451VSN561MA60S |

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency (Hz)            | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 160 to 250V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 315 to 450V <sub>dc</sub> | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

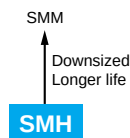


## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard snap-ins, 85°C

# SMH Series

- Endurance with ripple current : 2,000 hours at 85°C
- Non solvent resistant type
- RoHS Compliant

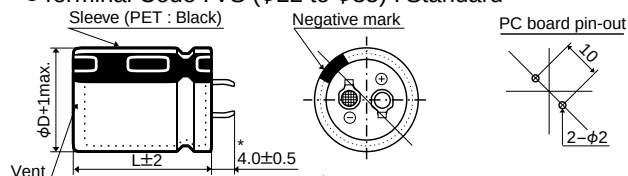


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                      |                                      |      |      |      |      |      |      |      |      |                 |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|------|------|------|-----------------|
| Category                                               | -40 to +85℃                                                                                                                                                                                                                                                                          |                                      |      |      |      |      |      |      |      |      |                 |
| Temperature Range                                      |                                                                                                                                                                                                                                                                                      |                                      |      |      |      |      |      |      |      |      |                 |
| Rated Voltage Range                                    | 6.3 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                            |                                      |      |      |      |      |      |      |      |      |                 |
| Capacitance Tolerance                                  | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                             |                                      |      |      |      |      |      |      |      |      |                 |
| Leakage Current                                        | I=0.02CV or 3mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)                                                                                                                         |                                      |      |      |      |      |      |      |      |      |                 |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                     | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  | 80V  | 100V | (at 20℃, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                          | 0.60                                 | 0.50 | 0.40 | 0.30 | 0.25 | 0.20 | 0.15 | 0.15 | 0.15 |                 |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                     | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  | 80V  | 100V | (at 120Hz)      |
|                                                        | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                      | 4                                    | 4    | 4    | 3    | 3    | 2    | 2    | 2    | 2    |                 |
|                                                        | Z(-40℃)/Z(+20℃)                                                                                                                                                                                                                                                                      | 15                                   | 15   | 15   | 10   | 8    | 6    | 6    | 5    | 5    |                 |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 85℃.                                                                                               |                                      |      |      |      |      |      |      |      |      |                 |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤±20% of the initial value           |      |      |      |      |      |      |      |      |                 |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                          | ≤200% of the initial specified value |      |      |      |      |      |      |      |      |                 |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤The initial specified value         |      |      |      |      |      |      |      |      |                 |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |      |      |      |                 |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                   | ≤±20% of the initial value           |      |      |      |      |      |      |      |      |                 |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                          | ≤150% of the initial specified value |      |      |      |      |      |      |      |      |                 |
|                                                        | Leakage current                                                                                                                                                                                                                                                                      | ≤The initial specified value         |      |      |      |      |      |      |      |      |                 |

## ◆DIMENSIONS [mm]

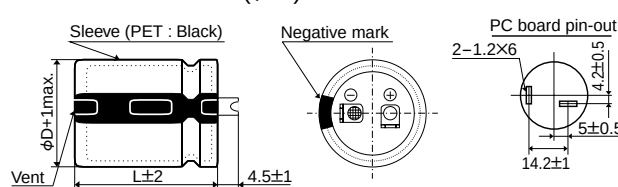
●Terminal Code : VS (φ22 to φ35) : Standard



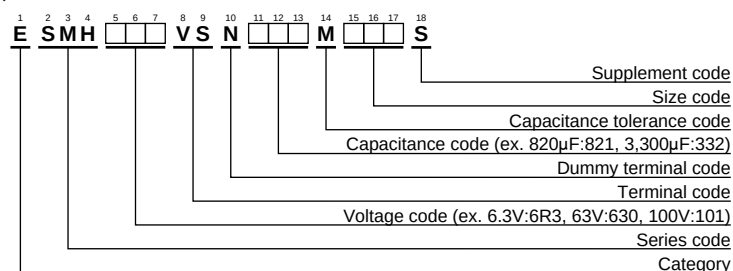
\*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

●Terminal Code : LI (φ35)



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"


**SMH**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|
| 6.3         | 15,000      | 22 × 25               | 0.60 | 2.44                                             | ESMH6R3VSN153MP25S | 16          | 27,000      | 25.4 × 45             | 0.40 | 4.72                                             | ESMH160VSN273MQ45S |
|             | 18,000      | 22 × 30               | 0.60 | 2.67                                             | ESMH6R3VSN183MP30S |             | 27,000      | 30 × 35               | 0.40 | 4.82                                             | ESMH160VSN273MR35S |
|             | 18,000      | 25.4 × 25             | 0.60 | 2.70                                             | ESMH6R3VSN183MQ25S |             | 27,000      | 35 × 30               | 0.40 | 4.65                                             | ESMH160VSN273MA30S |
|             | 22,000      | 22 × 30               | 0.60 | 3.06                                             | ESMH6R3VSN223MP30S |             | 33,000      | 25.4 × 50             | 0.40 | 5.33                                             | ESMH160VSN333MQ50S |
|             | 22,000      | 25.4 × 25             | 0.60 | 3.07                                             | ESMH6R3VSN223MQ25S |             | 33,000      | 30 × 40               | 0.40 | 5.36                                             | ESMH160VSN333MR40S |
|             | 27,000      | 22 × 35               | 0.60 | 3.49                                             | ESMH6R3VSN273MP35S |             | 33,000      | 35 × 30               | 0.40 | 5.15                                             | ESMH160VSN333MA30S |
|             | 27,000      | 25.4 × 30             | 0.60 | 3.52                                             | ESMH6R3VSN273MQ30S |             | 39,000      | 30 × 45               | 0.40 | 6.01                                             | ESMH160VSN393MR45S |
|             | 27,000      | 30 × 25               | 0.60 | 3.57                                             | ESMH6R3VSN273MR25S |             | 39,000      | 35 × 35               | 0.40 | 5.95                                             | ESMH160VSN393MA35S |
|             | 33,000      | 22 × 40               | 0.60 | 3.97                                             | ESMH6R3VSN333MP40S |             | 47,000      | 30 × 50               | 0.40 | 6.79                                             | ESMH160VSN473MR50S |
|             | 33,000      | 25.4 × 35             | 0.60 | 4.02                                             | ESMH6R3VSN333MQ35S |             | 47,000      | 35 × 40               | 0.40 | 6.76                                             | ESMH160VSN473MA40S |
|             | 33,000      | 30 × 25               | 0.60 | 3.95                                             | ESMH6R3VSN333MR25S |             | 56,000      | 35 × 45               | 0.40 | 7.62                                             | ESMH160VSN563MA45S |
|             | 39,000      | 22 × 50               | 0.60 | 4.55                                             | ESMH6R3VSN393MP50S |             | 68,000      | 35 × 50               | 0.40 | 8.63                                             | ESMH160VSN683MA50S |
|             | 39,000      | 25.4 × 40             | 0.60 | 4.50                                             | ESMH6R3VSN393MQ40S | 25          | 5,600       | 22 × 25               | 0.30 | 2.21                                             | ESMH250VSN682MP25S |
|             | 39,000      | 30 × 30               | 0.60 | 4.45                                             | ESMH6R3VSN393MR30S |             | 6,800       | 22 × 30               | 0.30 | 2.40                                             | ESMH250VSN682MP30S |
|             | 39,000      | 35 × 25               | 0.60 | 4.51                                             | ESMH6R3VSN393MA25S |             | 6,800       | 25.4 × 25             | 0.30 | 2.56                                             | ESMH250VSN682MQ25S |
|             | 47,000      | 25.4 × 45             | 0.60 | 5.09                                             | ESMH6R3VSN473MQ45S |             | 8,200       | 22 × 35               | 0.30 | 2.72                                             | ESMH250VSN822MP35S |
|             | 47,000      | 30 × 35               | 0.60 | 5.06                                             | ESMH6R3VSN473MR35S |             | 8,200       | 25.4 × 25             | 0.30 | 2.80                                             | ESMH250VSN822MQ25S |
|             | 47,000      | 35 × 30               | 0.60 | 5.01                                             | ESMH6R3VSN473MA30S |             | 10,000      | 22 × 40               | 0.30 | 3.09                                             | ESMH250VSN103MP40S |
|             | 56,000      | 25.4 × 50             | 0.60 | 5.71                                             | ESMH6R3VSN563MQ50S |             | 10,000      | 25.4 × 30             | 0.30 | 3.12                                             | ESMH250VSN103MQ30S |
|             | 56,000      | 30 × 40               | 0.60 | 5.70                                             | ESMH6R3VSN563MR40S |             | 10,000      | 30 × 25               | 0.30 | 3.21                                             | ESMH250VSN103MR25S |
|             | 56,000      | 35 × 30               | 0.60 | 5.77                                             | ESMH6R3VSN563MA30S |             | 12,000      | 22 × 45               | 0.30 | 3.48                                             | ESMH250VSN123MP45S |
|             | 68,000      | 30 × 45               | 0.60 | 6.48                                             | ESMH6R3VSN683MR45S |             | 12,000      | 25.4 × 35             | 0.30 | 3.43                                             | ESMH250VSN123MQ35S |
|             | 68,000      | 35 × 35               | 0.60 | 6.42                                             | ESMH6R3VSN683MA35S |             | 12,000      | 30 × 30               | 0.30 | 3.86                                             | ESMH250VSN123MR30S |
|             | 82,000      | 30 × 50               | 0.60 | 7.32                                             | ESMH6R3VSN823MR50S |             | 12,000      | 35 × 25               | 0.30 | 3.54                                             | ESMH250VSN123MA25S |
|             | 82,000      | 35 × 40               | 0.60 | 7.29                                             | ESMH6R3VSN823MA40S |             | 15,000      | 22 × 50               | 0.30 | 4.00                                             | ESMH250VSN153MP50S |
|             | 100,000     | 35 × 45               | 0.60 | 8.31                                             | ESMH6R3VSN104MA45S |             | 15,000      | 25.4 × 40             | 0.30 | 3.95                                             | ESMH250VSN153MQ40S |
| 10          | 12,000      | 22 × 25               | 0.50 | 2.39                                             | ESMH100VSN123MP25S |             | 15,000      | 30 × 30               | 0.30 | 4.00                                             | ESMH250VSN153MR30S |
|             | 15,000      | 22 × 30               | 0.50 | 2.76                                             | ESMH100VSN153MP30S |             | 15,000      | 35 × 25               | 0.30 | 3.95                                             | ESMH250VSN153MA25S |
|             | 15,000      | 25.4 × 25             | 0.50 | 2.77                                             | ESMH100VSN153MQ25S |             | 18,000      | 25.4 × 45             | 0.30 | 4.45                                             | ESMH250VSN183MQ45S |
|             | 18,000      | 22 × 35               | 0.50 | 3.12                                             | ESMH100VSN183MP35S |             | 18,000      | 30 × 35               | 0.30 | 4.46                                             | ESMH250VSN183MR35S |
|             | 18,000      | 25.4 × 25             | 0.50 | 3.04                                             | ESMH100VSN183MQ25S |             | 18,000      | 35 × 30               | 0.30 | 4.63                                             | ESMH250VSN183MA30S |
|             | 22,000      | 22 × 40               | 0.50 | 3.55                                             | ESMH100VSN223MP40S |             | 22,000      | 25.4 × 50             | 0.30 | 5.02                                             | ESMH250VSN223MQ50S |
|             | 22,000      | 25.4 × 30             | 0.50 | 3.48                                             | ESMH100VSN223MQ30S |             | 22,000      | 30 × 45               | 0.30 | 5.21                                             | ESMH250VSN223MR45S |
|             | 22,000      | 30 × 25               | 0.50 | 3.53                                             | ESMH100VSN223MR25S |             | 22,000      | 35 × 35               | 0.30 | 5.16                                             | ESMH250VSN223MA35S |
|             | 27,000      | 22 × 45               | 0.50 | 4.04                                             | ESMH100VSN273MP45S |             | 27,000      | 30 × 50               | 0.30 | 5.94                                             | ESMH250VSN273MR50S |
|             | 27,000      | 25.4 × 35             | 0.50 | 3.98                                             | ESMH100VSN273MQ35S |             | 27,000      | 35 × 40               | 0.30 | 5.92                                             | ESMH250VSN273MA40S |
|             | 27,000      | 30 × 30               | 0.50 | 3.73                                             | ESMH100VSN273MR30S |             | 33,000      | 35 × 45               | 0.30 | 6.75                                             | ESMH250VSN333MA45S |
|             | 27,000      | 35 × 25               | 0.50 | 3.73                                             | ESMH100VSN273MA25S |             | 39,000      | 35 × 50               | 0.30 | 7.56                                             | ESMH250VSN393MA50S |
|             | 33,000      | 22 × 50               | 0.50 | 4.58                                             | ESMH100VSN333MP50S | 35          | 3,900       | 22 × 25               | 0.25 | 2.22                                             | ESMH350VSN392MP25S |
|             | 33,000      | 25.4 × 40             | 0.50 | 4.54                                             | ESMH100VSN333MQ40S |             | 4,700       | 22 × 30               | 0.25 | 2.41                                             | ESMH350VSN472MP30S |
|             | 33,000      | 30 × 30               | 0.50 | 4.13                                             | ESMH100VSN333MR30S |             | 4,700       | 25.4 × 25             | 0.25 | 2.42                                             | ESMH350VSN472MQ25S |
|             | 33,000      | 35 × 25               | 0.50 | 4.13                                             | ESMH100VSN333MA25S |             | 5,600       | 22 × 35               | 0.25 | 2.75                                             | ESMH350VSN562MP35S |
|             | 39,000      | 25.4 × 45             | 0.50 | 5.08                                             | ESMH100VSN393MQ45S |             | 5,600       | 25.4 × 25             | 0.25 | 2.64                                             | ESMH350VSN562MQ25S |
|             | 39,000      | 30 × 35               | 0.50 | 5.05                                             | ESMH100VSN393MR35S |             | 6,800       | 22 × 40               | 0.25 | 2.80                                             | ESMH350VSN682MP40S |
|             | 39,000      | 35 × 30               | 0.50 | 4.80                                             | ESMH100VSN393MA30S |             | 6,800       | 25.4 × 30             | 0.25 | 2.74                                             | ESMH350VSN682MQ30S |
|             | 47,000      | 25.4 × 50             | 0.50 | 5.73                                             | ESMH100VSN473MQ50S |             | 6,800       | 30 × 25               | 0.25 | 2.97                                             | ESMH350VSN682MR25S |
|             | 47,000      | 30 × 40               | 0.50 | 5.72                                             | ESMH100VSN473MR40S |             | 8,200       | 22 × 45               | 0.25 | 3.47                                             | ESMH350VSN822MP45S |
|             | 47,000      | 35 × 30               | 0.50 | 5.27                                             | ESMH100VSN473MA30S |             | 8,200       | 25.4 × 35             | 0.25 | 3.10                                             | ESMH350VSN822MQ35S |
|             | 56,000      | 30 × 45               | 0.50 | 6.44                                             | ESMH100VSN563MR45S |             | 8,200       | 30 × 30               | 0.25 | 3.13                                             | ESMH350VSN822MR30S |
|             | 56,000      | 35 × 35               | 0.50 | 6.38                                             | ESMH100VSN563MA35S |             | 8,200       | 35 × 25               | 0.25 | 2.73                                             | ESMH350VSN822MA25S |
|             | 68,000      | 30 × 50               | 0.50 | 7.27                                             | ESMH100VSN683MR50S |             | 10,000      | 22 × 50               | 0.25 | 3.57                                             | ESMH350VSN103MP50S |
|             | 68,000      | 35 × 40               | 0.50 | 7.27                                             | ESMH100VSN683MA40S |             | 10,000      | 25.4 × 40             | 0.25 | 3.53                                             | ESMH350VSN103MQ40S |
|             | 82,000      | 35 × 50               | 0.50 | 8.49                                             | ESMH100VSN823MA50S |             | 10,000      | 30 × 30               | 0.25 | 3.46                                             | ESMH350VSN103MR30S |
| 16          | 8,200       | 22 × 25               | 0.40 | 2.51                                             | ESMH160VSN822MP25S |             | 10,000      | 35 × 25               | 0.25 | 3.02                                             | ESMH350VSN103MA25S |
|             | 10,000      | 22 × 25               | 0.40 | 2.77                                             | ESMH160VSN103MP25S | 50          | 12,000      | 25.4 × 45             | 0.25 | 3.98                                             | ESMH350VSN123MQ45S |
|             | 12,000      | 22 × 30               | 0.40 | 2.86                                             | ESMH160VSN123MP30S |             | 12,000      | 30 × 35               | 0.25 | 4.01                                             | ESMH350VSN123MR35S |
|             | 12,000      | 25.4 × 25             | 0.40 | 2.95                                             | ESMH160VSN123MQ25S |             | 12,000      | 35 × 30               | 0.25 | 4.42                                             | ESMH350VSN123MA30S |
|             | 15,000      | 22 × 35               | 0.40 | 3.29                                             | ESMH160VSN153MP35S |             | 15,000      | 25.4 × 50             | 0.25 | 4.54                                             | ESMH350VSN153MQ50S |
|             | 15,000      | 25.4 × 30             | 0.40 | 3.46                                             | ESMH160VSN153MQ30S |             | 15,000      | 30 × 40               | 0.25 | 4.52                                             | ESMH350VSN153MR40S |
|             | 15,000      | 30 × 25               | 0.40 | 3.66                                             | ESMH160VSN153MR25S |             | 15,000      | 35 × 35               | 0.25 | 5.01                                             | ESMH350VSN153MA35S |
|             | 18,000      | 22 × 40               | 0.40 | 3.72                                             | ESMH160VSN183MP40S |             | 18,000      | 30 × 45               | 0.25 | 4.71                                             | ESMH350VSN183MR45S |
|             | 18,000      | 25.4 × 35             | 0.40 | 3.98                                             | ESMH160VSN183MQ35S |             | 18,000      | 35 × 40               | 0.25 | 5.54                                             | ESMH350VSN183MA40S |
|             | 18,000      | 30 × 25               | 0.40 | 4.00                                             | ESMH160VSN183MR25S |             | 22,000      | 30 × 50               | 0.25 | 5.33                                             | ESMH350VSN223MR50S |
|             | 22,000      | 22 × 50               | 0.40 | 4.37                                             | ESMH160VSN223MP50S |             | 22,000      | 35 × 45               | 0.25 | 6.04                                             | ESMH350VSN223MA45S |
|             | 22,000      | 25.4 × 40             | 0.40 | 4.26                                             | ESMH160VSN223MQ40S |             | 27,000      | 35 × 50               | 0.25 | 6.89                                             | ESMH350VSN273MA50S |
|             | 22,000      | 30 × 30               | 0.40 | 4.21                                             | ESMH160VSN223MR30S |             | 2,200       | 22 × 25               | 0.20 | 1.91                                             | ESMH500VSN222MP25S |
|             | 22,000      | 35 × 25               | 0.40 | 4.15                                             | ESMH160VSN223MA25S |             | 3,300       | 22 × 30               | 0.20 | 2.37                                             | ESMH500VSN332MP30S |


**SMH**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|
| 50          | 3,300       | 25.4×25               | 0.20 | 2.38                                             | ESMH500VSN332MQ25S | 80          | 1,200       | 22×25                 | 0.15 | 1.69                                             | ESMH800VSN122MP25S |
|             | 3,900       | 22×35                 | 0.20 | 2.65                                             | ESMH500VSN392MP35S |             | 1,500       | 22×25                 | 0.15 | 1.88                                             | ESMH800VSN152MP25S |
|             | 3,900       | 25.4×30               | 0.20 | 2.68                                             | ESMH500VSN392MQ30S |             | 1,800       | 22×30                 | 0.15 | 2.14                                             | ESMH800VSN182MP30S |
|             | 3,900       | 30×25                 | 0.20 | 2.55                                             | ESMH500VSN392MR25S |             | 1,800       | 25.4×25               | 0.15 | 2.26                                             | ESMH800VSN182MQ25S |
|             | 4,700       | 22×40                 | 0.20 | 2.99                                             | ESMH500VSN472MP40S |             | 2,200       | 22×35                 | 0.15 | 2.44                                             | ESMH800VSN222MP35S |
|             | 4,700       | 25.4×35               | 0.20 | 3.03                                             | ESMH500VSN472MQ35S |             | 2,200       | 25.4×30               | 0.15 | 2.46                                             | ESMH800VSN222MQ30S |
|             | 4,700       | 30×25                 | 0.20 | 2.81                                             | ESMH500VSN472MR25S |             | 2,200       | 30×25                 | 0.15 | 2.49                                             | ESMH800VSN222MR25S |
|             | 5,600       | 22×45                 | 0.20 | 3.36                                             | ESMH500VSN562MP45S |             | 2,700       | 22×40                 | 0.15 | 2.78                                             | ESMH800VSN272MP40S |
|             | 5,600       | 25.4×35               | 0.20 | 3.31                                             | ESMH500VSN562MQ35S |             | 2,700       | 25.4×35               | 0.15 | 2.81                                             | ESMH800VSN272MQ35S |
|             | 5,600       | 30×30                 | 0.20 | 3.37                                             | ESMH500VSN562MR30S |             | 2,700       | 30×25                 | 0.15 | 2.75                                             | ESMH800VSN272MR30S |
|             | 5,600       | 35×25                 | 0.20 | 3.42                                             | ESMH500VSN562MA25S |             | 3,300       | 22×45                 | 0.15 | 3.16                                             | ESMH800VSN332MP45S |
|             | 6,800       | 22×50                 | 0.20 | 3.81                                             | ESMH500VSN682MP50S |             | 3,300       | 25.4×40               | 0.15 | 3.21                                             | ESMH800VSN332MQ40S |
|             | 6,800       | 25.4×40               | 0.20 | 3.81                                             | ESMH500VSN682MQ40S |             | 3,300       | 30×30                 | 0.15 | 3.17                                             | ESMH800VSN332MR30S |
|             | 6,800       | 30×35                 | 0.20 | 3.85                                             | ESMH500VSN682MR35S |             | 3,300       | 35×25                 | 0.15 | 3.21                                             | ESMH800VSN332MA25S |
|             | 6,800       | 35×30                 | 0.20 | 3.85                                             | ESMH500VSN682MA30S |             | 3,900       | 22×50                 | 0.15 | 3.52                                             | ESMH800VSN392MP50S |
|             | 8,200       | 25.4×50               | 0.20 | 4.37                                             | ESMH500VSN822MQ50S |             | 3,900       | 25.4×45               | 0.15 | 3.59                                             | ESMH800VSN392MQ45S |
|             | 8,200       | 30×40                 | 0.20 | 4.36                                             | ESMH500VSN822MR40S |             | 3,900       | 30×35                 | 0.15 | 3.57                                             | ESMH800VSN392MR35S |
|             | 8,200       | 35×30                 | 0.20 | 4.41                                             | ESMH500VSN822MA30S |             | 3,900       | 35×25                 | 0.15 | 3.50                                             | ESMH800VSN392MA25S |
|             | 10,000      | 30×45                 | 0.20 | 4.97                                             | ESMH500VSN103MR45S |             | 4,700       | 25.4×50               | 0.15 | 4.05                                             | ESMH800VSN472MQ50S |
|             | 10,000      | 35×35                 | 0.20 | 4.92                                             | ESMH500VSN103MA35S |             | 4,700       | 30×40                 | 0.15 | 4.05                                             | ESMH800VSN472MR40S |
| 63          | 12,000      | 30×50                 | 0.20 | 5.60                                             | ESMH500VSN123MR50S | 100         | 4,700       | 35×30                 | 0.15 | 4.09                                             | ESMH800VSN472MA30S |
|             | 12,000      | 35×40                 | 0.20 | 5.58                                             | ESMH500VSN123MA40S |             | 5,600       | 30×45                 | 0.15 | 4.55                                             | ESMH800VSN562MR45S |
|             | 15,000      | 35×45                 | 0.20 | 6.44                                             | ESMH500VSN153MA45S |             | 5,600       | 35×35                 | 0.15 | 4.51                                             | ESMH800VSN562MA35S |
|             | 18,000      | 35×50                 | 0.20 | 6.71                                             | ESMH500VSN183MA50S |             | 6,800       | 30×50                 | 0.15 | 5.16                                             | ESMH800VSN682MR50S |
|             | 1,800       | 22×25                 | 0.15 | 1.82                                             | ESMH630VSN182MP25S |             | 6,800       | 35×40                 | 0.15 | 5.14                                             | ESMH800VSN682MA40S |
|             | 2,200       | 22×30                 | 0.15 | 2.31                                             | ESMH630VSN222MP30S |             | 8,200       | 35×45                 | 0.15 | 5.83                                             | ESMH800VSN822MA45S |
|             | 2,200       | 25.4×25               | 0.15 | 2.30                                             | ESMH630VSN222MQ25S |             | 10,000      | 35×50                 | 0.15 | 6.63                                             | ESMH800VSN103MA50S |
|             | 2,700       | 22×35                 | 0.15 | 2.40                                             | ESMH630VSN272MP35S |             | 820         | 22×25                 | 0.15 | 1.86                                             | ESMH101VSN821MP25S |
|             | 2,700       | 25.4×25               | 0.15 | 2.40                                             | ESMH630VSN272MQ25S |             | 1,200       | 22×30                 | 0.15 | 2.09                                             | ESMH101VSN122MP30S |
|             | 3,300       | 22×35                 | 0.15 | 2.62                                             | ESMH630VSN332MP35S |             | 1,200       | 25.4×25               | 0.15 | 2.10                                             | ESMH101VSN122MQ25S |
|             | 3,300       | 25.4×30               | 0.15 | 2.64                                             | ESMH630VSN332MQ30S |             | 1,500       | 22×35                 | 0.15 | 2.41                                             | ESMH101VSN152MP35S |
|             | 3,300       | 30×25                 | 0.15 | 2.78                                             | ESMH630VSN332MR25S |             | 1,500       | 25.4×30               | 0.15 | 2.43                                             | ESMH101VSN152MQ30S |
|             | 3,900       | 22×40                 | 0.15 | 2.93                                             | ESMH630VSN392MP40S |             | 1,500       | 30×25                 | 0.15 | 2.46                                             | ESMH101VSN152MR25S |
|             | 3,900       | 25.4×35               | 0.15 | 2.97                                             | ESMH630VSN392MQ35S |             | 1,800       | 22×40                 | 0.15 | 2.71                                             | ESMH101VSN182MP40S |
|             | 3,900       | 30×30                 | 0.15 | 3.00                                             | ESMH630VSN392MR30S |             | 1,800       | 25.4×35               | 0.15 | 2.75                                             | ESMH101VSN182MQ35S |
|             | 3,900       | 35×25                 | 0.15 | 3.00                                             | ESMH630VSN392MA25S |             | 1,800       | 30×25                 | 0.15 | 2.72                                             | ESMH101VSN182MR25S |
|             | 4,700       | 22×50                 | 0.15 | 3.39                                             | ESMH630VSN472MP50S |             | 2,200       | 22×45                 | 0.15 | 3.08                                             | ESMH101VSN222MP45S |
|             | 4,700       | 25.4×40               | 0.15 | 3.36                                             | ESMH630VSN472MQ40S |             | 2,200       | 25.4×40               | 0.15 | 3.13                                             | ESMH101VSN222MQ40S |
|             | 4,700       | 30×30                 | 0.15 | 3.32                                             | ESMH630VSN472MR30S |             | 2,200       | 30×30                 | 0.15 | 3.09                                             | ESMH101VSN222MR30S |
|             | 4,700       | 35×25                 | 0.15 | 3.36                                             | ESMH630VSN472MA25S |             | 2,200       | 35×25                 | 0.15 | 3.14                                             | ESMH101VSN222MA25S |
| 63          | 5,600       | 25.4×45               | 0.15 | 3.77                                             | ESMH630VSN562MQ45S |             | 2,700       | 22×50                 | 0.15 | 3.53                                             | ESMH101VSN272MP50S |
|             | 5,600       | 30×35                 | 0.15 | 3.75                                             | ESMH630VSN562MR35S |             | 2,700       | 25.4×45               | 0.15 | 3.57                                             | ESMH101VSN272MQ45S |
|             | 5,600       | 35×30                 | 0.15 | 3.76                                             | ESMH630VSN562MA30S |             | 2,700       | 30×35                 | 0.15 | 3.55                                             | ESMH101VSN272MR35S |
|             | 6,800       | 25.4×50               | 0.15 | 4.27                                             | ESMH630VSN682MQ50S |             | 2,700       | 35×30                 | 0.15 | 3.71                                             | ESMH101VSN272MA30S |
|             | 6,800       | 30×40                 | 0.15 | 4.27                                             | ESMH630VSN682MR40S |             | 3,300       | 25.4×50               | 0.15 | 4.06                                             | ESMH101VSN332MQ50S |
|             | 6,800       | 35×30                 | 0.15 | 4.15                                             | ESMH630VSN682MA30S |             | 3,300       | 30×40                 | 0.15 | 4.05                                             | ESMH101VSN332MR40S |
|             | 8,200       | 30×45                 | 0.15 | 4.83                                             | ESMH630VSN822MR45S |             | 3,300       | 35×30                 | 0.15 | 4.05                                             | ESMH101VSN332MA30S |
|             | 8,200       | 35×35                 | 0.15 | 4.79                                             | ESMH630VSN822MA35S |             | 3,900       | 30×45                 | 0.15 | 4.54                                             | ESMH101VSN392MR45S |
|             | 10,000      | 30×50                 | 0.15 | 5.49                                             | ESMH630VSN103MR50S |             | 3,900       | 35×35                 | 0.15 | 4.49                                             | ESMH101VSN392MA35S |
|             | 10,000      | 35×40                 | 0.15 | 5.47                                             | ESMH630VSN103MA40S |             | 4,700       | 30×50                 | 0.15 | 5.13                                             | ESMH101VSN472MR50S |
|             | 12,000      | 35×45                 | 0.15 | 6.19                                             | ESMH630VSN123MA45S |             | 4,700       | 35×40                 | 0.15 | 5.11                                             | ESMH101VSN472MA40S |
|             |             |                       |      |                                                  |                    |             | 5,600       | 35×45                 | 0.15 | 5.75                                             | ESMH101VSN562MA45S |
|             |             |                       |      |                                                  |                    |             | 6,800       | 35×50                 | 0.15 | 6.50                                             | ESMH101VSN682MA50S |

\*For the rated voltage ≥ 160Vdc, please use SMQ series

**◆RATED RIPPLE CURRENT MULTIPLIERS**

## ●Frequency Multipliers

| Frequency (Hz) | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|----------------|------|------|------|------|------|------|
| 6.3 to 50Vdc   | 0.95 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |
| 63 to 100Vdc   | 0.92 | 1.00 | 1.07 | 1.13 | 1.19 | 1.20 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

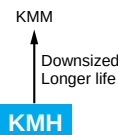


## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard snap-ins, 105°C

# KMH Series

- Endurance with ripple current : 2,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

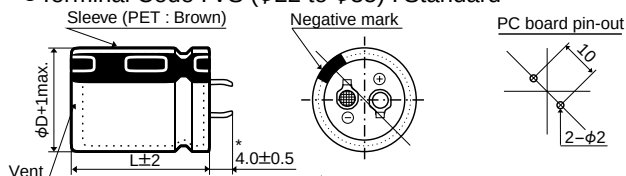


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                           |                                      |      |      |      |      |      |      |      |      |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|------|------|------|
| Category                                               | Temperature Range                                                                                                                                                                         |                                      |      |      |      |      |      |      |      |      |
| Rated Voltage Range                                    | -40 to +105°C                                                                                                                                                                             |                                      |      |      |      |      |      |      |      |      |
| Capacitance Tolerance                                  | 6.3 to 100V <sub>dc</sub>                                                                                                                                                                 |                                      |      |      |      |      |      |      |      |      |
| Leakage Current                                        | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                 |                                      |      |      |      |      |      |      |      |      |
| Dissipation Factor (tanδ)                              | I=0.02CV or 3mA, whichever is smaller                                                                                                                                                     |                                      |      |      |      |      |      |      |      |      |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                       |                                      |      |      |      |      |      |      |      |      |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                          | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  | 80V  | 100V |
| Low Temperature Characteristics (Max. Impedance Ratio) | tanδ (Max.)                                                                                                                                                                               | 0.60                                 | 0.50 | 0.40 | 0.30 | 0.25 | 0.20 | 0.15 | 0.15 | 0.15 |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                          | 6.3V                                 | 10V  | 16V  | 25V  | 35V  | 50V  | 63V  | 80V  | 100V |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                         | 4                                    | 4    | 4    | 3    | 3    | 2    | 2    | 2    | 2    |
| Endurance                                              | Z(-40°C)/Z(+20°C)                                                                                                                                                                         | 15                                   | 15   | 15   | 10   | 8    | 6    | 6    | 5    | 5    |
|                                                        | (at 120Hz)                                                                                                                                                                                |                                      |      |      |      |      |      |      |      |      |
|                                                        | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105°C. |                                      |      |      |      |      |      |      |      |      |
| Shelf Life                                             | Capacitance change                                                                                                                                                                        | ≤±20% of the initial value           |      |      |      |      |      |      |      |      |
|                                                        | D.F. (tanδ)                                                                                                                                                                               | ≤200% of the initial specified value |      |      |      |      |      |      |      |      |
|                                                        | Leakage current                                                                                                                                                                           | ≤The initial specified value         |      |      |      |      |      |      |      |      |

## ◆DIMENSIONS [mm]

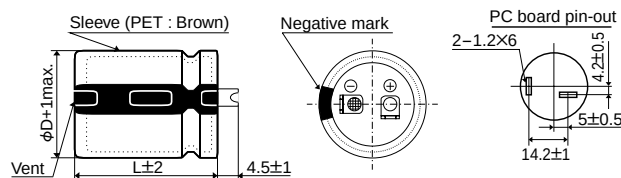
- Terminal Code : VS (φ22 to φ35) : Standard



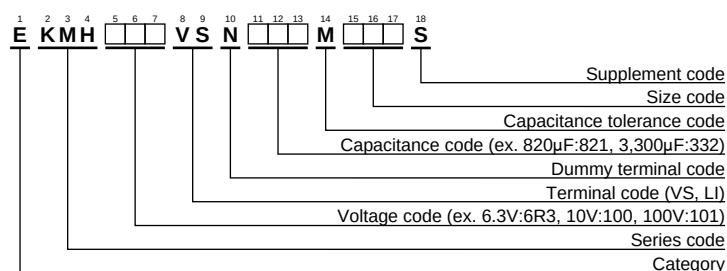
\*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

- Terminal Code : LI (φ35)



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"


**KMH**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ    | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc)        | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ    | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |                    |
|-------------|-------------|-----------------------|---------|---------------------------------------------------|--------------------|--------------------|-------------|-----------------------|---------|---------------------------------------------------|--------------------|--------------------|
| 6.3         | 12,000      | 22×25                 | 0.60    | 1.54                                              | EKMH6R3VSN123MP25S | 16                 | 27,000      | 35×30                 | 0.40    | 3.45                                              | EKMH160VSN273MA30S |                    |
|             | 15,000      | 22×25                 | 0.60    | 1.72                                              | EKMH6R3VSN153MP25S |                    | 33,000      | 30×45                 | 0.40    | 4.30                                              | EKMH160VSN333MR45S |                    |
|             | 18,000      | 22×30                 | 0.60    | 1.95                                              | EKMH6R3VSN183MP30S |                    | 33,000      | 35×35                 | 0.40    | 4.26                                              | EKMH160VSN333MA35S |                    |
|             | 18,000      | 25.4×25               | 0.60    | 1.96                                              | EKMH6R3VSN183MQ25S |                    | 39,000      | 30×50                 | 0.40    | 4.81                                              | EKMH160VSN393MR50S |                    |
|             | 22,000      | 22×35                 | 0.60    | 2.23                                              | EKMH6R3VSN223MP35S |                    | 39,000      | 35×40                 | 0.40    | 4.79                                              | EKMH160VSN393MA40S |                    |
|             | 22,000      | 25.4×30               | 0.60    | 2.25                                              | EKMH6R3VSN223MQ30S |                    | 47,000      | 35×45                 | 0.40    | 5.43                                              | EKMH160VSN473MA45S |                    |
|             | 22,000      | 30×25                 | 0.60    | 2.28                                              | EKMH6R3VSN223MR25S |                    | 25          | 4,700                 | 22×25   | 0.30                                              | 1.50               | EKMH250VSN472MP25S |
|             | 27,000      | 22×40                 | 0.60    | 2.54                                              | EKMH6R3VSN273MP40S |                    |             | 5,600                 | 22×25   | 0.30                                              | 1.63               | EKMH250VSN562MP25S |
|             | 27,000      | 25.4×35               | 0.60    | 2.57                                              | EKMH6R3VSN273MQ35S |                    |             | 6,800                 | 22×30   | 0.30                                              | 1.86               | EKMH250VSN682MP30S |
|             | 27,000      | 30×25                 | 0.60    | 2.52                                              | EKMH6R3VSN273MR25S |                    |             | 6,800                 | 25.4×25 | 0.30                                              | 1.87               | EKMH250VSN682MQ25S |
|             | 33,000      | 22×45                 | 0.60    | 2.88                                              | EKMH6R3VSN333MP45S | 8,200              |             | 22×35                 | 0.30    | 2.11                                              | EKMH250VSN822MP35S |                    |
|             | 33,000      | 25.4×40               | 0.60    | 2.93                                              | EKMH6R3VSN333MQ40S | 8,200              |             | 25.4×30               | 0.30    | 2.12                                              | EKMH250VSN822MQ30S |                    |
|             | 33,000      | 30×30                 | 0.60    | 2.89                                              | EKMH6R3VSN333MR30S | 8,200              |             | 30×25                 | 0.30    | 2.15                                              | EKMH250VSN822MR25S |                    |
|             | 33,000      | 35×25                 | 0.60    | 2.93                                              | EKMH6R3VSN333MA25S | 10,000             |             | 22×40                 | 0.30    | 2.39                                              | EKMH250VSN103MP40S |                    |
|             | 39,000      | 25.4×40               | 0.60    | 3.18                                              | EKMH6R3VSN393MQ40S | 10,000             |             | 25.4×35               | 0.30    | 2.42                                              | EKMH250VSN103MQ35S |                    |
|             | 39,000      | 30×35                 | 0.60    | 3.26                                              | EKMH6R3VSN393MR35S | 10,000             |             | 30×25                 | 0.30    | 2.37                                              | EKMH250VSN103MR25S |                    |
|             | 39,000      | 35×30                 | 0.60    | 3.40                                              | EKMH6R3VSN393MA30S | 12,000             |             | 22×45                 | 0.30    | 2.69                                              | EKMH250VSN123MP45S |                    |
|             | 47,000      | 25.4×50               | 0.60    | 3.69                                              | EKMH6R3VSN473MQ50S | 12,000             |             | 25.4×40               | 0.30    | 2.74                                              | EKMH250VSN123MQ40S |                    |
|             | 47,000      | 30×40                 | 0.60    | 3.69                                              | EKMH6R3VSN473MR40S | 12,000             |             | 30×30                 | 0.30    | 2.70                                              | EKMH250VSN123MR30S |                    |
|             | 47,000      | 35×30                 | 0.60    | 3.73                                              | EKMH6R3VSN473MA30S | 12,000             |             | 35×25                 | 0.30    | 2.74                                              | EKMH250VSN123MA25S |                    |
|             | 56,000      | 30×45                 | 0.60    | 4.16                                              | EKMH6R3VSN563MR45S | 15,000             |             | 25.4×45               | 0.30    | 3.15                                              | EKMH250VSN153MQ45S |                    |
|             | 56,000      | 35×35                 | 0.60    | 4.12                                              | EKMH6R3VSN563MA35S | 15,000             |             | 30×35                 | 0.30    | 3.13                                              | EKMH250VSN153MR35S |                    |
|             | 68,000      | 30×50                 | 0.60    | 4.71                                              | EKMH6R3VSN683MR50S | 15,000             |             | 35×30                 | 0.30    | 3.27                                              | EKMH250VSN153MA30S |                    |
|             | 68,000      | 35×40                 | 0.60    | 4.69                                              | EKMH6R3VSN683MA40S | 18,000             |             | 25.4×50               | 0.30    | 3.54                                              | EKMH250VSN183MQ50S |                    |
|             | 82,000      | 35×45                 | 0.60    | 5.32                                              | EKMH6R3VSN823MA45S | 18,000             |             | 30×40                 | 0.30    | 3.54                                              | EKMH250VSN183MR40S |                    |
|             | 10          | 10,000                | 22×25   | 0.50                                              | 1.55               | EKMH100VSN103MP25S |             | 18,000                | 35×30   | 0.30                                              | 3.58               | EKMH250VSN183MA30S |
|             |             | 12,000                | 22×30   | 0.50                                              | 1.77               | EKMH100VSN123MP30S |             | 22,000                | 30×45   | 0.30                                              | 4.04               | EKMH250VSN223MR45S |
|             |             | 15,000                | 22×30   | 0.50                                              | 1.97               | EKMH100VSN153MP30S |             | 22,000                | 35×35   | 0.30                                              | 3.64               | EKMH250VSN223MA35S |
|             |             | 15,000                | 25.4×25 | 0.50                                              | 1.96               | EKMH100VSN153MQ25S | 27,000      | 35×45                 | 0.30    | 4.73                                              | EKMH250VSN273MA45S |                    |
|             |             | 18,000                | 22×35   | 0.50                                              | 2.21               | EKMH100VSN183MP35S | 33,000      | 35×50                 | 0.30    | 5.39                                              | EKMH250VSN333MA50S |                    |
|             |             | 18,000                | 25.4×30 | 0.50                                              | 2.23               | EKMH100VSN183MQ30S | 35          | 3,300                 | 22×25   | 0.25                                              | 1.40               | EKMH350VSN332MP25S |
|             |             | 22,000                | 22×40   | 0.50                                              | 2.51               | EKMH100VSN223MP40S |             | 3,900                 | 22×30   | 0.25                                              | 1.57               | EKMH350VSN392MP30S |
| 22,000      |             | 25.4×35               | 0.50    | 2.54                                              | EKMH100VSN223MQ35S | 4,700              |             | 22×30                 | 0.25    | 1.72                                              | EKMH350VSN472MP30S |                    |
| 22,000      |             | 30×25                 | 0.50    | 2.40                                              | EKMH100VSN223MR25S | 4,700              |             | 25.4×25               | 0.25    | 1.80                                              | EKMH350VSN472MQ25S |                    |
| 27,000      |             | 22×50                 | 0.50    | 2.93                                              | EKMH100VSN273MP50S | 5,600              |             | 22×35                 | 0.25    | 1.95                                              | EKMH350VSN562MP35S |                    |
| 27,000      |             | 25.4×40               | 0.50    | 2.90                                              | EKMH100VSN273MQ40S | 5,600              |             | 25.4×30               | 0.25    | 1.96                                              | EKMH350VSN562MQ30S |                    |
| 27,000      |             | 30×30                 | 0.50    | 2.87                                              | EKMH100VSN273MR30S | 5,600              |             | 30×25                 | 0.25    | 1.99                                              | EKMH350VSN562MR25S |                    |
| 27,000      |             | 35×25                 | 0.50    | 2.73                                              | EKMH100VSN273MA25S | 6,800              |             | 22×40                 | 0.25    | 2.20                                              | EKMH350VSN682MP40S |                    |
| 33,000      |             | 25.4×45               | 0.50    | 3.30                                              | EKMH100VSN333MQ45S | 6,800              |             | 25.4×35               | 0.25    | 2.23                                              | EKMH350VSN682MQ35S |                    |
| 33,000      |             | 30×35                 | 0.50    | 3.28                                              | EKMH100VSN333MR35S | 6,800              |             | 30×25                 | 0.25    | 2.19                                              | EKMH350VSN682MR25S |                    |
| 33,000      |             | 35×30                 | 0.50    | 3.16                                              | EKMH100VSN333MA30S | 8,200              |             | 22×50                 | 0.25    | 2.55                                              | EKMH350VSN822MP50S |                    |
| 39,000      |             | 25.4×50               | 0.50    | 3.68                                              | EKMH100VSN393MQ50S | 8,200              |             | 25.4×40               | 0.25    | 2.53                                              | EKMH350VSN822MQ40S |                    |
| 39,000      |             | 30×40                 | 0.50    | 3.69                                              | EKMH100VSN393MR40S | 8,200              |             | 30×30                 | 0.25    | 2.75                                              | EKMH350VSN822MR30S |                    |
| 39,000      |             | 35×30                 | 0.50    | 3.43                                              | EKMH100VSN393MA30S | 8,200              |             | 35×25                 | 0.25    | 2.75                                              | EKMH350VSN822MA25S |                    |
| 47,000      |             | 30×45                 | 0.50    | 4.17                                              | EKMH100VSN473MR45S | 10,000             |             | 25.4×45               | 0.25    | 2.87                                              | EKMH350VSN103MQ45S |                    |
| 47,000      |             | 35×35                 | 0.50    | 3.76                                              | EKMH100VSN473MA35S | 10,000             |             | 30×35                 | 0.25    | 2.90                                              | EKMH350VSN103MR35S |                    |
| 56,000      |             | 30×50                 | 0.50    | 4.68                                              | EKMH100VSN563MR50S | 10,000             |             | 35×30                 | 0.25    | 2.91                                              | EKMH350VSN103MA30S |                    |
| 56,000      |             | 35×40                 | 0.50    | 4.67                                              | EKMH100VSN563MA40S | 12,000             |             | 25.4×50               | 0.25    | 3.24                                              | EKMH350VSN123MQ50S |                    |
| 68,000      |             | 35×50                 | 0.50    | 5.46                                              | EKMH100VSN683MA50S | 12,000             |             | 30×40                 | 0.25    | 3.23                                              | EKMH350VSN123MR40S |                    |
| 16          | 6,800       | 22×25                 | 0.40    | 1.57                                              | EKMH160VSN682MP25S | 12,000             |             | 35×30                 | 0.25    | 2.99                                              | EKMH350VSN123MA30S |                    |
|             | 10,000      | 22×30                 | 0.40    | 1.97                                              | EKMH160VSN103MP30S | 15,000             |             | 30×45                 | 0.25    | 3.72                                              | EKMH350VSN153MR45S |                    |
|             | 10,000      | 25.4×25               | 0.40    | 1.97                                              | EKMH160VSN103MQ25S | 15,000             |             | 35×35                 | 0.25    | 3.67                                              | EKMH350VSN153MA35S |                    |
|             | 12,000      | 22×35                 | 0.40    | 2.22                                              | EKMH160VSN123MP35S | 18,000             |             | 35×40                 | 0.25    | 4.37                                              | EKMH350VSN183MA40S |                    |
|             | 12,000      | 25.4×30               | 0.40    | 2.24                                              | EKMH160VSN123MQ30S | 22,000             |             | 35×50                 | 0.25    | 4.92                                              | EKMH350VSN223MA50S |                    |
|             | 12,000      | 30×25                 | 0.40    | 2.45                                              | EKMH160VSN123MR25S | 50                 | 1,800       | 22×25                 | 0.20    | 1.33                                              | EKMH500VSN182MP25S |                    |
|             | 15,000      | 22×40                 | 0.40    | 2.55                                              | EKMH160VSN153MP40S |                    | 2,700       | 22×30                 | 0.20    | 1.69                                              | EKMH500VSN272MP30S |                    |
|             | 15,000      | 25.4×35               | 0.40    | 2.58                                              | EKMH160VSN153MQ35S |                    | 2,700       | 25.4×25               | 0.20    | 1.70                                              | EKMH500VSN272MQ25S |                    |
|             | 15,000      | 30×25                 | 0.40    | 2.52                                              | EKMH160VSN153MR25S |                    | 3,300       | 22×35                 | 0.20    | 1.93                                              | EKMH500VSN332MP35S |                    |
|             | 18,000      | 22×45                 | 0.40    | 2.87                                              | EKMH160VSN183MP45S |                    | 3,300       | 25.4×30               | 0.20    | 1.85                                              | EKMH500VSN332MQ30S |                    |
|             | 18,000      | 25.4×40               | 0.40    | 2.92                                              | EKMH160VSN183MQ40S |                    | 3,900       | 22×40                 | 0.20    | 2.16                                              | EKMH500VSN392MP40S |                    |
|             | 18,000      | 30×30                 | 0.40    | 2.88                                              | EKMH160VSN183MR30S |                    | 3,900       | 25.4×35               | 0.20    | 2.18                                              | EKMH500VSN392MQ35S |                    |
|             | 18,000      | 35×25                 | 0.40    | 2.92                                              | EKMH160VSN183MA25S |                    | 3,900       | 30×25                 | 0.20    | 1.95                                              | EKMH500VSN392MR25S |                    |
|             | 22,000      | 25.4×45               | 0.40    | 3.32                                              | EKMH160VSN223MQ45S |                    | 4,700       | 22×45                 | 0.20    | 2.43                                              | EKMH500VSN472MP45S |                    |
|             | 22,000      | 30×35                 | 0.40    | 3.29                                              | EKMH160VSN223MR35S |                    | 4,700       | 25.4×35               | 0.20    | 2.39                                              | EKMH500VSN472MQ35S |                    |
|             | 22,000      | 35×25                 | 0.40    | 3.23                                              | EKMH160VSN223MA25S |                    | 4,700       | 30×30                 | 0.20    | 2.25                                              | EKMH500VSN472MR30S |                    |
|             | 27,000      | 25.4×50               | 0.40    | 3.78                                              | EKMH160VSN273MQ50S |                    | 4,700       | 35×25                 | 0.20    | 2.48                                              | EKMH500VSN472MA25S |                    |
|             | 27,000      | 30×40                 | 0.40    | 3.77                                              | EKMH160VSN273MR40S |                    | 5,600       | 22×50                 | 0.20    | 2.75                                              | EKMH500VSN562MP50S |                    |


**KMH**Series

### ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 50          | 5,600       | 25.4×40               | 0.20 | 2.70                                              | EKMH500VSN562MQ40S | 80          | 1,800       | 25.4×30               | 0.15 | 1.76                                              | EKMH800VSN182MQ30S |
|             | 5,600       | 30×35                 | 0.20 | 2.76                                              | EKMH500VSN562MR35S |             | 1,800       | 30×25                 | 0.15 | 1.65                                              | EKMH800VSN182MR25S |
|             | 5,600       | 35×25                 | 0.20 | 2.70                                              | EKMH500VSN562MA25S |             | 2,200       | 22×45                 | 0.15 | 2.04                                              | EKMH800VSN222MP45S |
|             | 6,800       | 25.4×50               | 0.20 | 3.30                                              | EKMH500VSN682MQ50S |             | 2,200       | 25.4×35               | 0.15 | 2.01                                              | EKMH800VSN222MQ35S |
|             | 6,800       | 30×40                 | 0.20 | 3.30                                              | EKMH500VSN682MR40S |             | 2,200       | 30×30                 | 0.15 | 2.05                                              | EKMH800VSN222MR30S |
|             | 6,800       | 35×30                 | 0.20 | 3.25                                              | EKMH500VSN682MA30S |             | 2,200       | 35×25                 | 0.15 | 2.07                                              | EKMH800VSN222MA25S |
|             | 8,200       | 30×45                 | 0.20 | 3.60                                              | EKMH500VSN822MR45S |             | 2,700       | 25.4×45               | 0.15 | 2.36                                              | EKMH800VSN272MQ45S |
|             | 8,200       | 35×35                 | 0.20 | 3.55                                              | EKMH500VSN822MA35S |             | 2,700       | 30×35                 | 0.15 | 2.35                                              | EKMH800VSN272MR35S |
|             | 10,000      | 30×50                 | 0.20 | 4.04                                              | EKMH500VSN103MR50S |             | 2,700       | 35×25                 | 0.15 | 2.29                                              | EKMH800VSN272MA25S |
|             | 10,000      | 35×40                 | 0.20 | 4.03                                              | EKMH500VSN103MA40S |             | 3,300       | 25.4×50               | 0.15 | 2.68                                              | EKMH800VSN332MQ50S |
| 63          | 12,000      | 35×45                 | 0.20 | 4.55                                              | EKMH500VSN123MA45S |             | 3,300       | 30×40                 | 0.15 | 2.68                                              | EKMH800VSN332MR40S |
|             | 1,200       | 22×25                 | 0.15 | 1.19                                              | EKMH630VSN122MP25S |             | 3,300       | 35×30                 | 0.15 | 2.45                                              | EKMH800VSN332MA30S |
|             | 1,500       | 22×25                 | 0.15 | 1.33                                              | EKMH630VSN152MP25S |             | 3,900       | 30×45                 | 0.15 | 3.00                                              | EKMH800VSN392MR45S |
|             | 1,800       | 22×30                 | 0.15 | 1.51                                              | EKMH630VSN182MP30S |             | 3,900       | 35×35                 | 0.15 | 2.98                                              | EKMH800VSN392MA35S |
|             | 1,800       | 25.4×25               | 0.15 | 1.52                                              | EKMH630VSN182MQ25S |             | 4,700       | 30×50                 | 0.15 | 3.39                                              | EKMH800VSN472MR50S |
|             | 2,200       | 22×35                 | 0.15 | 1.73                                              | EKMH630VSN222MP35S |             | 4,700       | 35×40                 | 0.15 | 3.38                                              | EKMH800VSN472MA40S |
|             | 2,200       | 25.4×30               | 0.15 | 1.74                                              | EKMH630VSN222MQ30S |             | 5,600       | 35×45                 | 0.15 | 3.80                                              | EKMH800VSN562MA45S |
|             | 2,700       | 22×40                 | 0.15 | 1.97                                              | EKMH630VSN272MP40S |             | 6,800       | 35×50                 | 0.15 | 3.90                                              | EKMH800VSN682MA50S |
|             | 2,700       | 25.4×35               | 0.15 | 1.99                                              | EKMH630VSN272MQ35S | 100         | 560         | 22×25                 | 0.15 | 1.05                                              | EKMH101VSN561MP25S |
|             | 2,700       | 30×25                 | 0.15 | 1.76                                              | EKMH630VSN272MR25S |             | 820         | 22×30                 | 0.15 | 1.32                                              | EKMH101VSN821MP30S |
| 80          | 3,300       | 22×50                 | 0.15 | 2.29                                              | EKMH630VSN332MP50S |             | 820         | 25.4×25               | 0.15 | 1.33                                              | EKMH101VSN821MQ25S |
|             | 3,300       | 25.4×40               | 0.15 | 2.27                                              | EKMH630VSN332MQ40S |             | 1,000       | 22×35                 | 0.15 | 1.50                                              | EKMH101VSN102MP35S |
|             | 3,300       | 30×30                 | 0.15 | 2.24                                              | EKMH630VSN332MR30S |             | 1,000       | 25.4×30               | 0.15 | 1.51                                              | EKMH101VSN102MQ30S |
|             | 3,300       | 35×25                 | 0.15 | 2.06                                              | EKMH630VSN332MA25S |             | 1,200       | 22×40                 | 0.15 | 1.69                                              | EKMH101VSN122MP40S |
|             | 3,900       | 25.4×45               | 0.15 | 2.54                                              | EKMH630VSN392MQ45S |             | 1,200       | 25.4×35               | 0.15 | 1.71                                              | EKMH101VSN122MQ35S |
|             | 3,900       | 30×35                 | 0.15 | 2.55                                              | EKMH630VSN392MR35S |             | 1,200       | 30×25                 | 0.15 | 1.68                                              | EKMH101VSN122MR25S |
|             | 3,900       | 35×25                 | 0.15 | 2.24                                              | EKMH630VSN392MA25S |             | 1,500       | 22×45                 | 0.15 | 1.94                                              | EKMH101VSN152MP45S |
|             | 4,700       | 25.4×50               | 0.15 | 2.86                                              | EKMH630VSN472MQ50S |             | 1,500       | 25.4×40               | 0.15 | 1.98                                              | EKMH101VSN152MQ40S |
|             | 4,700       | 30×40                 | 0.15 | 2.86                                              | EKMH630VSN472MR40S |             | 1,500       | 30×30                 | 0.15 | 1.95                                              | EKMH101VSN152MR30S |
|             | 4,700       | 35×30                 | 0.15 | 2.79                                              | EKMH630VSN472MA30S |             | 1,500       | 35×25                 | 0.15 | 1.98                                              | EKMH101VSN152MA25S |
| 80          | 5,600       | 30×45                 | 0.15 | 3.22                                              | EKMH630VSN562MR45S |             | 1,800       | 25.4×45               | 0.15 | 2.23                                              | EKMH101VSN182MQ45S |
|             | 5,600       | 35×35                 | 0.15 | 3.19                                              | EKMH630VSN562MA35S |             | 1,800       | 30×35                 | 0.15 | 2.50                                              | EKMH101VSN182MR35S |
|             | 6,800       | 30×50                 | 0.15 | 3.65                                              | EKMH630VSN682MR50S |             | 1,800       | 35×25                 | 0.15 | 2.17                                              | EKMH101VSN182MA25S |
|             | 6,800       | 35×40                 | 0.15 | 3.64                                              | EKMH630VSN682MA40S |             | 2,200       | 25.4×50               | 0.15 | 2.53                                              | EKMH101VSN222MQ50S |
|             | 8,200       | 35×45                 | 0.15 | 3.90                                              | EKMH630VSN822MA45S |             | 2,200       | 30×40                 | 0.15 | 2.70                                              | EKMH101VSN222MR40S |
|             | 10,000      | 35×50                 | 0.15 | 4.40                                              | EKMH630VSN103MA50S |             | 2,200       | 35×30                 | 0.15 | 2.50                                              | EKMH101VSN222MA30S |
|             | 820         | 22×25                 | 0.15 | 1.11                                              | EKMH800VSN821MP25S |             | 2,700       | 30×45                 | 0.15 | 2.88                                              | EKMH101VSN272MR45S |
|             | 1,000       | 22×25                 | 0.15 | 1.22                                              | EKMH800VSN102MP25S |             | 2,700       | 35×35                 | 0.15 | 2.86                                              | EKMH101VSN272MA35S |
|             | 1,200       | 22×30                 | 0.15 | 1.38                                              | EKMH800VSN122MP30S |             | 3,300       | 30×50                 | 0.15 | 3.28                                              | EKMH101VSN332MR50S |
|             | 1,200       | 25.4×25               | 0.15 | 1.39                                              | EKMH800VSN122MQ25S |             | 3,300       | 35×40                 | 0.15 | 3.27                                              | EKMH101VSN332MA40S |
| 80          | 1,500       | 22×35                 | 0.15 | 1.59                                              | EKMH800VSN152MP35S |             | 3,900       | 35×45                 | 0.15 | 3.67                                              | EKMH101VSN392MA45S |
|             | 1,500       | 25.4×30               | 0.15 | 1.61                                              | EKMH800VSN152MQ30S |             | 4,700       | 35×50                 | 0.15 | 3.80                                              | EKMH101VSN472MA50S |
|             | 1,800       | 22×40                 | 0.15 | 1.80                                              | EKMH800VSN182MP40S |             |             |                       |      |                                                   |                    |
|             |             |                       |      |                                                   |                    |             |             |                       |      |                                                   |                    |

\*For the rated voltage  $\geq 160V_{dc}$ , please use KMR and KMQ series

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency (Hz)           | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|--------------------------|------|------|------|------|------|------|
| 6.3 to 50V <sub>dc</sub> | 0.95 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |
| 63 to 100V <sub>dc</sub> | 0.92 | 1.00 | 1.07 | 1.13 | 1.19 | 1.20 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

15mm height snap-ins, 85°C

## SLM Series

- 15mm height snap-ins
- Endurance with ripple current : 2,000 hours at 85°C
- Non solvent resistant type
- RoHS Compliant

SLM

Low profile

SMQ

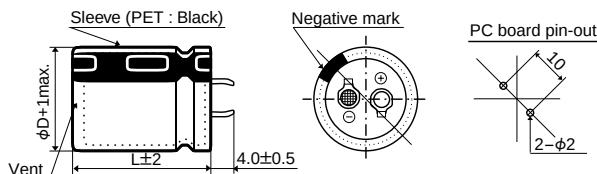


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                        |                                      |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                      |                                      |
| Temperature Range                                      | -25 to +85°C                                                                                                                                                                                                                                                                           |                                      |
| Rated Voltage Range                                    | 160 to 400V <sub>dc</sub>                                                                                                                                                                                                                                                              |                                      |
| Capacitance Tolerance                                  | ±20% (M)                                                                                                                                                                                                                                                                               |                                      |
| Leakage Current                                        | $I \leq 3\sqrt{CV}$                                                                                                                                                                                                                                                                    |                                      |
|                                                        | Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                                                                                              |                                      |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 160 to 400V                          |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                            | 0.20                                 |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                       | 160 to 400V                          |
|                                                        | Z (-25°C) / Z (+20°C)                                                                                                                                                                                                                                                                  | 4                                    |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 85°C.                                                                                               |                                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±20% of the initial value           |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤200% of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                     | ≤±15% of the initial value           |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                            | ≤150% of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                                                                                        | ≤The initial specified value         |

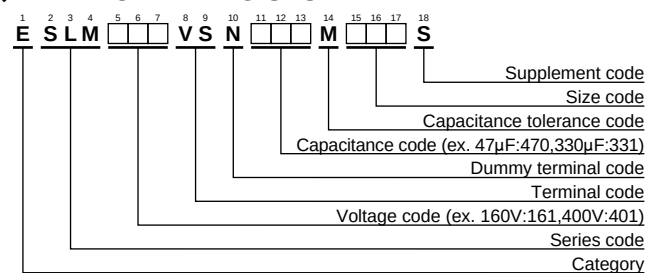
## ◆DIMENSIONS [mm]

- Terminal Code : VS



The standard design has no plastic disc.

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

## ◆RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Frequency (Hz)            | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 160 to 250V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 400V <sub>dc</sub>        | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise.

When long life performance is required in actual use, the rms ripple current has to be reduced.

## ◆STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/ 85°C,120Hz) | Part No.           |
|-----------------------|----------|--------------------|------|-----------------------------------------|--------------------|
| 160                   | 180      | 22×15              | 0.20 | 0.99                                    | ESLM161VSN181MP15S |
|                       | 270      | 25.4×15            | 0.20 | 1.29                                    | ESLM161VSN271MQ15S |
|                       | 390      | 30×15              | 0.20 | 1.47                                    | ESLM161VSN391MR15S |
|                       | 560      | 35×15              | 0.20 | 1.74                                    | ESLM161VSN561MA15S |
| 180                   | 150      | 22×15              | 0.20 | 0.90                                    | ESLM181VSN151MP15S |
|                       | 220      | 25.4×15            | 0.20 | 1.16                                    | ESLM181VSN221MQ15S |
|                       | 330      | 30×15              | 0.20 | 1.35                                    | ESLM181VSN331MR15S |
|                       | 470      | 35×15              | 0.20 | 1.60                                    | ESLM181VSN471MA15S |
| 200                   | 150      | 22×15              | 0.20 | 0.90                                    | ESLM201VSN151MP15S |
|                       | 220      | 25.4×15            | 0.20 | 1.16                                    | ESLM201VSN221MQ15S |
|                       |          |                    |      |                                         |                    |
| 200                   | 270      | 30×15              | 0.20 | 1.22                                    | ESLM201VSN271MR15S |
|                       | 390      | 35×15              | 0.20 | 1.46                                    | ESLM201VSN391MA15S |
|                       |          |                    |      |                                         |                    |
| 250                   | 100      | 22×15              | 0.20 | 0.73                                    | ESLM251VSN101MP15S |
|                       | 150      | 25.4×15            | 0.20 | 0.96                                    | ESLM251VSN151MQ15S |
|                       | 220      | 30×15              | 0.20 | 1.10                                    | ESLM251VSN221MR15S |
|                       | 330      | 35×15              | 0.20 | 1.34                                    | ESLM251VSN331MA15S |
| 400                   | 47       | 22×15              | 0.20 | 0.50                                    | ESLM401VSN470MP15S |
|                       | 68       | 25.4×15            | 0.20 | 0.65                                    | ESLM401VSN680MQ15S |
|                       | 100      | 30×15              | 0.20 | 0.74                                    | ESLM401VSN101MR15S |
|                       | 120      | 35×15              | 0.20 | 0.81                                    | ESLM401VSN121MA15S |



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS 15mm height snap-ins, 105°C

## KLM Series

- 15mm height snap-ins
- Endurance with ripple current : 2,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

### ◆ SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                       |                                      |
| Temperature Range                                      | -25 to +105°C                                                                                                                                                                                                                                                                           |                                      |
| Rated Voltage Range                                    | 160 to 400V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                      |
| Capacitance Tolerance                                  | ±20% (M)                                                                                                                                                                                                                                                                                |                                      |
| Leakage Current                                        | $I \leq 3\sqrt{C \cdot V}$<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)                                                                                                                                                                 |                                      |
|                                                        | (at 20°C after 5 minutes)                                                                                                                                                                                                                                                               |                                      |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 400V                          |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.20                                 |
|                                                        | (at 20°C, 120Hz)                                                                                                                                                                                                                                                                        |                                      |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 400V                          |
|                                                        | Z (-25°C) / Z (+20°C)                                                                                                                                                                                                                                                                   | 4                                    |
|                                                        | (at 120Hz)                                                                                                                                                                                                                                                                              |                                      |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105°C.                                                                                               |                                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±15% of the initial value           |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤150% of the initial specified value |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |

KLM

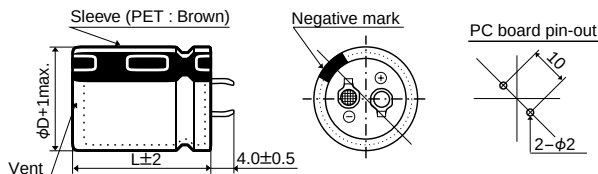
Low profile

KMQ



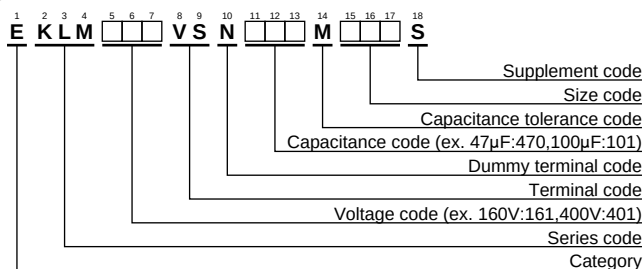
### ◆ DIMENSIONS [mm]

- Terminal Code : VS



The standard design has no plastic disc.

### ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

### ◆ STANDARD RATINGS

| WV (V <sub>dc</sub> ) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/105°C,120Hz) | Part No.           |
|-----------------------|----------|--------------------|------|-----------------------------------------|--------------------|
| 160                   | 150      | 22 × 15            | 0.20 | 0.68                                    | EKLM161VSN151MP15S |
|                       | 180      | 25.4 × 15          | 0.20 | 0.79                                    | EKLM161VSN181MQ15S |
|                       | 220      | 25.4 × 15          | 0.20 | 0.88                                    | EKLM161VSN221MQ15S |
|                       | 270      | 30 × 15            | 0.20 | 0.96                                    | EKLM161VSN271MR15S |
|                       | 330      | 30 × 15            | 0.20 | 1.06                                    | EKLM161VSN331MR15S |
|                       | 390      | 35 × 15            | 0.20 | 1.20                                    | EKLM161VSN391MA15S |
| 180                   | 120      | 22 × 15            | 0.20 | 0.61                                    | EKLM181VSN121MP15S |
|                       | 150      | 25.4 × 15          | 0.20 | 0.73                                    | EKLM181VSN151MQ15S |
|                       | 180      | 25.4 × 15          | 0.20 | 0.79                                    | EKLM181VSN181MQ15S |
|                       | 220      | 30 × 15            | 0.20 | 0.86                                    | EKLM181VSN221MR15S |
|                       | 270      | 30 × 15            | 0.20 | 0.96                                    | EKLM181VSN271MR15S |
|                       | 330      | 35 × 15            | 0.20 | 1.10                                    | EKLM181VSN331MA15S |
| 200                   | 390      | 35 × 15            | 0.20 | 1.17                                    | EKLM181VSN391MA15S |
|                       | 120      | 22 × 15            | 0.20 | 0.61                                    | EKLM201VSN121MP15S |
|                       | 150      | 25.4 × 15          | 0.20 | 0.73                                    | EKLM201VSN151MQ15S |
|                       | 180      | 30 × 15            | 0.20 | 0.79                                    | EKLM201VSN181MR15S |
| 250                   | 220      | 30 × 15            | 0.20 | 1.00                                    | EKLM251VSN221MR15S |
|                       | 270      | 35 × 15            | 0.20 | 1.07                                    | EKLM251VSN271MA15S |
|                       | 330      | 35 × 15            | 0.20 | 1.07                                    | EKLM251VSN331MA15S |
|                       | 82       | 22 × 15            | 0.20 | 0.50                                    | EKLM251VSN820MP15S |
| 400                   | 100      | 25.4 × 15          | 0.20 | 0.59                                    | EKLM251VSN101MQ15S |
|                       | 120      | 25.4 × 15          | 0.20 | 0.65                                    | EKLM251VSN121MQ15S |
|                       | 150      | 30 × 15            | 0.20 | 0.71                                    | EKLM251VSN151MR15S |
|                       | 180      | 30 × 15            | 0.20 | 0.79                                    | EKLM251VSN181MR15S |
| 400                   | 220      | 35 × 15            | 0.20 | 0.90                                    | EKLM251VSN221MA15S |
|                       | 39       | 22 × 15            | 0.20 | 0.35                                    | EKLM401VSN390MP15S |
|                       | 47       | 25.4 × 15          | 0.20 | 0.40                                    | EKLM401VSN470MQ15S |
|                       | 56       | 25.4 × 15          | 0.20 | 0.44                                    | EKLM401VSN560MQ15S |
|                       | 68       | 30 × 15            | 0.20 | 0.46                                    | EKLM401VSN680MR15S |
|                       | 82       | 30 × 15            | 0.20 | 0.51                                    | EKLM401VSN820MR15S |
|                       | 100      | 35 × 15            | 0.20 | 0.56                                    | EKLM401VSN101MA15S |
|                       | 120      | 35 × 15            | 0.20 | 0.62                                    | EKLM401VSN121MA15S |

### ◆ RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Frequency (Hz)            | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 160 to 250V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 400V <sub>dc</sub>        | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105°C

## LXM Series

- Endurance with ripple current : 7,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

LXM

↑ Longer life  
LXQ

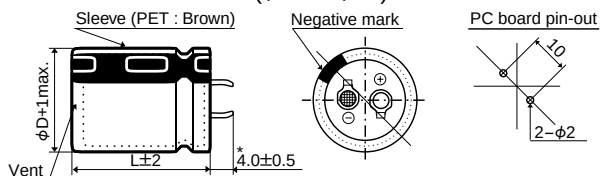


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |            |                  |  |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------|------------------|--|
| Category                                               |                                                                                                                                                                                                                                                                                         |                                      |            |                  |  |
| Temperature Range                                      | -25 to +105°C                                                                                                                                                                                                                                                                           |                                      |            |                  |  |
| Rated Voltage Range                                    | 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                      |            |                  |  |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |            |                  |  |
| Leakage Current                                        | I≤3√CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                           |                                      |            |                  |  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 400V                          | 420 & 450V | (at 20°C, 120Hz) |  |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.15                                 | 0.20       |                  |  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 400V                          | 420 & 450V | (at 120Hz)       |  |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 8          |                  |  |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 7,000 hours at 105°C.                                                                                               |                                      |            |                  |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |            |                  |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤250% of the initial specified value |            |                  |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |            |                  |  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |            |                  |  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±15% of the initial value           |            |                  |  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤150% of the initial specified value |            |                  |  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |            |                  |  |

## ◆DIMENSIONS [mm]

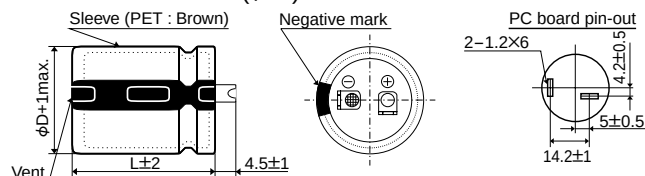
- Terminal Code : VS (φ22 to φ35) : Standard



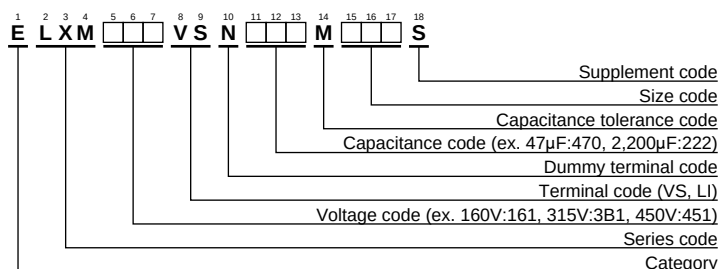
\*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

- Terminal Code : LI (φ35)



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"


**LXM**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 160         | 330         | 22×25                 | 0.15 | 1.11                                              | ELXM161VSN331MP25S | 220         | 220         | 22×25                 | 0.15 | 0.90                                              | ELXM221VSN221MP25S |
|             | 390         | 22×30                 | 0.15 | 1.26                                              | ELXM161VSN391MP30S |             | 270         | 22×30                 | 0.15 | 1.05                                              | ELXM221VSN221MP30S |
|             | 470         | 22×30                 | 0.15 | 1.39                                              | ELXM161VSN471MP30S |             | 330         | 22×35                 | 0.15 | 1.19                                              | ELXM221VSN331MP35S |
|             | 470         | 25.4×25               | 0.15 | 1.38                                              | ELXM161VSN471MQ25S |             | 330         | 25.4×25               | 0.15 | 1.16                                              | ELXM221VSN331MQ25S |
|             | 560         | 22×35                 | 0.15 | 1.55                                              | ELXM161VSN561MP35S |             | 390         | 22×40                 | 0.15 | 1.33                                              | ELXM221VSN391MP40S |
|             | 560         | 25.4×30               | 0.15 | 1.55                                              | ELXM161VSN561MQ30S |             | 390         | 25.4×30               | 0.15 | 1.29                                              | ELXM221VSN391MQ30S |
|             | 680         | 22×40                 | 0.15 | 1.75                                              | ELXM161VSN681MP40S |             | 470         | 22×45                 | 0.15 | 1.49                                              | ELXM221VSN471MP45S |
|             | 680         | 25.4×35               | 0.15 | 1.78                                              | ELXM161VSN681MQ35S |             | 470         | 25.4×35               | 0.15 | 1.48                                              | ELXM221VSN471MQ35S |
|             | 680         | 30×25                 | 0.15 | 1.74                                              | ELXM161VSN681MR25S |             | 470         | 30×25                 | 0.15 | 1.45                                              | ELXM221VSN471MR25S |
|             | 820         | 22×50                 | 0.15 | 1.97                                              | ELXM161VSN821MP50S |             | 560         | 22×50                 | 0.15 | 1.63                                              | ELXM221VSN561MP50S |
|             | 820         | 25.4×40               | 0.15 | 2.01                                              | ELXM161VSN821MQ40S |             | 560         | 25.4×40               | 0.15 | 1.71                                              | ELXM221VSN561MQ40S |
|             | 820         | 30×30                 | 0.15 | 1.96                                              | ELXM161VSN821MR30S |             | 560         | 30×30                 | 0.15 | 1.62                                              | ELXM221VSN561MR30S |
|             | 1,000       | 25.4×45               | 0.15 | 2.27                                              | ELXM161VSN102MQ45S |             | 680         | 25.4×45               | 0.15 | 1.87                                              | ELXM221VSN681MQ45S |
|             | 1,000       | 30×35                 | 0.15 | 2.26                                              | ELXM161VSN102MR35S |             | 680         | 30×35                 | 0.15 | 1.86                                              | ELXM221VSN681MR35S |
|             | 1,200       | 25.4×50               | 0.15 | 2.54                                              | ELXM161VSN122MQ50S |             | 820         | 25.4×50               | 0.15 | 2.10                                              | ELXM221VSN821MQ50S |
|             | 1,200       | 30×40                 | 0.15 | 2.56                                              | ELXM161VSN122MR40S |             | 820         | 30×40                 | 0.15 | 2.12                                              | ELXM221VSN821MR40S |
|             | 1,200       | 35×30                 | 0.15 | 2.52                                              | ELXM161VSN122MA30S |             | 820         | 35×30                 | 0.15 | 2.08                                              | ELXM221VSN821MA30S |
|             | 1,500       | 30×45                 | 0.15 | 2.96                                              | ELXM161VSN152MR45S |             | 1,000       | 30×50                 | 0.15 | 2.48                                              | ELXM221VSN102MR50S |
|             | 1,500       | 35×35                 | 0.15 | 2.89                                              | ELXM161VSN152MA35S |             | 1,000       | 35×40                 | 0.15 | 2.46                                              | ELXM221VSN102MA40S |
|             | 1,800       | 30×50                 | 0.15 | 3.32                                              | ELXM161VSN182MR50S |             | 1,200       | 35×45                 | 0.15 | 2.78                                              | ELXM221VSN122MA45S |
| 180         | 1,800       | 35×40                 | 0.15 | 3.30                                              | ELXM161VSN182MA40S | 250         | 1,500       | 35×50                 | 0.15 | 3.20                                              | ELXM221VSN152MA50S |
|             | 2,200       | 35×50                 | 0.15 | 3.87                                              | ELXM161VSN222MA50S |             | 180         | 22×25                 | 0.15 | 0.82                                              | ELXM251VSN181MP25S |
|             | 270         | 22×25                 | 0.15 | 1.00                                              | ELXM181VSN271MP25S |             | 220         | 22×30                 | 0.15 | 0.95                                              | ELXM251VSN221MP30S |
|             | 330         | 22×30                 | 0.15 | 1.16                                              | ELXM181VSN331MP30S |             | 270         | 22×35                 | 0.15 | 1.08                                              | ELXM251VSN271MP35S |
|             | 390         | 22×30                 | 0.15 | 1.26                                              | ELXM181VSN391MP30S |             | 270         | 25.4×25               | 0.15 | 1.05                                              | ELXM251VSN271MQ25S |
|             | 390         | 25.4×25               | 0.15 | 1.26                                              | ELXM181VSN391MQ25S |             | 330         | 22×40                 | 0.15 | 1.22                                              | ELXM251VSN331MP40S |
|             | 470         | 22×35                 | 0.15 | 1.42                                              | ELXM181VSN471MP35S |             | 330         | 25.4×30               | 0.15 | 1.19                                              | ELXM251VSN331MQ30S |
|             | 470         | 25.4×30               | 0.15 | 1.42                                              | ELXM181VSN471MQ30S |             | 390         | 22×45                 | 0.15 | 1.36                                              | ELXM251VSN391MP45S |
|             | 560         | 22×40                 | 0.15 | 1.59                                              | ELXM181VSN561MP40S |             | 390         | 25.4×35               | 0.15 | 1.35                                              | ELXM251VSN391MQ35S |
|             | 560         | 25.4×30               | 0.15 | 1.55                                              | ELXM181VSN561MQ30S |             | 390         | 30×25                 | 0.15 | 1.32                                              | ELXM251VSN391MR25S |
|             | 560         | 30×25                 | 0.15 | 1.58                                              | ELXM181VSN561MR25S |             | 470         | 22×50                 | 0.15 | 1.49                                              | ELXM251VSN471MP50S |
|             | 680         | 22×45                 | 0.15 | 1.79                                              | ELXM181VSN681MP45S |             | 470         | 25.4×40               | 0.15 | 1.52                                              | ELXM251VSN471MQ40S |
|             | 680         | 25.4×35               | 0.15 | 1.78                                              | ELXM181VSN681MQ35S |             | 470         | 30×30                 | 0.15 | 1.49                                              | ELXM251VSN471MR30S |
|             | 680         | 30×30                 | 0.15 | 1.79                                              | ELXM181VSN681MR30S |             | 560         | 25.4×45               | 0.15 | 1.70                                              | ELXM251VSN561MP45S |
|             | 820         | 25.4×40               | 0.15 | 2.01                                              | ELXM181VSN821MQ40S |             | 560         | 30×35                 | 0.15 | 1.69                                              | ELXM251VSN561MR35S |
|             | 820         | 30×35                 | 0.15 | 2.04                                              | ELXM181VSN821MR35S |             | 680         | 25.4×50               | 0.15 | 1.91                                              | ELXM251VSN681MQ50S |
|             | 1,000       | 25.4×50               | 0.15 | 2.32                                              | ELXM181VSN102MQ50S |             | 680         | 30×40                 | 0.15 | 1.93                                              | ELXM251VSN681MR40S |
|             | 1,000       | 30×35                 | 0.15 | 2.26                                              | ELXM181VSN102MR35S |             | 680         | 35×30                 | 0.15 | 1.90                                              | ELXM251VSN681MA30S |
|             | 1,000       | 35×30                 | 0.15 | 2.30                                              | ELXM181VSN102MA30S |             | 820         | 30×45                 | 0.15 | 2.19                                              | ELXM251VSN821MR45S |
| 200         | 1,200       | 30×45                 | 0.15 | 2.65                                              | ELXM181VSN122MR45S | 315         | 820         | 35×35                 | 0.15 | 2.13                                              | ELXM251VSN821MA35S |
|             | 1,200       | 35×35                 | 0.15 | 2.58                                              | ELXM181VSN122MA35S |             | 1,000       | 35×40                 | 0.15 | 2.46                                              | ELXM251VSN102MA40S |
|             | 1,500       | 30×50                 | 0.15 | 3.03                                              | ELXM181VSN152MR50S |             | 1,200       | 35×50                 | 0.15 | 2.86                                              | ELXM251VSN122MA50S |
|             | 1,500       | 35×40                 | 0.15 | 3.01                                              | ELXM181VSN152MA40S |             | 100         | 22×25                 | 0.15 | 0.67                                              | ELXM3B1VSN101MP25S |
|             | 1,800       | 35×45                 | 0.15 | 3.41                                              | ELXM181VSN182MA45S |             | 120         | 22×30                 | 0.15 | 0.77                                              | ELXM3B1VSN121MP30S |
|             | 2,200       | 35×50                 | 0.15 | 3.87                                              | ELXM181VSN222MA50S |             | 150         | 22×30                 | 0.15 | 0.86                                              | ELXM3B1VSN151MP30S |
|             | 220         | 22×25                 | 0.15 | 0.90                                              | ELXM201VSN221MP25S |             | 150         | 25.4×25               | 0.15 | 0.85                                              | ELXM3B1VSN151MQ25S |
|             | 270         | 22×30                 | 0.15 | 1.05                                              | ELXM201VSN271MP30S |             | 180         | 22×35                 | 0.15 | 0.96                                              | ELXM3B1VSN181MP35S |
|             | 330         | 22×30                 | 0.15 | 1.16                                              | ELXM201VSN331MP30S |             | 180         | 25.4×30               | 0.15 | 0.96                                              | ELXM3B1VSN181MQ30S |
|             | 330         | 25.4×25               | 0.15 | 1.16                                              | ELXM201VSN331MQ25S |             | 220         | 22×40                 | 0.15 | 1.09                                              | ELXM3B1VSN221MP40S |
|             | 390         | 22×35                 | 0.15 | 1.29                                              | ELXM201VSN391MP35S |             | 220         | 25.4×30               | 0.15 | 1.06                                              | ELXM3B1VSN221MQ30S |
|             | 390         | 25.4×30               | 0.15 | 1.29                                              | ELXM201VSN391MQ30S |             | 220         | 30×25                 | 0.15 | 1.08                                              | ELXM3B1VSN221MR25S |
|             | 470         | 22×40                 | 0.15 | 1.46                                              | ELXM201VSN471MP40S |             | 270         | 22×45                 | 0.15 | 1.24                                              | ELXM3B1VSN271MP45S |
|             | 470         | 25.4×30               | 0.15 | 1.42                                              | ELXM201VSN471MQ30S |             | 270         | 25.4×35               | 0.15 | 1.23                                              | ELXM3B1VSN271MQ35S |
|             | 470         | 30×25                 | 0.15 | 1.45                                              | ELXM201VSN471MR25S |             | 270         | 30×30                 | 0.15 | 1.23                                              | ELXM3B1VSN271MR30S |
|             | 560         | 22×45                 | 0.15 | 1.63                                              | ELXM201VSN561MP45S |             | 330         | 25.4×40               | 0.15 | 1.40                                              | ELXM3B1VSN331MQ40S |
|             | 560         | 25.4×35               | 0.15 | 1.62                                              | ELXM201VSN561MQ35S |             | 330         | 30×35                 | 0.15 | 1.42                                              | ELXM3B1VSN331MR35S |
|             | 560         | 30×30                 | 0.15 | 1.62                                              | ELXM201VSN561MR30S |             | 330         | 35×30                 | 0.15 | 1.45                                              | ELXM3B1VSN331MA30S |
|             | 680         | 25.4×40               | 0.15 | 1.83                                              | ELXM201VSN681MQ40S |             | 390         | 25.4×50               | 0.15 | 1.59                                              | ELXM3B1VSN391MQ50S |
|             | 680         | 30×30                 | 0.15 | 1.79                                              | ELXM201VSN681MR30S |             | 390         | 30×35                 | 0.15 | 1.54                                              | ELXM3B1VSN391MR35S |
|             | 820         | 25.4×45               | 0.15 | 2.06                                              | ELXM201VSN821MQ45S |             | 390         | 35×30                 | 0.15 | 1.57                                              | ELXM3B1VSN391MA30S |
|             | 820         | 30×35                 | 0.15 | 2.04                                              | ELXM201VSN821MR35S |             | 470         | 30×45                 | 0.15 | 1.81                                              | ELXM3B1VSN471MR45S |
|             | 1,000       | 30×45                 | 0.15 | 2.42                                              | ELXM201VSN102MR45S |             | 470         | 35×35                 | 0.15 | 1.77                                              | ELXM3B1VSN471MA35S |
|             | 1,000       | 35×30                 | 0.15 | 2.30                                              | ELXM201VSN102MA30S |             | 560         | 30×50                 | 0.15 | 2.03                                              | ELXM3B1VSN561MR50S |
|             | 1,200       | 30×50                 | 0.15 | 2.71                                              | ELXM201VSN122MR50S |             | 560         | 35×40                 | 0.15 | 2.02                                              | ELXM3B1VSN561MA40S |
|             | 1,200       | 35×40                 | 0.15 | 2.70                                              | ELXM201VSN122MA40S |             | 680         | 35×45                 | 0.15 | 2.29                                              | ELXM3B1VSN681MA45S |
|             | 1,500       | 35×45                 | 0.15 | 3.11                                              | ELXM201VSN152MA45S |             | 820         | 35×50                 | 0.15 | 2.59                                              | ELXM3B1VSN821MA50S |
|             | 1,800       | 35×50                 | 0.15 | 3.50                                              | ELXM201VSN182MA50S |             |             |                       |      |                                                   |                    |


**LXM**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ               | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|--------------------|---------------------------------------------------|--------------------|
| 350         | 100         | 22×25                 | 0.15 | 0.67                                              | ELXM351VSN101MP25S | 420         | 56          | 22×25                 | 0.20               | 0.50                                              | ELXM421VSN560MP25S |
|             | 120         | 22×30                 | 0.15 | 0.77                                              | ELXM351VSN121MP30S |             | 68          | 22×30                 | 0.20               | 0.58                                              | ELXM421VSN680MP30S |
|             | 120         | 25.4×25               | 0.15 | 0.76                                              | ELXM351VSN121MQ25S |             | 82          | 22×30                 | 0.20               | 0.63                                              | ELXM421VSN820MP30S |
|             | 150         | 22×35                 | 0.15 | 0.88                                              | ELXM351VSN151MP35S |             | 82          | 25.4×25               | 0.20               | 0.63                                              | ELXM421VSN820MQ25S |
|             | 150         | 25.4×30               | 0.15 | 0.88                                              | ELXM351VSN151MQ30S |             | 100         | 22×35                 | 0.20               | 0.72                                              | ELXM421VSN101MP35S |
|             | 180         | 22×40                 | 0.15 | 0.99                                              | ELXM351VSN181MP40S |             | 100         | 25.4×30               | 0.20               | 0.72                                              | ELXM421VSN101MQ30S |
|             | 180         | 25.4×30               | 0.15 | 0.96                                              | ELXM351VSN181MQ30S |             | 120         | 22×40                 | 0.20               | 0.81                                              | ELXM421VSN121MP40S |
|             | 180         | 30×25                 | 0.15 | 0.98                                              | ELXM351VSN181MR25S |             | 120         | 25.4×30               | 0.20               | 0.79                                              | ELXM421VSN121MQ30S |
|             | 220         | 22×45                 | 0.15 | 1.12                                              | ELXM351VSN221MP45S |             | 120         | 30×25                 | 0.20               | 0.80                                              | ELXM421VSN121MR25S |
|             | 220         | 25.4×35               | 0.15 | 1.11                                              | ELXM351VSN221MQ35S |             | 150         | 22×45                 | 0.20               | 0.92                                              | ELXM421VSN151MP45S |
|             | 220         | 30×30                 | 0.15 | 1.11                                              | ELXM351VSN221MR30S |             | 150         | 25.4×35               | 0.20               | 0.92                                              | ELXM421VSN151MQ35S |
|             | 270         | 25.4×40               | 0.15 | 1.26                                              | ELXM351VSN271MQ40S |             | 150         | 30×30                 | 0.20               | 0.92                                              | ELXM421VSN151MR30S |
|             | 270         | 30×35                 | 0.15 | 1.28                                              | ELXM351VSN271MR35S |             | 180         | 25.4×40               | 0.20               | 1.03                                              | ELXM421VSN181MQ40S |
|             | 330         | 25.4×45               | 0.15 | 1.40                                              | ELXM351VSN331MQ45S |             | 180         | 30×35                 | 0.20               | 1.05                                              | ELXM421VSN181MR35S |
|             | 330         | 30×35                 | 0.15 | 1.42                                              | ELXM351VSN331MR35S |             | 220         | 25.4×50               | 0.20               | 1.19                                              | ELXM421VSN221MQ50S |
|             | 330         | 35×30                 | 0.15 | 1.45                                              | ELXM351VSN331MA30S |             | 220         | 30×35                 | 0.20               | 1.16                                              | ELXM421VSN221MR35S |
|             | 390         | 30×40                 | 0.15 | 1.60                                              | ELXM351VSN391MR40S |             | 220         | 35×30                 | 0.20               | 1.18                                              | ELXM421VSN221MA30S |
|             | 390         | 35×35                 | 0.15 | 1.61                                              | ELXM351VSN391MA35S |             | 270         | 30×45                 | 0.20               | 1.38                                              | ELXM421VSN271MR45S |
|             | 470         | 30×50                 | 0.15 | 1.86                                              | ELXM351VSN471MR50S |             | 270         | 35×35                 | 0.20               | 1.34                                              | ELXM421VSN271MA35S |
|             | 470         | 35×40                 | 0.15 | 1.85                                              | ELXM351VSN471MA40S |             | 330         | 30×50                 | 0.20               | 1.56                                              | ELXM421VSN331MR50S |
| 400         | 560         | 35×40                 | 0.15 | 2.02                                              | ELXM351VSN561MA40S | 330         | 35×40       | 0.20                  | 1.55               | ELXM421VSN331MA40S                                |                    |
|             | 680         | 35×50                 | 0.15 | 2.36                                              | ELXM351VSN681MA50S | 390         | 35×45       | 0.20                  | 1.74               | ELXM421VSN391MA45S                                |                    |
|             | 68          | 22×25                 | 0.15 | 0.55                                              | ELXM401VSN680MP25S | 470         | 35×50       | 0.20                  | 1.96               | ELXM421VSN471MA50S                                |                    |
|             | 82          | 22×30                 | 0.15 | 0.63                                              | ELXM401VSN820MP30S | 47          | 22×25       | 0.20                  | 0.46               | ELXM451VSN470MP25S                                |                    |
|             | 100         | 22×30                 | 0.15 | 0.70                                              | ELXM401VSN101MP30S | 56          | 22×30       | 0.20                  | 0.52               | ELXM451VSN560MP30S                                |                    |
|             | 100         | 25.4×25               | 0.15 | 0.70                                              | ELXM401VSN101MQ25S | 68          | 22×30       | 0.20                  | 0.58               | ELXM451VSN680MP30S                                |                    |
|             | 120         | 22×35                 | 0.15 | 0.79                                              | ELXM401VSN121MP35S | 68          | 25.4×25     | 0.20                  | 0.58               | ELXM451VSN680MQ25S                                |                    |
|             | 120         | 25.4×30               | 0.15 | 0.79                                              | ELXM401VSN121MQ30S | 82          | 22×35       | 0.20                  | 0.65               | ELXM451VSN820MP35S                                |                    |
|             | 150         | 22×40                 | 0.15 | 0.90                                              | ELXM401VSN151MP40S | 82          | 25.4×30     | 0.20                  | 0.65               | ELXM451VSN820MQ30S                                |                    |
|             | 150         | 25.4×30               | 0.15 | 0.88                                              | ELXM401VSN151MQ30S | 100         | 22×40       | 0.20                  | 0.74               | ELXM451VSN101MP40S                                |                    |
|             | 150         | 30×25                 | 0.15 | 0.90                                              | ELXM401VSN151MR25S | 100         | 25.4×30     | 0.20                  | 0.72               | ELXM451VSN101MQ30S                                |                    |
|             | 180         | 22×45                 | 0.15 | 0.99                                              | ELXM401VSN181MP45S | 100         | 30×25       | 0.20                  | 0.73               | ELXM451VSN101MR25S                                |                    |
|             | 180         | 25.4×35               | 0.15 | 1.01                                              | ELXM401VSN181MQ35S | 120         | 22×45       | 0.20                  | 0.83               | ELXM451VSN121MP45S                                |                    |
|             | 180         | 30×30                 | 0.15 | 1.01                                              | ELXM401VSN181MR30S | 120         | 25.4×35     | 0.20                  | 0.82               | ELXM451VSN121MQ35S                                |                    |
|             | 220         | 25.4×40               | 0.15 | 1.14                                              | ELXM401VSN221MQ40S | 120         | 30×30       | 0.20                  | 0.82               | ELXM451VSN121MR30S                                |                    |
|             | 220         | 30×35                 | 0.15 | 1.16                                              | ELXM401VSN221MR35S | 150         | 25.4×40     | 0.20                  | 0.94               | ELXM451VSN151MQ40S                                |                    |
|             | 270         | 25.4×50               | 0.15 | 1.32                                              | ELXM401VSN271MQ50S | 150         | 30×35       | 0.20                  | 0.96               | ELXM451VSN151MR35S                                |                    |
|             | 270         | 30×40                 | 0.15 | 1.33                                              | ELXM401VSN271MR40S | 180         | 25.4×45     | 0.20                  | 1.06               | ELXM451VSN181MQ45S                                |                    |
|             | 270         | 35×30                 | 0.15 | 1.31                                              | ELXM401VSN271MA30S | 180         | 30×35       | 0.20                  | 1.05               | ELXM451VSN181MR35S                                |                    |
|             | 330         | 30×45                 | 0.15 | 1.52                                              | ELXM401VSN331MR45S | 180         | 35×30       | 0.20                  | 1.07               | ELXM451VSN181MA30S                                |                    |
| 330         | 35×35       | 0.15                  | 1.48 | ELXM401VSN331MA35S                                | 220                | 30×40       | 0.20        | 1.20                  | ELXM451VSN221MR40S |                                                   |                    |
| 390         | 30×50       | 0.15                  | 1.69 | ELXM401VSN391MR50S                                | 220                | 35×35       | 0.20        | 1.21                  | ELXM451VSN221MA35S |                                                   |                    |
| 390         | 35×40       | 0.15                  | 1.68 | ELXM401VSN391MA40S                                | 270                | 30×50       | 0.20        | 1.41                  | ELXM451VSN271MR50S |                                                   |                    |
| 470         | 35×45       | 0.15                  | 1.91 | ELXM401VSN471MA45S                                | 270                | 35×40       | 0.20        | 1.40                  | ELXM451VSN271MA40S |                                                   |                    |
| 560         | 35×50       | 0.15                  | 2.14 | ELXM401VSN561MA50S                                | 330                | 35×45       | 0.20        | 1.60                  | ELXM451VSN331MA45S |                                                   |                    |
|             |             |                       |      |                                                   | 390                | 35×50       | 0.20        | 1.79                  | ELXM451VSN391MA50S |                                                   |                    |

**◆RATED RIPPLE CURRENT MULTIPLIERS**
**●Frequency Multipliers**

| Frequency(Hz)             | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 160 to 250V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 315 to 450V <sub>dc</sub> | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

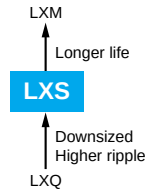


## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105°C

# LXS Series

- Endurance with ripple current : 5,000 hours at 105°C
- Downsized from LXQ series
- Non solvent resistant type
- RoHS Compliant

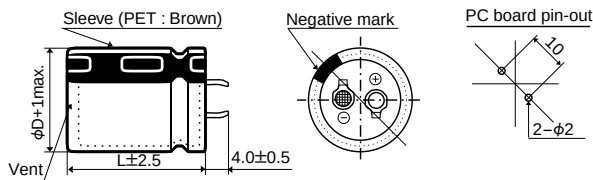


## SPECIFICATIONS

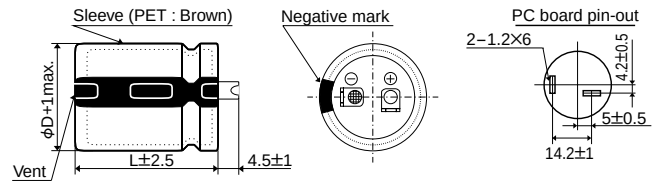
| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |                      |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                     |                                      |                      |
| Temperature Range                                      | -25 to +105℃                                                                                                                                                                                                                                                                          |                                      |                      |
| Rated Voltage Range                                    | 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                             |                                      |                      |
| Capacitance Tolerance                                  | ±20% (M)                                                                                                                                                                                                                                                                              |                                      | (at 20℃, 120Hz)      |
| Leakage Current                                        | $I \leq 3\sqrt{CV}$<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)                                                                                                                                             |                                      |                      |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 160 to 400V                          | 420 & 450V           |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.15                                 | 0.20 (at 20℃, 120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 160 to 400V                          | 420 & 450V           |
|                                                        | Z(-25℃)/Z(+20℃)                                                                                                                                                                                                                                                                       | 4                                    | 8 (at 120Hz)         |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 105℃.                                                                                               |                                      |                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |                      |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤200% of the initial specified value |                      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |                      |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 105℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |                      |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±15% of the initial value           |                      |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤150% of the initial specified value |                      |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |                      |

## DIMENSIONS [mm]

●Terminal Code : VS (φ22 to φ35) : Standard

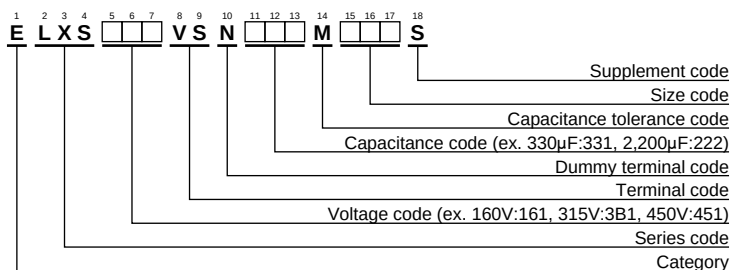


●Terminal Code : LI (φ30, φ35)



The standard design has no plastic disc.

## PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"


**LXS** Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 160         | 470         | 22×25                 | 0.15 | 1.47                                              | ELXS161VSN471MP25S | 200         | 1,500       | 35×35                 | 0.15 | 3.36                                              | ELXS201VSN152MA35S |
|             | 680         | 22×30                 | 0.15 | 1.86                                              | ELXS161VSN681MP30S |             | 1,800       | 30×50                 | 0.15 | 3.72                                              | ELXS201VSN182MR50S |
|             | 680         | 25.4×25               | 0.15 | 1.84                                              | ELXS161VSN681MQ25S |             | 1,800       | 35×40                 | 0.15 | 3.81                                              | ELXS201VSN182MA40S |
|             | 820         | 22×35                 | 0.15 | 2.09                                              | ELXS161VSN821MP35S |             | 2,200       | 35×45                 | 0.15 | 4.32                                              | ELXS201VSN222MA45S |
|             | 820         | 25.4×30               | 0.15 | 2.08                                              | ELXS161VSN821MQ30S |             | 2,700       | 35×50                 | 0.15 | 4.88                                              | ELXS201VSN272MA50S |
|             | 1,000       | 22×40                 | 0.15 | 2.35                                              | ELXS161VSN102MP40S |             | 270         | 22×25                 | 0.15 | 1.11                                              | ELXS251VSN271MP25S |
|             | 1,000       | 22×45                 | 0.15 | 2.40                                              | ELXS161VSN102MP45S |             | 330         | 22×30                 | 0.15 | 1.29                                              | ELXS251VSN331MP30S |
|             | 1,000       | 25.4×35               | 0.15 | 2.40                                              | ELXS161VSN102MQ35S |             | 390         | 22×35                 | 0.15 | 1.44                                              | ELXS251VSN391MP35S |
|             | 1,000       | 30×25                 | 0.15 | 2.50                                              | ELXS161VSN102MR25S |             | 390         | 25.4×25               | 0.15 | 1.40                                              | ELXS251VSN391MQ25S |
|             | 1,200       | 22×50                 | 0.15 | 2.69                                              | ELXS161VSN122MP50S |             | 470         | 22×40                 | 0.15 | 1.61                                              | ELXS251VSN471MP40S |
|             | 1,200       | 25.4×40               | 0.15 | 2.68                                              | ELXS161VSN122MQ40S | 250         | 470         | 25.4×30               | 0.15 | 1.57                                              | ELXS251VSN471MQ30S |
|             | 1,200       | 30×30                 | 0.15 | 2.77                                              | ELXS161VSN122MR30S |             | 560         | 22×45                 | 0.15 | 1.79                                              | ELXS251VSN561MP45S |
|             | 1,200       | 35×25                 | 0.15 | 2.91                                              | ELXS161VSN122MA25S |             | 560         | 25.4×35               | 0.15 | 1.79                                              | ELXS251VSN561MQ35S |
|             | 1,500       | 25.4×45               | 0.15 | 3.05                                              | ELXS161VSN122MA45S |             | 560         | 30×25                 | 0.15 | 1.87                                              | ELXS251VSN561MR25S |
|             | 1,500       | 30×35                 | 0.15 | 3.17                                              | ELXS161VSN152MR35S |             | 680         | 22×50                 | 0.15 | 2.02                                              | ELXS251VSN681MP50S |
|             | 1,800       | 25.4×50               | 0.15 | 3.40                                              | ELXS161VSN182MQ50S |             | 680         | 25.4×40               | 0.15 | 2.02                                              | ELXS251VSN681MQ40S |
|             | 1,800       | 30×40                 | 0.15 | 3.57                                              | ELXS161VSN182MR40S |             | 680         | 30×30                 | 0.15 | 2.08                                              | ELXS251VSN681MR30S |
|             | 1,800       | 35×30                 | 0.15 | 3.62                                              | ELXS161VSN182MA30S |             | 680         | 35×25                 | 0.15 | 2.19                                              | ELXS251VSN681MA25S |
|             | 2,200       | 30×45                 | 0.15 | 4.05                                              | ELXS161VSN222MR45S |             | 820         | 25.4×45               | 0.15 | 2.26                                              | ELXS251VSN821MQ45S |
|             | 2,200       | 30×50                 | 0.15 | 4.11                                              | ELXS161VSN222MR50S |             | 820         | 25.4×50               | 0.15 | 2.29                                              | ELXS251VSN821MQ50S |
|             | 2,200       | 35×35                 | 0.15 | 4.07                                              | ELXS161VSN222MA35S |             | 820         | 30×35                 | 0.15 | 2.34                                              | ELXS251VSN821MR35S |
|             | 2,700       | 35×40                 | 0.15 | 4.67                                              | ELXS161VSN272MA40S |             | 820         | 35×30                 | 0.15 | 2.45                                              | ELXS251VSN821MA30S |
|             | 2,700       | 35×45                 | 0.15 | 4.78                                              | ELXS161VSN272MA45S |             | 1,000       | 30×40                 | 0.15 | 2.66                                              | ELXS251VSN102MR40S |
|             | 3,300       | 35×50                 | 0.15 | 5.40                                              | ELXS161VSN332MA50S |             | 1,200       | 30×45                 | 0.15 | 2.99                                              | ELXS251VSN122MR45S |
|             |             |                       |      |                                                   |                    |             | 1,200       | 30×50                 | 0.15 | 3.04                                              | ELXS251VSN122MR50S |
|             |             |                       |      |                                                   |                    |             | 1,200       | 35×35                 | 0.15 | 3.00                                              | ELXS251VSN122MA35S |
|             |             |                       |      |                                                   |                    |             | 1,200       | 35×40                 | 0.15 | 3.11                                              | ELXS251VSN122MA40S |
| 180         | 390         | 22×25                 | 0.15 | 1.34                                              | ELXS181VSN391MP25S |             | 1,500       | 35×45                 | 0.15 | 3.56                                              | ELXS251VSN152MA45S |
|             | 560         | 22×30                 | 0.15 | 1.68                                              | ELXS181VSN561MP30S |             | 1,800       | 35×50                 | 0.15 | 3.98                                              | ELXS251VSN182MA50S |
|             | 560         | 25.4×25               | 0.15 | 1.67                                              | ELXS181VSN561MQ25S | 315         | 180         | 22×25                 | 0.15 | 0.95                                              | ELXS3B1VSN181MP25S |
|             | 680         | 22×35                 | 0.15 | 1.90                                              | ELXS181VSN681MP35S |             | 220         | 22×30                 | 0.15 | 1.10                                              | ELXS3B1VSN221MP30S |
|             | 820         | 22×40                 | 0.15 | 2.13                                              | ELXS181VSN821MP40S |             | 220         | 25.4×25               | 0.15 | 1.10                                              | ELXS3B1VSN221MQ25S |
|             | 820         | 25.4×30               | 0.15 | 2.08                                              | ELXS181VSN821MQ30S |             | 270         | 22×35                 | 0.15 | 1.24                                              | ELXS3B1VSN271MP35S |
|             | 820         | 25.4×35               | 0.15 | 2.17                                              | ELXS181VSN821MQ35S |             | 270         | 25.4×30               | 0.15 | 1.25                                              | ELXS3B1VSN271MQ30S |
|             | 820         | 30×25                 | 0.15 | 2.26                                              | ELXS181VSN821MR25S |             | 330         | 22×40                 | 0.15 | 1.40                                              | ELXS3B1VSN331MP40S |
|             | 1,000       | 22×45                 | 0.15 | 2.40                                              | ELXS181VSN102MP45S |             | 330         | 30×25                 | 0.15 | 1.43                                              | ELXS3B1VSN331MR25S |
|             | 1,000       | 22×50                 | 0.15 | 2.45                                              | ELXS181VSN102MP50S |             | 390         | 22×45                 | 0.15 | 1.56                                              | ELXS3B1VSN391MP45S |
|             | 1,000       | 25.4×40               | 0.15 | 2.45                                              | ELXS181VSN102MQ40S |             | 390         | 22×50                 | 0.15 | 1.59                                              | ELXS3B1VSN391MP50S |
|             | 1,000       | 30×30                 | 0.15 | 2.52                                              | ELXS181VSN102MR30S |             | 390         | 25.4×35               | 0.15 | 1.57                                              | ELXS3B1VSN391MQ35S |
|             | 1,000       | 35×25                 | 0.15 | 2.66                                              | ELXS181VSN102MA25S |             | 470         | 25.4×40               | 0.15 | 1.76                                              | ELXS3B1VSN471MQ40S |
|             | 1,200       | 25.4×45               | 0.15 | 2.73                                              | ELXS181VSN122MQ45S |             | 470         | 25.4×45               | 0.15 | 1.79                                              | ELXS3B1VSN471MQ45S |
|             | 1,200       | 30×35                 | 0.15 | 2.83                                              | ELXS181VSN122MR35S |             | 470         | 30×30                 | 0.15 | 1.73                                              | ELXS3B1VSN471MR30S |
|             | 1,500       | 25.4×50               | 0.15 | 3.10                                              | ELXS181VSN152MQ50S |             | 470         | 35×25                 | 0.15 | 1.82                                              | ELXS3B1VSN471MA25S |
|             | 1,500       | 30×40                 | 0.15 | 3.26                                              | ELXS181VSN152MR40S |             | 560         | 25.4×50               | 0.15 | 1.99                                              | ELXS3B1VSN561MQ50S |
|             | 1,500       | 35×30                 | 0.15 | 3.31                                              | ELXS181VSN152MA30S |             | 560         | 30×35                 | 0.15 | 1.93                                              | ELXS3B1VSN561MR35S |
|             | 1,800       | 30×45                 | 0.15 | 3.66                                              | ELXS181VSN182MR45S |             | 560         | 35×30                 | 0.15 | 2.02                                              | ELXS3B1VSN561MA30S |
|             | 1,800       | 35×35                 | 0.15 | 3.68                                              | ELXS181VSN182MA35S |             | 680         | 30×40                 | 0.15 | 2.19                                              | ELXS3B1VSN681MQ40S |
|             | 2,200       | 30×50                 | 0.15 | 4.11                                              | ELXS181VSN222MR50S |             | 680         | 30×45                 | 0.15 | 2.25                                              | ELXS3B1VSN681MR45S |
|             | 2,200       | 35×40                 | 0.15 | 4.22                                              | ELXS181VSN222MA40S | 400         | 680         | 35×35                 | 0.15 | 2.26                                              | ELXS3B1VSN681MA35S |
|             | 2,200       | 35×45                 | 0.15 | 4.32                                              | ELXS181VSN222MA45S |             | 820         | 30×50                 | 0.15 | 2.51                                              | ELXS3B1VSN821MR50S |
|             | 2,700       | 35×50                 | 0.15 | 4.88                                              | ELXS181VSN272MA50S |             | 820         | 35×40                 | 0.15 | 2.57                                              | ELXS3B1VSN821MQ40S |
| 200         | 390         | 22×25                 | 0.15 | 1.34                                              | ELXS201VSN391MP25S |             | 1,000       | 35×45                 | 0.15 | 2.91                                              | ELXS3B1VSN102MA45S |
|             | 470         | 22×30                 | 0.15 | 1.54                                              | ELXS201VSN471MP30S |             | 1,200       | 35×50                 | 0.15 | 3.25                                              | ELXS3B1VSN122MA50S |
|             | 560         | 22×35                 | 0.15 | 1.72                                              | ELXS201VSN561MP35S |             | 120         | 22×25                 | 0.15 | 0.77                                              | ELXS401VSN121MP25S |
|             | 560         | 25.4×25               | 0.15 | 1.67                                              | ELXS201VSN561MQ25S |             | 150         | 22×30                 | 0.15 | 0.90                                              | ELXS401VSN151MP30S |
|             | 680         | 22×40                 | 0.15 | 1.94                                              | ELXS201VSN681MP40S |             | 180         | 22×35                 | 0.15 | 1.02                                              | ELXS401VSN181MP35S |
|             | 680         | 25.4×30               | 0.15 | 1.89                                              | ELXS201VSN681MQ30S |             | 180         | 25.4×25               | 0.15 | 0.99                                              | ELXS401VSN181MQ25S |
|             | 680         | 30×25                 | 0.15 | 2.06                                              | ELXS201VSN681MR25S |             | 220         | 22×40                 | 0.15 | 1.15                                              | ELXS401VSN221MP40S |
|             | 820         | 22×45                 | 0.15 | 2.17                                              | ELXS201VSN821MP45S |             | 220         | 25.4×30               | 0.15 | 1.13                                              | ELXS401VSN221MQ30S |
|             | 820         | 25.4×35               | 0.15 | 2.17                                              | ELXS201VSN821MQ35S |             | 220         | 30×25                 | 0.15 | 1.17                                              | ELXS401VSN221MR25S |
|             | 1,000       | 22×50                 | 0.15 | 2.45                                              | ELXS201VSN102MP50S |             | 270         | 22×45                 | 0.15 | 1.29                                              | ELXS401VSN271MP45S |
|             | 1,000       | 25.4×40               | 0.15 | 2.45                                              | ELXS201VSN102MQ40S |             | 270         | 22×50                 | 0.15 | 1.32                                              | ELXS401VSN271MP50S |
|             | 1,000       | 30×30                 | 0.15 | 2.52                                              | ELXS201VSN102MR30S |             | 270         | 25.4×35               | 0.15 | 1.30                                              | ELXS401VSN271MQ35S |
|             | 1,000       | 35×25                 | 0.15 | 2.66                                              | ELXS201VSN102MA25S |             | 330         | 25.4×40               | 0.15 | 1.47                                              | ELXS401VSN331MQ40S |
|             | 1,200       | 25.4×45               | 0.15 | 2.73                                              | ELXS201VSN122MQ45S |             | 330         | 30×30                 | 0.15 | 1.45                                              | ELXS401VSN331MR30S |
|             | 1,200       | 25.4×50               | 0.15 | 2.78                                              | ELXS201VSN122MQ50S |             | 330         | 35×25                 | 0.15 | 1.52                                              | ELXS401VSN331MA25S |
|             | 1,200       | 30×35                 | 0.15 | 2.83                                              | ELXS201VSN122MR35S |             | 390         | 25.4×45               | 0.15 | 1.63                                              | ELXS401VSN391MQ45S |
|             | 1,200       | 35×30                 | 0.15 | 2.96                                              | ELXS201VSN122MA30S |             |             |                       |      |                                                   |                    |
|             | 1,500       | 30×40                 | 0.15 | 3.26                                              | ELXS201VSN152MR40S |             |             |                       |      |                                                   |                    |
|             | 1,500       | 30×45                 | 0.15 | 3.34                                              | ELXS201VSN152MR45S |             |             |                       |      |                                                   |                    |


**LXS** Series

### ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|--------------------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 400                      | 390         | 25.4×50               | 0.15 | 1.66                                              | ELXS401VSN391MQ50S | 420                      | 390         | 35×35                 | 0.20 | 1.71                                              | ELXS421VSN391MA35S |
|                          | 390         | 30×35                 | 0.15 | 1.61                                              | ELXS401VSN391MR35S |                          | 470         | 30×50                 | 0.20 | 1.90                                              | ELXS421VSN471MR50S |
|                          | 390         | 35×30                 | 0.15 | 1.68                                              | ELXS401VSN391MA30S |                          | 470         | 35×40                 | 0.20 | 1.95                                              | ELXS421VSN471MA40S |
|                          | 470         | 30×40                 | 0.15 | 1.82                                              | ELXS401VSN471MR40S |                          | 560         | 35×45                 | 0.20 | 2.17                                              | ELXS421VSN561MA45S |
|                          | 470         | 35×35                 | 0.15 | 1.88                                              | ELXS401VSN471MA35S |                          | 680         | 35×50                 | 0.20 | 2.45                                              | ELXS421VSN681MA50S |
|                          | 560         | 30×45                 | 0.15 | 2.04                                              | ELXS401VSN561MR45S | 450                      | 82          | 22×25                 | 0.20 | 0.64                                              | ELXS451VSN820MP25S |
|                          | 560         | 30×50                 | 0.15 | 2.07                                              | ELXS401VSN561MR50S |                          | 120         | 22×30                 | 0.20 | 0.81                                              | ELXS451VSN121MP30S |
|                          | 560         | 35×40                 | 0.15 | 2.13                                              | ELXS401VSN561MA40S |                          | 120         | 22×35                 | 0.20 | 0.83                                              | ELXS451VSN121MP35S |
|                          | 680         | 35×45                 | 0.15 | 2.40                                              | ELXS401VSN681MA45S |                          | 120         | 25.4×25               | 0.20 | 0.81                                              | ELXS451VSN121MQ25S |
|                          | 820         | 35×50                 | 0.15 | 2.69                                              | ELXS401VSN821MA50S |                          | 150         | 22×40                 | 0.20 | 0.94                                              | ELXS451VSN151MP40S |
| 420                      | 100         | 22×25                 | 0.20 | 0.70                                              | ELXS421VSN101MP25S |                          | 150         | 25.4×30               | 0.20 | 0.93                                              | ELXS451VSN151MQ30S |
|                          | 120         | 22×30                 | 0.20 | 0.81                                              | ELXS421VSN121MP30S |                          | 180         | 22×45                 | 0.20 | 1.06                                              | ELXS451VSN181MP45S |
|                          | 120         | 25.4×25               | 0.20 | 0.81                                              | ELXS421VSN121MQ25S |                          | 180         | 25.4×35               | 0.20 | 1.06                                              | ELXS451VSN181MQ35S |
|                          | 150         | 22×35                 | 0.20 | 0.93                                              | ELXS421VSN151MP35S |                          | 180         | 30×25                 | 0.20 | 1.06                                              | ELXS451VSN181MR25S |
|                          | 180         | 22×40                 | 0.20 | 1.04                                              | ELXS421VSN181MP40S |                          | 220         | 22×50                 | 0.20 | 1.20                                              | ELXS451VSN221MP50S |
|                          | 180         | 25.4×30               | 0.20 | 1.02                                              | ELXS421VSN181MQ30S |                          | 220         | 25.4×40               | 0.20 | 1.20                                              | ELXS451VSN221MQ40S |
|                          | 180         | 30×25                 | 0.20 | 1.06                                              | ELXS421VSN181MR25S |                          | 220         | 30×30                 | 0.20 | 1.18                                              | ELXS451VSN221MR30S |
|                          | 220         | 22×45                 | 0.20 | 1.17                                              | ELXS421VSN221MP45S |                          | 220         | 35×25                 | 0.20 | 1.24                                              | ELXS451VSN221MA25S |
|                          | 220         | 22×50                 | 0.20 | 1.20                                              | ELXS421VSN221MP50S |                          | 270         | 25.4×45               | 0.20 | 1.36                                              | ELXS451VSN271MQ45S |
|                          | 220         | 25.4×35               | 0.20 | 1.18                                              | ELXS421VSN221MQ35S |                          | 270         | 25.4×50               | 0.20 | 1.38                                              | ELXS451VSN271MQ50S |
|                          | 270         | 25.4×40               | 0.20 | 1.33                                              | ELXS421VSN271MQ40S |                          | 270         | 30×35                 | 0.20 | 1.34                                              | ELXS451VSN271MR35S |
|                          | 270         | 25.4×45               | 0.20 | 1.36                                              | ELXS421VSN271MQ45S |                          | 270         | 35×30                 | 0.20 | 1.40                                              | ELXS451VSN271MA30S |
|                          | 270         | 30×30                 | 0.20 | 1.31                                              | ELXS421VSN271MR30S |                          | 330         | 30×40                 | 0.20 | 1.52                                              | ELXS451VSN331MR40S |
|                          | 270         | 35×25                 | 0.20 | 1.38                                              | ELXS421VSN271MA25S |                          | 390         | 30×45                 | 0.20 | 1.70                                              | ELXS451VSN391MR45S |
|                          | 330         | 25.4×50               | 0.20 | 1.52                                              | ELXS421VSN331MQ50S |                          | 390         | 30×50                 | 0.20 | 1.73                                              | ELXS451VSN391MR50S |
|                          | 330         | 30×35                 | 0.20 | 1.48                                              | ELXS421VSN331MR35S |                          | 390         | 35×35                 | 0.20 | 1.71                                              | ELXS451VSN391MA35S |
|                          | 330         | 35×30                 | 0.20 | 1.55                                              | ELXS421VSN331MA30S |                          | 470         | 35×40                 | 0.20 | 1.95                                              | ELXS451VSN471MA40S |
|                          | 390         | 30×40                 | 0.20 | 1.66                                              | ELXS421VSN391MR40S |                          | 470         | 35×45                 | 0.20 | 1.99                                              | ELXS451VSN471MA45S |
|                          | 390         | 30×45                 | 0.20 | 1.70                                              | ELXS421VSN391MR45S |                          | 560         | 35×50                 | 0.20 | 2.22                                              | ELXS451VSN561MA50S |

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency (Hz)            | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 160 to 250V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 315 to 450V <sub>dc</sub> | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

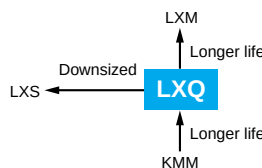


## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105°C

## LXQ Series

- Endurance with ripple current : 5,000 hours at 105°C
- Downsized and higher ripple version of LXG series
- Non solvent resistant type
- RoHS Compliant

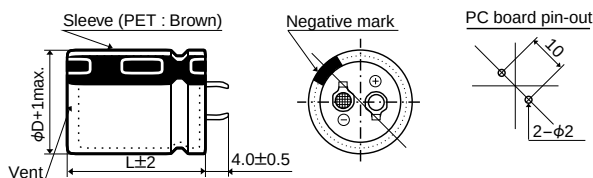


## ◆SPECIFICATIONS

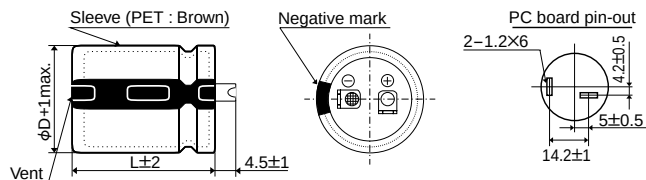
| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |                       |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                       |                                      |                       |
| Temperature Range                                      | -25 to +105°C                                                                                                                                                                                                                                                                           |                                      |                       |
| Rated Voltage Range                                    | 160 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                      |                       |
| Capacitance Tolerance                                  | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                               |                                      |                       |
| Leakage Current                                        | I≤3√CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                           |                                      |                       |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 400V                          | 420 & 450V            |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.15                                 | 0.20 (at 20°C, 120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 160 to 400V                          | 420 & 450V            |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 4                                    | 8 (at 120Hz)          |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 105°C.                                                                                               |                                      |                       |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |                       |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |                       |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |                       |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |                       |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±15% of the initial value           |                       |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤150% of the initial specified value |                       |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |                       |

## ◆DIMENSIONS [mm]

- Terminal Code : VS (φ22 to φ35) : Standard

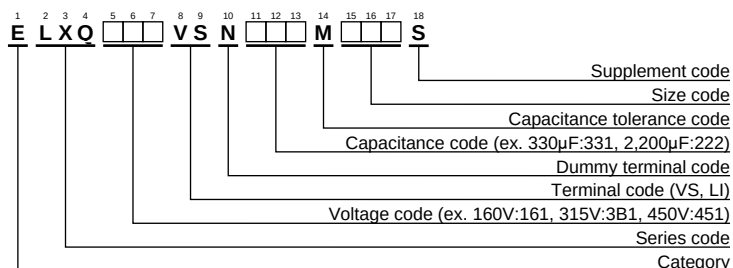


- Terminal Code : LI (φ30, φ35)



The standard design has no plastic disc.

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"


**LXQ**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φDXL(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 160         | 390         | 22×25                 | 0.15 | 1.32                                              | ELXQ161VSN391MP25S | 200         | 1,200       | 30×50                 | 0.15 | 2.88                                              | ELXQ201VSN122MR50S |
|             | 560         | 22×30                 | 0.15 | 1.66                                              | ELXQ161VSN561MP30S |             | 1,200       | 35×35                 | 0.15 | 2.88                                              | ELXQ201VSN122MA35S |
|             | 560         | 25.4×25               | 0.15 | 1.68                                              | ELXQ161VSN561MQ25S |             | 1,500       | 35×40                 | 0.15 | 3.34                                              | ELXQ201VSN152MA40S |
|             | 680         | 22×35                 | 0.15 | 1.87                                              | ELXQ161VSN681MP35S |             | 1,800       | 35×45                 | 0.15 | 3.74                                              | ELXQ201VSN182MA45S |
|             | 680         | 25.4×30               | 0.15 | 1.88                                              | ELXQ161VSN681MQ30S |             | 1,800       | 35×50                 | 0.15 | 3.82                                              | ELXQ201VSN182MA50S |
|             | 680         | 30×25                 | 0.15 | 1.96                                              | ELXQ161VSN681MR25S | 220         | 270         | 22×25                 | 0.15 | 1.10                                              | ELXQ221VSN271MP25S |
|             | 820         | 22×40                 | 0.15 | 2.09                                              | ELXQ161VSN821MP40S |             | 330         | 22×30                 | 0.15 | 1.19                                              | ELXQ221VSN331MP30S |
|             | 1,000       | 22×45                 | 0.15 | 2.36                                              | ELXQ161VSN102MP45S |             | 390         | 25.4×25               | 0.15 | 1.39                                              | ELXQ221VSN391MQ25S |
|             | 1,000       | 22×50                 | 0.15 | 2.41                                              | ELXQ161VSN102MP50S |             | 470         | 22×35                 | 0.15 | 1.55                                              | ELXQ221VSN471MP35S |
|             | 1,000       | 25.4×35               | 0.15 | 2.38                                              | ELXQ161VSN102MQ35S |             | 470         | 25.4×30               | 0.15 | 1.56                                              | ELXQ221VSN471MQ30S |
|             | 1,000       | 30×30                 | 0.15 | 2.40                                              | ELXQ161VSN102MR30S |             | 470         | 30×25                 | 0.15 | 1.63                                              | ELXQ221VSN471MR25S |
|             | 1,000       | 35×25                 | 0.15 | 2.55                                              | ELXQ161VSN102MA25S |             | 560         | 22×40                 | 0.15 | 1.73                                              | ELXQ221VSN561MP40S |
|             | 1,200       | 25.4×40               | 0.15 | 2.66                                              | ELXQ161VSN122MQ40S |             | 560         | 30×30                 | 0.15 | 1.79                                              | ELXQ221VSN561MR30S |
|             | 1,200       | 25.4×45               | 0.15 | 2.71                                              | ELXQ161VSN122MQ45S |             | 680         | 22×45                 | 0.15 | 1.94                                              | ELXQ221VSN681MP45S |
|             | 1,200       | 30×35                 | 0.15 | 2.69                                              | ELXQ161VSN122MR35S |             | 680         | 22×50                 | 0.15 | 1.99                                              | ELXQ221VSN681MP50S |
|             | 1,200       | 30×40                 | 0.15 | 2.77                                              | ELXQ161VSN122MR40S |             | 680         | 25.4×35               | 0.15 | 1.96                                              | ELXQ221VSN681MQ35S |
|             | 1,200       | 35×30                 | 0.15 | 2.86                                              | ELXQ161VSN122MA30S |             | 680         | 30×35                 | 0.15 | 2.02                                              | ELXQ221VSN681MR35S |
|             | 1,500       | 25.4×50               | 0.15 | 3.08                                              | ELXQ161VSN152MQ50S |             | 680         | 35×25                 | 0.15 | 2.10                                              | ELXQ221VSN681MA25S |
|             | 1,500       | 30×45                 | 0.15 | 3.17                                              | ELXQ161VSN152MR45S |             | 820         | 25.4×40               | 0.15 | 2.20                                              | ELXQ221VSN821MQ40S |
|             | 1,500       | 35×35                 | 0.15 | 3.22                                              | ELXQ161VSN152MA35S |             | 820         | 25.4×45               | 0.15 | 2.24                                              | ELXQ221VSN821MQ45S |
|             | 1,800       | 30×50                 | 0.15 | 3.53                                              | ELXQ161VSN182MR50S |             | 820         | 30×40                 | 0.15 | 2.29                                              | ELXQ221VSN821MR40S |
|             | 1,800       | 35×40                 | 0.15 | 3.66                                              | ELXQ161VSN182MA40S |             | 820         | 35×30                 | 0.15 | 2.36                                              | ELXQ221VSN821MA30S |
|             | 2,200       | 35×45                 | 0.15 | 4.14                                              | ELXQ161VSN222MA45S |             | 1,000       | 25.4×50               | 0.15 | 2.51                                              | ELXQ221VSN102MQ50S |
|             | 2,700       | 35×50                 | 0.15 | 4.68                                              | ELXQ161VSN272MA50S |             | 1,000       | 30×45                 | 0.15 | 2.59                                              | ELXQ221VSN102MR45S |
| 180         | 330         | 22×25                 | 0.15 | 1.21                                              | ELXQ181VSN331MP25S |             | 1,000       | 35×35                 | 0.15 | 2.63                                              | ELXQ221VSN102MA35S |
|             | 470         | 22×30                 | 0.15 | 1.52                                              | ELXQ181VSN471MP30S |             | 1,200       | 30×50                 | 0.15 | 2.88                                              | ELXQ221VSN122MR50S |
|             | 470         | 25.4×25               | 0.15 | 1.52                                              | ELXQ181VSN471MQ25S |             | 1,200       | 35×40                 | 0.15 | 2.98                                              | ELXQ221VSN122MA40S |
|             | 560         | 22×35                 | 0.15 | 1.70                                              | ELXQ181VSN561MP35S |             | 1,500       | 35×45                 | 0.15 | 3.41                                              | ELXQ221VSN152MA45S |
|             | 560         | 30×25                 | 0.15 | 1.78                                              | ELXQ181VSN561MR25S |             | 1,800       | 35×50                 | 0.15 | 3.82                                              | ELXQ221VSN182MA50S |
|             | 680         | 22×40                 | 0.15 | 1.91                                              | ELXQ181VSN681MP40S | 250         | 220         | 22×25                 | 0.15 | 1.01                                              | ELXQ251VSN221MP25S |
|             | 680         | 25.4×30               | 0.15 | 1.88                                              | ELXQ181VSN681MQ30S |             | 270         | 22×30                 | 0.15 | 1.20                                              | ELXQ251VSN271MP30S |
|             | 820         | 22×45                 | 0.15 | 1.99                                              | ELXQ181VSN821MP45S |             | 330         | 25.4×25               | 0.15 | 1.32                                              | ELXQ251VSN331MQ25S |
|             | 820         | 25.4×35               | 0.15 | 2.16                                              | ELXQ181VSN821MQ35S |             | 390         | 22×35                 | 0.15 | 1.44                                              | ELXQ251VSN391MP35S |
|             | 820         | 30×30                 | 0.15 | 2.17                                              | ELXQ181VSN821MR30S |             | 390         | 25.4×30               | 0.15 | 1.43                                              | ELXQ251VSN391MQ30S |
|             | 820         | 35×25                 | 0.15 | 2.31                                              | ELXQ181VSN821MA25S |             | 390         | 30×25                 | 0.15 | 1.51                                              | ELXQ251VSN391MR25S |
|             | 1,000       | 22×50                 | 0.15 | 2.25                                              | ELXQ181VSN102MP50S |             | 470         | 22×40                 | 0.15 | 1.62                                              | ELXQ251VSN471MP40S |
|             | 1,000       | 25.4×40               | 0.15 | 2.43                                              | ELXQ181VSN102MQ40S |             | 560         | 22×45                 | 0.15 | 1.80                                              | ELXQ251VSN561MP45S |
|             | 1,000       | 25.4×45               | 0.15 | 2.47                                              | ELXQ181VSN102MQ45S |             | 560         | 22×50                 | 0.15 | 1.84                                              | ELXQ251VSN561MP50S |
|             | 1,000       | 30×35                 | 0.15 | 2.46                                              | ELXQ181VSN102MR35S |             | 560         | 25.4×35               | 0.15 | 1.78                                              | ELXQ251VSN561MQ35S |
|             | 1,200       | 25.4×50               | 0.15 | 2.75                                              | ELXQ181VSN122MQ50S |             | 560         | 30×30                 | 0.15 | 1.83                                              | ELXQ251VSN561MR30S |
|             | 1,200       | 30×40                 | 0.15 | 2.77                                              | ELXQ181VSN122MR40S |             | 560         | 35×25                 | 0.15 | 1.91                                              | ELXQ251VSN561MA25S |
|             | 1,200       | 35×30                 | 0.15 | 2.86                                              | ELXQ181VSN122MA30S |             | 680         | 25.4×40               | 0.15 | 2.00                                              | ELXQ251VSN681MQ40S |
|             | 1,500       | 30×45                 | 0.15 | 3.17                                              | ELXQ181VSN152MR45S |             | 680         | 25.4×45               | 0.15 | 2.04                                              | ELXQ251VSN681MQ45S |
|             | 1,500       | 30×50                 | 0.15 | 3.22                                              | ELXQ181VSN152MR50S |             | 680         | 30×35                 | 0.15 | 2.06                                              | ELXQ251VSN681MR35S |
|             | 1,500       | 35×35                 | 0.15 | 3.22                                              | ELXQ181VSN152MA35S |             | 680         | 35×30                 | 0.15 | 2.15                                              | ELXQ251VSN681MA30S |
|             | 1,800       | 35×40                 | 0.15 | 3.66                                              | ELXQ181VSN182MA40S |             | 820         | 25.4×50               | 0.15 | 2.28                                              | ELXQ251VSN821MQ50S |
|             | 1,800       | 35×45                 | 0.15 | 3.74                                              | ELXQ181VSN182MA45S |             | 820         | 30×40                 | 0.15 | 2.33                                              | ELXQ251VSN821MR40S |
|             | 2,200       | 35×50                 | 0.15 | 4.22                                              | ELXQ181VSN222MA50S |             | 820         | 30×45                 | 0.15 | 2.39                                              | ELXQ251VSN821MR45S |
| 200         | 270         | 22×25                 | 0.15 | 1.10                                              | ELXQ201VSN271MP25S |             | 820         | 35×35                 | 0.15 | 2.38                                              | ELXQ251VSN821MA35S |
|             | 390         | 22×30                 | 0.15 | 1.38                                              | ELXQ201VSN391MP30S |             | 1,000       | 30×50                 | 0.15 | 2.68                                              | ELXQ251VSN102MR50S |
|             | 390         | 25.4×25               | 0.15 | 1.39                                              | ELXQ201VSN391MQ25S |             | 1,000       | 35×40                 | 0.15 | 2.72                                              | ELXQ251VSN102MA40S |
|             | 470         | 22×35                 | 0.15 | 1.55                                              | ELXQ201VSN471MP35S |             | 1,200       | 35×45                 | 0.15 | 3.05                                              | ELXQ251VSN122MA45S |
|             | 560         | 22×40                 | 0.15 | 1.73                                              | ELXQ201VSN561MP40S |             | 1,500       | 35×50                 | 0.15 | 3.49                                              | ELXQ251VSN152MA50S |
|             | 560         | 25.4×30               | 0.15 | 1.71                                              | ELXQ201VSN561MQ30S | 315         | 150         | 22×25                 | 0.15 | 0.80                                              | ELXQ3B1VSN151MP25S |
|             | 560         | 30×25                 | 0.15 | 1.78                                              | ELXQ201VSN561MR25S |             | 180         | 22×30                 | 0.15 | 0.92                                              | ELXQ3B1VSN181MP30S |
|             | 680         | 22×45                 | 0.15 | 1.81                                              | ELXQ201VSN681MP45S |             | 180         | 25.4×25               | 0.15 | 0.94                                              | ELXQ3B1VSN181MQ25S |
|             | 680         | 25.4×35               | 0.15 | 1.87                                              | ELXQ201VSN681MQ35S |             | 220         | 22×35                 | 0.15 | 1.04                                              | ELXQ3B1VSN221MP35S |
|             | 680         | 30×30                 | 0.15 | 1.98                                              | ELXQ201VSN681MR30S |             | 220         | 30×25                 | 0.15 | 1.17                                              | ELXQ3B1VSN221MR25S |
|             | 680         | 35×25                 | 0.15 | 2.10                                              | ELXQ201VSN681MA25S |             | 270         | 22×40                 | 0.15 | 1.18                                              | ELXQ3B1VSN271MP40S |
|             | 820         | 22×50                 | 0.15 | 2.18                                              | ELXQ201VSN821MP50S |             | 270         | 25.4×30               | 0.15 | 1.19                                              | ELXQ3B1VSN271MQ30S |
|             | 820         | 25.4×40               | 0.15 | 2.09                                              | ELXQ201VSN821MQ40S |             | 330         | 22×45                 | 0.15 | 1.33                                              | ELXQ3B1VSN331MP45S |
|             | 820         | 30×35                 | 0.15 | 2.22                                              | ELXQ201VSN821MR35S |             | 330         | 25.4×35               | 0.15 | 1.37                                              | ELXQ3B1VSN331MQ35S |
|             | 1,000       | 25.4×45               | 0.15 | 2.35                                              | ELXQ201VSN102MQ45S |             | 330         | 30×30                 | 0.15 | 1.40                                              | ELXQ3B1VSN331MR30S |
|             | 1,000       | 25.4×50               | 0.15 | 2.39                                              | ELXQ201VSN102MQ50S |             | 330         | 35×25                 | 0.15 | 1.49                                              | ELXQ3B1VSN331MA25S |
|             | 1,000       | 30×40                 | 0.15 | 2.53                                              | ELXQ201VSN102MR40S |             | 390         | 22×50                 | 0.15 | 1.48                                              | ELXQ3B1VSN391MP50S |
|             | 1,000       | 35×30                 | 0.15 | 2.61                                              | ELXQ201VSN102MA30S |             | 390         | 25.4×40               | 0.15 | 1.52                                              | ELXQ3B1VSN391MQ40S |
|             | 1,200       | 30×45                 | 0.15 | 2.84                                              | ELXQ201VSN122MR45S |             | 470         | 25.4×45               | 0.15 | 1.70                                              | ELXQ3B1VSN471MQ45S |


**LXQ**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 315         | 470         | 30×35                 | 0.15 | 1.71                                              | ELXQ3B1VSN471MR35S | 400         | 470         | 30×45                 | 0.15 | 1.81                                              | ELXQ401VSN471MR45S |
|             | 470         | 35×30                 | 0.15 | 1.82                                              | ELXQ3B1VSN471MA30S |             | 470         | 30×50                 | 0.15 | 1.84                                              | ELXQ401VSN471MR50S |
|             | 560         | 25.4×50               | 0.15 | 1.88                                              | ELXQ3B1VSN561MQ50S |             | 470         | 35×40                 | 0.15 | 1.90                                              | ELXQ401VSN471MA40S |
|             | 560         | 30×40                 | 0.15 | 1.92                                              | ELXQ3B1VSN561MR40S |             | 560         | 35×45                 | 0.15 | 2.12                                              | ELXQ401VSN561MA45S |
|             | 560         | 30×45                 | 0.15 | 1.97                                              | ELXQ3B1VSN561MR45S |             | 680         | 35×50                 | 0.15 | 2.39                                              | ELXQ401VSN681MA50S |
|             | 560         | 35×35                 | 0.15 | 2.00                                              | ELXQ3B1VSN561MA35S | 420         | 100         | 22×25                 | 0.20 | 0.66                                              | ELXQ421VSN101MP25S |
|             | 680         | 30×50                 | 0.15 | 2.21                                              | ELXQ3B1VSN681MR50S |             | 120         | 22×30                 | 0.20 | 0.75                                              | ELXQ421VSN121MP30S |
|             | 680         | 35×40                 | 0.15 | 2.29                                              | ELXQ3B1VSN681MA40S |             | 120         | 25.4×25               | 0.20 | 0.77                                              | ELXQ421VSN121MQ25S |
|             | 820         | 35×45                 | 0.15 | 2.57                                              | ELXQ3B1VSN821MA45S |             | 150         | 22×35                 | 0.20 | 0.86                                              | ELXQ421VSN151MP35S |
|             | 1,000       | 35×50                 | 0.15 | 2.89                                              | ELXQ3B1VSN102MA50S |             | 180         | 22×40                 | 0.20 | 0.96                                              | ELXQ421VSN181MP40S |
| 350         | 120         | 22×25                 | 0.15 | 0.72                                              | ELXQ351VSN121MP25S |             | 180         | 22×45                 | 0.20 | 0.98                                              | ELXQ421VSN181MP45S |
|             | 150         | 22×30                 | 0.15 | 0.84                                              | ELXQ351VSN151MP30S |             | 180         | 25.4×30               | 0.20 | 0.97                                              | ELXQ421VSN181MQ30S |
|             | 180         | 25.4×25               | 0.15 | 0.94                                              | ELXQ351VSN181MQ25S |             | 180         | 25.4×35               | 0.20 | 1.01                                              | ELXQ421VSN181MQ35S |
|             | 220         | 22×35                 | 0.15 | 1.04                                              | ELXQ351VSN221MP35S |             | 180         | 30×25                 | 0.20 | 1.02                                              | ELXQ421VSN181MP25S |
|             | 220         | 22×40                 | 0.15 | 1.06                                              | ELXQ351VSN221MP40S |             | 220         | 22×50                 | 0.20 | 1.11                                              | ELXQ421VSN221MP50S |
|             | 220         | 25.4×30               | 0.15 | 1.07                                              | ELXQ351VSN221MQ30S |             | 220         | 25.4×40               | 0.20 | 1.14                                              | ELXQ421VSN221MQ40S |
|             | 220         | 30×25                 | 0.15 | 1.13                                              | ELXQ351VSN221MR25S |             | 220         | 30×30                 | 0.20 | 1.14                                              | ELXQ421VSN221MR30S |
|             | 270         | 22×45                 | 0.15 | 1.20                                              | ELXQ351VSN271MP45S |             | 220         | 35×25                 | 0.20 | 1.22                                              | ELXQ421VSN221MA25S |
|             | 270         | 25.4×35               | 0.15 | 1.24                                              | ELXQ351VSN271MQ35S |             | 270         | 25.4×45               | 0.20 | 1.29                                              | ELXQ421VSN271MQ45S |
|             | 270         | 30×30                 | 0.15 | 1.27                                              | ELXQ351VSN271MR30S |             | 270         | 30×35                 | 0.20 | 1.30                                              | ELXQ421VSN271MR35S |
|             | 270         | 35×25                 | 0.15 | 1.35                                              | ELXQ351VSN271MA25S |             | 270         | 35×30                 | 0.20 | 1.38                                              | ELXQ421VSN271MA30S |
|             | 330         | 22×50                 | 0.15 | 1.36                                              | ELXQ351VSN331MP50S |             | 330         | 25.4×50               | 0.20 | 1.44                                              | ELXQ421VSN331MQ50S |
|             | 330         | 25.4×40               | 0.15 | 1.39                                              | ELXQ351VSN331MQ40S |             | 330         | 30×40                 | 0.20 | 1.48                                              | ELXQ421VSN331MR40S |
|             | 330         | 30×35                 | 0.15 | 1.43                                              | ELXQ351VSN331MR35S |             | 330         | 35×35                 | 0.20 | 1.54                                              | ELXQ421VSN331MA35S |
|             | 390         | 25.4×45               | 0.15 | 1.55                                              | ELXQ351VSN391MQ45S |             | 390         | 30×45                 | 0.20 | 1.64                                              | ELXQ421VSN391MR45S |
|             | 390         | 30×40                 | 0.15 | 1.60                                              | ELXQ351VSN391MR40S |             | 390         | 35×40                 | 0.20 | 1.73                                              | ELXQ421VSN391MA40S |
|             | 390         | 35×30                 | 0.15 | 1.66                                              | ELXQ351VSN391MA30S |             | 470         | 30×50                 | 0.20 | 1.84                                              | ELXQ421VSN471MR50S |
|             | 470         | 25.4×50               | 0.15 | 1.72                                              | ELXQ351VSN471MQ50S |             | 470         | 35×45                 | 0.20 | 1.94                                              | ELXQ421VSN471MA45S |
|             | 470         | 30×45                 | 0.15 | 1.81                                              | ELXQ351VSN471MR45S |             | 560         | 35×50                 | 0.20 | 2.17                                              | ELXQ421VSN561MA50S |
|             | 470         | 35×35                 | 0.15 | 1.83                                              | ELXQ351VSN471MA35S | 450         | 82          | 22×25                 | 0.20 | 0.59                                              | ELXQ451VSN820MP25S |
| 400         | 560         | 30×50                 | 0.15 | 2.00                                              | ELXQ351VSN561MR50S |             | 100         | 22×30                 | 0.20 | 0.69                                              | ELXQ451VSN101MP30S |
|             | 560         | 35×40                 | 0.15 | 2.07                                              | ELXQ351VSN561MA40S |             | 100         | 25.4×25               | 0.20 | 0.70                                              | ELXQ451VSN101MQ25S |
|             | 680         | 35×45                 | 0.15 | 2.34                                              | ELXQ351VSN681MA45S |             | 120         | 22×35                 | 0.20 | 0.77                                              | ELXQ451VSN121MP35S |
|             | 820         | 35×50                 | 0.15 | 2.62                                              | ELXQ351VSN821MA50S |             | 150         | 22×40                 | 0.20 | 0.88                                              | ELXQ451VSN151MP40S |
|             | 100         | 22×25                 | 0.15 | 0.66                                              | ELXQ401VSN101MP25S |             | 150         | 22×45                 | 0.20 | 0.90                                              | ELXQ451VSN151MP45S |
|             | 120         | 22×30                 | 0.15 | 0.75                                              | ELXQ401VSN121MP30S |             | 150         | 25.4×30               | 0.20 | 0.88                                              | ELXQ451VSN151MQ30S |
|             | 150         | 22×35                 | 0.15 | 0.86                                              | ELXQ401VSN151MP35S |             | 150         | 25.4×35               | 0.20 | 0.92                                              | ELXQ451VSN151MQ35S |
|             | 150         | 25.4×25               | 0.15 | 0.86                                              | ELXQ401VSN151MQ25S |             | 150         | 30×25                 | 0.20 | 0.93                                              | ELXQ451VSN151MR25S |
|             | 180         | 22×40                 | 0.15 | 0.96                                              | ELXQ401VSN181MP40S |             | 180         | 22×50                 | 0.20 | 1.01                                              | ELXQ451VSN181MP50S |
|             | 180         | 25.4×30               | 0.15 | 0.97                                              | ELXQ401VSN181MQ30S |             | 180         | 25.4×40               | 0.20 | 1.03                                              | ELXQ451VSN181MQ40S |
|             | 180         | 30×25                 | 0.15 | 1.02                                              | ELXQ401VSN181MR25S |             | 180         | 30×30                 | 0.20 | 1.03                                              | ELXQ451VSN181MR30S |
|             | 220         | 22×45                 | 0.15 | 1.09                                              | ELXQ401VSN221MP45S |             | 180         | 35×25                 | 0.20 | 1.10                                              | ELXQ451VSN181MA25S |
|             | 220         | 25.4×35               | 0.15 | 1.12                                              | ELXQ401VSN221MQ35S |             | 220         | 25.4×45               | 0.20 | 1.16                                              | ELXQ451VSN221MQ45S |
|             | 220         | 35×25                 | 0.15 | 1.22                                              | ELXQ401VSN221MA25S |             | 220         | 30×35                 | 0.20 | 1.17                                              | ELXQ451VSN221MR35S |
|             | 270         | 22×50                 | 0.15 | 1.23                                              | ELXQ401VSN271MP50S |             | 220         | 35×30                 | 0.20 | 1.24                                              | ELXQ451VSN221MA30S |
|             | 270         | 25.4×40               | 0.15 | 1.26                                              | ELXQ401VSN271MQ40S |             | 270         | 25.4×50               | 0.20 | 1.31                                              | ELXQ451VSN271MQ50S |
|             | 270         | 25.4×45               | 0.15 | 1.29                                              | ELXQ401VSN271MQ45S |             | 270         | 30×40                 | 0.20 | 1.33                                              | ELXQ451VSN271MR40S |
|             | 270         | 30×30                 | 0.15 | 1.27                                              | ELXQ401VSN271MR30S |             | 270         | 35×35                 | 0.20 | 1.39                                              | ELXQ451VSN271MA35S |
|             | 330         | 25.4×50               | 0.15 | 1.44                                              | ELXQ401VSN331MQ50S |             | 330         | 30×45                 | 0.20 | 1.51                                              | ELXQ451VSN331MR45S |
|             | 330         | 30×35                 | 0.15 | 1.43                                              | ELXQ401VSN331MR35S |             | 390         | 30×50                 | 0.20 | 1.67                                              | ELXQ451VSN391MR50S |
|             | 330         | 35×30                 | 0.15 | 1.52                                              | ELXQ401VSN331MA30S |             | 390         | 35×40                 | 0.20 | 1.73                                              | ELXQ451VSN391MA40S |
|             | 390         | 30×40                 | 0.15 | 1.60                                              | ELXQ401VSN391MR40S |             | 390         | 35×45                 | 0.20 | 1.77                                              | ELXQ451VSN391MA45S |
|             | 390         | 35×35                 | 0.15 | 1.67                                              | ELXQ401VSN391MA35S |             | 470         | 35×50                 | 0.20 | 1.98                                              | ELXQ451VSN471MA50S |

**◆RATED RIPPLE CURRENT MULTIPLIERS**

●Frequency Multipliers

| Frequency (Hz)            | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 160 to 250V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 315 to 450V <sub>dc</sub> | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

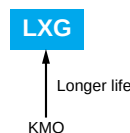


## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life snap-ins, 105°C

# LXG Series

- Endurance with ripple current : 5,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

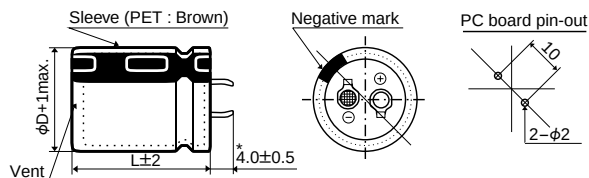


## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                       |                                      |      |      |      |      |      |           |                  |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------|------|------|------|------|-----------|------------------|
| Category                                               | Temperature Range                                                                                                                                                                                                                                                                     |                                      |      |      |      |      |      |           |                  |
| Temperature Range                                      | -40 to +105°C                                                                                                                                                                                                                                                                         |                                      |      |      |      |      |      |           |                  |
| Rated Voltage Range                                    | 10 to 100V <sub>dc</sub> (at 20°C, 120Hz)                                                                                                                                                                                                                                             |                                      |      |      |      |      |      |           |                  |
| Capacitance Tolerance                                  | ±20% (M)                                                                                                                                                                                                                                                                              |                                      |      |      |      |      |      |           |                  |
| Leakage Current                                        | I=0.02CV or 3mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                         |                                      |      |      |      |      |      |           |                  |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 10V                                  | 16V  | 25V  | 35V  | 50V  | 63V  | 80 & 100V | (at 20°C, 120Hz) |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                           | 0.60                                 | 0.45 | 0.30 | 0.25 | 0.20 | 0.15 | 0.15      |                  |
| Low Temperature Characteristics (Max. Impedance Ratio) | Capacitance change : Capacitance at the lowest operating temperature shall not be less than 70% of the 20°C value.                                                                                                                                                                    |                                      |      |      |      |      |      |           |                  |
|                                                        | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                      | 10V                                  | 16V  | 25V  | 35V  | 50V  | 63V  | 80 & 100V |                  |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 4                                    | 4    | 3    | 3    | 2    | 2    | 2         |                  |
|                                                        | Z(-40°C)/Z(+20°C)                                                                                                                                                                                                                                                                     | 15                                   | 15   | 10   | 8    | 6    | 6    | 5         | (at 120Hz)       |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with rated ripple current is applied for 5,000 hours at 105°C.                                                                                                 |                                      |      |      |      |      |      |           |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±25% of the initial value           |      |      |      |      |      |           |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤250% of the initial specified value |      |      |      |      |      |           |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |      |           |                  |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |      |      |      |      |      |           |                  |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                    | ≤±20% of the initial value           |      |      |      |      |      |           |                  |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                           | ≤150% of the initial specified value |      |      |      |      |      |           |                  |
|                                                        | Leakage current                                                                                                                                                                                                                                                                       | ≤The initial specified value         |      |      |      |      |      |           |                  |

## ◆DIMENSIONS [mm]

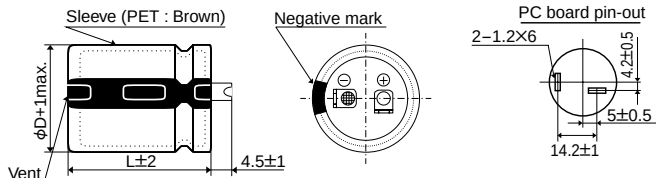
- Terminal Code : VS (φ22 to φ35) : Standard



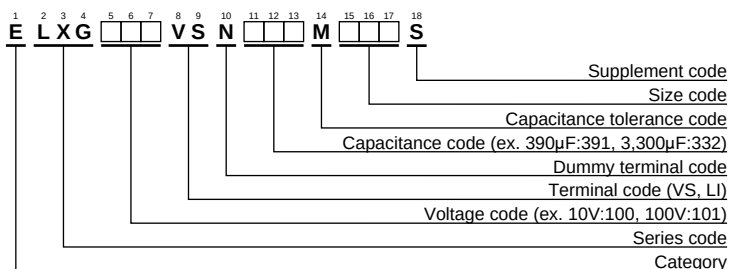
\*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

- Terminal Code : LI (φ35)



## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

## ◆RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Frequency (Hz)           | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|--------------------------|------|------|------|------|------|------|
| 10 to 50V <sub>dc</sub>  | 0.95 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |
| 63 to 100V <sub>dc</sub> | 0.92 | 1.00 | 1.07 | 1.13 | 1.19 | 1.20 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.


**LXG**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 10          | 6,800       | 22×25                 | 0.60 | 1.30                                              | ELXG100VSN682MP25S | 35          | 5,600       | 25.4×35               | 0.25 | 1.98                                              | ELXG350VSN562MQ35S |
|             | 10,000      | 22×30                 | 0.60 | 1.65                                              | ELXG100VSN103MP30S |             | 5,600       | 30×30                 | 0.25 | 1.98                                              | ELXG350VSN562MR30S |
|             | 10,000      | 25.4×25               | 0.60 | 1.64                                              | ELXG100VSN103MQ25S |             | 5,600       | 35×25                 | 0.25 | 2.03                                              | ELXG350VSN562MA25S |
|             | 12,000      | 22×35                 | 0.60 | 1.85                                              | ELXG100VSN123MP35S |             | 6,800       | 22×50                 | 0.25 | 2.26                                              | ELXG350VSN682MP50S |
|             | 12,000      | 25.4×30               | 0.60 | 1.85                                              | ELXG100VSN123MQ30S |             | 6,800       | 25.4×40               | 0.25 | 2.24                                              | ELXG350VSN682MQ40S |
|             | 12,000      | 30×25                 | 0.60 | 1.89                                              | ELXG100VSN123MR25S |             | 8,200       | 25.4×50               | 0.25 | 2.57                                              | ELXG350VSN822MQ50S |
|             | 15,000      | 22×40                 | 0.60 | 2.12                                              | ELXG100VSN153MP40S |             | 8,200       | 30×35                 | 0.25 | 2.50                                              | ELXG350VSN822MR35S |
|             | 15,000      | 25.4×35               | 0.60 | 2.16                                              | ELXG100VSN153MQ35S |             | 8,200       | 35×30                 | 0.25 | 2.55                                              | ELXG350VSN822MA30S |
|             | 18,000      | 22×50                 | 0.60 | 2.45                                              | ELXG100VSN183MP50S |             | 10,000      | 30×40                 | 0.25 | 2.86                                              | ELXG350VSN103MR40S |
|             | 18,000      | 25.4×40               | 0.60 | 2.43                                              | ELXG100VSN183MQ40S |             | 10,000      | 35×35                 | 0.25 | 2.88                                              | ELXG350VSN103MA35S |
|             | 18,000      | 30×30                 | 0.60 | 2.37                                              | ELXG100VSN183MR30S |             | 12,000      | 30×50                 | 0.25 | 3.32                                              | ELXG350VSN123MR50S |
|             | 18,000      | 35×25                 | 0.60 | 2.42                                              | ELXG100VSN183MA25S |             | 12,000      | 35×40                 | 0.25 | 3.30                                              | ELXG350VSN123MA40S |
|             | 22,000      | 30×35                 | 0.60 | 2.73                                              | ELXG100VSN223MR35S |             | 18,000      | 35×50                 | 0.25 | 4.29                                              | ELXG350VSN183MA50S |
|             | 22,000      | 35×30                 | 0.60 | 2.79                                              | ELXG100VSN223MA30S |             | 1,500       | 22×25                 | 0.20 | 1.02                                              | ELXG500VSN152MP25S |
|             | 27,000      | 25.4×50               | 0.60 | 3.11                                              | ELXG100VSN273MQ50S |             | 1,800       | 22×30                 | 0.20 | 1.17                                              | ELXG500VSN182MP30S |
|             | 27,000      | 30×40                 | 0.60 | 3.13                                              | ELXG100VSN273MR40S |             | 1,800       | 25.4×25               | 0.20 | 1.17                                              | ELXG500VSN182MQ25S |
|             | 33,000      | 35×35                 | 0.60 | 3.49                                              | ELXG100VSN333MA35S |             | 2,200       | 22×35                 | 0.20 | 1.33                                              | ELXG500VSN222MP35S |
|             | 39,000      | 30×50                 | 0.60 | 3.99                                              | ELXG100VSN393MR50S |             | 2,700       | 22×40                 | 0.20 | 1.51                                              | ELXG500VSN272MP40S |
|             | 39,000      | 35×40                 | 0.60 | 3.96                                              | ELXG100VSN393MA40S |             | 2,700       | 25.4×30               | 0.20 | 1.47                                              | ELXG500VSN272MQ30S |
|             | 47,000      | 35×50                 | 0.60 | 4.62                                              | ELXG100VSN473MA50S |             | 2,700       | 30×25                 | 0.20 | 1.50                                              | ELXG500VSN272MR25S |
| 16          | 5,600       | 22×25                 | 0.45 | 1.44                                              | ELXG160VSN562MP25S | 50          | 3,300       | 25.4×35               | 0.20 | 1.70                                              | ELXG500VSN332MQ35S |
|             | 6,800       | 22×30                 | 0.45 | 1.66                                              | ELXG160VSN682MP30S |             | 3,300       | 30×30                 | 0.20 | 1.70                                              | ELXG500VSN332MR30S |
|             | 6,800       | 25.4×25               | 0.45 | 1.66                                              | ELXG160VSN682MQ25S |             | 3,300       | 35×25                 | 0.20 | 1.74                                              | ELXG500VSN332MA25S |
|             | 8,200       | 22×35                 | 0.45 | 1.87                                              | ELXG160VSN822MP35S |             | 3,900       | 22×50                 | 0.20 | 1.91                                              | ELXG500VSN392MP50S |
|             | 10,000      | 22×40                 | 0.45 | 2.12                                              | ELXG160VSN103MP40S |             | 3,900       | 25.4×40               | 0.20 | 1.89                                              | ELXG500VSN392MQ40S |
|             | 10,000      | 25.4×30               | 0.45 | 2.07                                              | ELXG160VSN103MQ30S |             | 4,700       | 30×35                 | 0.20 | 2.11                                              | ELXG500VSN472MR35S |
|             | 10,000      | 30×25                 | 0.45 | 2.11                                              | ELXG160VSN103MR25S |             | 4,700       | 35×30                 | 0.20 | 2.16                                              | ELXG500VSN472MA30S |
|             | 12,000      | 25.4×35               | 0.45 | 2.37                                              | ELXG160VSN123MQ35S |             | 5,600       | 25.4×50               | 0.20 | 2.38                                              | ELXG500VSN562MQ50S |
|             | 12,000      | 30×30                 | 0.45 | 2.37                                              | ELXG160VSN123MR30S |             | 5,600       | 30×40                 | 0.20 | 2.39                                              | ELXG500VSN562MR40S |
|             | 12,000      | 35×25                 | 0.45 | 2.42                                              | ELXG160VSN123MA25S |             | 5,600       | 35×35                 | 0.20 | 2.41                                              | ELXG500VSN562MA35S |
|             | 15,000      | 22×50                 | 0.45 | 2.74                                              | ELXG160VSN153MP50S |             | 6,800       | 30×50                 | 0.20 | 2.79                                              | ELXG500VSN682MR50S |
|             | 15,000      | 25.4×40               | 0.45 | 2.71                                              | ELXG160VSN153MQ40S |             | 6,800       | 35×40                 | 0.20 | 2.78                                              | ELXG500VSN682MA40S |
|             | 18,000      | 25.4×50               | 0.45 | 3.11                                              | ELXG160VSN183MQ50S |             | 10,000      | 35×50                 | 0.20 | 3.57                                              | ELXG500VSN103MA50S |
|             | 18,000      | 30×35                 | 0.45 | 3.02                                              | ELXG160VSN183MR35S |             | 1,000       | 22×25                 | 0.15 | 1.00                                              | ELXG630VSN122MP25S |
|             | 18,000      | 35×30                 | 0.45 | 3.09                                              | ELXG160VSN183MA30S |             | 1,200       | 22×30                 | 0.15 | 1.15                                              | ELXG630VSN122MP30S |
|             | 22,000      | 30×40                 | 0.45 | 3.46                                              | ELXG160VSN223MR40S |             | 1,200       | 25.4×25               | 0.15 | 1.15                                              | ELXG630VSN122MQ25S |
|             | 22,000      | 35×35                 | 0.45 | 3.49                                              | ELXG160VSN223MA35S |             | 1,500       | 22×35                 | 0.15 | 1.32                                              | ELXG630VSN152MP35S |
|             | 27,000      | 30×50                 | 0.45 | 4.07                                              | ELXG160VSN273MR50S |             | 1,800       | 22×40                 | 0.15 | 1.49                                              | ELXG630VSN182MP40S |
|             | 27,000      | 35×40                 | 0.45 | 4.04                                              | ELXG160VSN273MA40S |             | 1,800       | 25.4×30               | 0.15 | 1.45                                              | ELXG630VSN182MQ30S |
|             | 39,000      | 35×50                 | 0.45 | 5.16                                              | ELXG160VSN393MA50S |             | 1,800       | 30×25                 | 0.15 | 1.48                                              | ELXG630VSN182MR25S |
| 25          | 3,900       | 22×25                 | 0.30 | 1.31                                              | ELXG250VSN392MP25S | 63          | 2,200       | 25.4×35               | 0.15 | 1.67                                              | ELXG630VSN222MQ35S |
|             | 4,700       | 22×30                 | 0.30 | 1.51                                              | ELXG250VSN472MP30S |             | 2,200       | 30×30                 | 0.15 | 1.68                                              | ELXG630VSN222MR30S |
|             | 4,700       | 25.4×25               | 0.30 | 1.51                                              | ELXG250VSN472MQ25S |             | 2,200       | 35×25                 | 0.15 | 1.71                                              | ELXG630VSN222MA25S |
|             | 5,600       | 22×35                 | 0.30 | 1.70                                              | ELXG250VSN562MP35S |             | 2,700       | 22×50                 | 0.15 | 1.92                                              | ELXG630VSN272MP50S |
|             | 6,800       | 22×40                 | 0.30 | 1.92                                              | ELXG250VSN682MP40S |             | 2,700       | 25.4×40               | 0.15 | 1.90                                              | ELXG630VSN272MQ40S |
|             | 6,800       | 25.4×30               | 0.30 | 1.87                                              | ELXG250VSN682MQ30S |             | 2,700       | 30×35                 | 0.15 | 1.93                                              | ELXG630VSN272MR35S |
|             | 6,800       | 30×25                 | 0.30 | 1.90                                              | ELXG250VSN682MR25S |             | 3,300       | 25.4×50               | 0.15 | 2.20                                              | ELXG630VSN332MQ50S |
|             | 8,200       | 25.4×35               | 0.30 | 2.14                                              | ELXG250VSN822MQ35S |             | 3,300       | 35×30                 | 0.15 | 2.18                                              | ELXG630VSN332MA30S |
|             | 8,200       | 30×30                 | 0.30 | 2.15                                              | ELXG250VSN822MR30S |             | 3,900       | 30×40                 | 0.15 | 2.41                                              | ELXG630VSN392MR40S |
|             | 8,200       | 35×25                 | 0.30 | 2.19                                              | ELXG250VSN822MA25S |             | 3,900       | 35×35                 | 0.15 | 2.43                                              | ELXG630VSN392MA35S |
|             | 10,000      | 22×50                 | 0.30 | 2.45                                              | ELXG250VSN103MP50S |             | 4,700       | 30×50                 | 0.15 | 2.80                                              | ELXG630VSN472MR50S |
|             | 10,000      | 25.4×40               | 0.30 | 2.43                                              | ELXG250VSN103MQ40S |             | 4,700       | 35×40                 | 0.15 | 2.78                                              | ELXG630VSN472MA40S |
|             | 12,000      | 25.4×50               | 0.30 | 2.78                                              | ELXG250VSN123MQ50S |             | 6,800       | 35×50                 | 0.15 | 3.55                                              | ELXG630VSN682MA50S |
|             | 12,000      | 30×35                 | 0.30 | 2.70                                              | ELXG250VSN123MR35S |             | 680         | 22×25                 | 0.15 | 0.97                                              | ELXG800VSN681MP25S |
|             | 12,000      | 35×30                 | 0.30 | 2.76                                              | ELXG250VSN123MA30S |             | 820         | 22×30                 | 0.15 | 1.12                                              | ELXG800VSN821MP30S |
|             | 15,000      | 30×40                 | 0.30 | 3.13                                              | ELXG250VSN153MR40S |             | 1,000       | 22×35                 | 0.15 | 1.27                                              | ELXG800VSN102MP35S |
|             | 15,000      | 35×35                 | 0.30 | 3.16                                              | ELXG250VSN153MA35S |             | 1,000       | 25.4×25               | 0.15 | 1.23                                              | ELXG800VSN102MQ25S |
|             | 18,000      | 30×50                 | 0.30 | 3.64                                              | ELXG250VSN183MR50S |             | 1,200       | 22×40                 | 0.15 | 1.42                                              | ELXG800VSN122MP40S |
|             | 18,000      | 35×40                 | 0.30 | 3.61                                              | ELXG250VSN183MA40S |             | 1,200       | 25.4×30               | 0.15 | 1.39                                              | ELXG800VSN122MQ30S |
|             | 27,000      | 35×50                 | 0.30 | 4.70                                              | ELXG250VSN273MA50S |             | 1,200       | 30×25                 | 0.15 | 1.41                                              | ELXG800VSN122MR25S |
| 35          | 2,200       | 22×25                 | 0.25 | 1.10                                              | ELXG350VSN222MP25S | 80          | 1,500       | 25.4×35               | 0.15 | 1.62                                              | ELXG800VSN152MQ35S |
|             | 3,300       | 22×30                 | 0.25 | 1.42                                              | ELXG350VSN332MP30S |             | 1,800       | 22×50                 | 0.15 | 1.84                                              | ELXG800VSN182MP50S |
|             | 3,300       | 25.4×25               | 0.25 | 1.41                                              | ELXG350VSN332MQ25S |             | 1,800       | 25.4×40               | 0.15 | 1.82                                              | ELXG800VSN182MQ40S |
|             | 3,900       | 22×35                 | 0.25 | 1.58                                              | ELXG350VSN392MP35S |             | 1,800       | 30×30                 | 0.15 | 1.78                                              | ELXG800VSN182MR30S |
|             | 3,900       | 25.4×30               | 0.25 | 1.58                                              | ELXG350VSN392MQ30S |             | 1,800       | 35×25                 | 0.15 | 1.82                                              | ELXG800VSN182MA25S |
|             | 4,700       | 22×40                 | 0.25 | 1.78                                              | ELXG350VSN472MP40S |             | 2,200       | 25.4×50               | 0.15 | 2.11                                              | ELXG800VSN222MQ50S |
|             | 4,700       | 30×25                 | 0.25 | 1.77                                              | ELXG350VSN472MR25S |             | 2,200       | 30×35                 | 0.15 | 2.05                                              | ELXG800VSN222MR35S |


**LXG**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 80          | 2,200       | 35×30                 | 0.15 | 2.09                                              | ELXG800VSN222MA30S | 100         | 1,000       | 25.4×35               | 0.15 | 1.41                                              | ELXG101VSN102MQ35S |
|             | 2,700       | 30×40                 | 0.15 | 2.35                                              | ELXG800VSN272MR40S |             | 1,000       | 30×30                 | 0.15 | 1.42                                              | ELXG101VSN102MR30S |
|             | 2,700       | 35×35                 | 0.15 | 2.37                                              | ELXG800VSN272MA35S |             | 1,000       | 35×25                 | 0.15 | 1.45                                              | ELXG101VSN102MA25S |
|             | 3,300       | 30×50                 | 0.15 | 2.75                                              | ELXG800VSN332MR50S |             | 1,200       | 22×50                 | 0.15 | 1.60                                              | ELXG101VSN122MP50S |
|             | 3,300       | 35×40                 | 0.15 | 2.73                                              | ELXG800VSN332MA40S |             | 1,200       | 25.4×40               | 0.15 | 1.59                                              | ELXG101VSN122MQ40S |
|             | 4,700       | 35×50                 | 0.15 | 3.46                                              | ELXG800VSN472MA50S |             | 1,200       | 30×35                 | 0.15 | 1.61                                              | ELXG101VSN122MR35S |
| 100         | 390         | 22×25                 | 0.15 | 0.78                                              | ELXG101VSN391MP25S |             | 1,500       | 25.4×50               | 0.15 | 1.86                                              | ELXG101VSN152MQ50S |
|             | 560         | 22×30                 | 0.15 | 0.99                                              | ELXG101VSN561MP30S |             | 1,500       | 30×40                 | 0.15 | 1.87                                              | ELXG101VSN152MR40S |
|             | 560         | 25.4×25               | 0.15 | 0.98                                              | ELXG101VSN561MQ25S |             | 1,500       | 35×30                 | 0.15 | 1.85                                              | ELXG101VSN152MA30S |
|             | 680         | 22×35                 | 0.15 | 1.12                                              | ELXG101VSN681MP35S |             | 1,800       | 35×35                 | 0.15 | 2.07                                              | ELXG101VSN182MA35S |
|             | 820         | 22×40                 | 0.15 | 1.26                                              | ELXG101VSN821MP40S |             | 2,200       | 30×50                 | 0.15 | 2.40                                              | ELXG101VSN222MR50S |
|             | 820         | 25.4×30               | 0.15 | 1.23                                              | ELXG101VSN821MQ30S |             | 2,200       | 35×40                 | 0.15 | 2.39                                              | ELXG101VSN222MA40S |
|             | 820         | 30×25                 | 0.15 | 1.25                                              | ELXG101VSN821MR25S |             | 2,700       | 35×50                 | 0.15 | 2.81                                              | ELXG101VSN272MA50S |
|             |             |                       |      |                                                   |                    |             |             |                       |      |                                                   |                    |

**◆MAXIMUM IMPEDANCE [mΩ/20°C, 30kHz]**

| Case size<br>φD×L (mm) | V <sub>dc</sub> | 10 to 63 | 80  | 100 |
|------------------------|-----------------|----------|-----|-----|
| 22×25                  |                 | 120      | 150 |     |
| 22×30                  |                 | 100      | 120 |     |
| 22×35                  |                 | 80       | 95  |     |
| 22×40                  |                 | 70       | 80  |     |
| 22×50                  |                 | 50       | 60  |     |
| 25.4×25                |                 | 90       | 110 |     |
| 25.4×30                |                 | 70       | 85  |     |
| 25.4×35                |                 | 60       | 70  |     |
| 25.4×40                |                 | 50       | 60  |     |
| 25.4×50                |                 | 40       | 45  |     |
| 30×25                  |                 | 70       | 80  |     |
| 30×30                  |                 | 50       | 60  |     |
| 30×35                  |                 | 40       | 50  |     |
| 30×40                  |                 | 35       | 40  |     |
| 30×50                  |                 | 25       | 30  |     |
| 35×25                  |                 | 65       | 70  |     |
| 35×30                  |                 | 45       | 50  |     |
| 35×35                  |                 | 38       | 40  |     |
| 35×40                  |                 | 30       | 30  |     |
| 35×50                  |                 | 23       | 25  |     |

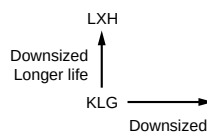


# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Overvoltage resistant design, 105°C

Upgrade!

# CHA Series

- Doesn't spark with DC over voltage
- Downsized from current KLG series
- Endurance with ripple current : 2,000hours at 105°C
- Non solvent resistant type
- RoHS Compliant

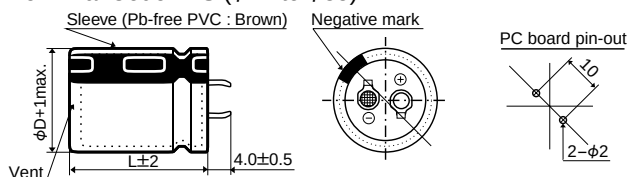


## SPECIFICATIONS

| Items                                                 | Characteristics                                                                                                                                                                                                                                                                         |                                      |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Category                                              |                                                                                                                                                                                                                                                                                         |                                      |
| Temperature Range                                     | -25 to +105°C                                                                                                                                                                                                                                                                           |                                      |
| Rated Voltage Range                                   | 200 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                      |
| Capacitance Tolerance                                 | ±20% (M)                                                                                                                                                                                                                                                                                |                                      |
| Leakage Current                                       | $I \leq 3\sqrt{CV}$<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V <sub>dc</sub> )                                                                                                                                                         |                                      |
|                                                       | (at 20°C, 120Hz)                                                                                                                                                                                                                                                                        |                                      |
| Dissipation Factor (tanδ)                             | 200V <sub>dc</sub> : 0.15 max. (0.20 max. for φD=35mm)<br>400V <sub>dc</sub> : 0.15 max.                                                                                                                                                                                                |                                      |
|                                                       | (at 20°C, 120Hz)                                                                                                                                                                                                                                                                        |                                      |
| Low Temperature Characteristics (Max.Impedance Ratio) | Rated Voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 200 to 450V                          |
|                                                       | Z(-25°C) / Z(+20°C)                                                                                                                                                                                                                                                                     | 4                                    |
|                                                       | (at 120Hz)                                                                                                                                                                                                                                                                              |                                      |
| ESL                                                   | 50nH max.                                                                                                                                                                                                                                                                               |                                      |
|                                                       | (at 20°C, 1MHz)                                                                                                                                                                                                                                                                         |                                      |
| Endurance                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105°C.                                                                                               |                                      |
|                                                       | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |
|                                                       | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |
|                                                       | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |
| Shelf Life                                            | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |
|                                                       | Capacitance change                                                                                                                                                                                                                                                                      | ≤±15% of the initial value           |
|                                                       | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤150% of the initial specified value |
|                                                       | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |

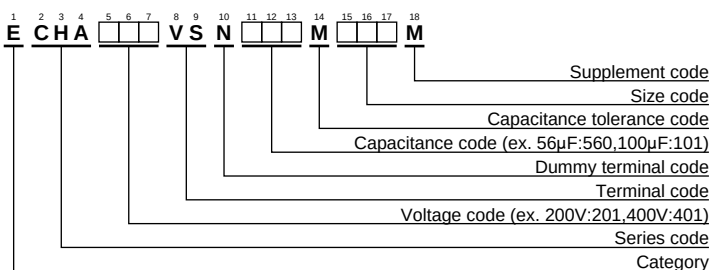
## DIMENSIONS [mm]

- Terminal Code : VS (φ22 to φ35)



The standard design has no plastic disc.

## PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

## RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Frequency (Hz)            | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|
| 200 to 450V <sub>dc</sub> | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Overvoltage resistant design, 105°C

Upgrade!

**CHA** Series

## ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/105°C,120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/105°C,120Hz) | Part No.           |
|----------|----------|--------------------|------|-----------------------------------------|--------------------|----------|----------|--------------------|------|-----------------------------------------|--------------------|
| 200      | 180      | 22×20              | 0.15 | 0.82                                    | ECHA201VSN181MP20M | 250      | 680      | 30×40              | 0.15 | 2.12                                    | ECHA251VSN681MR40M |
|          | 220      | 22×20              | 0.15 | 0.90                                    | ECHA201VSN221MP20M |          | 680      | 35×30              | 0.20 | 2.19                                    | ECHA251VSN681MA30M |
|          | 270      | 22×25              | 0.15 | 1.02                                    | ECHA201VSN271MP25M |          | 820      | 30×45              | 0.15 | 2.39                                    | ECHA251VSN821MR45M |
|          | 330      | 22×30              | 0.15 | 1.20                                    | ECHA201VSN331MP30M |          | 820      | 35×35              | 0.20 | 2.42                                    | ECHA251VSN821MA35M |
|          | 330      | 25.4×25            | 0.15 | 1.20                                    | ECHA201VSN331MQ25M |          | 56       | 22×20              | 0.15 | 0.45                                    | ECHA401VSN560MP20M |
|          | 390      | 22×30              | 0.15 | 1.35                                    | ECHA201VSN391MP30M | 400      | 68       | 22×20              | 0.15 | 0.51                                    | ECHA401VSN680MP20M |
|          | 390      | 25.4×25            | 0.15 | 1.35                                    | ECHA201VSN391MQ25M |          | 82       | 22×25              | 0.15 | 0.58                                    | ECHA401VSN820MP25M |
|          | 470      | 22×35              | 0.15 | 1.45                                    | ECHA201VSN471MP35M |          | 100      | 22×25              | 0.15 | 0.66                                    | ECHA401VSN101MP25M |
|          | 470      | 25.4×30            | 0.15 | 1.45                                    | ECHA201VSN471MQ30M |          | 100      | 25.4×25            | 0.15 | 0.66                                    | ECHA401VSN101MQ25M |
|          | 470      | 30×25              | 0.15 | 1.47                                    | ECHA201VSN471MR25M |          | 120      | 22×30              | 0.15 | 0.76                                    | ECHA401VSN121MP30M |
|          | 560      | 22×40              | 0.15 | 1.62                                    | ECHA201VSN561MP40M |          | 120      | 25.4×25            | 0.15 | 0.76                                    | ECHA401VSN121MQ25M |
|          | 560      | 25.4×30            | 0.15 | 1.60                                    | ECHA201VSN561MQ30M |          | 150      | 22×35              | 0.15 | 0.85                                    | ECHA401VSN151MP35M |
|          | 560      | 30×25              | 0.15 | 1.60                                    | ECHA201VSN561MR25M |          | 150      | 25.4×30            | 0.15 | 0.85                                    | ECHA401VSN151MQ30M |
|          | 680      | 25.4×35            | 0.15 | 1.82                                    | ECHA201VSN681MQ35M |          | 150      | 30×25              | 0.15 | 0.85                                    | ECHA401VSN151MR35M |
|          | 680      | 30×30              | 0.15 | 1.81                                    | ECHA201VSN681MR30M |          | 180      | 22×40              | 0.15 | 0.94                                    | ECHA401VSN181MP40M |
|          | 680      | 35×25              | 0.20 | 1.86                                    | ECHA201VSN681MA25M |          | 180      | 25.4×35            | 0.15 | 0.95                                    | ECHA401VSN181MQ35M |
|          | 820      | 25.4×45            | 0.15 | 2.11                                    | ECHA201VSN821MQ45M |          | 180      | 30×25              | 0.15 | 0.95                                    | ECHA401VSN181MR25M |
|          | 820      | 30×35              | 0.15 | 2.11                                    | ECHA201VSN821MR35M |          | 220      | 25.4×35            | 0.15 | 1.24                                    | ECHA401VSN221MQ35M |
|          | 820      | 35×25              | 0.20 | 2.11                                    | ECHA201VSN821MA25M |          | 220      | 30×30              | 0.15 | 1.24                                    | ECHA401VSN221MR30M |
|          | 1,000    | 30×35              | 0.15 | 2.40                                    | ECHA201VSN102MR35M |          | 220      | 35×25              | 0.15 | 1.24                                    | ECHA401VSN221MA25M |
|          | 1,000    | 35×30              | 0.20 | 2.40                                    | ECHA201VSN102MA30M |          | 270      | 25.4×45            | 0.15 | 1.30                                    | ECHA401VSN271MQ45M |
|          | 1,200    | 30×45              | 0.15 | 2.69                                    | ECHA201VSN122MR45M |          | 270      | 30×35              | 0.15 | 1.30                                    | ECHA401VSN271MR35M |
|          | 1,200    | 35×35              | 0.20 | 2.65                                    | ECHA201VSN122MA35M |          | 270      | 35×25              | 0.15 | 1.30                                    | ECHA401VSN271MA25M |
| 250      | 120      | 22×20              | 0.15 | 0.68                                    | ECHA251VSN121MP20M | 450      | 330      | 30×35              | 0.15 | 1.45                                    | ECHA401VSN331MR35M |
|          | 180      | 22×25              | 0.15 | 0.87                                    | ECHA251VSN181MP25M |          | 330      | 30×40              | 0.15 | 1.47                                    | ECHA401VSN331MR40M |
|          | 180      | 25.4×20            | 0.15 | 0.93                                    | ECHA251VSN181MQ20M |          | 330      | 35×30              | 0.15 | 1.47                                    | ECHA401VSN331MA30M |
|          | 220      | 22×30              | 0.15 | 1.00                                    | ECHA251VSN221MP30M |          | 82       | 25.4×25            | 0.20 | 0.61                                    | ECHA451VSN820MQ25M |
|          | 270      | 22×35              | 0.15 | 1.14                                    | ECHA251VSN271MP35M |          | 120      | 25.4×30            | 0.20 | 0.76                                    | ECHA451VSN121MQ30M |
|          | 270      | 25.4×25            | 0.15 | 1.13                                    | ECHA251VSN271MQ25M |          | 120      | 30×25              | 0.20 | 0.77                                    | ECHA451VSN121MR25M |
|          | 270      | 30×20              | 0.15 | 1.25                                    | ECHA251VSN271MR20M |          | 150      | 25.4×35            | 0.20 | 0.88                                    | ECHA451VSN151MQ35M |
|          | 330      | 22×40              | 0.15 | 1.28                                    | ECHA251VSN331MP40M |          | 180      | 25.4×40            | 0.20 | 0.99                                    | ECHA451VSN181MQ40M |
|          | 330      | 25.4×30            | 0.15 | 1.29                                    | ECHA251VSN331MQ30M |          | 180      | 30×30              | 0.20 | 0.97                                    | ECHA451VSN181MR30M |
|          | 390      | 22×45              | 0.15 | 1.42                                    | ECHA251VSN391MP45M |          | 180      | 30×35              | 0.20 | 1.00                                    | ECHA451VSN181MR35M |
|          | 390      | 25.4×35            | 0.15 | 1.46                                    | ECHA251VSN391MQ35M | 450      | 220      | 30×35              | 0.20 | 1.30                                    | ECHA451VSN221MR35M |
|          | 390      | 30×25              | 0.15 | 1.52                                    | ECHA251VSN391MR25M |          | 220      | 35×25              | 0.20 | 1.20                                    | ECHA451VSN221MA25M |
|          | 390      | 35×20              | 0.20 | 1.62                                    | ECHA251VSN391MA20M |          | 270      | 30×40              | 0.20 | 1.28                                    | ECHA451VSN271MR40M |
|          | 470      | 25.4×40            | 0.15 | 1.64                                    | ECHA251VSN471MQ40M |          | 270      | 35×30              | 0.20 | 1.30                                    | ECHA451VSN271MA30M |
|          | 470      | 30×30              | 0.15 | 1.67                                    | ECHA251VSN471MR30M |          | 330      | 35×35              | 0.20 | 1.40                                    | ECHA451VSN331MA35M |
|          | 560      | 25.4×45            | 0.15 | 1.82                                    | ECHA251VSN561MQ45M |          | 390      | 35×40              | 0.20 | 1.60                                    | ECHA451VSN391MA40M |
|          | 560      | 30×35              | 0.15 | 1.87                                    | ECHA251VSN561MR35M |          | 420      | 35×50              | 0.20 | 1.56                                    | ECHA451VSN421MA50M |
|          | 560      | 35×25              | 0.20 | 1.99                                    | ECHA251VSN561MA25M |          |          |                    |      |                                         |                    |

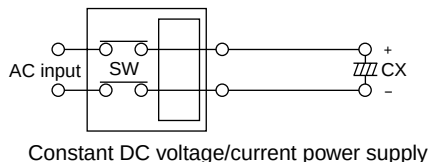
## ◆DC OVERVOLTAGE TEST CONDITIONS

The vent will operate and the capacitor shall become an open circuit without burning materials when the following test DC voltage is applied.

### ●Test DC voltage

| Rated Voltage      | Nominal Capacitance | Current Limit | Test Voltage           |
|--------------------|---------------------|---------------|------------------------|
| 200V <sub>dc</sub> | <330                | 4A            | 300/375V <sub>dc</sub> |
|                    | 330μF≤C<470μF       | 5A            |                        |
|                    | ≥470μF              | 7A            |                        |
| 250V <sub>dc</sub> | <330μF              | 4A            | 350/450V <sub>dc</sub> |
|                    | 330μF≤C<470μF       | 5A            |                        |
|                    | ≥470μF              | 7A            |                        |
| 400V <sub>dc</sub> | <100μF              | 2A            | 500/600V <sub>dc</sub> |
|                    | 100μF≤C<220μF       | 4A            |                        |
|                    | ≥220μF              | 7A            |                        |
| 450V <sub>dc</sub> | <100μF              | 2A            | 550/675V <sub>dc</sub> |
|                    | 100μF≤C<220μF       | 4A            |                        |
|                    | ≥220μF              | 7A            |                        |

### ●Test Circuit



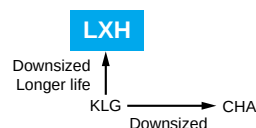


# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Long life, Overvoltage resistant design, 105°C

## LXH Series

- Doesn't spark with DC over voltage
- Same case sizes of KMH
- Endurance with ripple current : 5,000 hours at 105°C
- Non solvent resistant type
- RoHS Compliant

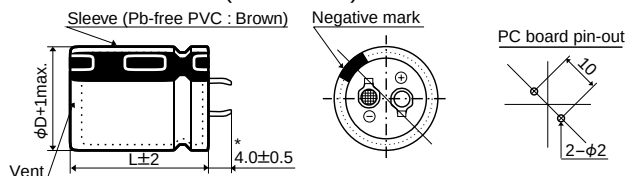


### SPECIFICATIONS

| Items                           | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                             |             |                                       |                 |                               |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------------|-------------|---------------------------------------|-----------------|-------------------------------|
| Category                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                             |             |                                       |                 |                               |
| Temperature Range               | -25 to +105°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                             |             |                                       |                 |                               |
| Rated Voltage                   | 200 & 400V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                             |             |                                       |                 |                               |
| Capacitance Tolerance           | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                             |             |                                       |                 |                               |
| Leakage Current                 | I=0.02CV or 3mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                                                                                                                                                                                                                                                       |                    |                             |             |                                       |                 |                               |
| Dissipation Factor (tanδ)       | 0.15 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                             |             |                                       |                 |                               |
| Low Temperature Characteristics | Z(-25°C) / Z(+20°C) ≤ 4 (at 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                             |             |                                       |                 |                               |
| ESL                             | 50nH max. (at 20°C, 1MHz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                             |             |                                       |                 |                               |
| DC Overvoltage Test             | When an excessive DC voltage is applied to the capacitors under the test conditions on next page, the vent shall operate and then the capacitors shall become open-circuit without burning materials.                                                                                                                                                                                                                                                                                                                                               |                    |                             |             |                                       |                 |                               |
| Endurance                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 5,000 or 3,000 hours at 105°C. <table border="1"> <tr> <td>Capacitance change</td><td>≤ ±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤ 200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤ The initial specified value</td></tr> </table>                                                                                      | Capacitance change | ≤ ±20% of the initial value | D.F. (tanδ) | ≤ 200% of the initial specified value | Leakage current | ≤ The initial specified value |
| Capacitance change              | ≤ ±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                             |             |                                       |                 |                               |
| D.F. (tanδ)                     | ≤ 200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                             |             |                                       |                 |                               |
| Leakage current                 | ≤ The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                             |             |                                       |                 |                               |
| Shelf Life                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. <table border="1"> <tr> <td>Capacitance change</td><td>≤ ±15% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤ 150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤ The initial specified value</td></tr> </table> | Capacitance change | ≤ ±15% of the initial value | D.F. (tanδ) | ≤ 150% of the initial specified value | Leakage current | ≤ The initial specified value |
| Capacitance change              | ≤ ±15% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                             |             |                                       |                 |                               |
| D.F. (tanδ)                     | ≤ 150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                             |             |                                       |                 |                               |
| Leakage current                 | ≤ The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                             |             |                                       |                 |                               |

### DIMENSIONS [mm]

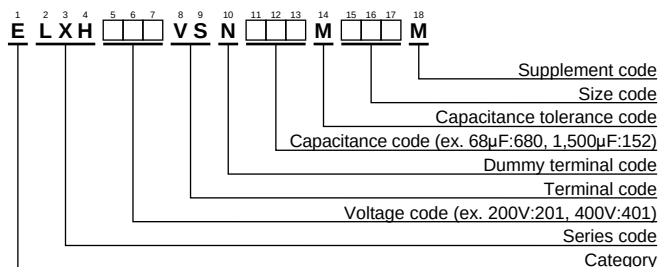
- Terminal Code : VS (φ22 to φ35)



\*φD=35mm : 3.5±0.5mm

The standard design has no plastic disc.

### PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

### RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Frequency (Hz)     | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|--------------------|------|------|------|------|------|------|
| 200V <sub>dc</sub> | 0.81 | 1.00 | 1.17 | 1.32 | 1.45 | 1.50 |
| 400V <sub>dc</sub> | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.


**LXH**Series

**◆STANDARD RATINGS**

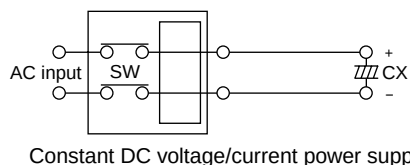
| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple current<br>(Arms/105°C,120Hz) |             | Part No.           |
|-------------|-------------|-----------------------|------|--------------------------------------------|-------------|--------------------|
|             |             |                       |      | 5,000 hours                                | 3,000 hours |                    |
| 200         | 270         | 22×25                 | 0.15 | 0.45                                       | 0.87        | ELXH201VSN271MP25M |
|             | 330         | 22×30                 | 0.15 | 0.62                                       | 1.20        | ELXH201VSN331MP30M |
|             | 330         | 25.4×25               | 0.15 | 0.62                                       | 1.21        | ELXH201VSN331MQ25M |
|             | 390         | 22×35                 | 0.15 | 0.67                                       | 1.31        | ELXH201VSN391MP35M |
|             | 390         | 25.4×30               | 0.15 | 0.66                                       | 1.28        | ELXH201VSN391MQ30M |
|             | 470         | 22×40                 | 0.15 | 0.72                                       | 1.40        | ELXH201VSN471MP40M |
|             | 470         | 25.4×30               | 0.15 | 0.72                                       | 1.41        | ELXH201VSN471MQ30M |
|             | 470         | 30×25                 | 0.15 | 0.77                                       | 1.50        | ELXH201VSN471MR25M |
|             | 560         | 22×45                 | 0.15 | 0.80                                       | 1.56        | ELXH201VSN561MP45M |
|             | 560         | 25.4×35               | 0.15 | 0.78                                       | 1.53        | ELXH201VSN561MQ35M |
|             | 560         | 30×30                 | 0.15 | 0.81                                       | 1.57        | ELXH201VSN561MR30M |
|             | 680         | 22×50                 | 0.15 | 0.89                                       | 1.74        | ELXH201VSN681MP50M |
|             | 680         | 25.4×40               | 0.15 | 0.89                                       | 1.74        | ELXH201VSN681MQ40M |
|             | 680         | 30×30                 | 0.15 | 0.89                                       | 1.74        | ELXH201VSN681MR30M |
|             | 680         | 35×25                 | 0.15 | 0.88                                       | 1.72        | ELXH201VSN681MA25M |
|             | 820         | 25.4×50               | 0.15 | 1.05                                       | 2.04        | ELXH201VSN821MQ50M |
|             | 820         | 30×35                 | 0.15 | 1.03                                       | 2.00        | ELXH201VSN821MR35M |
|             | 820         | 35×30                 | 0.15 | 1.05                                       | 2.04        | ELXH201VSN821MA30M |
|             | 1,000       | 30×45                 | 0.15 | 1.18                                       | 2.30        | ELXH201VSN102MR45M |
|             | 1,000       | 35×35                 | 0.15 | 1.18                                       | 2.30        | ELXH201VSN102MA35M |
|             | 1,200       | 30×50                 | 0.15 | 1.33                                       | 2.60        | ELXH201VSN122MR50M |
|             | 1,200       | 35×40                 | 0.15 | 1.36                                       | 2.65        | ELXH201VSN122MA40M |
|             | 1,500       | 35×45                 | 0.15 | 1.57                                       | 3.08        | ELXH201VSN152MA45M |
| 400         | 68          | 22×25                 | 0.15 | 0.26                                       | 0.51        | ELXH401VSN680MP25M |
|             | 68          | 25.4×20               | 0.15 | 0.24                                       | 0.46        | ELXH401VSN680MQ20M |
|             | 82          | 22×30                 | 0.15 | 0.30                                       | 0.58        | ELXH401VSN820MP30M |
|             | 82          | 25.4×25               | 0.15 | 0.30                                       | 0.58        | ELXH401VSN820MQ25M |
|             | 100         | 22×35                 | 0.15 | 0.34                                       | 0.66        | ELXH401VSN101MP35M |
|             | 100         | 25.4×30               | 0.15 | 0.34                                       | 0.66        | ELXH401VSN101MQ30M |
|             | 120         | 22×40                 | 0.15 | 0.37                                       | 0.72        | ELXH401VSN121MP40M |
|             | 120         | 25.4×30               | 0.15 | 0.37                                       | 0.72        | ELXH401VSN121MQ30M |
|             | 120         | 30×25                 | 0.15 | 0.39                                       | 0.76        | ELXH401VSN121MR25M |
|             | 150         | 22×45                 | 0.15 | 0.42                                       | 0.82        | ELXH401VSN151MP45M |
|             | 150         | 25.4×35               | 0.15 | 0.43                                       | 0.84        | ELXH401VSN151MQ35M |
|             | 150         | 30×30                 | 0.15 | 0.43                                       | 0.84        | ELXH401VSN151MR30M |
|             | 180         | 22×50                 | 0.15 | 0.49                                       | 0.95        | ELXH401VSN181MP50M |
|             | 180         | 25.4×40               | 0.15 | 0.48                                       | 0.94        | ELXH401VSN181MQ40M |
|             | 180         | 30×30                 | 0.15 | 0.47                                       | 0.92        | ELXH401VSN181MR30M |
|             | 180         | 35×25                 | 0.15 | 0.48                                       | 0.94        | ELXH401VSN181MA25M |
|             | 220         | 25.4×45               | 0.15 | 0.55                                       | 1.07        | ELXH401VSN221MQ45M |
|             | 220         | 30×35                 | 0.15 | 0.54                                       | 1.06        | ELXH401VSN221MR35M |
|             | 220         | 35×30                 | 0.15 | 0.55                                       | 1.08        | ELXH401VSN221MA30M |
|             | 270         | 25.4×50               | 0.15 | 0.62                                       | 1.21        | ELXH401VSN271MQ50M |
|             | 270         | 30×40                 | 0.15 | 0.62                                       | 1.21        | ELXH401VSN271MR40M |
|             | 270         | 35×30                 | 0.15 | 0.59                                       | 1.15        | ELXH401VSN271MA30M |
|             | 330         | 30×45                 | 0.15 | 0.71                                       | 1.39        | ELXH401VSN331MR45M |
|             | 330         | 35×35                 | 0.15 | 0.69                                       | 1.35        | ELXH401VSN331MA35M |
|             | 390         | 30×50                 | 0.15 | 0.80                                       | 1.55        | ELXH401VSN391MR50M |
|             | 390         | 35×40                 | 0.15 | 0.79                                       | 1.54        | ELXH401VSN391MA40M |
|             | 470         | 35×45                 | 0.15 | 0.89                                       | 1.74        | ELXH401VSN471MA45M |

**◆DC OVERVOLTAGE TEST CONDITIONS**

The vent will operate and the capacitor shall become an open circuit without burning materials when the following test DC voltage is applied.

**●Test DC voltage**

| Rated Voltage      | Capacitance | Current limit | Test DC voltage        |
|--------------------|-------------|---------------|------------------------|
| 200V <sub>dc</sub> | <330μF      | 4A            | 300/375V <sub>dc</sub> |
|                    | 330≤C<470μF | 5A            |                        |
|                    | ≥470μF      | 7A            |                        |
| 400V <sub>dc</sub> | <100μF      | 2A            | 500/600V <sub>dc</sub> |
|                    | 100≤C<220μF | 4A            |                        |
|                    | ≥220μF      | 7A            |                        |

**●Test Circuit**




## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Snap-ins, 105°C

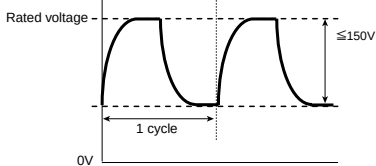
New!

## KMV Series

- For frequently change of regenerative voltage from AC servo amplifier and inverter control
- Ideal use to power supply, specially power source with turn on and off frequently and highly voltage fluctuation
- Improved the resistance for charge and discharge from same dimension of KMQ series
- Endurance with ripple current : 3,000 hours at 105°C
- Rated voltage range : 350 to 450V<sub>dc</sub>, Capacitance 82 to 1,200μF
- Non Solvent resistant type
- RoHS Compliant



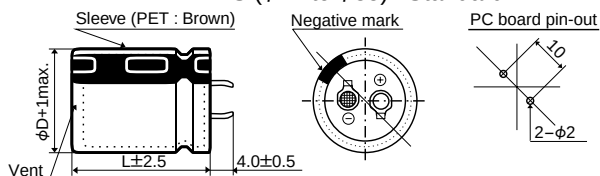
## ◆SPECIFICATIONS

| Items                                                  | Characteristics                                                                                                                                                                                                                                                                         |                                      |                          |
|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------|
| Category                                               |                                                                                                                                                                                                                                                                                         |                                      |                          |
| Temperature Range                                      | -25 to +105°C                                                                                                                                                                                                                                                                           |                                      |                          |
| Rated Voltage Range                                    | 350 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                               |                                      |                          |
| Capacitance Tolerance                                  | ±20% (M)                                                                                                                                                                                                                                                                                |                                      | (at 20°C, 120Hz)         |
| Leakage Current                                        | I≤3√CV<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V)<br>(at 20°C after 5 minutes)                                                                                                                                                        |                                      |                          |
| Dissipation Factor (tanδ)                              | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 350 & 400V                           | 420 & 450V               |
|                                                        | tanδ (Max.)                                                                                                                                                                                                                                                                             | 0.15                                 | 0.20<br>(at 20°C, 120Hz) |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                        | 350 to 450V                          |                          |
|                                                        | Z(-25°C)/Z(+20°C)                                                                                                                                                                                                                                                                       | 8<br>(at 120Hz)                      |                          |
| Charge and Discharge                                   | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to charge and discharge test with the voltage waveform shown below at room temperature (15 to 35°C).                                                                           |                                      |                          |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |                          |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |                          |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |                          |
|                                                        |                                                                                                                                                                                                                                                                                         |                                      |                          |
|                                                        | Frequency                                                                                                                                                                                                                                                                               | 6Hz                                  |                          |
|                                                        | Number of cycles                                                                                                                                                                                                                                                                        | 50 million times                     |                          |
| Voltage waveform                                       |                                                                                                                                                                                                      |                                      |                          |
| Endurance                                              | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 3,000 hours at 105°C.                                                                                               |                                      |                          |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value           |                          |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value |                          |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |                          |
| Shelf Life                                             | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |                          |
|                                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±15% of the initial value           |                          |
|                                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤150% of the initial specified value |                          |
|                                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value         |                          |

\*Please consult with us about charge and discharge conditions.

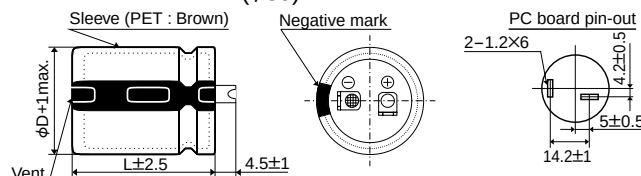
## ◆DIMENSIONS [mm]

## ●Terminal Code : VS (φ22 to φ35) : Standard



No plastic disk is the standard design.

## ●Terminal Code : LI (φ35)



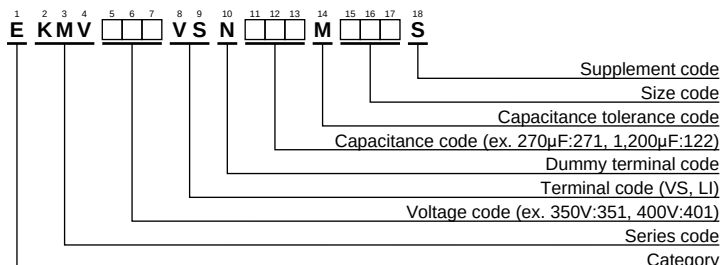


## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Snap-ins, 105°C

New!  
**KMV** Series

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (snap-in type)"

## ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size φDXL(mm) | Rated ripple current (Arms/ 105°C,120Hz) | Max. charge current and Max. discharge current (Arms/ 6Hz) | Part No.           |
|----------|----------|--------------------|------------------------------------------|------------------------------------------------------------|--------------------|
| 350      | 120      | 22×25              | 0.74                                     | 0.42                                                       | EKMV351VSN121MP25S |
|          | 150      | 22×30              | 0.87                                     | 0.49                                                       | EKMV351VSN151MP30S |
|          | 180      | 25.4×25            | 0.92                                     | 0.54                                                       | EKMV351VSN181MQ25S |
|          | 220      | 22×35              | 1.08                                     | 0.60                                                       | EKMV351VSN221MP35S |
|          | 220      | 22×40              | 1.10                                     | 0.62                                                       | EKMV351VSN221MP40S |
|          | 220      | 25.4×30            | 1.05                                     | 0.61                                                       | EKMV351VSN221MQ30S |
|          | 270      | 22×45              | 1.24                                     | 0.71                                                       | EKMV351VSN271MP45S |
|          | 270      | 25.4×35            | 1.21                                     | 0.70                                                       | EKMV351VSN271MQ35S |
|          | 270      | 30×25              | 1.15                                     | 0.68                                                       | EKMV351VSN271MR25S |
|          | 330      | 22×50              | 1.41                                     | 0.80                                                       | EKMV351VSN331MP50S |
|          | 330      | 25.4×40            | 1.37                                     | 0.80                                                       | EKMV351VSN331MQ40S |
|          | 330      | 30×30              | 1.29                                     | 0.77                                                       | EKMV351VSN331MR30S |
|          | 330      | 35×25              | 1.31                                     | 0.78                                                       | EKMV351VSN331MA25S |
|          | 390      | 25.4×45            | 1.51                                     | 0.89                                                       | EKMV351VSN391MQ45S |
|          | 390      | 30×35              | 1.44                                     | 0.88                                                       | EKMV351VSN391MR35S |
|          | 470      | 25.4×50            | 1.69                                     | 0.99                                                       | EKMV351VSN471MQ50S |
|          | 470      | 30×40              | 1.62                                     | 1.00                                                       | EKMV351VSN471MR40S |
|          | 470      | 35×30              | 1.61                                     | 0.97                                                       | EKMV351VSN471MA30S |
|          | 560      | 30×45              | 1.82                                     | 1.12                                                       | EKMV351VSN561MR45S |
|          | 560      | 35×35              | 1.77                                     | 1.08                                                       | EKMV351VSN561MA35S |
| 400      | 680      | 30×50              | 2.04                                     | 1.27                                                       | EKMV351VSN681MR50S |
|          | 680      | 35×40              | 2.02                                     | 1.25                                                       | EKMV351VSN681MA40S |
|          | 820      | 35×45              | 2.27                                     | 1.41                                                       | EKMV351VSN821MA45S |
|          | 820      | 35×50              | 2.32                                     | 1.46                                                       | EKMV351VSN821MA50S |
|          | 1,200    | 35×60              | 2.88                                     | 1.84                                                       | EKMV351VSN122MA60S |
| 420      | 82       | 22×25              | 0.64                                     | 0.34                                                       | EKMV421VSN820MP25S |
|          | 120      | 22×30              | 0.81                                     | 0.44                                                       | EKMV421VSN121MP30S |
|          | 120      | 25.4×25            | 0.81                                     | 0.44                                                       | EKMV421VSN121MQ25S |
|          | 150      | 22×35              | 0.93                                     | 0.50                                                       | EKMV421VSN151MP35S |
|          | 150      | 25.4×30            | 0.93                                     | 0.50                                                       | EKMV421VSN151MQ30S |
|          | 180      | 22×40              | 1.04                                     | 0.56                                                       | EKMV421VSN181MP40S |
|          | 180      | 22×45              | 1.06                                     | 0.58                                                       | EKMV421VSN181MP45S |
|          | 180      | 25.4×35            | 1.06                                     | 0.58                                                       | EKMV421VSN181MQ35S |
|          | 180      | 30×25              | 1.02                                     | 0.56                                                       | EKMV421VSN181MR25S |
|          | 220      | 22×50              | 1.20                                     | 0.66                                                       | EKMV421VSN221MP50S |
|          | 220      | 25.4×40            | 1.20                                     | 0.65                                                       | EKMV421VSN221MQ40S |
|          | 220      | 30×30              | 1.14                                     | 0.63                                                       | EKMV421VSN221MR30S |
|          | 270      | 25.4×45            | 1.36                                     | 0.74                                                       | EKMV421VSN271MQ45S |
|          | 270      | 30×35              | 1.29                                     | 0.73                                                       | EKMV421VSN271MR35S |
|          | 270      | 35×25              | 1.26                                     | 0.71                                                       | EKMV421VSN271MA25S |
|          | 330      | 25.4×50            | 1.52                                     | 0.83                                                       | EKMV421VSN331MQ50S |
|          | 330      | 30×40              | 1.47                                     | 0.84                                                       | EKMV421VSN331MR40S |
|          | 330      | 35×30              | 1.42                                     | 0.82                                                       | EKMV421VSN331MA30S |
|          | 390      | 30×45              | 1.64                                     | 0.94                                                       | EKMV421VSN391MR45S |
|          | 390      | 35×35              | 1.56                                     | 0.91                                                       | EKMV421VSN391MA35S |
| 450      | 470      | 30×50              | 1.83                                     | 1.06                                                       | EKMV421VSN471MR50S |
|          | 470      | 35×40              | 1.78                                     | 1.05                                                       | EKMV421VSN471MA40S |
|          | 560      | 35×45              | 1.98                                     | 1.18                                                       | EKMV421VSN561MA45S |
|          | 680      | 35×50              | 2.23                                     | 1.34                                                       | EKMV421VSN681MA50S |
|          | 820      | 35×60              | 2.52                                     | 1.55                                                       | EKMV421VSN821MA60S |
| 400      | 100      | 22×25              | 0.69                                     | 0.38                                                       | EKMV401VSN101MP25S |
|          | 120      | 22×30              | 0.79                                     | 0.44                                                       | EKMV401VSN121MP30S |
|          | 150      | 25.4×25            | 0.87                                     | 0.49                                                       | EKMV401VSN151MQ25S |
|          | 180      | 22×35              | 0.99                                     | 0.55                                                       | EKMV401VSN181MP35S |
|          | 180      | 22×40              | 1.01                                     | 0.56                                                       | EKMV401VSN181MP40S |
|          | 180      | 25.4×30            | 0.98                                     | 0.55                                                       | EKMV401VSN181MQ30S |
|          | 220      | 22×45              | 1.14                                     | 0.64                                                       | EKMV401VSN221MP45S |
|          | 220      | 25.4×35            | 1.13                                     | 0.63                                                       | EKMV401VSN221MQ35S |
|          | 220      | 30×25              | 1.10                                     | 0.61                                                       | EKMV401VSN221MR25S |
|          | 270      | 22×50              | 1.30                                     | 0.73                                                       | EKMV401VSN271MP50S |
|          | 270      | 25.4×40            | 1.28                                     | 0.72                                                       | EKMV401VSN271MQ40S |
|          | 270      | 30×30              | 1.22                                     | 0.70                                                       | EKMV401VSN271MR30S |
|          | 270      | 35×25              | 1.26                                     | 0.71                                                       | EKMV401VSN271MA25S |
|          | 330      | 25.4×45            | 1.44                                     | 0.82                                                       | EKMV401VSN331MQ45S |
|          | 330      | 30×35              | 1.38                                     | 0.81                                                       | EKMV401VSN331MR35S |
|          | 390      | 25.4×50            | 1.59                                     | 0.91                                                       | EKMV401VSN391MQ50S |
|          | 390      | 30×40              | 1.55                                     | 0.91                                                       | EKMV401VSN391MR40S |
|          | 390      | 35×30              | 1.55                                     | 0.89                                                       | EKMV401VSN391MA30S |
|          | 470      | 30×45              | 1.74                                     | 1.03                                                       | EKMV401VSN471MR45S |
|          | 470      | 35×35              | 1.71                                     | 1.00                                                       | EKMV401VSN471MA35S |
| 450      | 560      | 30×50              | 1.93                                     | 1.15                                                       | EKMV401VSN561MR50S |
|          | 560      | 35×40              | 1.94                                     | 1.14                                                       | EKMV401VSN561MA40S |
|          | 680      | 35×45              | 2.19                                     | 1.29                                                       | EKMV401VSN681MA45S |
|          | 820      | 35×50              | 2.45                                     | 1.44                                                       | EKMV401VSN821MA50S |
|          | 1,000    | 35×60              | 2.79                                     | 1.70                                                       | EKMV401VSN102MA60S |
| 450      | 82       | 22×25              | 0.64                                     | 0.34                                                       | EKMV451VSN820MP25S |
|          | 100      | 22×30              | 0.72                                     | 0.40                                                       | EKMV451VSN101MP30S |
|          | 100      | 25.4×25            | 0.72                                     | 0.40                                                       | EKMV451VSN101MQ25S |
|          | 120      | 22×35              | 0.81                                     | 0.45                                                       | EKMV451VSN121MP35S |
|          | 150      | 22×40              | 0.93                                     | 0.51                                                       | EKMV451VSN151MP40S |
|          | 150      | 25.4×30            | 0.91                                     | 0.50                                                       | EKMV451VSN151MQ30S |
|          | 150      | 30×25              | 0.90                                     | 0.51                                                       | EKMV451VSN151MR25S |
|          | 180      | 22×45              | 1.03                                     | 0.58                                                       | EKMV451VSN181MP45S |
|          | 180      | 22×50              | 1.06                                     | 0.59                                                       | EKMV451VSN181MP50S |
|          | 180      | 25.4×35            | 1.04                                     | 0.57                                                       | EKMV451VSN181MQ35S |
|          | 220      | 25.4×40            | 1.18                                     | 0.65                                                       | EKMV451VSN221MQ40S |
|          | 220      | 25.4×45            | 1.20                                     | 0.67                                                       | EKMV451VSN221MQ45S |
|          | 220      | 30×30              | 1.10                                     | 0.63                                                       | EKMV451VSN221MR30S |
|          | 220      | 35×25              | 1.12                                     | 0.64                                                       | EKMV451VSN221MA25S |
|          | 270      | 25.4×50            | 1.35                                     | 0.75                                                       | EKMV451VSN271MQ50S |
|          | 270      | 30×35              | 1.25                                     | 0.73                                                       | EKMV451VSN271MR35S |
|          | 270      | 35×30              | 1.27                                     | 0.74                                                       | EKMV451VSN271MA30S |
|          | 330      | 30×40              | 1.42                                     | 0.84                                                       | EKMV451VSN331MR40S |
|          | 330      | 30×45              | 1.46                                     | 0.87                                                       | EKMV451VSN331MR45S |
|          | 330      | 35×35              | 1.41                                     | 0.84                                                       | EKMV451VSN331MA35S |
| 450      | 390      | 30×50              | 1.61                                     | 0.97                                                       | EKMV451VSN391MR50S |
|          | 390      | 35×40              | 1.59                                     | 0.96                                                       | EKMV451VSN391MA40S |
|          | 470      | 35×45              | 1.79                                     | 1.08                                                       | EKMV451VSN471MA45S |
|          | 560      | 35×50              | 2.00                                     | 1.22                                                       | EKMV451VSN561MA50S |
|          | 680      | 35×60              | 2.26                                     | 1.42                                                       | EKMV451VSN681MA60S |



## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Snap-ins, 105°C

New!

**KMV** Series

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

| Frequency(Hz) | 50   | 120  | 300  | 1k   | 10k  | 50k  |
|---------------|------|------|------|------|------|------|
| Coefficient   | 0.77 | 1.00 | 1.16 | 1.30 | 1.41 | 1.43 |

The endurance of capacitors is shorted with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

## Screw Terminal Aluminum Electrolytic Capacitors (Large Capacitors)



## PART NUMBERING SYSTEM

## Product code guide (Screw mount terminal type)

(Example : KMH series, 400V-3,300 $\mu$ F,  $\phi$ 63.5X120L, Without mounting clamp)

Please refer to the following table

The diagram shows the 18-digit part number **401LG332MDC0N** with each digit in a box and its corresponding meaning:

- Category①**: Digit 1 (4)
- Series code②**: Digit 2 (0)
- Voltage code③**: Digit 3 (1)
- Terminal code④**: Digit 4 (L)
- Mounting clamp code⑤**: Digit 5 (G)
- Capacitance code⑥**: Digit 6 (3)
- Capacitance tolerance code⑦**: Digit 7 (3)
- Size code⑧**: Digit 8 (2)
- Supplement code⑨**: Digit 9 (M)
- Digit 10**: Digit 10 (D)
- Digit 11**: Digit 11 (C)
- Digit 12**: Digit 12 (0)
- Digit 13**: Digit 13 (N)
- Digit 14**: Digit 14 (N)
- Digit 15**: Digit 15 (N)
- Digit 16**: Digit 16 (N)
- Digit 17**: Digit 17 (N)
- Digit 18**: Digit 18 (N)

### ①Category

| Type  | Code |
|-------|------|
|       | 1th  |
| Polar | E    |

②Series code

| Series name    | Code |     |     |
|----------------|------|-----|-----|
|                | 2th  | 3th | 4th |
| SME            | S    | M   | E   |
| No series name | C    | S   | T   |

### ③Voltage code

| Voltage<br>(V) | Code |     |     |
|----------------|------|-----|-----|
|                | 5th  | 6th | 7th |
| 10             | 1    | 0   | 0   |
| 16             | 1    | 6   | 0   |
| 25             | 2    | 5   | 0   |
| 35             | 3    | 5   | 0   |
| 50             | 5    | 0   | 0   |
| 63             | 6    | 3   | 0   |
| 80             | 8    | 0   | 0   |
| 100            | 1    | 0   | 1   |
| 160            | 1    | 6   | 1   |
| 200            | 2    | 0   | 1   |
| 250            | 2    | 5   | 1   |
| 315            | 3    | B   | 1   |
| 350            | 3    | 5   | 1   |
| 400            | 4    | 0   | 1   |
| 450            | 4    | 5   | 1   |
| 500            | 5    | 0   | 1   |
| 525            | 5    | C   | 1   |
| 550            | 5    | 5   | 1   |

#### ④Terminal code

| Type           | Code |     |
|----------------|------|-----|
|                | 8th  | 9th |
| Screw terminal | L    | G   |

⑤Mounting clamp code

| Type                                                                               | Code |
|------------------------------------------------------------------------------------|------|
|                                                                                    | 10th |
|  | B    |
|  | C    |
| <b>Without clamp</b>                                                               | N    |

⑥Capacitance code

| Cap.<br>( $\mu$ F) | Code |      |      |
|--------------------|------|------|------|
|                    | 11th | 12th | 13th |
| 100                | 1    | 0    | 1    |
| 220                | 2    | 2    | 1    |
| 330                | 3    | 3    | 1    |
| 470                | 4    | 7    | 1    |
| 680                | 6    | 8    | 1    |
| 1,000              | 1    | 0    | 2    |
| 2,200              | 2    | 2    | 2    |
| 3,300              | 3    | 3    | 2    |
| 4,700              | 4    | 7    | 2    |
| 6,800              | 6    | 8    | 2    |
| 10,000             | 1    | 0    | 3    |
| 22,000             | 2    | 2    | 3    |
| 33,000             | 3    | 3    | 3    |
| 47,000             | 4    | 7    | 3    |
| 68,000             | 6    | 8    | 3    |
| 100,000            | 1    | 0    | 4    |
| 220,000            | 2    | 2    | 4    |
| 330,000            | 3    | 3    | 4    |
| 470,000            | 4    | 7    | 4    |
| 680,000            | 6    | 8    | 4    |

### ⑦Capacitance tolerance

|             |      |
|-------------|------|
| Tol.<br>(%) | Code |
|             | 14th |
| ±20         | M    |

⑧Size code

| $\phi D$ | Code |
|----------|------|
|          | 15th |
| 35       | A    |
| 50       | C    |
| 63.5     | D    |
| 76.2     | E    |
| 89       | F    |
| 100      | G    |

| L   | Code |      |
|-----|------|------|
|     | 16th | 17th |
| 50  | 5    | 0    |
| 60  | 6    | 0    |
| 75  | 7    | 5    |
| 80  | 8    | 0    |
| 85  | 8    | 5    |
| 96  | 9    | 6    |
| 100 | A    | 0    |
| 105 | A    | 5    |
| 115 | B    | 5    |
| 120 | C    | 0    |
| 125 | C    | 5    |
| 130 | D    | 0    |
| 140 | E    | 0    |
| 145 | E    | 5    |
| 155 | F    | 5    |
| 170 | H    | 0    |
| 190 | K    | 0    |
| 220 | N    | 0    |
| 250 | R    | 0    |
| 270 | T    | 0    |

⑨Supplement code

|                 |      |
|-----------------|------|
| Sleeve Material | Code |
|                 | 18th |
| Ph-free PVC     | M    |

\* Refer to the appendix (Part number) for codes not listed here.

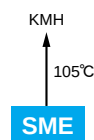


# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard screw terminals, 85°C

## SME Series

- Endurance with ripple current : 2,000 hours at 85°C
- RoHS Compliant



### ◆SPECIFICATIONS

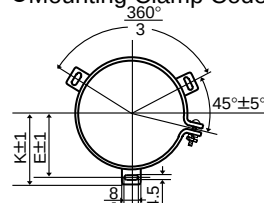
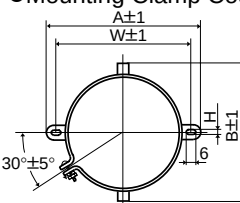
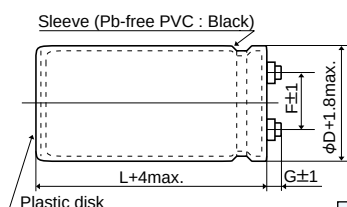
| Items                                  | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                              |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-------------|--------------------------------------|-----------------|------------------------------|
| <b>Category</b>                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                              |
| <b>Temperature Range</b>               | −40 to +85°C (10 to 100V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |
| <b>Rated Voltage Range</b>             | 10 to 100V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |
| <b>Capacitance Tolerance</b>           | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |             |                                      |                 |                              |
| <b>Leakage Current</b>                 | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                                                                                                                                                                                                                                                 |                    |                            |             |                                      |                 |                              |
| <b>Dissipation Factor (tanδ)</b>       | Shall not exceed the values shown in the STANDARD RATINGS (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| <b>Low Temperature Characteristics</b> | Capacitance change $C(-25^{\circ}\text{C})/C(+20^{\circ}\text{C}) \geq 0.7$ (at 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |
| <b>Insulation Resistance</b>           | When measured between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500V <sub>dc</sub> , the insulation resistance shall not be less than 100MΩ.                                                                                                                                                                                                                                                                             |                    |                            |             |                                      |                 |                              |
| <b>Insulation Withstanding Voltage</b> | When a voltage of 2,000V <sub>ac</sub> is applied for 1 minute between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.                                                                                                                                                                                                                                                                                                             |                    |                            |             |                                      |                 |                              |
| <b>Endurance</b>                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 85°C. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                                                             | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                            | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                            |             |                                      |                 |                              |
| Leakage current                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |
| <b>Shelf Life</b>                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤150% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤150% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                            | ≤150% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                            |             |                                      |                 |                              |
| Leakage current                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |

### ◆DIMENSIONS (Screw-Mount) [mm]

- Terminal Code : LG

- Mounting Clamp Code : B

- Mounting Clamp Code : C



- φ35 to φ63.5 : G=6
- φ76.2 & φ89 : G=5

| φD   | A     | B    | W    | H   | F    |
|------|-------|------|------|-----|------|
| 35   | 58.0  | 44.0 | 48.0 | 3.5 | 12.7 |
| 50   | 78.0  | 64.0 | 68.0 | 4.5 | 22.4 |
| 63.5 | 90.0  | 76.0 | 80.0 | 4.5 | 28.0 |
| 76.2 | 104.5 | 90.0 | 93.5 | 4.5 | 31.5 |

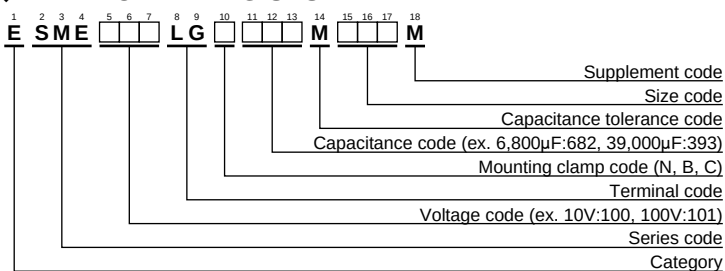
| φD   | E    | K    | J    | F    |
|------|------|------|------|------|
| 50   | 32.5 | 37.0 | 14.0 | 22.4 |
| 63.5 | 38.1 | 43.5 | 14.0 | 28.0 |
| 76.2 | 44.5 | 50.0 | 14.0 | 31.5 |
| 89   | 50.8 | 56.5 | 16.0 | 31.5 |

&lt;Screw specifications&gt;

Plus hexagon-headed screw:  
M5×0.8×10Maximum screw tightening torque:  
3.23Nm

\* The screw and the mounting clamp are separately supplied and not attached to the product.

### ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"

### ◆RATED RIPPLE CURRENT MULTIPLIERS

- Frequency Multipliers

| Rated voltage (V <sub>dc</sub> ) | Case diameter (mm) | Frequency (Hz) |      |      |      |      |      |
|----------------------------------|--------------------|----------------|------|------|------|------|------|
|                                  |                    | 50             | 120  | 300  | 1k   | 10k  | 50k  |
| 10 to 50                         | φ35 to φ89         | 0.95           | 1.00 | 1.03 | 1.05 | 1.09 | 1.12 |
|                                  | φ35                | 0.90           | 1.00 | 1.06 | 1.10 | 1.18 | 1.22 |
| 63 & 80                          | φ50 to φ89         | 0.95           | 1.00 | 1.03 | 1.05 | 1.09 | 1.12 |
|                                  | φ35                | 0.82           | 1.00 | 1.12 | 1.22 | 1.30 | 1.33 |
| 100                              | φ50                | 0.90           | 1.00 | 1.06 | 1.10 | 1.18 | 1.22 |
|                                  | φ63.5 to φ89       | 0.95           | 1.00 | 1.03 | 1.05 | 1.09 | 1.12 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise.

When long life performance is required in actual use, the rms ripple current has to be reduced.



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard screw terminals, 85°C

## SME Series

### ◆STANDARD RATINGS

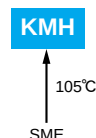
| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/ 85°C,120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/ 85°C,120Hz) | Part No.           |
|----------|----------|--------------------|------|-----------------------------------------|--------------------|----------|----------|--------------------|------|-----------------------------------------|--------------------|
| 10       | 39,000   | 35×50              | 0.60 | 4.70                                    | ESME100LGB393MA50M | 50       | 10,000   | 35×50              | 0.25 | 4.10                                    | ESME500LGB103MA50M |
|          | 82,000   | 35×80              | 0.60 | 7.40                                    | ESME100LGB823MA80M |          | 18,000   | 35×80              | 0.25 | 5.20                                    | ESME500LGB183MA80M |
|          | 100,000  | 35×100             | 0.70 | 8.00                                    | ESME100LGB104MAA0M |          | 22,000   | 35×100             | 0.30 | 5.90                                    | ESME500LGB223MAA0M |
|          | 120,000  | 35×120             | 0.70 | 9.40                                    | ESME100LGB124MAC0M |          | 27,000   | 35×120             | 0.35 | 6.60                                    | ESME500LGB273MAC0M |
|          | 150,000  | 50×80              | 0.90 | 9.80                                    | ESME100LGC154MC80M |          | 39,000   | 50×80              | 0.40 | 7.40                                    | ESME500LGC393MC80M |
|          | 220,000  | 50×100             | 1.00 | 12.1                                    | ESME100LGC224MCA0M |          | 56,000   | 50×100             | 0.40 | 9.80                                    | ESME500LGC563MCA0M |
|          | 270,000  | 50×120             | 1.20 | 13.6                                    | ESME100LGC274MCC0M |          | 68,000   | 50×120             | 0.45 | 11.1                                    | ESME500LGC683MCC0M |
|          | 390,000  | 63.5×100           | 1.50 | 15.3                                    | ESME100LGC394MDA0M |          | 82,000   | 63.5×100           | 0.50 | 12.2                                    | ESME500LGC823MDA0M |
|          | 470,000  | 63.5×120           | 2.00 | 16.0                                    | ESME100LGC474MDC0M |          | 120,000  | 63.5×120           | 0.50 | 16.0                                    | ESME500LGC124MDC0M |
|          | 560,000  | 76.2×100           | 2.50 | 17.3                                    | ESME100LGC564MEA0M |          | 150,000  | 76.2×120           | 0.60 | 18.1                                    | ESME500LGC154MEC0M |
| 16       | 680,000  | 76.2×120           | 3.00 | 18.7                                    | ESME100LGC684MEC0M |          | 180,000  | 76.2×140           | 0.70 | 19.5                                    | ESME500LGC184MEE0M |
|          | 27,000   | 35×50              | 0.45 | 4.20                                    | ESME160LGB273MA50M | 63       | 270,000  | 89×140             | 0.80 | 24.6                                    | ESME500LGC274MFE0M |
|          | 56,000   | 35×80              | 0.60 | 6.50                                    | ESME160LGB563MA80M |          | 5,600    | 35×50              | 0.20 | 3.00                                    | ESME630LGB562MA50M |
|          | 82,000   | 35×100             | 0.70 | 8.00                                    | ESME160LGB823MAA0M |          | 10,000   | 35×80              | 0.25 | 4.00                                    | ESME630LGB103MA80M |
|          | 100,000  | 35×120             | 0.70 | 9.60                                    | ESME160LGB104MAC0M |          | 15,000   | 35×100             | 0.25 | 5.30                                    | ESME630LGB153MAA0M |
|          | 120,000  | 50×80              | 0.80 | 9.60                                    | ESME160LGB124MC80M |          | 18,000   | 35×120             | 0.25 | 6.20                                    | ESME630LGB183MDA0M |
|          | 150,000  | 50×100             | 0.90 | 11.2                                    | ESME160LGC154MCA0M |          | 22,000   | 50×80              | 0.30 | 6.50                                    | ESME630LGC223MC80M |
|          | 220,000  | 50×120             | 1.00 | 14.2                                    | ESME160LGC224MCC0M |          | 33,000   | 50×100             | 0.35 | 8.10                                    | ESME630LGC333MCA0M |
|          | 270,000  | 63.5×100           | 1.20 | 15.3                                    | ESME160LGC274MDA0M |          | 39,000   | 50×120             | 0.35 | 9.60                                    | ESME630LGC393MCC0M |
|          | 330,000  | 63.5×120           | 1.30 | 17.1                                    | ESME160LGC334MDC0M |          | 47,000   | 63.5×100           | 0.40 | 10.2                                    | ESME630LGC473MDA0M |
|          | 390,000  | 76.2×100           | 1.60 | 18.0                                    | ESME160LGC394MEA0M |          | 68,000   | 63.5×120           | 0.40 | 13.3                                    | ESME630LGC683MDC0M |
| 25       | 470,000  | 76.2×120           | 1.80 | 19.3                                    | ESME160LGC474MEC0M |          | 100,000  | 76.2×120           | 0.45 | 17.1                                    | ESME630LGC104MEC0M |
|          | 560,000  | 76.2×140           | 2.00 | 20.7                                    | ESME160LGC564MEE0M | 80       | 120,000  | 76.2×140           | 0.50 | 19.0                                    | ESME630LGC124MEE0M |
|          | 18,000   | 35×50              | 0.35 | 4.00                                    | ESME250LGB183MA50M |          | 150,000  | 89×140             | 0.55 | 22.0                                    | ESME630LGC154MFE0M |
|          | 39,000   | 35×80              | 0.40 | 6.20                                    | ESME250LGB393MA80M |          | 3,300    | 35×50              | 0.15 | 2.50                                    | ESME800LGB332MA50M |
|          | 47,000   | 35×100             | 0.40 | 7.40                                    | ESME250LGB473MAA0M |          | 6,800    | 35×80              | 0.20 | 3.70                                    | ESME800LGB682MA80M |
|          | 56,000   | 35×120             | 0.45 | 8.30                                    | ESME250LGB563MAC0M |          | 10,000   | 35×100             | 0.20 | 4.90                                    | ESME800LGB103MAA0M |
|          | 82,000   | 50×80              | 0.50 | 9.70                                    | ESME250LGC823MC80M |          | 12,000   | 35×120             | 0.20 | 5.40                                    | ESME800LGB123MDA0M |
|          | 100,000  | 50×100             | 0.60 | 10.8                                    | ESME250LGC104MCA0M |          | 15,000   | 50×80              | 0.25 | 6.00                                    | ESME800LGC153MC80M |
|          | 120,000  | 50×120             | 0.60 | 12.8                                    | ESME250LGC124MCC0M |          | 22,000   | 50×100             | 0.30 | 7.10                                    | ESME800LGC223MCA0M |
|          | 180,000  | 63.5×100           | 0.75 | 14.7                                    | ESME250LGC184MDA0M |          | 27,000   | 50×120             | 0.30 | 8.60                                    | ESME800LGC273MCC0M |
|          | 220,000  | 63.5×120           | 0.80 | 16.8                                    | ESME250LGC224MDC0M |          | 33,000   | 63.5×100           | 0.35 | 9.30                                    | ESME800LGC333MDA0M |
| 35       | 270,000  | 76.2×100           | 0.90 | 18.3                                    | ESME250LGC274MEA0M |          | 47,000   | 63.5×120           | 0.35 | 12.0                                    | ESME800LGC473MDC0M |
|          | 330,000  | 76.2×120           | 1.00 | 20.7                                    | ESME250LGC334MEC0M | 100      | 68,000   | 76.2×120           | 0.35 | 15.4                                    | ESME800LGC683MEC0M |
|          | 390,000  | 76.2×140           | 1.20 | 22.1                                    | ESME250LGC394MEE0M |          | 82,000   | 76.2×140           | 0.35 | 18.1                                    | ESME800LGC823MEE0M |
|          | 560,000  | 89×140             | 1.50 | 25.8                                    | ESME250LGC564MFE0M |          | 100,000  | 89×140             | 0.40 | 21.0                                    | ESME800LGC104MFE0M |
|          | 15,000   | 35×50              | 0.30 | 3.90                                    | ESME350LGB153MA50M |          | 2,200    | 35×50              | 0.10 | 2.50                                    | ESME101LGB222MA50M |
|          | 33,000   | 35×80              | 0.40 | 6.00                                    | ESME350LGB333MA80M |          | 4,700    | 35×80              | 0.15 | 3.40                                    | ESME101LGB472MA80M |
|          | 39,000   | 35×100             | 0.40 | 7.00                                    | ESME350LGB393MAA0M |          | 6,800    | 35×100             | 0.15 | 4.20                                    | ESME101LGB682MAA0M |
|          | 47,000   | 35×120             | 0.45 | 8.00                                    | ESME350LGB473MAC0M |          | 8,200    | 35×120             | 0.15 | 5.00                                    | ESME101LGB822MAC0M |
|          | 68,000   | 50×80              | 0.50 | 9.00                                    | ESME350LGC683MC80M |          | 10,000   | 50×80              | 0.20 | 5.20                                    | ESME101LGC103MC80M |
|          | 82,000   | 50×100             | 0.55 | 10.3                                    | ESME350LGC823MCA0M |          | 18,000   | 50×120             | 0.20 | 8.10                                    | ESME101LGC183MCC0M |
|          | 120,000  | 50×120             | 0.60 | 12.8                                    | ESME350LGC124MCC0M |          | 22,000   | 63.5×100           | 0.25 | 8.60                                    | ESME101LGC223MDA0M |
| 47       | 150,000  | 63.5×100           | 0.70 | 14.0                                    | ESME350LGC154MDA0M |          | 27,000   | 63.5×120           | 0.25 | 10.3                                    | ESME101LGC273MDC0M |
|          | 180,000  | 63.5×120           | 0.70 | 16.6                                    | ESME350LGC184MDC0M |          | 33,000   | 76.2×100           | 0.25 | 11.1                                    | ESME101LGC333MEA0M |
|          | 220,000  | 76.2×100           | 0.75 | 17.3                                    | ESME350LGC224MEA0M |          | 39,000   | 76.2×120           | 0.25 | 12.4                                    | ESME101LGC393MEC0M |
|          | 270,000  | 76.2×120           | 0.80 | 19.8                                    | ESME350LGC274MEC0M |          | 47,000   | 76.2×140           | 0.25 | 14.3                                    | ESME101LGC473MEE0M |
|          | 330,000  | 76.2×140           | 0.90 | 22.5                                    | ESME350LGC334MEE0M |          | 68,000   | 89×140             | 0.30 | 18.0                                    | ESME101LGC683MFE0M |
|          | 470,000  | 89×140             | 1.00 | 28.3                                    | ESME350LGC474MFE0M |          |          |                    |      |                                         |                    |



## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Standard screw terminals, 105°C

# KMH Series

- Endurance with ripple current : 2,000 hours at 105°C
- RoHS Compliant



## ◆ SPECIFICATIONS

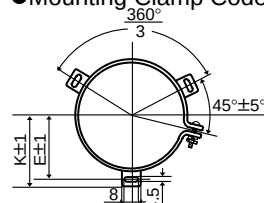
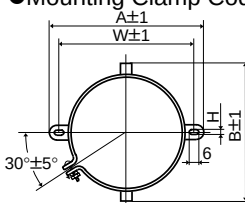
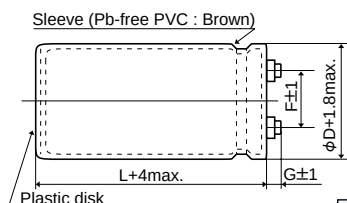
| Items                              | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                            |             |                                      |                 |                              |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-------------|--------------------------------------|-----------------|------------------------------|
| Category<br>Temperature Range      | −40 to +105°C (10 to 100V <sub>dc</sub> )    −25 to +105°C (160 to 400V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                            |             |                                      |                 |                              |
| Rated Voltage Range                | 10 to 400V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                            |             |                                      |                 |                              |
| Capacitance Tolerance              | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                            |             |                                      |                 |                              |
| Leakage Current                    | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |             |                                      |                 |                              |
| Dissipation Factor<br>(tanδ)       | Shall not exceed the values shown in the STANDARD RATINGS (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |
| Low Temperature<br>Characteristics | Capacitance change    10 to 100V <sub>dc</sub> : C(−40°C)/C(+20°C)≥0.6<br>160 to 400V <sub>dc</sub> : C(−25°C)/C(+20°C)≥0.7 (at 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                            |             |                                      |                 |                              |
| Insulation Resistance              | When measured between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500V <sub>dc</sub> , the insulation resistance shall not be less than 100MΩ.                                                                                                                                                                                                                                                                                 |                    |                            |             |                                      |                 |                              |
| Insulation<br>Withstanding Voltage | When a voltage of 2,000Vac is applied for 1 minute between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.                                                                                                                                                                                                                                                                                                                             |                    |                            |             |                                      |                 |                              |
| Endurance                          | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 105°C.<br><table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                                                             | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change                 | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                        | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                            |             |                                      |                 |                              |
| Leakage current                    | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |
| Shelf Life                         | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.<br><table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change                 | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                        | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                            |             |                                      |                 |                              |
| Leakage current                    | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |

### ◆ DIMENSIONS (Screw-Mount) [mm]

- Terminal Code : LG

- Mounting Clamp Code : B

- Mounting Clamp Code : C



| $\phi D$ | A     | B    | W    | H   | F    |
|----------|-------|------|------|-----|------|
| 35       | 58.0  | 44.0 | 48.0 | 3.5 | 12.7 |
| 50       | 78.0  | 64.0 | 68.0 | 4.5 | 22.4 |
| 63.5     | 90.0  | 76.0 | 80.0 | 4.5 | 28.0 |
| 76.2     | 104.5 | 90.0 | 93.5 | 4.5 | 31.5 |

| $\phi D$ | E    | K    | J    | F    |
|----------|------|------|------|------|
| 50       | 32.5 | 37.0 | 14.0 | 22.4 |
| 63.5     | 38.1 | 43.5 | 14.0 | 28.0 |
| 76.2     | 44.5 | 50.0 | 14.0 | 31.5 |
| 89       | 50.8 | 56.5 | 16.0 | 31.5 |

<Screw specifications>

Plus hexagon-headed screw:

M5X0.8X10

Maximum screw tightening torque:

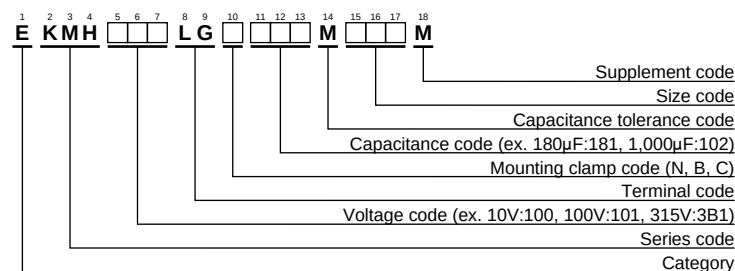
3.23Nm

$\phi 35$  to  $\phi 63.5$  : G=6

$\phi 76.2$  &  $\phi 89$  : G=5

\* The screw and the mounting clamp are separately supplied and not attached to the product.

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard screw terminals, 105°C

## KMH Series

### ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/105°C,120Hz) | Part No.          | WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/105°C,120Hz) | Part No.          |
|----------|----------|--------------------|------|-----------------------------------------|-------------------|----------|----------|--------------------|------|-----------------------------------------|-------------------|
| 10       | 27,000   | 35×50              | 0.45 | 4.90                                    | EKM100LGB273MA50M | 35       | 56,000   | 50×100             | 0.40 | 11.4                                    | EKM350LGC563MA0M  |
|          | 33,000   | 35×50              | 0.50 | 5.10                                    | EKM100LGB333MA50M |          | 68,000   | 50×120             | 0.40 | 13.6                                    | EKM350LGC683MCC0M |
|          | 39,000   | 35×60              | 0.50 | 5.90                                    | EKM100LGB393MA60M |          | 82,000   | 63.5×100           | 0.45 | 14.8                                    | EKM350LGC823MDA0M |
|          | 47,000   | 35×80              | 0.50 | 7.10                                    | EKM100LGB473MA80M |          | 100,000  | 63.5×120           | 0.45 | 17.6                                    | EKM350LGC104MDC0M |
|          | 56,000   | 35×80              | 0.60 | 7.10                                    | EKM100LGB563MA80M |          | 120,000  | 63.5×120           | 0.55 | 17.6                                    | EKM350LGC124MDC0M |
|          | 68,000   | 35×100             | 0.60 | 8.50                                    | EKM100LGB683MAA0M |          | 150,000  | 76.2×120           | 0.65 | 19.8                                    | EKM350LGC154MEC0M |
|          | 82,000   | 35×100             | 0.65 | 8.90                                    | EKM100LGB823MAA0M |          | 180,000  | 76.2×120           | 0.80 | 19.8                                    | EKM350LGC184MEC0M |
|          | 100,000  | 35×120             | 0.65 | 10.7                                    | EKM100LGB104MAC0M |          | 220,000  | 76.2×140           | 0.80 | 23.4                                    | EKM350LGC224MEE0M |
|          | 120,000  | 50×80              | 0.75 | 11.0                                    | EKM100LGC124MDC0M |          | 270,000  | 89×140             | 1.00 | 25.5                                    | EKM350LGC274MFE0M |
|          | 150,000  | 50×100             | 0.80 | 13.2                                    | EKM100LGC154MA0M  | 50       | 3,900    | 35×50              | 0.20 | 2.80                                    | EKM500LGB392MA50M |
|          | 180,000  | 50×120             | 0.80 | 15.7                                    | EKM100LGC184MCC0M |          | 4,700    | 35×50              | 0.20 | 3.10                                    | EKM500LGB472MA50M |
|          | 220,000  | 50×120             | 0.85 | 16.8                                    | EKM100LGC224MCC0M |          | 5,600    | 35×50              | 0.20 | 3.30                                    | EKM500LGB562MA50M |
|          | 270,000  | 63.5×120           | 1.00 | 19.6                                    | EKM100LGC274MDC0M |          | 6,800    | 35×50              | 0.25 | 3.30                                    | EKM500LGB682MA50M |
|          | 330,000  | 63.5×120           | 1.20 | 19.7                                    | EKM100LGC334MDC0M |          | 8,200    | 35×60              | 0.25 | 3.80                                    | EKM500LGB822MA60M |
|          | 390,000  | 76.2×120           | 1.50 | 21.3                                    | EKM100LGC394MEC0M |          | 10,000   | 35×80              | 0.25 | 4.60                                    | EKM500LGB103MA80M |
|          | 470,000  | 76.2×120           | 1.80 | 21.4                                    | EKM100LGC474MEC0M |          | 12,000   | 35×80              | 0.25 | 5.10                                    | EKM500LGB123MA80M |
|          | 560,000  | 76.2×140           | 2.00 | 23.6                                    | EKM100LGC564MEE0M |          | 15,000   | 35×80              | 0.25 | 5.70                                    | EKM500LGB153MA80M |
|          | 680,000  | 89×140             | 2.40 | 26.0                                    | EKM100LGC684MFE0M |          | 18,000   | 35×100             | 0.25 | 6.70                                    | EKM500LGB183MAA0M |
| 16       | 18,000   | 35×50              | 0.40 | 4.20                                    | EKM160LGB183MA50M |          | 22,000   | 35×120             | 0.25 | 8.10                                    | EKM500LGB223MAC0M |
|          | 22,000   | 35×50              | 0.40 | 4.70                                    | EKM160LGB223MA50M |          | 27,000   | 50×80              | 0.25 | 9.10                                    | EKM500LGC273MC80M |
|          | 27,000   | 35×60              | 0.40 | 5.50                                    | EKM160LGB273MA60M |          | 33,000   | 50×100             | 0.25 | 11.1                                    | EKM500LGC333MAA0M |
|          | 33,000   | 35×60              | 0.45 | 5.70                                    | EKM160LGB333MA60M |          | 39,000   | 50×120             | 0.25 | 13.1                                    | EKM500LGC393MCC0M |
|          | 39,000   | 35×80              | 0.45 | 6.80                                    | EKM160LGB393MA80M |          | 47,000   | 50×120             | 0.30 | 13.9                                    | EKM500LGC473MCC0M |
|          | 47,000   | 35×80              | 0.50 | 7.10                                    | EKM160LGB473MA80M |          | 56,000   | 63.5×100           | 0.35 | 13.9                                    | EKM500LGC563MDA0M |
|          | 56,000   | 35×100             | 0.50 | 8.40                                    | EKM160LGB563MAA0M |          | 68,000   | 63.5×120           | 0.35 | 16.6                                    | EKM500LGC683MDC0M |
|          | 68,000   | 35×100             | 0.55 | 8.80                                    | EKM160LGB683MAA0M |          | 82,000   | 76.2×120           | 0.40 | 18.9                                    | EKM500LGC823MEC0M |
|          | 82,000   | 50×80              | 0.55 | 10.7                                    | EKM160LGC823MC80M |          | 100,000  | 76.2×120           | 0.45 | 19.5                                    | EKM500LGC104MEC0M |
|          | 100,000  | 50×80              | 0.65 | 10.8                                    | EKM160LGC104MC80M |          | 120,000  | 76.2×120           | 0.55 | 19.5                                    | EKM500LGC124MEC0M |
|          | 120,000  | 50×100             | 0.65 | 13.1                                    | EKM160LGC124MA0M  |          | 150,000  | 89×140             | 0.60 | 23.9                                    | EKM500LGC154MFE0M |
|          | 150,000  | 50×120             | 0.70 | 15.3                                    | EKM160LGC154MCC0M |          | 180,000  | 89×140             | 0.75 | 23.9                                    | EKM500LGC184MFE0M |
|          | 180,000  | 50×120             | 0.80 | 15.7                                    | EKM160LGC184MCC0M | 63       | 2,700    | 35×50              | 0.20 | 2.30                                    | EKM630LGB272MA50M |
|          | 220,000  | 63.5×120           | 0.85 | 19.2                                    | EKM160LGC224MDC0M |          | 3,300    | 35×50              | 0.20 | 2.50                                    | EKM630LGB332MA50M |
|          | 270,000  | 63.5×120           | 1.00 | 19.6                                    | EKM160LGC274MDC0M |          | 3,900    | 35×50              | 0.20 | 2.80                                    | EKM630LGB392MA50M |
|          | 330,000  | 76.2×120           | 1.30 | 21.1                                    | EKM160LGC334MEC0M |          | 4,700    | 35×50              | 0.20 | 3.10                                    | EKM630LGB472MA50M |
|          | 390,000  | 76.2×120           | 1.50 | 21.3                                    | EKM160LGC394MEC0M |          | 5,600    | 35×60              | 0.20 | 3.50                                    | EKM630LGB562MA60M |
|          | 470,000  | 76.2×140           | 1.60 | 24.2                                    | EKM160LGC474MEE0M |          | 6,800    | 35×60              | 0.20 | 3.90                                    | EKM630LGB682MA60M |
|          | 560,000  | 89×140             | 2.00 | 28.1                                    | EKM160LGC564MFE0M |          | 8,200    | 35×80              | 0.20 | 4.70                                    | EKM630LGB822MA80M |
|          | 680,000  | 89×140             | 2.40 | 28.5                                    | EKM160LGC684MFE0M |          | 10,000   | 35×80              | 0.25 | 4.70                                    | EKM630LGB103MA80M |
| 25       | 12,000   | 35×50              | 0.35 | 3.70                                    | EKM250LGB123MA50M |          | 12,000   | 35×100             | 0.25 | 5.50                                    | EKM630LGB123MAA0M |
|          | 15,000   | 35×50              | 0.35 | 4.10                                    | EKM250LGB153MA50M |          | 15,000   | 35×120             | 0.25 | 6.60                                    | EKM630LGB153MAC0M |
|          | 18,000   | 35×60              | 0.35 | 4.80                                    | EKM250LGB183MA60M |          | 18,000   | 50×80              | 0.25 | 7.40                                    | EKM630LGC183MC80M |
|          | 22,000   | 35×60              | 0.35 | 5.30                                    | EKM250LGB223MA60M |          | 22,000   | 50×100             | 0.25 | 9.00                                    | EKM630LGC223MAA0M |
|          | 27,000   | 35×80              | 0.35 | 6.40                                    | EKM250LGB273MA80M |          | 27,000   | 50×120             | 0.25 | 10.9                                    | EKM630LGC273MCC0M |
|          | 33,000   | 35×80              | 0.40 | 6.70                                    | EKM250LGB333MA80M |          | 33,000   | 50×120             | 0.25 | 12.0                                    | EKM630LGC333MCC0M |
|          | 39,000   | 35×100             | 0.40 | 7.80                                    | EKM250LGB393MAA0M |          | 39,000   | 63.5×100           | 0.30 | 12.5                                    | EKM630LGC393MDA0M |
|          | 47,000   | 35×120             | 0.40 | 9.30                                    | EKM250LGB473MAC0M |          | 47,000   | 63.5×120           | 0.30 | 14.9                                    | EKM630LGC473MDC0M |
|          | 56,000   | 50×80              | 0.45 | 9.70                                    | EKM250LGC563MC80M |          | 56,000   | 63.5×120           | 0.30 | 16.3                                    | EKM630LGC563MDC0M |
|          | 68,000   | 50×100             | 0.45 | 11.2                                    | EKM250LGC683MCA0M |          | 68,000   | 76.2×120           | 0.35 | 18.4                                    | EKM630LGC683MEC0M |
|          | 82,000   | 50×100             | 0.50 | 11.2                                    | EKM250LGC823MCA0M |          | 82,000   | 76.2×140           | 0.40 | 20.0                                    | EKM630LGC823MEE0M |
|          | 100,000  | 50×120             | 0.50 | 14.8                                    | EKM250LGC104MCC0M |          | 100,000  | 76.2×140           | 0.50 | 20.0                                    | EKM630LGC104MEE0M |
|          | 120,000  | 63.5×100           | 0.65 | 14.9                                    | EKM250LGC124MDA0M |          | 120,000  | 89×140             | 0.60 | 21.8                                    | EKM630LGC124MFE0M |
|          | 150,000  | 63.5×120           | 0.65 | 17.9                                    | EKM250LGC154MDC0M | 80       | 2,200    | 35×50              | 0.15 | 2.40                                    | EKM800LGB222MA50M |
|          | 180,000  | 63.5×120           | 0.80 | 17.9                                    | EKM250LGC184MDC0M |          | 2,700    | 35×50              | 0.15 | 2.70                                    | EKM800LGB272MA50M |
|          | 220,000  | 76.2×120           | 0.85 | 21.3                                    | EKM250LGC224MEC0M |          | 3,300    | 35×50              | 0.15 | 3.00                                    | EKM800LGB332MA50M |
|          | 270,000  | 76.2×120           | 1.00 | 21.7                                    | EKM250LGC274MEC0M |          | 3,900    | 35×60              | 0.15 | 3.40                                    | EKM800LGB392MA60M |
|          | 330,000  | 76.2×140           | 1.20 | 23.4                                    | EKM250LGC334MEE0M |          | 4,700    | 35×60              | 0.15 | 3.70                                    | EKM800LGB472MA60M |
|          | 390,000  | 89×140             | 1.50 | 24.9                                    | EKM250LGC394MFE0M |          | 5,600    | 35×80              | 0.15 | 4.50                                    | EKM800LGB562MA80M |
| 35       | 8,200    | 35×50              | 0.30 | 3.30                                    | EKM350LGB822MA50M |          | 6,800    | 35×80              | 0.15 | 4.90                                    | EKM800LGB682MA80M |
|          | 10,000   | 35×50              | 0.30 | 3.60                                    | EKM350LGB103MA50M |          | 8,200    | 35×100             | 0.20 | 5.10                                    | EKM800LGB822MAA0M |
|          | 12,000   | 35×60              | 0.30 | 4.20                                    | EKM350LGB123MA60M |          | 10,000   | 35×120             | 0.20 | 6.10                                    | EKM800LGB103MAC0M |
|          | 15,000   | 35×60              | 0.30 | 4.70                                    | EKM350LGB153MA60M |          | 12,000   | 50×80              | 0.20 | 6.70                                    | EKM800LGC123MC80M |
|          | 18,000   | 35×80              | 0.30 | 5.70                                    | EKM350LGB183MA80M |          | 15,000   | 50×100             | 0.20 | 8.30                                    | EKM800LGC153MCA0M |
|          | 22,000   | 35×80              | 0.30 | 6.30                                    | EKM350LGB223MA80M |          | 18,000   | 50×120             | 0.20 | 9.90                                    | EKM800LGC183MCC0M |
|          | 27,000   | 35×100             | 0.30 | 7.50                                    | EKM350LGB273MAA0M |          | 22,000   | 50×120             | 0.20 | 11.0                                    | EKM800LGC223MCC0M |
|          | 33,000   | 35×120             | 0.30 | 9.00                                    | EKM350LGB333MAC0M |          | 27,000   | 63.5×100           | 0.25 | 11.4                                    | EKM800LGC273MDA0M |
|          | 39,000   | 50×80              | 0.35 | 9.20                                    | EKM350LGC393MC80M |          | 33,000   | 76.2×100           | 0.25 | 13.9                                    | EKM800LGC333MEA0M |
|          | 47,000   | 50×100             | 0.35 | 11.2                                    | EKM350LGC473MCA0M |          | 39,000   | 76.2×100           | 0.30 | 13.9                                    | EKM800LGC393MEA0M |



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Standard screw terminals, 105°C

## KMH Series

### ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.          | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.          |
|-------------|-------------|-----------------------|------|---------------------------------------------------|-------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|-------------------|
| 80          | 47,000      | 76.2×120              | 0.30 | 16.5                                              | EKM800LGC473MEC0M | 250         | 330         | 35×50                 | 0.15 | 0.90                                              | EKM251LGB331MA50M |
|             | 56,000      | 76.2×120              | 0.30 | 18.1                                              | EKM800LGC563MEC0M |             | 390         | 35×50                 | 0.15 | 1.00                                              | EKM251LGB391MA50M |
|             | 68,000      | 76.2×140              | 0.35 | 19.7                                              | EKM800LGC683MEE0M |             | 470         | 35×50                 | 0.15 | 1.10                                              | EKM251LGB471MA50M |
|             | 82,000      | 89×140                | 0.40 | 22.1                                              | EKM800LGC823MFE0M |             | 560         | 35×50                 | 0.15 | 1.20                                              | EKM251LGB561MA50M |
| 100         | 1,800       | 35×50                 | 0.10 | 2.70                                              | EKM101LGB182MA50M |             | 680         | 35×60                 | 0.15 | 1.40                                              | EKM251LGB681MA60M |
|             | 2,200       | 35×50                 | 0.10 | 3.00                                              | EKM101LGB222MA50M |             | 820         | 35×80                 | 0.15 | 1.60                                              | EKM251LGB821MA80M |
|             | 2,700       | 35×60                 | 0.10 | 3.50                                              | EKM101LGB272MA60M |             | 1,000       | 35×80                 | 0.20 | 1.60                                              | EKM251LGB102MA80M |
|             | 3,300       | 35×80                 | 0.10 | 4.20                                              | EKM101LGB332MA80M |             | 1,200       | 35×80                 | 0.20 | 1.80                                              | EKM251LGB122MA80M |
|             | 3,900       | 35×80                 | 0.12 | 4.20                                              | EKM101LGB392MA80M |             | 1,500       | 35×100                | 0.20 | 2.10                                              | EKM251LGB152MAA0M |
|             | 4,700       | 35×100                | 0.12 | 5.00                                              | EKM101LGB472MAA0M |             | 1,800       | 35×120                | 0.20 | 2.50                                              | EKM251LGB182MAC0M |
|             | 5,600       | 35×100                | 0.12 | 5.40                                              | EKM101LGB562MAA0M |             | 2,200       | 50×80                 | 0.20 | 2.90                                              | EKM251LGC222MC80M |
|             | 6,800       | 35×120                | 0.15 | 5.80                                              | EKM101LGB682MAC0M |             | 2,700       | 50×100                | 0.20 | 3.50                                              | EKM251LGC272MCA0M |
|             | 8,200       | 50×80                 | 0.15 | 6.40                                              | EKM101LGC822MC80M |             | 3,300       | 50×120                | 0.20 | 4.20                                              | EKM251LGC332MCC0M |
|             | 10,000      | 50×100                | 0.15 | 7.80                                              | EKM101LGC103MCA0M |             | 3,900       | 50×120                | 0.20 | 4.60                                              | EKM251LGC392MCC0M |
|             | 12,000      | 50×120                | 0.15 | 9.30                                              | EKM101LGC123MCC0M |             | 4,700       | 63.5×120              | 0.20 | 5.70                                              | EKM251LGC472MDC0M |
|             | 15,000      | 50×120                | 0.15 | 10.4                                              | EKM101LGC153MCC0M |             | 5,600       | 63.5×120              | 0.20 | 6.30                                              | EKM251LGC562MDC0M |
|             | 18,000      | 63.5×100              | 0.20 | 10.4                                              | EKM101LGC183MDA0M |             | 6,800       | 76.2×120              | 0.20 | 7.70                                              | EKM251LGC682MEC0M |
|             | 22,000      | 63.5×120              | 0.20 | 12.5                                              | EKM101LGC223MDC0M |             | 8,200       | 76.2×120              | 0.20 | 8.40                                              | EKM251LGC822MEC0M |
|             | 27,000      | 76.2×120              | 0.25 | 13.7                                              | EKM101LGC273MEC0M |             | 10,000      | 76.2×140              | 0.20 | 10.0                                              | EKM251LGC103MEE0M |
| 160         | 33,000      | 76.2×120              | 0.25 | 15.2                                              | EKM101LGC333MEC0M | 315         | 12,000      | 89×140                | 0.20 | 11.9                                              | EKM251LGC123MFE0M |
|             | 39,000      | 76.2×140              | 0.30 | 16.1                                              | EKM101LGC393MEE0M |             | 180         | 35×50                 | 0.10 | 0.80                                              | EKM315LGB181MA50M |
|             | 47,000      | 89×140                | 0.30 | 19.3                                              | EKM101LGC473MFE0M |             | 220         | 35×50                 | 0.10 | 0.90                                              | EKM315LGB221MA50M |
|             | 56,000      | 89×140                | 0.30 | 21.1                                              | EKM101LGC563MFE0M |             | 270         | 35×50                 | 0.10 | 1.00                                              | EKM315LGB271MA50M |
|             | 560         | 35×50                 | 0.15 | 1.20                                              | EKM161LGB561MA50M |             | 330         | 35×50                 | 0.10 | 1.10                                              | EKM315LGB331MA50M |
|             | 680         | 35×50                 | 0.15 | 1.30                                              | EKM161LGB681MA50M |             | 390         | 35×50                 | 0.10 | 1.20                                              | EKM315LGB391MA50M |
|             | 820         | 35×50                 | 0.15 | 1.40                                              | EKM161LGB821MA50M |             | 470         | 35×60                 | 0.10 | 1.40                                              | EKM315LGB471MA60M |
|             | 1,000       | 35×50                 | 0.15 | 1.60                                              | EKM161LGB102MA50M |             | 560         | 35×60                 | 0.10 | 1.50                                              | EKM315LGB561MA60M |
|             | 1,200       | 35×60                 | 0.15 | 1.90                                              | EKM161LGB122MA60M |             | 680         | 35×80                 | 0.10 | 1.70                                              | EKM315LGB681MA80M |
|             | 1,500       | 35×60                 | 0.15 | 2.10                                              | EKM161LGB152MA60M |             | 820         | 35×80                 | 0.15 | 1.70                                              | EKM315LGB821MA80M |
|             | 1,800       | 35×80                 | 0.15 | 2.50                                              | EKM161LGB182MA80M |             | 1,000       | 35×100                | 0.15 | 2.00                                              | EKM315LGB102MAA0M |
|             | 2,200       | 35×80                 | 0.15 | 2.80                                              | EKM161LGB222MA80M |             | 1,200       | 35×120                | 0.15 | 2.40                                              | EKM315LGB122MAC0M |
|             | 2,700       | 35×100                | 0.15 | 3.30                                              | EKM161LGB272MAA0M |             | 1,500       | 50×80                 | 0.15 | 2.70                                              | EKM315LGC152MC80M |
|             | 3,300       | 35×120                | 0.15 | 3.80                                              | EKM161LGB332MAC0M |             | 1,800       | 50×100                | 0.15 | 3.30                                              | EKM315LGC182MCA0M |
|             | 3,900       | 50×80                 | 0.20 | 3.80                                              | EKM161LGC392MC80M |             | 2,200       | 50×120                | 0.15 | 4.00                                              | EKM315LGC222MCC0M |
| 200         | 4,700       | 50×100                | 0.20 | 4.60                                              | EKM161LGC472MCA0M |             | 2,700       | 50×120                | 0.15 | 4.40                                              | EKM315LGC272MCC0M |
|             | 5,600       | 50×100                | 0.20 | 5.10                                              | EKM161LGC562MCA0M | 350         | 3,300       | 63.5×100              | 0.15 | 5.10                                              | EKM351LGC332MDA0M |
|             | 6,800       | 50×120                | 0.20 | 6.10                                              | EKM161LGC682MCC0M |             | 3,900       | 63.5×120              | 0.15 | 6.00                                              | EKM351LGC392MDC0M |
|             | 8,200       | 63.5×100              | 0.20 | 7.00                                              | EKM161LGC822MDA0M |             | 4,700       | 76.2×100              | 0.15 | 6.80                                              | EKM351LGC472MEA0M |
|             | 10,000      | 63.5×120              | 0.20 | 8.40                                              | EKM161LGC103MDC0M |             | 5,600       | 76.2×120              | 0.15 | 8.00                                              | EKM351LGC562MEC0M |
|             | 12,000      | 76.2×100              | 0.20 | 9.40                                              | EKM161LGC123MEA0M |             | 6,800       | 76.2×130              | 0.15 | 9.20                                              | EKM351LGC682MED0M |
|             | 15,000      | 76.2×120              | 0.20 | 11.4                                              | EKM161LGC153MEC0M |             | 8,200       | 89×140                | 0.15 | 11.4                                              | EKM351LGC822MFE0M |
|             | 18,000      | 76.2×140              | 0.20 | 13.4                                              | EKM161LGC183MEE0M |             | 10,000      | 89×140                | 0.15 | 12.6                                              | EKM351LGC103MFE0M |
|             | 22,000      | 89×140                | 0.25 | 14.5                                              | EKM161LGC223MFE0M |             | 180         | 35×50                 | 0.10 | 0.80                                              | EKM351LGB181MA50M |
|             | 27,000      | 89×140                | 0.25 | 16.0                                              | EKM161LGC273MFE0M |             | 220         | 35×50                 | 0.10 | 0.90                                              | EKM351LGB221MA50M |
|             | 330         | 35×50                 | 0.15 | 0.90                                              | EKM201LGB331MA50M |             | 270         | 35×50                 | 0.10 | 1.00                                              | EKM351LGB271MA50M |
|             | 390         | 35×50                 | 0.15 | 1.00                                              | EKM201LGB391MA50M |             | 330         | 35×50                 | 0.10 | 1.10                                              | EKM351LGB331MA50M |
|             | 470         | 35×50                 | 0.15 | 1.10                                              | EKM201LGB471MA50M |             | 390         | 35×60                 | 0.10 | 1.30                                              | EKM351LGB391MA60M |
|             | 560         | 35×50                 | 0.15 | 1.20                                              | EKM201LGB561MA50M |             | 470         | 35×60                 | 0.10 | 1.40                                              | EKM351LGB471MA60M |
|             | 680         | 35×50                 | 0.15 | 1.30                                              | EKM201LGB681MA50M |             | 560         | 35×80                 | 0.10 | 1.60                                              | EKM351LGB561MA80M |
|             | 820         | 35×50                 | 0.15 | 1.40                                              | EKM201LGB821MA50M |             | 680         | 35×80                 | 0.15 | 1.60                                              | EKM351LGB681MA80M |
|             | 1,000       | 35×60                 | 0.15 | 1.70                                              | EKM201LGB102MA60M |             | 820         | 35×100                | 0.15 | 1.80                                              | EKM351LGB821MAA0M |
| 250         | 1,200       | 35×60                 | 0.15 | 1.90                                              | EKM201LGB122MA60M |             | 1,000       | 35×120                | 0.15 | 2.20                                              | EKM351LGB102MAC0M |
|             | 1,500       | 35×80                 | 0.15 | 2.30                                              | EKM201LGB152MA80M | 400         | 1,200       | 50×80                 | 0.15 | 2.40                                              | EKM351LGC122MC80M |
|             | 1,800       | 35×80                 | 0.15 | 2.50                                              | EKM201LGB182MA80M |             | 1,500       | 50×100                | 0.15 | 3.00                                              | EKM351LGC152MCA0M |
|             | 2,200       | 35×100                | 0.15 | 3.00                                              | EKM201LGB222MAA0M |             | 1,800       | 50×120                | 0.15 | 3.60                                              | EKM351LGC182MCC0M |
|             | 2,700       | 35×120                | 0.15 | 3.60                                              | EKM201LGB272MAC0M |             | 2,200       | 50×120                | 0.15 | 4.00                                              | EKM351LGC222MCC0M |
|             | 3,300       | 50×80                 | 0.15 | 4.10                                              | EKM201LGC332MC80M |             | 2,700       | 63.5×100              | 0.15 | 4.60                                              | EKM351LGC272MDA0M |
|             | 3,900       | 50×100                | 0.15 | 4.90                                              | EKM201LGC392MCA0M |             | 3,900       | 76.2×120              | 0.15 | 6.70                                              | EKM351LGC392MEC0M |
|             | 4,700       | 63.5×100              | 0.20 | 5.30                                              | EKM201LGC472MDA0M |             | 5,600       | 76.2×130              | 0.15 | 8.30                                              | EKM351LGC562MED0M |
|             | 5,600       | 63.5×100              | 0.20 | 5.80                                              | EKM201LGC562MDA0M |             | 6,800       | 76.2×140              | 0.15 | 9.50                                              | EKM351LGC682MEE0M |
|             | 6,800       | 63.5×120              | 0.20 | 6.90                                              | EKM201LGC682MDC0M |             | 8,200       | 89×140                | 0.15 | 11.4                                              | EKM351LGC822MFE0M |
|             | 8,200       | 63.5×120              | 0.20 | 7.60                                              | EKM201LGC822MDC0M |             | 180         | 35×50                 | 0.10 | 0.80                                              | EKM401LGB181MA50M |
|             | 10,000      | 76.2×120              | 0.20 | 9.30                                              | EKM201LGC103MEC0M |             | 220         | 35×50                 | 0.10 | 0.90                                              | EKM401LGB221MA50M |
|             | 12,000      | 76.2×120              | 0.20 | 10.2                                              | EKM201LGC123MEC0M |             | 270         | 35×50                 | 0.10 | 1.00                                              | EKM401LGB271MA50M |
|             | 15,000      | 76.2×140              | 0.20 | 12.2                                              | EKM201LGC153MEE0M |             | 330         | 35×60                 | 0.10 | 1.20                                              | EKM401LGB331MA60M |
|             | 18,000      | 89×140                | 0.25 | 13.1                                              | EKM201LGC183MFE0M |             | 390         | 35×60                 | 0.10 | 1.30                                              | EKM401LGB391MA60M |
|             | 270         | 35×50                 | 0.15 | 0.80                                              | EKM251LGB271MA50M |             | 470         | 35×80                 | 0.10 | 1.40                                              | EKM401LGB471MA80M |



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Standard screw terminals, 105°C

## KMH Series

### ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 400                      | 560         | 35×80                 | 0.15 | 1.40                                              | EKMH401LGB561MA80M |
|                          | 680         | 35×100                | 0.15 | 1.70                                              | EKMH401LGB681MAA0M |
|                          | 820         | 35×120                | 0.15 | 2.00                                              | EKMH401LGB821MAC0M |
|                          | 1,000       | 50×80                 | 0.15 | 2.20                                              | EKMH401LGC102MC80M |
|                          | 1,200       | 50×100                | 0.15 | 2.70                                              | EKMH401LGC122MCA0M |
|                          | 1,500       | 50×120                | 0.15 | 3.30                                              | EKMH401LGC152MCC0M |
| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
| 400                      | 2,200       | 63.5×100              | 0.15 | 4.20                                              | EKMH401LGC222MDA0M |
|                          | 3,300       | 63.5×120              | 0.15 | 5.50                                              | EKMH401LGC332MDC0M |
|                          | 4,700       | 76.2×130              | 0.15 | 7.60                                              | EKMH401LGC472MED0M |
|                          | 5,600       | 89×140                | 0.15 | 9.40                                              | EKMH401LGC562MFE0M |
|                          | 6,800       | 89×140                | 0.15 | 10.4                                              | EKMH401LGC682MFE0M |

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Rated voltage<br>(V <sub>dc</sub> ) | Case diameter<br>(mm) | Frequency (Hz) |      |      |      |      |      |
|-------------------------------------|-----------------------|----------------|------|------|------|------|------|
|                                     |                       | 50             | 120  | 300  | 1k   | 10k  | 50k  |
| 10 to 50                            | φ35 to φ89            | 0.95           | 1.00 | 1.03 | 1.05 | 1.09 | 1.12 |
|                                     | φ35                   | 0.90           | 1.00 | 1.06 | 1.10 | 1.18 | 1.22 |
| 63 & 80                             | φ50 to φ89            | 0.95           | 1.00 | 1.03 | 1.05 | 1.09 | 1.12 |
|                                     | φ35                   | 0.82           | 1.00 | 1.12 | 1.22 | 1.30 | 1.33 |
| 100                                 | φ50                   | 0.90           | 1.00 | 1.06 | 1.10 | 1.18 | 1.22 |
|                                     | φ63.5 to φ89          | 0.95           | 1.00 | 1.03 | 1.05 | 1.09 | 1.12 |
| 160 to 250                          | φ35                   | 0.80           | 1.00 | 1.19 | 1.34 | 1.46 | 1.52 |
|                                     | φ50 & φ63.5           | 0.81           | 1.00 | 1.14 | 1.26 | 1.36 | 1.41 |
|                                     | φ76.2 & φ89           | 0.82           | 1.00 | 1.12 | 1.22 | 1.30 | 1.33 |
| 315 to 400                          | φ35 to φ89            | 0.80           | 1.00 | 1.19 | 1.34 | 1.46 | 1.52 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85°C

## RWG Series

- Downsized, high ripple version of RWF series
- 20% better ripple current at 300Hz than RWF series
- Endurance with ripple current : 5,000 hours at 85°C
- RoHS Compliant

RWG

↓  
Downsized  
RWF



### ◆SPECIFICATIONS

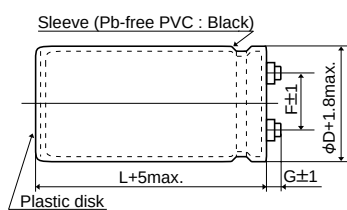
| Items                           | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                              |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-------------|--------------------------------------|-----------------|------------------------------|
| Category                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                              |
| Temperature Range               | -25 to +85°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |
| Rated Voltage Range             | 350 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |             |                                      |                 |                              |
| Capacitance Tolerance           | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |             |                                      |                 |                              |
| Leakage Current                 | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                                                                                                                                                                                                                                                 |                    |                            |             |                                      |                 |                              |
| Dissipation Factor (tanδ)       | 0.25 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| Low Temperature Characteristics | Capacitance change $C(-25^{\circ}\text{C})/C(+20^{\circ}\text{C}) \geq 0.7$ (at 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |
| Insulation Resistance           | When measured between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500V <sub>dc</sub> , the insulation resistance shall not be less than 100MΩ.                                                                                                                                                                                                                                                                             |                    |                            |             |                                      |                 |                              |
| Insulation Withstanding Voltage | When a voltage of 2,000Vac is applied for 1 minute between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.                                                                                                                                                                                                                                                                                                                         |                    |                            |             |                                      |                 |                              |
| Endurance                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 85°C. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                                                             | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                            |             |                                      |                 |                              |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |
| Shelf Life                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                            |             |                                      |                 |                              |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |

### ◆DIMENSIONS (Screw-Mount) [mm]

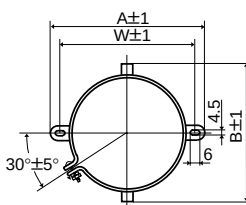
●Terminal Code : LG

●Mounting Clamp Code : B

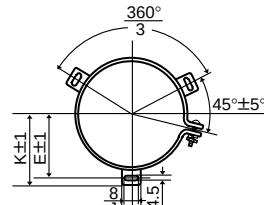
●Mounting Clamp Code : C



φ50 : G=6  
φ63.5, φ76.2 : G=5  
φ89 : G=4



| φD   | A     | B    | W    | F    |
|------|-------|------|------|------|
| 50   | 78.0  | 64.0 | 68.0 | 22.4 |
| 63.5 | 90.0  | 76.0 | 80.0 | 28.0 |
| 76.2 | 104.5 | 90.0 | 93.5 | 31.5 |



| φD   | E    | K    | F    | J    |
|------|------|------|------|------|
| 50   | 32.5 | 37.0 | 22.4 | 14.0 |
| 63.5 | 38.1 | 43.5 | 28.0 | 14.0 |
| 76.2 | 44.5 | 50.0 | 31.5 | 14.0 |
| 89   | 50.8 | 56.5 | 31.5 | 16.0 |

&lt;Screw specifications&gt;

φ50 to φ89

Plus hexagon-headed screw :

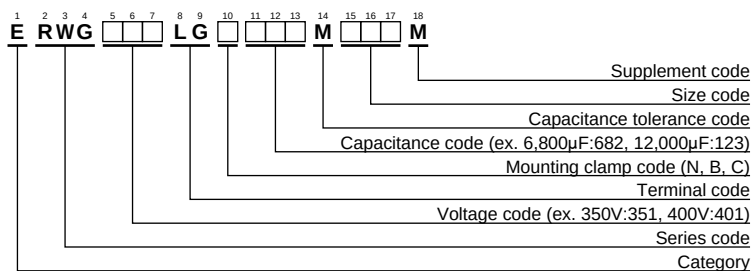
M5X0.8X10

Maximum screw tightening torque :

3.23Nm

\* The screw and the mounting clamp are separately supplied and not attached to the product.

### ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85°C

## RWG Series

### ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple current<br>(Arms/85°C) |       | Part No.           |
|-------------|-------------|-----------------------|------|-------------------------------------|-------|--------------------|
|             |             |                       |      | 120Hz                               | 300Hz |                    |
| 350         | 2,200       | 50×96                 | 0.25 | 7.70                                | 9.20  | ERWG351LGC222MC96M |
|             | 2,700       | 50×105                | 0.25 | 8.90                                | 10.6  | ERWG351LGC272MCA5M |
|             | 3,300       | 50×115                | 0.25 | 10.3                                | 12.3  | ERWG351LGC332MCB5M |
|             | 3,900       | 50×130                | 0.25 | 11.8                                | 14.1  | ERWG351LGC392MCD0M |
|             | 4,700       | 63.5×115              | 0.25 | 13.6                                | 16.3  | ERWG351LGC472MDB5M |
|             | 5,600       | 63.5×130              | 0.25 | 15.7                                | 18.8  | ERWG351LGC562MDD0M |
|             | 6,800       | 63.5×155              | 0.25 | 18.8                                | 22.5  | ERWG351LGC682MDF5M |
|             | 6,800       | 76.2×115              | 0.25 | 18.2                                | 21.8  | ERWG351LGC682MEB5M |
|             | 8,200       | 63.5×190              | 0.25 | 22.6                                | 27.1  | ERWG351LGC822MDK0M |
|             | 8,200       | 76.2×130              | 0.25 | 21.0                                | 25.2  | ERWG351LGC822MED0M |
|             | 10,000      | 76.2×155              | 0.25 | 25.1                                | 30.1  | ERWG351LGC103MEF5M |
|             | 12,000      | 76.2×170              | 0.25 | 28.7                                | 34.4  | ERWG351LGC123MEH0M |
|             | 15,000      | 89×155                | 0.25 | 33.6                                | 40.3  | ERWG351LGC153MFF5M |
|             | 15,000      | 89×170                | 0.25 | 35.0                                | 42.0  | ERWG351LGC153MFH0M |
|             | 18,000      | 89×190                | 0.25 | 40.3                                | 48.3  | ERWG351LGC183MFK0M |
| 400         | 1,800       | 50×96                 | 0.25 | 7.00                                | 8.40  | ERWG401LGC182MC96M |
|             | 2,200       | 50×105                | 0.25 | 8.10                                | 9.70  | ERWG401LGC222MCA5M |
|             | 2,700       | 50×115                | 0.25 | 9.30                                | 11.1  | ERWG401LGC272MCB5M |
|             | 3,300       | 50×130                | 0.25 | 10.9                                | 13.0  | ERWG401LGC332MCD0M |
|             | 3,900       | 63.5×115              | 0.25 | 12.4                                | 14.8  | ERWG401LGC392MDB5M |
|             | 4,700       | 63.5×130              | 0.25 | 14.4                                | 17.2  | ERWG401LGC472MDD0M |
|             | 5,600       | 63.5×155              | 0.25 | 17.0                                | 20.4  | ERWG401LGC562MDF5M |
|             | 5,600       | 76.2×115              | 0.25 | 16.5                                | 19.8  | ERWG401LGC562MEB5M |
| 400         | 6,800       | 63.5×190              | 0.25 | 20.6                                | 24.7  | ERWG401LGC682MDK0M |
|             | 6,800       | 76.2×130              | 0.25 | 19.2                                | 23.0  | ERWG401LGC682MED0M |
|             | 8,200       | 76.2×155              | 0.25 | 22.7                                | 27.2  | ERWG401LGC822MEF5M |
|             | 10,000      | 76.2×170              | 0.25 | 26.2                                | 31.4  | ERWG401LGC103MEH0M |
|             | 12,000      | 89×155                | 0.25 | 30.0                                | 36.0  | ERWG401LGC123MFF5M |
|             | 12,000      | 89×170                | 0.25 | 31.3                                | 37.5  | ERWG401LGC123MFH0M |
|             | 15,000      | 89×190                | 0.25 | 36.7                                | 44.0  | ERWG401LGC153MFK0M |
|             | 1,500       | 50×96                 | 0.25 | 6.40                                | 7.60  | ERWG451LGC152MC96M |
|             | 1,800       | 50×105                | 0.25 | 7.30                                | 8.70  | ERWG451LGC182MCA5M |
|             | 2,200       | 50×115                | 0.25 | 8.40                                | 10.0  | ERWG451LGC222MCB5M |
|             | 2,700       | 50×130                | 0.25 | 9.80                                | 11.7  | ERWG451LGC272MCD0M |
|             | 3,300       | 63.5×115              | 0.25 | 11.4                                | 13.6  | ERWG451LGC332MDB5M |
|             | 3,900       | 63.5×130              | 0.25 | 13.1                                | 15.7  | ERWG451LGC392MDD0M |
|             | 4,700       | 63.5×155              | 0.25 | 15.6                                | 18.7  | ERWG451LGC472MDF5M |
|             | 4,700       | 76.2×115              | 0.25 | 15.1                                | 18.1  | ERWG451LGC472MEB5M |
| 450         | 5,600       | 63.5×190              | 0.25 | 18.7                                | 22.4  | ERWG451LGC562MDK0M |
|             | 5,600       | 76.2×130              | 0.25 | 17.4                                | 20.8  | ERWG451LGC562MED0M |
|             | 6,800       | 76.2×155              | 0.25 | 20.7                                | 24.8  | ERWG451LGC682MEF5M |
|             | 8,200       | 76.2×170              | 0.25 | 23.7                                | 28.4  | ERWG451LGC822MEH0M |
|             | 10,000      | 89×155                | 0.25 | 27.4                                | 32.8  | ERWG451LGC103MFF5M |
|             | 10,000      | 89×170                | 0.25 | 28.6                                | 34.3  | ERWG451LGC103MFH0M |
|             | 12,000      | 89×190                | 0.25 | 32.9                                | 39.4  | ERWG451LGC123MFK0M |

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency (Hz) | 50  | 120 | 300 | 1k  | 3k  |
|----------------|-----|-----|-----|-----|-----|
| Coefficient    | 0.8 | 1.0 | 1.2 | 1.4 | 1.5 |

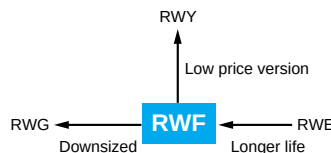
Note : The endurance of capacitors is reduced with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for the RWG series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For details, please contact a representative of Nippon Chemi-Con.



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85°C

## RWF Series

- High ripple capability
- Endurance with ripple current : 5,000 hours at 85°C
- Wide range of case sizes from  $\phi 50$  to  $\phi 100$
- RoHS Compliant



### SPECIFICATIONS

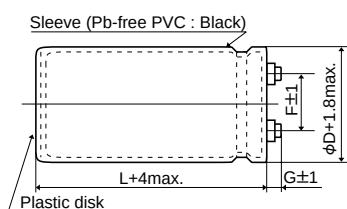
| Items                           | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                              |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-------------|--------------------------------------|-----------------|------------------------------|
| Category                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                              |
| Temperature Range               | -25 to +85°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |
| Rated Voltage Range             | 350 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |             |                                      |                 |                              |
| Capacitance Tolerance           | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |             |                                      |                 |                              |
| Leakage Current                 | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                                                                                                                                                                                                                                                 |                    |                            |             |                                      |                 |                              |
| Dissipation Factor (tanδ)       | 0.25 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| Low Temperature Characteristics | Capacitance change $C(-25^{\circ}\text{C})/C(+20^{\circ}\text{C}) \geq 0.7$ (at 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |
| Insulation Resistance           | When measured between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500V <sub>dc</sub> , the insulation resistance shall not be less than 100MΩ.                                                                                                                                                                                                                                                                             |                    |                            |             |                                      |                 |                              |
| Insulation Withstanding Voltage | When a voltage of 2,000Vac is applied for 1 minute between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.                                                                                                                                                                                                                                                                                                                         |                    |                            |             |                                      |                 |                              |
| Endurance                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 85°C. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                                                             | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                            |             |                                      |                 |                              |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |
| Shelf Life                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                            |             |                                      |                 |                              |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |

### DIMENSIONS (Screw-Mount) [mm]

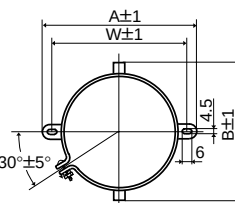
● Terminal Code : LG

● Mounting Clamp Code : B

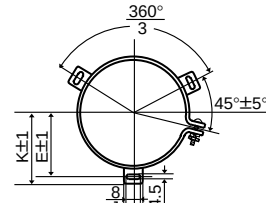
● Mounting Clamp Code : C



$\phi 50$  &  $\phi 63.5$  : G=6  
 $\phi 76.2$  &  $\phi 89$  : G=5  
 $\phi 100$  : G=10



| φD   | A     | B    | W    | F    |
|------|-------|------|------|------|
| 50   | 78.0  | 64.0 | 68.0 | 22.4 |
| 63.5 | 90.0  | 76.0 | 80.0 | 28.0 |
| 76.2 | 104.5 | 90.0 | 93.5 | 31.5 |



| φD   | E    | K    | F    | J    |
|------|------|------|------|------|
| 50   | 32.5 | 37.0 | 22.4 | 14.0 |
| 63.5 | 38.1 | 43.5 | 28.0 | 14.0 |
| 76.2 | 44.5 | 50.0 | 31.5 | 14.0 |
| 89   | 50.8 | 56.5 | 31.5 | 16.0 |
| 100  | 56.5 | 63.4 | 41.5 | 18.0 |

<Screw specifications>

$\phi 50$  to  $\phi 89$

Plus hexagon-headed screw :

M5X0.8X10

Maximum screw tightening torque :  
3.23Nm

$\phi 100$

Cross-recessed head (phillips)  
screw : M8X1.25X16

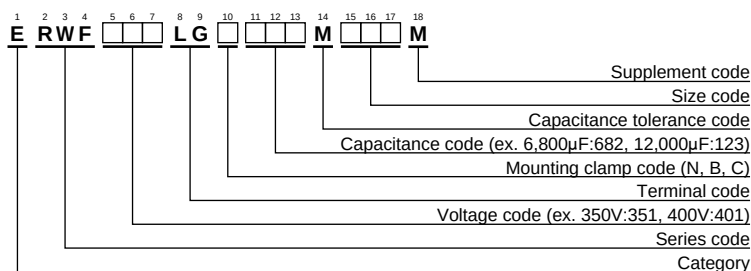
Spring washer

Washer

Maximum screw tightening torque :  
6.31Nm

\* The screw and the mounting clamp are separately supplied and not attached to the product.

### PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85°C

## RWF Series

### ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/ 85°C, 120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/ 85°C, 120Hz) | Part No.           |
|----------|----------|--------------------|------|------------------------------------------|--------------------|----------|----------|--------------------|------|------------------------------------------|--------------------|
| 350      | 1,200    | 50×60              | 0.25 | 4.90                                     | ERWF351LGC122MC60M | 400      | 5,600    | 63.5×190           | 0.25 | 18.2                                     | ERWF401LGC562MDK0M |
|          | 1,800    | 50×75              | 0.25 | 6.50                                     | ERWF351LGC182MC75M |          | 5,600    | 76.2×130           | 0.25 | 16.9                                     | ERWF401LGC562MED0M |
|          | 2,200    | 50×85              | 0.25 | 7.50                                     | ERWF351LGC222MC85M |          | 6,800    | 76.2×155           | 0.25 | 20.2                                     | ERWF401LGC682MEF5M |
|          | 2,200    | 50×96              | 0.25 | 7.70                                     | ERWF351LGC222MC96M |          | 8,200    | 76.2×170           | 0.25 | 22.8                                     | ERWF401LGC822MEH0M |
|          | 2,700    | 50×115             | 0.25 | 9.30                                     | ERWF351LGC272MCB5M |          | 10,000   | 89×155             | 0.25 | 26.6                                     | ERWF401LGC103MFF5M |
|          | 3,300    | 50×130             | 0.25 | 10.8                                     | ERWF351LGC332MCD0M |          | 12,000   | 89×170             | 0.25 | 30.0                                     | ERWF401LGC123MFH0M |
|          | 3,900    | 63.5×115           | 0.25 | 12.1                                     | ERWF351LGC392MDB5M |          | 15,000   | 100×190            | 0.25 | 33.7                                     | ERWF401LGC153MGK0M |
|          | 4,700    | 63.5×130           | 0.25 | 14.0                                     | ERWF351LGC472MDD0M |          | 18,000   | 100×220            | 0.25 | 37.4                                     | ERWF401LGC183MGN0M |
|          | 5,600    | 63.5×155           | 0.25 | 16.6                                     | ERWF351LGC562MDF5M | 450      | 820      | 50×60              | 0.25 | 4.00                                     | ERWF451LGC821MC60M |
|          | 5,600    | 76.2×115           | 0.25 | 16.1                                     | ERWF351LGC562MEB5M |          | 1,000    | 50×75              | 0.25 | 4.80                                     | ERWF451LGC102MC75M |
|          | 6,800    | 63.5×190           | 0.25 | 20.0                                     | ERWF351LGC682MDK0M |          | 1,200    | 50×85              | 0.25 | 5.60                                     | ERWF451LGC122MC85M |
|          | 6,800    | 76.2×130           | 0.25 | 18.6                                     | ERWF351LGC682MED0M |          | 1,200    | 50×96              | 0.25 | 5.70                                     | ERWF451LGC122MC96M |
|          | 8,200    | 76.2×155           | 0.25 | 22.2                                     | ERWF351LGC822MEF5M |          | 1,500    | 50×96              | 0.25 | 6.30                                     | ERWF451LGC152MC96M |
|          | 10,000   | 76.2×170           | 0.25 | 25.2                                     | ERWF351LGC103MEH0M |          | 1,800    | 50×115             | 0.25 | 7.60                                     | ERWF451LGC182MCB5M |
|          | 12,000   | 89×155             | 0.25 | 29.1                                     | ERWF351LGC123MFF5M |          | 2,200    | 50×130             | 0.25 | 8.80                                     | ERWF451LGC222MCD0M |
|          | 15,000   | 89×190             | 0.25 | 35.7                                     | ERWF351LGC153MFK0M |          | 2,700    | 63.5×115           | 0.25 | 10.1                                     | ERWF451LGC272MDB5M |
|          | 18,000   | 100×190            | 0.25 | 36.9                                     | ERWF351LGC183MGK0M |          | 3,300    | 63.5×130           | 0.25 | 11.7                                     | ERWF451LGC332MDD0M |
|          | 22,000   | 100×250            | 0.25 | 46.1                                     | ERWF351LGC223MGR0M |          | 3,900    | 63.5×155           | 0.25 | 13.8                                     | ERWF451LGC392MDF5M |
| 400      | 1,000    | 50×60              | 0.25 | 4.40                                     | ERWF401LGC102MC60M |          | 3,900    | 76.2×115           | 0.25 | 13.4                                     | ERWF451LGC392MEB5M |
|          | 1,500    | 50×75              | 0.25 | 5.90                                     | ERWF401LGC152MC75M |          | 4,700    | 63.5×190           | 0.25 | 16.7                                     | ERWF451LGC472MDK0M |
|          | 1,800    | 50×85              | 0.25 | 6.80                                     | ERWF401LGC182MC85M |          | 4,700    | 76.2×130           | 0.25 | 15.5                                     | ERWF451LGC472MED0M |
|          | 1,800    | 50×96              | 0.25 | 7.00                                     | ERWF401LGC182MC96M |          | 5,600    | 76.2×155           | 0.25 | 18.3                                     | ERWF451LGC562MEF5M |
|          | 2,200    | 50×105             | 0.25 | 8.00                                     | ERWF401LGC222MCA5M |          | 6,800    | 76.2×170           | 0.25 | 20.7                                     | ERWF451LGC682MEH0M |
|          | 2,700    | 50×130             | 0.25 | 9.80                                     | ERWF401LGC272MCD0M |          | 8,200    | 89×155             | 0.25 | 24.1                                     | ERWF451LGC822MFF5M |
|          | 3,300    | 63.5×115           | 0.25 | 11.1                                     | ERWF401LGC332MDB5M |          | 10,000   | 89×170             | 0.25 | 27.8                                     | ERWF451LGC103MFH0M |
|          | 3,900    | 63.5×130           | 0.25 | 12.7                                     | ERWF401LGC392MDD0M |          | 12,000   | 100×190            | 0.25 | 29.3                                     | ERWF451LGC123MGK0M |
|          | 4,700    | 63.5×155           | 0.25 | 15.2                                     | ERWF401LGC472MDF5M |          | 15,000   | 100×250            | 0.25 | 37.0                                     | ERWF451LGC153MGR0M |
|          | 4,700    | 76.2×115           | 0.25 | 14.7                                     | ERWF401LGC472MEB5M |          |          |                    |      |                                          |                    |

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency (Hz) | 50  | 120 | 300 | 1k  | 3k  |
|----------------|-----|-----|-----|-----|-----|
| Coefficient    | 0.8 | 1.0 | 1.1 | 1.3 | 1.4 |

Note : The endurance of capacitors is reduced with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for the RWF series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For details, please contact a representative of Nippon Chemi-Con.



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85°C

## RWQ Series

- Downsized and high ripple current from RWE series
- Endurance with ripple current : 2,000 hours at 85°C
- RoHS Compliant

RWQ

Downsized

RWE



### SPECIFICATIONS

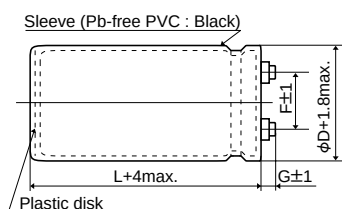
| Items                           | Characteristics                                                                                                                                                                                                                                                                   |                                      |             |                 |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------|-----------------|
| Category                        | -25 to +85℃                                                                                                                                                                                                                                                                       |                                      |             |                 |
| Temperature Range               |                                                                                                                                                                                                                                                                                   |                                      |             |                 |
| Rated Voltage Range             | 350 to 550V <sub>dc</sub>                                                                                                                                                                                                                                                         |                                      |             |                 |
| Capacitance Tolerance           | ±20% (M)                                                                                                                                                                                                                                                                          |                                      |             | (at 20℃, 120Hz) |
| Leakage Current                 | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V <sub>dc</sub> )<br>(at 20℃ after 5 minutes)                                                                                                    |                                      |             |                 |
| Dissipation Factor (tanδ)       | 0.25 max.                                                                                                                                                                                                                                                                         |                                      |             | (at 20℃, 120Hz) |
| Low Temperature Characteristics | Rated voltage (V <sub>dc</sub> )                                                                                                                                                                                                                                                  | 350 to 450V                          | 500 to 550V | (at 120Hz)      |
|                                 | C(-25℃) / C(+20℃)                                                                                                                                                                                                                                                                 | ≥0.7                                 | ≥0.6        |                 |
| Insulation Resistance           | When measured between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500V <sub>dc</sub> , the insulation resistance shall not be less than 100MΩ.                                  |                                      |             |                 |
| Insulation Withstanding Voltage | When a voltage of 2,000Vac is applied for 1 minute between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.                                                                              |                                      |             |                 |
| Endurance                       | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 85℃.                                                                                            |                                      |             |                 |
|                                 | Capacitance change                                                                                                                                                                                                                                                                | ≤±20% of the initial value           |             |                 |
|                                 | D.F. (tanδ)                                                                                                                                                                                                                                                                       | ≤300% of the initial specified value |             |                 |
|                                 | Leakage current                                                                                                                                                                                                                                                                   | ≤The initial specified value         |             |                 |
| Shelf Life                      | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 500 hours at 85℃ without voltage applied.Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |             |                 |
|                                 | Capacitance change                                                                                                                                                                                                                                                                | ≤±20% of the initial value           |             |                 |
|                                 | D.F. (tanδ)                                                                                                                                                                                                                                                                       | ≤300% of the initial specified value |             |                 |
|                                 | Leakage current                                                                                                                                                                                                                                                                   | ≤The initial specified value         |             |                 |

### DIMENSIONS (Screw-Mount) [mm]

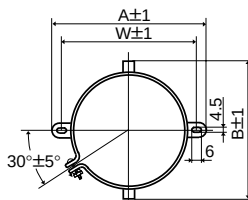
● Terminal Code : LG

● Mounting Clamp Code : B

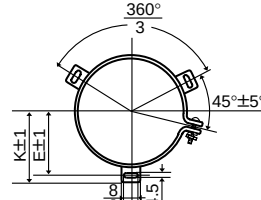
● Mounting Clamp Code : C



φ50 & φ63.5 : G=6  
φ76.2 & φ89 : G=5



| φD   | A     | B    | W    | F    |
|------|-------|------|------|------|
| 50   | 78.0  | 64.0 | 68.0 | 22.4 |
| 63.5 | 90.0  | 76.0 | 80.0 | 28.0 |
| 76.2 | 104.5 | 90.0 | 93.5 | 31.5 |



| φD   | E    | K    | F    | J    |
|------|------|------|------|------|
| 50   | 32.5 | 37.0 | 22.4 | 14.0 |
| 63.5 | 38.1 | 43.5 | 28.0 | 14.0 |
| 76.2 | 44.5 | 50.0 | 31.5 | 14.0 |
| 89   | 50.8 | 56.5 | 31.5 | 16.0 |

&lt;Screw specifications&gt;

φ50 to φ89

Plus hexagon-headed screw :

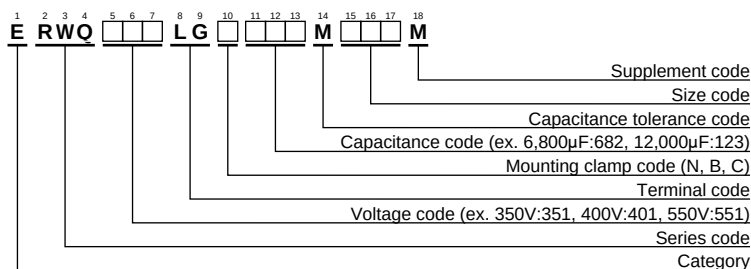
M5×0.8×10

Maximum screw tightening torque :

3.23Nm

\* The screw and the mounting clamp are separately supplied and not attached to the product.

### PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"


**RWQ** Series

**◆STANDARD RATINGS**

| WV (Vdc) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (Arms/ 85°C,120Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case size φDXL(mm) | tanδ | Rated ripple current (Arms/ 85°C,120Hz) | Part No.           |
|----------|----------|--------------------|------|-----------------------------------------|--------------------|----------|----------|--------------------|------|-----------------------------------------|--------------------|
| 350      | 1,500    | 50 × 65            | 0.25 | 5.09                                    | ERWQ351LGC152MC65M | 500      | 470      | 50 × 60            | 0.25 | 2.17                                    | ERWQ501LGC471MC60M |
|          | 1,800    | 50 × 75            | 0.25 | 5.93                                    | ERWQ351LGC182MC75M |          | 680      | 50 × 65            | 0.25 | 2.70                                    | ERWQ501LGC681MC65M |
|          | 2,200    | 50 × 96            | 0.25 | 7.30                                    | ERWQ351LGC222MC96M |          | 820      | 50 × 75            | 0.25 | 3.15                                    | ERWQ501LGC821MC75M |
|          | 2,700    | 50 × 115           | 0.25 | 8.76                                    | ERWQ351LGC272MCB5M |          | 1,000    | 50 × 85            | 0.25 | 3.67                                    | ERWQ501LGC102MC85M |
|          | 3,300    | 63.5 × 85          | 0.25 | 9.71                                    | ERWQ351LGC332MD85M |          | 1,200    | 50 × 96            | 0.25 | 4.22                                    | ERWQ501LGC122MC96M |
|          | 3,900    | 50 × 130           | 0.25 | 11.1                                    | ERWQ351LGC392MCD0M |          | 1,500    | 50 × 115           | 0.25 | 5.14                                    | ERWQ501LGC152MCB5M |
|          | 3,900    | 63.5 × 96          | 0.25 | 11.1                                    | ERWQ351LGC392MD96M |          | 1,500    | 63.5 × 96          | 0.25 | 5.42                                    | ERWQ501LGC152MD96M |
|          | 4,700    | 63.5 × 115         | 0.25 | 13.2                                    | ERWQ351LGC472MDB5M |          | 1,800    | 50 × 130           | 0.25 | 5.95                                    | ERWQ501LGC182MCD0M |
|          | 5,600    | 63.5 × 130         | 0.25 | 15.2                                    | ERWQ351LGC562MDD0M |          | 1,800    | 63.5 × 96          | 0.25 | 5.94                                    | ERWQ501LGC182MD96M |
|          | 5,600    | 76.2 × 96          | 0.25 | 14.3                                    | ERWQ351LGC562ME96M |          | 2,200    | 63.5 × 115         | 0.25 | 7.10                                    | ERWQ501LGC222MDB5M |
|          | 6,800    | 76.2 × 115         | 0.25 | 17.0                                    | ERWQ351LGC682MEB5M |          | 2,200    | 76.2 × 96          | 0.25 | 7.30                                    | ERWQ501LGC222ME96M |
|          | 8,200    | 76.2 × 130         | 0.25 | 19.6                                    | ERWQ351LGC822MED0M |          | 2,700    | 63.5 × 130         | 0.25 | 8.31                                    | ERWQ501LGC272MDD0M |
|          | 10,000   | 76.2 × 155         | 0.25 | 23.4                                    | ERWQ351LGC103MEF5M |          | 3,300    | 76.2 × 115         | 0.25 | 9.65                                    | ERWQ501LGC332MEB5M |
|          | 12,000   | 89 × 130           | 0.25 | 24.1                                    | ERWQ351LGC123MFD0M |          | 3,900    | 76.2 × 130         | 0.25 | 11.1                                    | ERWQ501LGC392MED0M |
|          | 15,000   | 89 × 155           | 0.25 | 29.1                                    | ERWQ351LGC153MFF5M |          | 4,700    | 76.2 × 155         | 0.25 | 13.1                                    | ERWQ501LGC472MEF5M |
| 400      | 1,200    | 50 × 65            | 0.25 | 4.55                                    | ERWQ401LGC122MC65M | 550      | 6,800    | 89 × 155           | 0.25 | 15.9                                    | ERWQ501LGC682MFF5M |
|          | 1,500    | 50 × 75            | 0.25 | 5.41                                    | ERWQ401LGC152MC75M |          | 390      | 50 × 60            | 0.25 | 1.98                                    | ERWQ551LGC391MC60M |
|          | 1,800    | 50 × 85            | 0.25 | 6.26                                    | ERWQ401LGC182MC85M |          | 560      | 50 × 65            | 0.25 | 2.45                                    | ERWQ551LGC561MC65M |
|          | 2,200    | 50 × 96            | 0.25 | 7.30                                    | ERWQ401LGC222MC96M |          | 680      | 50 × 75            | 0.25 | 2.87                                    | ERWQ551LGC681MC75M |
|          | 2,700    | 50 × 115           | 0.25 | 8.76                                    | ERWQ401LGC272MCB5M |          | 820      | 50 × 85            | 0.25 | 3.32                                    | ERWQ551LGC821MC85M |
|          | 3,300    | 63.5 × 96          | 0.25 | 10.2                                    | ERWQ401LGC332MD96M |          | 1,200    | 50 × 115           | 0.25 | 4.60                                    | ERWQ551LGC122MCB5M |
|          | 3,900    | 63.5 × 115         | 0.25 | 12.0                                    | ERWQ401LGC392MDB5M |          | 1,500    | 63.5 × 96          | 0.25 | 5.42                                    | ERWQ551LGC152MD96M |
|          | 4,700    | 63.5 × 130         | 0.25 | 13.9                                    | ERWQ401LGC472MDD0M |          | 1,800    | 76.2 × 80          | 0.25 | 6.12                                    | ERWQ551LGC182ME80M |
|          | 4,700    | 76.2 × 96          | 0.25 | 13.1                                    | ERWQ401LGC472ME96M |          | 2,200    | 76.2 × 96          | 0.25 | 7.30                                    | ERWQ551LGC222ME96M |
|          | 5,600    | 63.5 × 155         | 0.25 | 16.5                                    | ERWQ401LGC562MDF5M |          | 2,700    | 76.2 × 115         | 0.25 | 8.73                                    | ERWQ551LGC272MEB5M |
|          | 6,800    | 76.2 × 115         | 0.25 | 17.0                                    | ERWQ401LGC682MEB5M |          | 3,300    | 76.2 × 130         | 0.25 | 10.2                                    | ERWQ551LGC332MED0M |
|          | 8,200    | 76.2 × 155         | 0.25 | 21.2                                    | ERWQ401LGC822MEF5M |          | 5,600    | 89 × 155           | 0.25 | 14.5                                    | ERWQ551LGC562MFF5M |
|          | 10,000   | 89 × 130           | 0.25 | 22.0                                    | ERWQ401LGC103MFD0M |          |          |                    |      |                                         |                    |
|          | 12,000   | 89 × 155           | 0.25 | 26.0                                    | ERWQ401LGC123MFF5M |          |          |                    |      |                                         |                    |
| 450      | 1,000    | 50 × 70            | 0.25 | 3.87                                    | ERWQ451LGC102MC70M |          |          |                    |      |                                         |                    |
|          | 1,200    | 50 × 75            | 0.25 | 4.36                                    | ERWQ451LGC122MC75M |          |          |                    |      |                                         |                    |
|          | 1,500    | 50 × 90            | 0.25 | 5.28                                    | ERWQ451LGC152MC90M |          |          |                    |      |                                         |                    |
|          | 1,800    | 50 × 96            | 0.25 | 5.95                                    | ERWQ451LGC182MC96M |          |          |                    |      |                                         |                    |
|          | 2,200    | 50 × 130           | 0.25 | 7.54                                    | ERWQ451LGC222MCD0M |          |          |                    |      |                                         |                    |
|          | 2,700    | 63.5 × 96          | 0.25 | 8.34                                    | ERWQ451LGC272MD96M |          |          |                    |      |                                         |                    |
|          | 3,300    | 63.5 × 115         | 0.25 | 9.97                                    | ERWQ451LGC332MDB5M |          |          |                    |      |                                         |                    |
|          | 3,900    | 63.5 × 130         | 0.25 | 11.4                                    | ERWQ451LGC392MDD0M |          |          |                    |      |                                         |                    |
|          | 3,900    | 76.2 × 96          | 0.25 | 11.1                                    | ERWQ451LGC392ME96M |          |          |                    |      |                                         |                    |
|          | 4,700    | 63.5 × 155         | 0.25 | 13.6                                    | ERWQ451LGC472MDF5M |          |          |                    |      |                                         |                    |
|          | 4,700    | 76.2 × 115         | 0.25 | 13.2                                    | ERWQ451LGC472MEB5M |          |          |                    |      |                                         |                    |
|          | 5,600    | 76.2 × 130         | 0.25 | 15.2                                    | ERWQ451LGC562MED0M |          |          |                    |      |                                         |                    |
|          | 6,800    | 76.2 × 155         | 0.25 | 18.1                                    | ERWQ451LGC682MEF5M |          |          |                    |      |                                         |                    |
|          | 8,200    | 89 × 130           | 0.25 | 19.2                                    | ERWQ451LGC822MFD0M |          |          |                    |      |                                         |                    |

**◆RATED RIPPLE CURRENT MULTIPLIERS**
**●Frequency Multipliers**

| Frequency (Hz) | 50  | 120 | 300 | 1k  | 3k  |
|----------------|-----|-----|-----|-----|-----|
| Coefficient    | 0.8 | 1.0 | 1.1 | 1.3 | 1.4 |

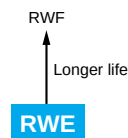
Note : The endurance of capacitors is shorted with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for the RWQ series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For the details, please contact a representative of Nippon Chemi-Con.



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85°C

## RWE Series

- Rated voltage range : 350 to 550V<sub>dc</sub>
- Endurance with ripple current : 85°C 2,000 hours
- RoHS Compliant



### ◆SPECIFICATIONS

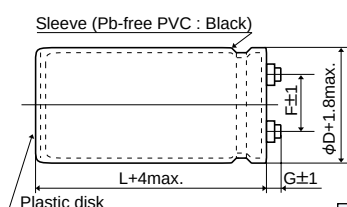
| Items                           | Characteristics                                                                                                                                                                                                                                                                    |                                      |             |            |            |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------|------------|------------|
| Category                        |                                                                                                                                                                                                                                                                                    |                                      |             |            |            |
| Temperature Range               | -25 to +85℃                                                                                                                                                                                                                                                                        |                                      |             |            |            |
| Rated Voltage Range             | 350 to 550V <sub>dc</sub>                                                                                                                                                                                                                                                          |                                      |             |            |            |
| Capacitance Tolerance           | ±20% (M) (at 20℃, 120Hz)                                                                                                                                                                                                                                                           |                                      |             |            |            |
| Leakage Current                 | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 5 minutes)                                                                                                                       |                                      |             |            |            |
| Dissipation Factor (tanδ)       | 0.25 max. (at 20℃, 120Hz)                                                                                                                                                                                                                                                          |                                      |             |            |            |
| Low Temperature Characteristics | Capacitance change                                                                                                                                                                                                                                                                 | Rated Voltage (V <sub>dc</sub> )     | 350 to 450V | 500 & 550V | (at 120Hz) |
|                                 |                                                                                                                                                                                                                                                                                    | C(-25℃)/C(+20℃)                      | ≥0.7        | ≥0.6       |            |
| Insulation Resistance           | When measured between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500V <sub>dc</sub> , the insulation resistance shall not be less than 100MΩ.                  |                                      |             |            |            |
| Insulation Withstanding Voltage | When a voltage of 2,000Vac is applied for 1 minute between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.                                                              |                                      |             |            |            |
| Endurance                       | The following specifications shall be satisfied when the capacitors are restored to 20℃ after subjected to DC voltage with the rated ripple current is applied for 2,000 hours at 85℃.                                                                                             |                                      |             |            |            |
|                                 | Capacitance change                                                                                                                                                                                                                                                                 | ≤±20% of the initial value           |             |            |            |
|                                 | D.F. (tanδ)                                                                                                                                                                                                                                                                        | ≤300% of the initial specified value |             |            |            |
|                                 | Leakage current                                                                                                                                                                                                                                                                    | ≤The initial specified value         |             |            |            |
| Shelf Life                      | The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 500 hours at 85℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                      |             |            |            |
|                                 | Capacitance change                                                                                                                                                                                                                                                                 | ≤±20% of the initial value           |             |            |            |
|                                 | D.F. (tanδ)                                                                                                                                                                                                                                                                        | ≤300% of the initial specified value |             |            |            |
|                                 | Leakage current                                                                                                                                                                                                                                                                    | ≤The initial specified value         |             |            |            |

### ◆DIMENSIONS (Screw-Mount) [mm]

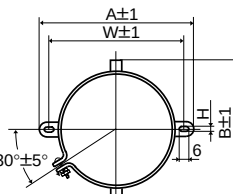
● Terminal Code : LG

● Mounting Clamp Code : B

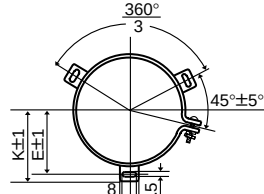
● Mounting Clamp Code : C



φ35 to φ63.5 : G=6  
φ76.2 & φ89 : G=5



| φD   | A     | B    | W    | H   | F    |
|------|-------|------|------|-----|------|
| 35   | 58.0  | 44.0 | 48.0 | 3.5 | 12.7 |
| 50   | 78.0  | 64.0 | 68.0 | 4.5 | 22.4 |
| 63.5 | 90.0  | 76.0 | 80.0 | 4.5 | 28.0 |
| 76.2 | 104.5 | 90.0 | 93.5 | 4.5 | 31.5 |



| φD   | E    | K    | F    | J    |
|------|------|------|------|------|
| 50   | 32.5 | 37.0 | 22.4 | 14.0 |
| 63.5 | 38.1 | 43.5 | 28.0 | 14.0 |
| 76.2 | 44.5 | 50.0 | 31.5 | 14.0 |
| 89   | 50.8 | 56.5 | 31.5 | 16.0 |

&lt;Screw specifications&gt;

Plus hexagon-headed screw:

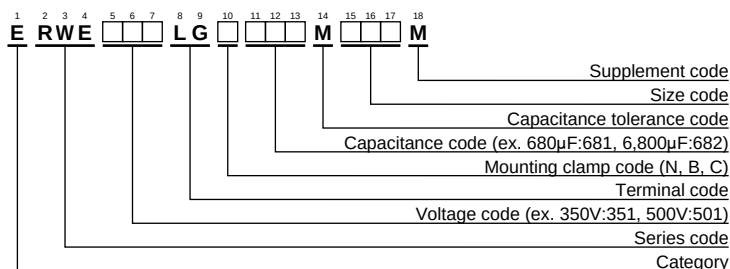
M5X0.8X10

Maximum screw tightening torque:

3.23Nm

\* The screw and the mounting clamp are separately supplied and not attached to the product.

### ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"


**RWE**Series

**◆STANDARD RATINGS**

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|
| 350         | 390         | 35×50                 | 0.25 | 1.90                                             | ERWE351LGB391MA50M | 450         | 2,700       | 63.5×115              | 0.25 | 8.60                                             | ERWE451LGC272MDB5M |
|             | 680         | 35×80                 | 0.25 | 2.90                                             | ERWE351LGB681MA80M |             | 3,300       | 63.5×130              | 0.25 | 10.0                                             | ERWE451LGC332MDD0M |
|             | 1,000       | 35×100                | 0.25 | 3.80                                             | ERWE351LGB102MAA0M |             | 3,300       | 76.2×96               | 0.25 | 9.80                                             | ERWE451LGC332ME96M |
|             | 1,200       | 35×120                | 0.25 | 4.20                                             | ERWE351LGB122MAC0M |             | 3,900       | 76.2×115              | 0.25 | 11.5                                             | ERWE451LGC392MEB5M |
|             | 1,500       | 50×75                 | 0.25 | 4.70                                             | ERWE351LGC152MC75M |             | 4,700       | 76.2×130              | 0.25 | 13.3                                             | ERWE451LGC472MED0M |
|             | 2,200       | 50×96                 | 0.25 | 6.30                                             | ERWE351LGC222MCF5M |             | 5,600       | 76.2×155              | 0.25 | 15.7                                             | ERWE451LGC562MEF5M |
|             | 3,300       | 50×130                | 0.25 | 8.80                                             | ERWE351LGC332MCD0M |             | 8,200       | 89×155                | 0.25 | 18.6                                             | ERWE451LGC822MFF5M |
|             | 3,300       | 63.5×96               | 0.25 | 8.80                                             | ERWE351LGC332MD96M | 500         | 120         | 35×50                 | 0.25 | 0.70                                             | ERWE501LGB121MA50M |
|             | 3,900       | 63.5×115              | 0.25 | 10.3                                             | ERWE351LGC392MDB5M |             | 270         | 35×80                 | 0.25 | 1.20                                             | ERWE501LGB271MA80M |
|             | 4,700       | 63.5×130              | 0.25 | 12.0                                             | ERWE351LGC472MDD0M |             | 330         | 35×100                | 0.25 | 1.40                                             | ERWE501LGB331MAA0M |
|             | 4,700       | 76.2×96               | 0.25 | 11.7                                             | ERWE351LGC472ME96M |             | 390         | 35×120                | 0.25 | 1.70                                             | ERWE501LGB391MAC0M |
|             | 5,600       | 76.2×115              | 0.25 | 12.6                                             | ERWE351LGC562MEB5M |             | 470         | 50×75                 | 0.25 | 1.80                                             | ERWE501LGC471MC75M |
|             | 6,800       | 76.2×130              | 0.25 | 15.9                                             | ERWE351LGC682MED0M |             | 680         | 50×96                 | 0.25 | 2.50                                             | ERWE501LGC681MC96M |
|             | 8,200       | 76.2×155              | 0.25 | 19.0                                             | ERWE351LGC822MEF5M |             | 820         | 50×115                | 0.25 | 2.90                                             | ERWE501LGC821MCB5M |
|             | 12,000      | 89×155                | 0.25 | 22.5                                             | ERWE351LGC123MFF5M |             | 1,000       | 50×130                | 0.25 | 3.40                                             | ERWE501LGC102MCD0M |
| 400         | 330         | 35×50                 | 0.25 | 1.70                                             | ERWE401LGB331MA50M |             | 1,000       | 63.5×96               | 0.25 | 3.40                                             | ERWE501LGC102MD96M |
|             | 560         | 35×80                 | 0.25 | 2.70                                             | ERWE401LGB561MA80M |             | 1,500       | 63.5×115              | 0.25 | 4.50                                             | ERWE501LGC152MDB5M |
|             | 820         | 35×100                | 0.25 | 3.40                                             | ERWE401LGB821MAA0M |             | 1,500       | 76.2×96               | 0.25 | 4.60                                             | ERWE501LGC152ME96M |
|             | 1,000       | 35×120                | 0.25 | 3.90                                             | ERWE401LGB102MAC0M |             | 1,800       | 63.5×130              | 0.25 | 5.20                                             | ERWE501LGC182MDD0M |
|             | 1,200       | 50×75                 | 0.25 | 4.20                                             | ERWE401LGC122MC75M |             | 2,200       | 76.2×115              | 0.25 | 6.10                                             | ERWE501LGC222MEB5M |
|             | 1,800       | 50×96                 | 0.25 | 5.70                                             | ERWE401LGC182MC96M |             | 2,700       | 76.2×155              | 0.25 | 7.70                                             | ERWE501LGC272MEF5M |
|             | 2,200       | 50×130                | 0.25 | 7.20                                             | ERWE401LGC222MCD0M |             | 3,900       | 89×155                | 0.25 | 10.1                                             | ERWE501LGC392MFF5M |
|             | 2,700       | 63.5×96               | 0.25 | 7.90                                             | ERWE401LGC272MD96M | 550         | 100         | 35×50                 | 0.25 | 0.60                                             | ERWE551LGB101MA50M |
|             | 3,300       | 63.5×115              | 0.25 | 9.50                                             | ERWE401LGC332MDB5M |             | 180         | 35×80                 | 0.25 | 1.00                                             | ERWE551LGB181MA80M |
|             | 3,900       | 63.5×130              | 0.25 | 10.9                                             | ERWE401LGC392MDD0M |             | 270         | 35×100                | 0.25 | 1.30                                             | ERWE551LGB271MAA0M |
|             | 3,900       | 76.2×96               | 0.25 | 10.6                                             | ERWE401LGC392ME96M |             | 330         | 35×120                | 0.25 | 1.60                                             | ERWE551LGB331MAC0M |
|             | 4,700       | 76.2×115              | 0.25 | 12.6                                             | ERWE401LGC472MEB5M |             | 390         | 50×75                 | 0.25 | 1.70                                             | ERWE551LGC391MC75M |
|             | 5,600       | 76.2×130              | 0.25 | 14.5                                             | ERWE401LGC562MED0M |             | 560         | 50×96                 | 0.25 | 2.10                                             | ERWE551LGC561MC96M |
|             | 6,800       | 76.2×155              | 0.25 | 17.3                                             | ERWE401LGC682MEF5M |             | 560         | 63.5×96               | 0.25 | 2.50                                             | ERWE551LGC561MD96M |
|             | 10,000      | 89×155                | 0.25 | 20.5                                             | ERWE401LGC103MFF5M |             | 680         | 50×115                | 0.25 | 2.70                                             | ERWE551LGC681MCB5M |
| 450         | 270         | 35×50                 | 0.25 | 1.60                                             | ERWE451LGB271MA50M |             | 680         | 63.5×115              | 0.25 | 3.00                                             | ERWE551LGC681MDB5M |
|             | 470         | 35×80                 | 0.25 | 2.40                                             | ERWE451LGB471MA80M |             | 820         | 50×130                | 0.25 | 3.10                                             | ERWE551LGC821MCD0M |
|             | 680         | 35×100                | 0.25 | 3.10                                             | ERWE451LGB681MAA0M |             | 820         | 63.5×130              | 0.25 | 3.50                                             | ERWE551LGC821MDD0M |
|             | 820         | 35×120                | 0.25 | 3.50                                             | ERWE451LGB821MAC0M |             | 1,200       | 76.2×96               | 0.25 | 4.20                                             | ERWE551LGC122ME96M |
|             | 1,000       | 50×75                 | 0.25 | 3.90                                             | ERWE451LGC102MC75M |             | 1,500       | 76.2×115              | 0.25 | 5.00                                             | ERWE551LGC152MEB5M |
|             | 1,200       | 50×96                 | 0.25 | 4.70                                             | ERWE451LGC122MC96M |             | 1,800       | 76.2×130              | 0.25 | 5.80                                             | ERWE551LGC182MED0M |
|             | 1,500       | 50×115                | 0.25 | 5.60                                             | ERWE451LGC152MCB5M |             | 2,200       | 76.2×155              | 0.25 | 7.00                                             | ERWE551LGC222MEF5M |
|             | 1,800       | 50×130                | 0.25 | 6.50                                             | ERWE451LGC182MCD0M |             | 3,300       | 89×155                | 0.25 | 9.30                                             | ERWE551LGC332MFF5M |
|             | 2,200       | 63.5×96               | 0.25 | 7.20                                             | ERWE451LGC222MD96M |             |             |                       |      |                                                  |                    |
|             |             |                       |      |                                                  |                    |             |             |                       |      |                                                  |                    |

**◆RATED RIPLE CURRENT MULTIPLIERS**
**●Frequency Multipliers**

| Frequency (Hz) | 50  | 120 | 300 | 1k  | 3k  |
|----------------|-----|-----|-----|-----|-----|
| Coefficient    | 0.8 | 1.0 | 1.1 | 1.3 | 1.4 |

Note : The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5 to 10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for the RWE series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For details, please contact a representative of Nippon Chemi-Con.



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85°C

## RWY Series

- High ripple capability
- Endurance with ripple current : 5,000 hours at 85°C
- Reduced cost design for three-phase input inverters
- RoHS Compliant

RWY

Low price version

RWF



### ◆ SPECIFICATIONS

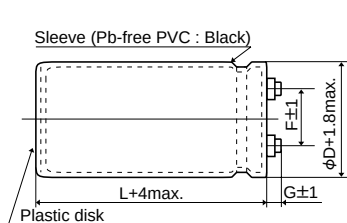
| Items                           | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                            |             |                                      |                 |                              |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-------------|--------------------------------------|-----------------|------------------------------|
| Category                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                            |             |                                      |                 |                              |
| Temperature Range               | -25 to +85°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| Rated Voltage Range             | 350 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                            |             |                                      |                 |                              |
| Capacitance Tolerance           | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                            |             |                                      |                 |                              |
| Leakage Current                 | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                                                                                                                                                                                                                                                   |                    |                            |             |                                      |                 |                              |
| Dissipation Factor (tanδ)       | 0.12 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |
| Low Temperature Characteristics | Capacitance change $C(-25^{\circ}\text{C})/C(+20^{\circ}\text{C}) \geq 0.7$ (at 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                            |             |                                      |                 |                              |
| Insulation Resistance           | When it is measured between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500V <sub>dc</sub> , the insulation resistance shall not be less than 100MΩ.                                                                                                                                                                                                                                                                         |                    |                            |             |                                      |                 |                              |
| Insulation Withstanding Voltage | When a voltage of 2,000Vac is applied for 1 minute between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.                                                                                                                                                                                                                                                                                                                           |                    |                            |             |                                      |                 |                              |
| Endurance                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 85°C. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                                                               | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                            |             |                                      |                 |                              |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| Shelf Life                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                            |             |                                      |                 |                              |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |

### ◆ DIMENSIONS (Screw-Mount) [mm]

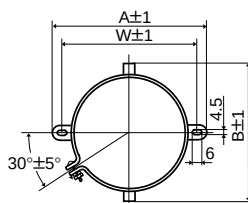
● Terminal Code : LG

● Mounting Clamp Code : B

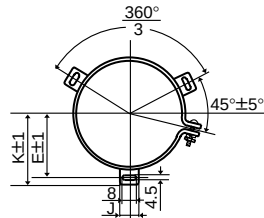
● Mounting Clamp Code : C



φ50 to φ76.2 : G=6  
 φ89 : G=4  
 φ100 : G=10



| φD   | A     | B    | W    | F    |
|------|-------|------|------|------|
| 50   | 78.0  | 64.0 | 68.0 | 22.4 |
| 63.5 | 90.0  | 76.0 | 80.0 | 28.0 |
| 76.2 | 104.5 | 90.0 | 93.5 | 31.5 |



| φD   | E    | K    | F    | J    |
|------|------|------|------|------|
| 50   | 32.5 | 37.0 | 22.4 | 14.0 |
| 63.5 | 38.1 | 43.5 | 28.0 | 14.0 |
| 76.2 | 44.5 | 50.0 | 31.5 | 14.0 |
| 89   | 50.8 | 56.5 | 31.5 | 16.0 |
| 100  | 56.5 | 63.4 | 41.5 | 18.0 |

&lt;Screw specifications&gt;

φ50 to φ89

Plus hexagon-headed screw :

M5×0.8×10

Maximum screw tightening torque :  
3.23Nm

φ100

Cross-recessed head (Phillips)  
screw : M8×1.25×16

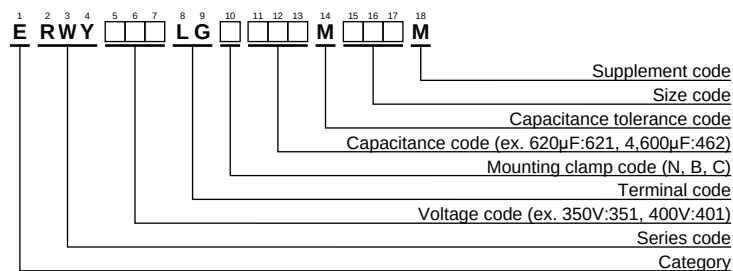
Spring washer

Washer

Maximum screw tightening torque :  
6.31Nm

\* The screw and the mounting clamp are separately supplied and not attached to the product.

### ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"


**RWY** Series

**◆STANDARD RATINGS**

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/ 85°C,300Hz) | Part No.           | WV (Vdc) | Cap (μF) | Case size φD×L(mm) | tanδ | Rated ripple current (Arms/ 85°C,300Hz) | Part No.           |
|----------|----------|--------------------|------|-----------------------------------------|--------------------|----------|----------|--------------------|------|-----------------------------------------|--------------------|
| 350      | 750      | 50×75              | 0.12 | 5.10                                    | ERWY351LGC751MC75M | 400      | 3,200    | 63.5×170           | 0.12 | 17.3                                    | ERWY401LGC322MDH0M |
|          | 1,100    | 50×96              | 0.12 | 6.90                                    | ERWY351LGC112MC96M |          | 3,400    | 76.2×130           | 0.12 | 17.5                                    | ERWY401LGC342MED0M |
|          | 1,300    | 50×105             | 0.12 | 7.80                                    | ERWY351LGC132MCA5M |          | 4,200    | 76.2×155           | 0.12 | 21.1                                    | ERWY401LGC422MEF5M |
|          | 1,600    | 50×130             | 0.12 | 9.50                                    | ERWY351LGC162MCD0M |          | 4,600    | 76.2×170           | 0.12 | 23.0                                    | ERWY401LGC462MEH0M |
|          | 1,800    | 63.5×96            | 0.12 | 10.0                                    | ERWY351LGC182MD96M |          | 5,700    | 89×155             | 0.12 | 24.7                                    | ERWY401LGC572MFF5M |
|          | 1,900    | 50×145             | 0.12 | 10.7                                    | ERWY351LGC192MCE5M |          | 6,400    | 89×170             | 0.12 | 27.0                                    | ERWY401LGC642MFH0M |
|          | 2,400    | 63.5×115           | 0.12 | 12.6                                    | ERWY351LGC242MDB5M |          | 7,000    | 89×190             | 0.12 | 30.0                                    | ERWY401LGC702MFK0M |
|          | 2,800    | 63.5×130           | 0.12 | 14.3                                    | ERWY351LGC282MDD0M |          | 7,900    | 100×190            | 0.12 | 34.0                                    | ERWY401LGC792MGK0M |
|          | 3,400    | 63.5×155           | 0.12 | 17.1                                    | ERWY351LGC342MDF5M |          | 9,400    | 100×220            | 0.12 | 39.6                                    | ERWY401LGC942MGN0M |
|          | 3,500    | 76.2×115           | 0.12 | 16.9                                    | ERWY351LGC352MEB5M |          | 12,000   | 100×270            | 0.12 | 49.2                                    | ERWY401LGC123MGT0M |
|          | 3,800    | 63.5×170           | 0.12 | 18.8                                    | ERWY351LGC382MDH0M | 450      | 500      | 50×75              | 0.12 | 4.00                                    | ERWY451LGC501MC75M |
|          | 4,000    | 76.2×130           | 0.12 | 19.0                                    | ERWY351LGC402MED0M |          | 710      | 50×96              | 0.12 | 5.20                                    | ERWY451LGC711MC96M |
|          | 5,000    | 76.2×155           | 0.12 | 23.0                                    | ERWY351LGC502MEF5M |          | 840      | 50×105             | 0.12 | 5.90                                    | ERWY451LGC841MCA5M |
|          | 5,600    | 76.2×170           | 0.12 | 25.3                                    | ERWY351LGC562MEH0M |          | 1,100    | 50×130             | 0.12 | 7.50                                    | ERWY451LGC112MCD0M |
|          | 6,900    | 89×155             | 0.12 | 27.2                                    | ERWY351LGC692MFF5M |          | 1,200    | 63.5×96            | 0.12 | 7.80                                    | ERWY451LGC122MD96M |
|          | 7,700    | 89×170             | 0.12 | 29.6                                    | ERWY351LGC772MFH0M |          | 1,300    | 50×145             | 0.12 | 8.40                                    | ERWY451LGC132MCE5M |
|          | 8,400    | 89×190             | 0.12 | 32.9                                    | ERWY351LGC842MFK0M |          | 1,600    | 63.5×115           | 0.12 | 9.80                                    | ERWY451LGC162MDB5M |
|          | 9,500    | 100×190            | 0.12 | 37.3                                    | ERWY351LGC952MGK0M |          | 1,800    | 63.5×130           | 0.12 | 10.9                                    | ERWY451LGC182MDD0M |
|          | 11,000   | 100×220            | 0.12 | 42.9                                    | ERWY351LGC113MGN0M |          | 2,300    | 63.5×155           | 0.12 | 13.3                                    | ERWY451LGC232MDF5M |
|          | 14,000   | 100×270            | 0.12 | 53.1                                    | ERWY351LGC143MGT0M |          | 2,300    | 76.2×115           | 0.12 | 13.0                                    | ERWY451LGC232MEB5M |
| 400      | 620      | 50×75              | 0.12 | 4.60                                    | ERWY401LGC621MC75M |          | 2,500    | 63.5×170           | 0.12 | 14.5                                    | ERWY451LGC252MDH0M |
|          | 880      | 50×96              | 0.12 | 6.10                                    | ERWY401LGC881MC96M |          | 2,700    | 76.2×130           | 0.12 | 14.8                                    | ERWY451LGC272MED0M |
|          | 1,000    | 50×105             | 0.12 | 6.80                                    | ERWY401LGC102MCA5M |          | 3,300    | 76.2×155           | 0.12 | 17.7                                    | ERWY451LGC332MEF5M |
|          | 1,400    | 50×130             | 0.12 | 8.90                                    | ERWY401LGC142MCD0M |          | 3,700    | 76.2×170           | 0.12 | 19.5                                    | ERWY451LGC372MEH0M |
|          | 1,500    | 63.5×96            | 0.12 | 9.10                                    | ERWY401LGC152MD96M |          | 4,600    | 89×155             | 0.12 | 22.2                                    | ERWY451LGC462MFF5M |
|          | 1,600    | 50×145             | 0.12 | 9.90                                    | ERWY401LGC162MCE5M |          | 5,100    | 89×170             | 0.12 | 24.1                                    | ERWY451LGC512MFH0M |
|          | 2,000    | 63.5×115           | 0.12 | 11.5                                    | ERWY401LGC202MDB5M |          | 5,700    | 89×190             | 0.12 | 27.1                                    | ERWY451LGC572MFK0M |
|          | 2,300    | 63.5×130           | 0.12 | 13.0                                    | ERWY401LGC232MDD0M |          | 6,400    | 100×190            | 0.12 | 30.6                                    | ERWY451LGC642MGK0M |
|          | 2,800    | 63.5×155           | 0.12 | 15.5                                    | ERWY401LGC282MDF5M |          | 7,600    | 100×220            | 0.12 | 35.6                                    | ERWY451LGC762MGN0M |
|          | 2,900    | 76.2×115           | 0.12 | 15.4                                    | ERWY401LGC292MEB5M |          | 9,500    | 100×270            | 0.12 | 43.7                                    | ERWY451LGC952MGT0M |

**◆RATED RIPPLE CURRENT MULTIPLIERS**
**●Frequency Multipliers**

| Frequency (Hz) | 120  | 300  | 1k   | 3k   |
|----------------|------|------|------|------|
| Coefficient    | 0.83 | 1.00 | 1.25 | 1.33 |

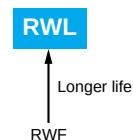
Note : The endurance of capacitors is reduced with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for RWY series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For details, please contact a representative of Nippon Chemi-Con.



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85°C

## RWL Series

- High ripple capability
- For train systems and high power consuming inverter circuits
- Endurance with ripple current : 20,000 hours at 85°C
- RoHS Compliant



### ◆ SPECIFICATIONS

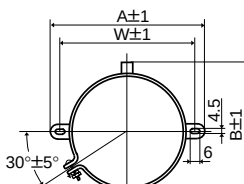
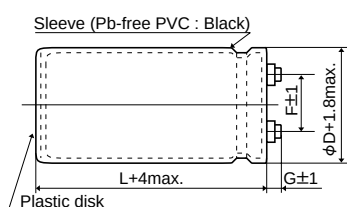
| Items                           | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                              |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-------------|--------------------------------------|-----------------|------------------------------|
| Category                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                              |
| Temperature Range               | -25 to +85°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |
| Rated Voltage Range             | 350 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |             |                                      |                 |                              |
| Capacitance Tolerance           | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |             |                                      |                 |                              |
| Leakage Current                 | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                                                                                                                                                                                                                                                 |                    |                            |             |                                      |                 |                              |
| Dissipation Factor (tanδ)       | 0.25 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| Low Temperature Characteristics | Capacitance change $C(-25^{\circ}\text{C})/C(+20^{\circ}\text{C}) \geq 0.7$ (at 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |
| Insulation Resistance           | When measured between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500V <sub>dc</sub> , the insulation resistance shall not be less than 100MΩ.                                                                                                                                                                                                                                                                             |                    |                            |             |                                      |                 |                              |
| Insulation Withstanding Voltage | When a voltage of 2,000Vac is applied for 1 minute between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.                                                                                                                                                                                                                                                                                                                         |                    |                            |             |                                      |                 |                              |
| Endurance                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied 20,000 hours at 85°C. <table border="1"> <tr> <td>Capacitance change</td><td>≤±30% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤300% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                                                                | Capacitance change | ≤±30% of the initial value | D.F. (tanδ) | ≤300% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change              | ≤±30% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                     | ≤300% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                            |             |                                      |                 |                              |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |
| Shelf Life                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤300% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤300% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                     | ≤300% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                            |             |                                      |                 |                              |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |

### ◆ DIMENSIONS (Screw-Mount) [mm]

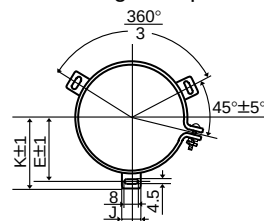
● Terminal Code : LG

● Mounting Clamp Code : B

● Mounting Clamp Code : C



| φD   | A     | B    | W    | F    |
|------|-------|------|------|------|
| 63.5 | 90.0  | 76.0 | 80.0 | 28.0 |
| 76.2 | 104.5 | 90.0 | 93.5 | 31.5 |



| φD   | E    | K    | F    | J    |
|------|------|------|------|------|
| 63.5 | 38.1 | 43.5 | 28.0 | 14.0 |
| 76.2 | 44.5 | 50.0 | 31.5 | 14.0 |
| 89   | 50.8 | 56.5 | 31.5 | 16.0 |

<Screw specifications>

Plus hexagon-headed screw:

M5×0.8×10

Maximum screw tightening torque:

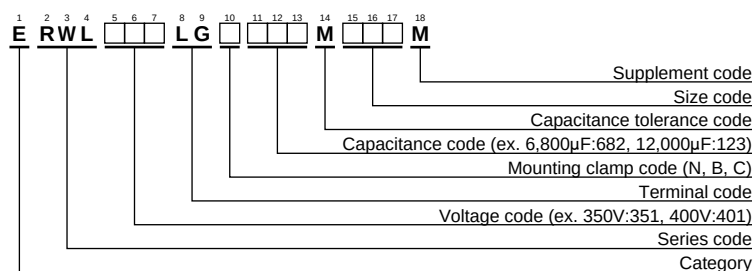
3.23Nm

φ63.5 : G=6

φ76.2 & φ89 : G=5

\* The screw and the mounting clamp are separately supplied and not attached to the product.

### ◆ PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85°C

## RWL Series

### ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>85°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|--------------------------------------------------|--------------------|
| 350         | 3,300       | 63.5×115              | 0.25 | 11.1                                             | ERWL351LGC332MDB5M | 400         | 5,600       | 63.5×190              | 0.25 | 18.2                                             | ERWL401LGC562MDK0M |
|             | 3,900       | 63.5×130              | 0.25 | 12.8                                             | ERWL351LGC392MDD0M |             | 5,600       | 76.2×155              | 0.25 | 18.3                                             | ERWL401LGC562MEF5M |
|             | 4,700       | 63.5×155              | 0.25 | 15.2                                             | ERWL351LGC472MDF5M |             | 6,800       | 76.2×170              | 0.25 | 21.0                                             | ERWL401LGC682MEH0M |
|             | 4,700       | 76.2×115              | 0.25 | 14.7                                             | ERWL351LGC472MEB5M |             | 8,200       | 89×155                | 0.25 | 24.1                                             | ERWL401LGC822MFF5M |
|             | 5,600       | 63.5×170              | 0.25 | 17.3                                             | ERWL351LGC562MDH0M |             | 10,000      | 89×190                | 0.25 | 29.1                                             | ERWL401LGC103MFK0M |
|             | 5,600       | 76.2×130              | 0.25 | 16.9                                             | ERWL351LGC562MED0M | 450         | 2,200       | 63.5×115              | 0.25 | 9.10                                             | ERWL451LGC222MDB5M |
|             | 6,800       | 63.5×190              | 0.25 | 20.0                                             | ERWL351LGC682MDK0M |             | 2,700       | 63.5×130              | 0.25 | 10.6                                             | ERWL451LGC272MDD0M |
|             | 6,800       | 76.2×155              | 0.25 | 20.2                                             | ERWL351LGC682MEF5M |             | 2,700       | 76.2×115              | 0.25 | 11.2                                             | ERWL451LGC272MEB5M |
|             | 8,200       | 76.2×170              | 0.25 | 23.1                                             | ERWL351LGC822MEH0M |             | 3,300       | 63.5×155              | 0.25 | 12.7                                             | ERWL451LGC332MDF5M |
|             | 10,000      | 89×155                | 0.25 | 26.6                                             | ERWL351LGC103MFF5M |             | 3,300       | 76.2×130              | 0.25 | 13.0                                             | ERWL451LGC332MED0M |
|             | 12,000      | 89×190                | 0.25 | 32.0                                             | ERWL351LGC123MFK0M |             | 3,900       | 63.5×170              | 0.25 | 14.4                                             | ERWL451LGC392MDH0M |
| 400         | 2,700       | 63.5×115              | 0.25 | 10.1                                             | ERWL401LGC272MDB5M |             | 4,700       | 76.2×155              | 0.25 | 16.7                                             | ERWL451LGC472MEF5M |
|             | 3,300       | 63.5×130              | 0.25 | 11.7                                             | ERWL401LGC332MDD0M |             | 5,600       | 76.2×190              | 0.25 | 20.1                                             | ERWL451LGC562MEK0M |
|             | 3,900       | 63.5×155              | 0.25 | 13.8                                             | ERWL401LGC392MDF5M |             | 5,600       | 89×155                | 0.25 | 19.9                                             | ERWL451LGC562MFF5M |
|             | 3,900       | 76.2×115              | 0.25 | 14.7                                             | ERWL401LGC392MEB5M |             | 6,800       | 89×170                | 0.25 | 23.0                                             | ERWL451LGC682MFH0M |
|             | 4,700       | 63.5×170              | 0.25 | 15.8                                             | ERWL401LGC472MDH0M |             | 8,200       | 89×190                | 0.25 | 26.4                                             | ERWL451LGC822MFK0M |
|             | 4,700       | 76.2×130              | 0.25 | 15.5                                             | ERWL401LGC472MED0M |             |             |                       |      |                                                  |                    |

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency (Hz) | 50  | 120 | 300 | 1k  | 3k  |
|----------------|-----|-----|-----|-----|-----|
| Coefficient    | 0.8 | 1.0 | 1.1 | 1.3 | 1.4 |

Note : The endurance of capacitors is reduced with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for RWL series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For details, please contact a representative of Nippon Chemi-Con.



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS Inverter-use screw terminal, 85°C

## FTP Series

- Ideal for inverter smoothing capacitors such as Electric Vehicles, Hybrid Cars, etc.
- Endurance with ripple current : 5,000 hours at 85°C
- Rated voltage range : 63 to 450V<sub>dc</sub>
- Lower profile offers drastic space saving compared with conventional cylindrical type
- Superior heat radiation realizes higher ripple current
- RoHS Compliant



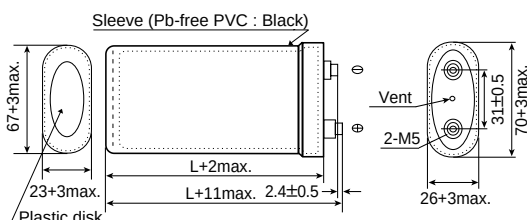
### ◆SPECIFICATIONS

| Items                                  | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-------------|--------------------------------------|-----------------|------------------------------|
| <b>Category</b>                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| <b>Temperature Range</b>               | -40 to +85°C (63~100V <sub>dc</sub> ), -25 to +85°C (350~450V <sub>dc</sub> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |
| <b>Rated Voltage Range</b>             | 63 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                            |             |                                      |                 |                              |
| <b>Capacitance Tolerance</b>           | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                    |                            |             |                                      |                 |                              |
| <b>Leakage Current</b>                 | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (µA), C : Nominal capacitance (µF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |
| <b>Dissipation Factor (tanδ)</b>       | 0.25 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                            |             |                                      |                 |                              |
| <b>Low Temperature Characteristics</b> | Capacitance change 63 to 100V <sub>dc</sub> : C(-40°C)/C(+20°C)≥0.6<br>350 to 450V <sub>dc</sub> : C(-25°C)/C(+20°C)≥0.7 (at 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                            |             |                                      |                 |                              |
| <b>Endurance</b>                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 85°C.<br><table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                                                               | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                            | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                              |
| Leakage current                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                            |             |                                      |                 |                              |
| <b>Shelf Life</b>                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.<br><table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change                     | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                            | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                              |
| Leakage current                        | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                            |             |                                      |                 |                              |

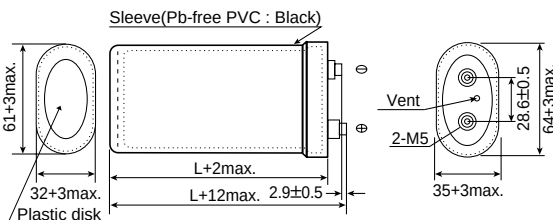
### ◆DIMENSIONS (Screw-Mount) [mm]

● Terminal Code : LG

● Size Code : L



● Size Code : R



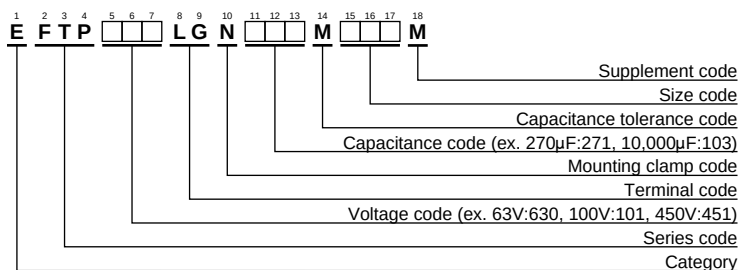
\* Polyolefin is available upon request.

<Screw specifications>

Plus hexagon-headed screw: M5×0.8

Maximum screw tightening torque: 3.23Nm

### ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"

### ◆SIZE CODE

| Code | Case size H×W×L (mm) |
|------|----------------------|
| L50  | 26×70×50             |
| L75  | 26×70×75             |
| L95  | 26×70×95             |
| R50  | 35×64×50             |
| R75  | 35×64×75             |
| R95  | 35×64×95             |

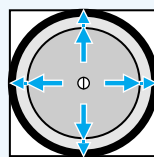

**FTP** Series

**◆STANDARD RATINGS**

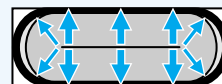
| WV (Vdc) | Cap (μF) | Case size H×W×L(mm) | tanδ | Rated ripple current (Arms/ 85°C,10kHz) | Part No.           | WV (Vdc) | Cap (μF) | Case size H×W×L(mm) | tanδ | Rated ripple current (Arms/ 85°C,10kHz) | Part No.           |
|----------|----------|---------------------|------|-----------------------------------------|--------------------|----------|----------|---------------------|------|-----------------------------------------|--------------------|
| 63       | 6,000    | 26×70×50            | 0.25 | 14.0                                    | EFTP630LGN602ML50M | 350      | 400      | 26×70×50            | 0.25 | 10.6                                    | EFTP351LGN401ML50M |
|          | 12,000   | 26×70×75            | 0.25 | 19.0                                    | EFTP630LGN123ML75M |          | 800      | 26×70×75            | 0.25 | 15.7                                    | EFTP351LGN801ML75M |
|          | 17,000   | 26×70×95            | 0.25 | 22.0                                    | EFTP630LGN173ML95M |          | 1,100    | 26×70×95            | 0.25 | 18.7                                    | EFTP351LGN112ML95M |
|          | 7,400    | 35×64×50            | 0.25 | 16.1                                    | EFTP630LGN742MR50M |          | 490      | 35×64×50            | 0.25 | 11.9                                    | EFTP351LGN491MR50M |
|          | 15,000   | 35×64×75            | 0.25 | 21.7                                    | EFTP630LGN153MR75M |          | 970      | 35×64×75            | 0.25 | 17.6                                    | EFTP351LGN971MR75M |
|          | 21,000   | 35×64×95            | 0.25 | 25.3                                    | EFTP630LGN213MR95M |          | 1,400    | 35×64×95            | 0.25 | 21.0                                    | EFTP351LGN142MR95M |
| 80       | 4,300    | 26×70×50            | 0.25 | 14.0                                    | EFTP800LGN432ML50M | 400      | 330      | 26×70×50            | 0.25 | 10.6                                    | EFTP401LGN331ML50M |
|          | 8,600    | 26×70×75            | 0.25 | 19.0                                    | EFTP800LGN862ML75M |          | 660      | 26×70×75            | 0.25 | 15.7                                    | EFTP401LGN661ML75M |
|          | 12,000   | 26×70×95            | 0.25 | 22.0                                    | EFTP800LGN123ML95M |          | 930      | 26×70×95            | 0.25 | 18.7                                    | EFTP401LGN931ML95M |
|          | 5,300    | 35×64×50            | 0.25 | 16.1                                    | EFTP800LGN532MR50M |          | 400      | 35×64×50            | 0.25 | 11.9                                    | EFTP401LGN401MR50M |
|          | 10,000   | 35×64×75            | 0.25 | 21.7                                    | EFTP800LGN103MR75M |          | 800      | 35×64×75            | 0.25 | 17.6                                    | EFTP401LGN801MR75M |
|          | 15,000   | 35×64×95            | 0.25 | 25.3                                    | EFTP800LGN153MR95M |          | 1,100    | 35×64×95            | 0.25 | 21.0                                    | EFTP401LGN112MR95M |
| 100      | 2,900    | 26×70×50            | 0.25 | 14.0                                    | EFTP101LGN292ML50M | 450      | 270      | 26×70×50            | 0.25 | 10.1                                    | EFTP451LGN271ML50M |
|          | 5,700    | 26×70×75            | 0.25 | 19.0                                    | EFTP101LGN572ML75M |          | 540      | 26×70×75            | 0.25 | 15.0                                    | EFTP451LGN541ML75M |
|          | 8,100    | 26×70×95            | 0.25 | 22.0                                    | EFTP101LGN812ML95M |          | 760      | 26×70×95            | 0.25 | 18.0                                    | EFTP451LGN761ML95M |
|          | 3,600    | 35×64×50            | 0.25 | 16.1                                    | EFTP101LGN362MR50M |          | 330      | 35×64×50            | 0.25 | 11.4                                    | EFTP451LGN331MR50M |
|          | 7,100    | 35×64×75            | 0.25 | 21.7                                    | EFTP101LGN712MR75M |          | 660      | 35×64×75            | 0.25 | 16.7                                    | EFTP451LGN661MR75M |
|          | 10,000   | 35×64×95            | 0.25 | 25.3                                    | EFTP101LGN103MR95M |          | 930      | 35×64×95            | 0.25 | 20.1                                    | EFTP451LGN931MR95M |

**◆Improvement of space factor and heat radiation**

Dead spaces are found in the conventional cylindrical shape. But lower profile offers reduced dead space, and makes the equipment smaller in size. Moreover, the internal element of the lower profile capacitor is in greater contact with the can. This greatly improves the heat dissipation compared with the cylindrical shape.



Cylindrical shape



FTP series



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS long life screw terminals ,105°C

## LXA Series

- Rated voltage range up to 525V<sub>dc</sub>
- Endurance with ripple current : 5,000 hours at 105°C (2,000 hours for 500V<sub>dc</sub> & 525V<sub>dc</sub>)
- High reliability products
- RoHS Compliant

LXA

Long life

KMH



### SPECIFICATIONS

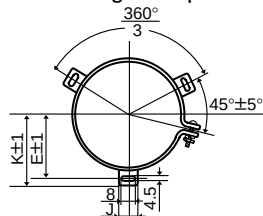
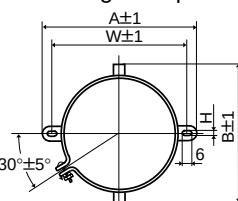
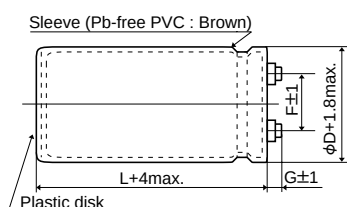
| Items                                  | Characteristics                                                                                                                                                                                                                                                                         |                                                                           |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <b>Category</b>                        | -40 to +105°C (10 to 100V <sub>dc</sub> ) -25 to +105°C (160 to 525V <sub>dc</sub> )                                                                                                                                                                                                    |                                                                           |
| <b>Temperature Range</b>               |                                                                                                                                                                                                                                                                                         |                                                                           |
| <b>Rated Voltage Range</b>             | 10 to 525V <sub>dc</sub>                                                                                                                                                                                                                                                                |                                                                           |
| <b>Capacitance Tolerance</b>           | -10 to +50% (T) (10 to 250V <sub>dc</sub> ) ±20% (M) (350 to 525V <sub>dc</sub> ) (at 20°C, 120Hz)                                                                                                                                                                                      |                                                                           |
| <b>Leakage Current</b>                 | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                           |                                                                           |
| <b>Dissipation Factor (tanδ)</b>       | See STANDARD RATINGS (10 to 250V <sub>dc</sub> ) 0.20max (350 to 525V <sub>dc</sub> ) (at 20°C, 120Hz)                                                                                                                                                                                  |                                                                           |
| <b>Low Temperature Characteristics</b> | Capacitance change C(-40°C)/C(+20°C)≥0.6(10 to 100V <sub>dc</sub> ) C(-25°C)/C(+20°C)≥0.7(160 to 250V <sub>dc</sub> )<br>C(-25°C)/C(+20°C)≥0.65(350 to 525V <sub>dc</sub> ) (at 120Hz)                                                                                                  |                                                                           |
| <b>Insulation Resistance</b>           | When measured between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500V <sub>dc</sub> , the insulation resistance shall not be less than 100MΩ.                       |                                                                           |
| <b>Insulation Withstanding Voltage</b> | When a voltage of 2,000V <sub>ac</sub> is applied for 1 minute between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.                                                       |                                                                           |
| <b>Endurance</b>                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage with the rated ripple current is applied for 5,000 hours (2,000 hours for 500 & 525V <sub>dc</sub> products) at 105°C.                                                        |                                                                           |
|                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±20% of the initial value                                                |
|                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤200% of the initial specified value                                      |
|                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value                                              |
| <b>Shelf Life</b>                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. |                                                                           |
|                                        | Rated voltage                                                                                                                                                                                                                                                                           | 10 to 250V <sub>dc</sub> 350 to 525V <sub>dc</sub>                        |
|                                        | Capacitance change                                                                                                                                                                                                                                                                      | ≤±15% of the initial value ≤±20% of the initial value                     |
|                                        | D.F. (tanδ)                                                                                                                                                                                                                                                                             | ≤150% of the initial specified value ≤200% of the initial specified value |
|                                        | Leakage current                                                                                                                                                                                                                                                                         | ≤The initial specified value ≤The initial specified value                 |

### DIMENSIONS (Screw-Mount) [mm]

● Terminal Code : LG

● Mounting Clamp Code : B

● Mounting Clamp Code : C



| φD     | G                        |                           |
|--------|--------------------------|---------------------------|
|        | 10 to 250V <sub>dc</sub> | 350 to 525V <sub>dc</sub> |
| ~φ63.5 | 6                        | 6                         |
| φ76.2  | 5                        | 6                         |
| φ89    | 5                        | 4                         |

| φD   | A     | B  | W    | H   | F    |
|------|-------|----|------|-----|------|
| 35   | 58    | 44 | 48   | 3.5 | 12.7 |
| 50   | 78    | 64 | 68   | 4.5 | 22.4 |
| 63.5 | 90    | 76 | 80   | 4.5 | 28.0 |
| 76.2 | 104.5 | 90 | 93.5 | 4.5 | 31.5 |

| φD   | E    | K    | J    | F    |
|------|------|------|------|------|
| 50   | 32.5 | 37.0 | 14.0 | 22.4 |
| 63.5 | 38.1 | 43.5 | 14.0 | 28.0 |
| 76.2 | 44.5 | 50.0 | 14.0 | 31.5 |
| 89   | 50.8 | 56.5 | 16.0 | 31.5 |

&lt;Screw specifications&gt;

Plus hexagon-headed screw:

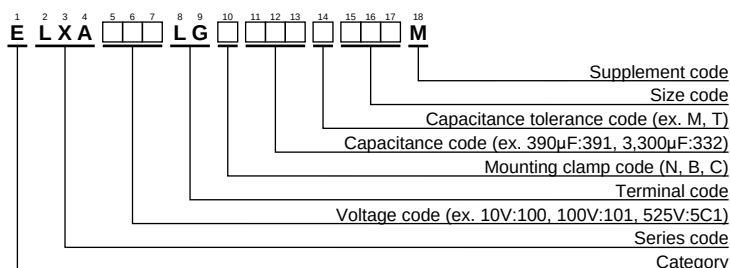
M5×0.8×10

Maximum screw tightening torque:

3.23Nm

\* The screw and the mounting clamp are separately supplied and not attached to the product.

### PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"



LXA Series

## ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.            |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|---------------------|
| 10          | 27,000      | 35×80                 | 0.45 | 4.30                                              | ELXA100LGB273TA80M | 50          | 10,000      | 35×80                 | 0.25 | 3.70                                              | ELXA500LGB103TA80M  |
|             | 33,000      | 35×80                 | 0.45 | 4.70                                              | ELXA100LGB333TA80M |             | 12,000      | 35×100                | 0.25 | 4.40                                              | ELXA500LGB123TAA0M  |
|             | 39,000      | 35×80                 | 0.45 | 5.30                                              | ELXA100LGB393TA80M |             | 15,000      | 35×120                | 0.30 | 4.70                                              | ELXA500LGB153TAC0M  |
|             | 47,000      | 35×100                | 0.45 | 6.10                                              | ELXA100LGB473TAA0M |             | 18,000      | 50×80                 | 0.35 | 4.80                                              | ELXA500LGC183TC80M  |
|             | 56,000      | 35×100                | 0.50 | 6.20                                              | ELXA100LGB563TAA0M |             | 22,000      | 50×100                | 0.35 | 5.90                                              | ELXA500LGC223TCA0M  |
|             | 68,000      | 35×120                | 0.60 | 6.80                                              | ELXA100LGB683TAC0M |             | 27,000      | 50×120                | 0.35 | 7.00                                              | ELXA500LGC273TCC0M  |
|             | 82,000      | 50×80                 | 0.60 | 7.80                                              | ELXA100LGC823TC80M |             | 33,000      | 63.5×100              | 0.40 | 7.60                                              | ELXA500LGC333TDA0M  |
|             | 100,000     | 50×100                | 0.70 | 8.50                                              | ELXA100LGC104TCA0M |             | 39,000      | 63.5×120              | 0.40 | 8.90                                              | ELXA500LGC393TDC0M  |
|             | 120,000     | 50×100                | 0.70 | 9.50                                              | ELXA100LGC124TCA0M |             | 47,000      | 63.5×120              | 0.40 | 9.80                                              | ELXA500LGC473TDC0M  |
|             | 150,000     | 63.5×100              | 0.80 | 11.0                                              | ELXA100LGC154TDA0M |             | 56,000      | 76.2×120              | 0.40 | 11.9                                              | ELXA500LGC563TEC0M  |
|             | 180,000     | 63.5×100              | 0.80 | 12.1                                              | ELXA100LGC184TDA0M |             | 68,000      | 76.2×140              | 0.45 | 13.1                                              | ELXA500LGC683TEE0M  |
|             | 220,000     | 76.2×100              | 1.00 | 13.2                                              | ELXA100LGC224TEA0M |             | 82,000      | 89×140                | 0.50 | 14.8                                              | ELXA500LGC823TFE0M  |
|             | 270,000     | 76.2×120              | 1.20 | 14.4                                              | ELXA100LGC274TEC0M | 63          | 2,700       | 35×50                 | 0.15 | 1.90                                              | ELXA630LGB272TA50M  |
|             | 330,000     | 76.2×140              | 1.20 | 17.0                                              | ELXA100LGC334TEE0M |             | 3,300       | 35×50                 | 0.15 | 2.10                                              | ELXA630LGB323TA50M  |
|             | 390,000     | 89×140                | 1.40 | 18.6                                              | ELXA100LGC394TFE0M |             | 3,900       | 35×80                 | 0.20 | 2.70                                              | ELXA630LGB392TA80M  |
| 16          | 15,000      | 35×50                 | 0.45 | 2.90                                              | ELXA160LGB153TA50M |             | 4,700       | 35×80                 | 0.20 | 2.90                                              | ELXA630LGB472TA80M  |
|             | 18,000      | 35×80                 | 0.45 | 3.50                                              | ELXA160LGB183TA80M |             | 5,600       | 35×80                 | 0.20 | 3.20                                              | ELXA630LGB562TA80M  |
|             | 22,000      | 35×80                 | 0.45 | 3.90                                              | ELXA160LGB223TA80M |             | 6,800       | 35×80                 | 0.20 | 3.50                                              | ELXA630LGB682TA80M  |
|             | 27,000      | 35×80                 | 0.45 | 4.30                                              | ELXA160LGB273TA80M |             | 8,200       | 35×100                | 0.20 | 4.20                                              | ELXA630LGB822TAA0M  |
|             | 33,000      | 35×100                | 0.50 | 4.80                                              | ELXA160LGB333TAA0M |             | 10,000      | 35×120                | 0.25 | 4.30                                              | ELXA630LGB103TAC0M  |
|             | 39,000      | 35×100                | 0.50 | 5.30                                              | ELXA160LGB393TAA0M |             | 12,000      | 50×80                 | 0.25 | 4.80                                              | ELXA630LGC123TC80M  |
|             | 47,000      | 35×120                | 0.50 | 6.20                                              | ELXA160LGB473TAC0M |             | 15,000      | 50×100                | 0.25 | 5.90                                              | ELXA630LGC153TCA0M  |
|             | 56,000      | 50×80                 | 0.60 | 6.30                                              | ELXA160LGC563TC80M |             | 18,000      | 50×120                | 0.25 | 6.30                                              | ELXA630LGC183TCC0M  |
|             | 68,000      | 50×100                | 0.60 | 7.60                                              | ELXA160LGC683TCA0M |             | 22,000      | 50×120                | 0.30 | 6.70                                              | ELXA630LGC223TCC0M  |
|             | 82,000      | 50×120                | 0.70 | 8.30                                              | ELXA160LGC823TCC0M |             | 27,000      | 63.5×120              | 0.30 | 8.80                                              | ELXA630LGC273TDC0M  |
|             | 100,000     | 50×120                | 0.70 | 9.20                                              | ELXA160LGC104TCC0M |             | 33,000      | 76.2×100              | 0.30 | 10.0                                              | ELXA630LGC333TEA0M  |
|             | 120,000     | 63.5×100              | 0.80 | 9.90                                              | ELXA160LGC124TDA0M |             | 39,000      | 76.2×120              | 0.35 | 10.7                                              | ELXA630LGC393TEC0M  |
|             | 150,000     | 76.2×100              | 0.80 | 12.3                                              | ELXA160LGC154TEA0M |             | 47,000      | 76.2×140              | 0.35 | 12.5                                              | ELXA630LGC473TTEE0M |
|             | 180,000     | 76.2×120              | 0.80 | 14.5                                              | ELXA160LGC184TEC0M |             | 56,000      | 89×140                | 0.40 | 13.8                                              | ELXA630LGC563TFE0M  |
|             | 220,000     | 76.2×140              | 1.00 | 15.2                                              | ELXA160LGC224TEE0M | 80          | 2,200       | 35×50                 | 0.15 | 1.90                                              | ELXA800LGB222TA50M  |
|             | 270,000     | 89×140                | 1.20 | 16.8                                              | ELXA160LGC274TFE0M |             | 2,700       | 35×80                 | 0.15 | 2.20                                              | ELXA800LGB272TA80M  |
| 25          | 12,000      | 35×80                 | 0.35 | 3.30                                              | ELXA250LGB123TA80M |             | 3,300       | 35×80                 | 0.15 | 2.50                                              | ELXA800LGB332TA80M  |
|             | 15,000      | 35×80                 | 0.35 | 3.70                                              | ELXA250LGB153TA80M |             | 3,900       | 35×80                 | 0.15 | 2.90                                              | ELXA800LGB392TA80M  |
|             | 18,000      | 35×80                 | 0.35 | 4.00                                              | ELXA250LGB183TA80M |             | 4,700       | 35×100                | 0.15 | 3.10                                              | ELXA800LGB472TA80M  |
|             | 22,000      | 35×80                 | 0.35 | 4.50                                              | ELXA250LGB223TA80M |             | 5,600       | 35×100                | 0.15 | 3.50                                              | ELXA800LGB562TAA0M  |
|             | 27,000      | 35×100                | 0.40 | 5.00                                              | ELXA250LGB273TAA0M |             | 6,800       | 35×120                | 0.20 | 4.10                                              | ELXA800LGB682TAC0M  |
|             | 33,000      | 35×120                | 0.40 | 5.90                                              | ELXA250LGB333TAC0M |             | 8,200       | 50×80                 | 0.20 | 4.80                                              | ELXA800LGC822TC80M  |
|             | 39,000      | 50×80                 | 0.40 | 6.50                                              | ELXA250LGC393TC80M |             | 10,000      | 50×100                | 0.20 | 5.60                                              | ELXA800LGC103TCA0M  |
|             | 47,000      | 50×100                | 0.40 | 7.90                                              | ELXA250LGC473TCA0M |             | 12,000      | 50×100                | 0.20 | 6.10                                              | ELXA800LGC123TCA0M  |
|             | 56,000      | 50×120                | 0.40 | 8.80                                              | ELXA250LGC563TCC0M |             | 15,000      | 50×120                | 0.20 | 7.40                                              | ELXA800LGC153TCC0M  |
|             | 68,000      | 50×120                | 0.50 | 9.10                                              | ELXA250LGC683TCC0M |             | 18,000      | 63.5×120              | 0.25 | 8.00                                              | ELXA800LGC183TDC0M  |
|             | 82,000      | 63.5×100              | 0.50 | 10.6                                              | ELXA250LGC823TDA0M |             | 22,000      | 76.2×100              | 0.25 | 9.10                                              | ELXA800LGC223TEA0M  |
|             | 100,000     | 63.5×120              | 0.60 | 11.4                                              | ELXA250LGC104TDC0M |             | 27,000      | 76.2×120              | 0.30 | 9.70                                              | ELXA800LGC273TEC0M  |
|             | 120,000     | 76.2×100              | 0.60 | 12.8                                              | ELXA250LGC124TEA0M |             | 33,000      | 76.2×140              | 0.30 | 11.5                                              | ELXA800LGC333TEE0M  |
|             | 150,000     | 76.2×120              | 0.75 | 13.7                                              | ELXA250LGC154TEC0M |             | 39,000      | 89×140                | 0.35 | 12.5                                              | ELXA800LGC393TFE0M  |
|             | 180,000     | 76.2×140              | 0.75 | 16.1                                              | ELXA250LGC184TEE0M | 100         | 1,200       | 35×50                 | 0.15 | 1.40                                              | ELXA101LGB122TA50M  |
|             | 220,000     | 89×140                | 1.00 | 16.6                                              | ELXA250LGC224TFE0M |             | 1,500       | 35×80                 | 0.15 | 1.60                                              | ELXA101LGB152TA80M  |
| 35          | 8,200       | 35×80                 | 0.30 | 3.00                                              | ELXA350LGB822TA80M |             | 1,800       | 35×80                 | 0.15 | 1.80                                              | ELXA101LGB182TA80M  |
|             | 10,000      | 35×80                 | 0.30 | 3.30                                              | ELXA350LGB103TA80M |             | 2,200       | 35×80                 | 0.15 | 2.00                                              | ELXA101LGB222TA80M  |
|             | 12,000      | 35×80                 | 0.30 | 3.60                                              | ELXA350LGB123TA80M |             | 2,700       | 35×80                 | 0.15 | 2.40                                              | ELXA101LGB272TA80M  |
|             | 15,000      | 35×80                 | 0.30 | 4.10                                              | ELXA350LGB153TA80M |             | 3,300       | 35×100                | 0.15 | 2.80                                              | ELXA101LGB332TAA0M  |
|             | 18,000      | 35×100                | 0.30 | 4.80                                              | ELXA350LGB183TAA0M |             | 3,900       | 35×120                | 0.15 | 3.10                                              | ELXA101LGB392TAC0M  |
|             | 22,000      | 35×120                | 0.35 | 5.20                                              | ELXA350LGB223TAC0M |             | 4,700       | 50×80                 | 0.15 | 3.60                                              | ELXA101LGC472TC80M  |
|             | 27,000      | 50×80                 | 0.40 | 5.90                                              | ELXA350LGC273TC80M |             | 5,600       | 50×100                | 0.15 | 4.30                                              | ELXA101LGC562TCA0M  |
|             | 33,000      | 50×100                | 0.40 | 6.60                                              | ELXA350LGC333TCA0M |             | 6,800       | 50×120                | 0.15 | 5.00                                              | ELXA101LGC682TCC0M  |
|             | 39,000      | 50×120                | 0.40 | 7.80                                              | ELXA350LGC393TCC0M |             | 8,200       | 50×120                | 0.15 | 5.50                                              | ELXA101LGC822TCA0M  |
|             | 47,000      | 50×120                | 0.45 | 8.00                                              | ELXA350LGC473TCC0M |             | 10,000      | 63.5×100              | 0.15 | 6.40                                              | ELXA101LGC103TDA0M  |
|             | 56,000      | 63.5×100              | 0.45 | 9.20                                              | ELXA350LGC563TDA0M |             | 12,000      | 63.5×120              | 0.20 | 6.60                                              | ELXA101LGC123TDC0M  |
|             | 68,000      | 63.5×120              | 0.45 | 11.0                                              | ELXA350LGC683TDC0M |             | 15,000      | 76.2×100              | 0.20 | 7.50                                              | ELXA101LGC153TEA0M  |
|             | 82,000      | 76.2×120              | 0.50 | 12.7                                              | ELXA350LGC823TEC0M |             | 18,000      | 76.2×120              | 0.25 | 8.00                                              | ELXA101LGC183TEC0M  |
|             | 100,000     | 76.2×140              | 0.60 | 13.5                                              | ELXA350LGC104TEE0M |             | 22,000      | 76.2×140              | 0.25 | 9.40                                              | ELXA101LGC223TEE0M  |
|             | 120,000     | 89×140                | 0.60 | 16.1                                              | ELXA350LGC124TFE0M |             | 27,000      | 89×140                | 0.30 | 10.4                                              | ELXA101LGC273TFE0M  |
| 50          | 3,900       | 35×50                 | 0.20 | 2.00                                              | ELXA500LGB392TA50M | 160         | 680         | 35×50                 | 0.15 | 1.10                                              | ELXA161LGB681TA50M  |
|             | 4,700       | 35×50                 | 0.25 | 2.20                                              | ELXA500LGB472TA50M |             | 820         | 35×80                 | 0.15 | 1.20                                              | ELXA161LGB821TA80M  |
|             | 5,600       | 35×80                 | 0.25 | 2.80                                              | ELXA500LGB562TA80M |             | 1,000       | 35×80                 | 0.15 | 1.30                                              | ELXA161LGB102TA80M  |
|             | 6,800       | 35×80                 | 0.25 | 3.00                                              | ELXA500LGB682TA80M |             | 1,200       | 35×80                 | 0.15 | 1.50                                              | ELXA161LGB122TA80M  |
|             | 8,200       | 35×80                 | 0.25 | 3.30                                              | ELXA500LGB822TA80M |             | 1,500       | 35×80                 | 0.15 | 1.70                                              | ELXA161LGB152TA80M  |



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS long life screw terminals ,105°C

## LXA Series

### ◆STANDARD RATINGS

| WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           | WV<br>(Vdc) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C,120Hz) | Part No.           |
|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|-------------|-------------|-----------------------|------|---------------------------------------------------|--------------------|
| 160         | 1,800       | 35×100                | 0.15 | 2.00                                              | ELXA161LGB182TAA0M | 400         | 680         | 50×60                 | 0.20 | 3.00                                              | ELXA401LGC681MC60M |
|             | 2,200       | 35×120                | 0.15 | 2.30                                              | ELXA161LGB222TAC0M |             | 1,200       | 50×85                 | 0.20 | 4.70                                              | ELXA401LGC122MC85M |
|             | 2,700       | 35×120                | 0.15 | 2.70                                              | ELXA161LGB272TAC0M |             | 1,800       | 50×105                | 0.20 | 6.30                                              | ELXA401LGC182MCA5M |
|             | 3,300       | 50×100                | 0.15 | 3.30                                              | ELXA161LGC332TCA0M |             | 2,200       | 50×125                | 0.20 | 7.50                                              | ELXA401LGC222MCC5M |
|             | 3,900       | 50×120                | 0.15 | 3.80                                              | ELXA161LGC392TCC0M |             | 2,200       | 63.5×85               | 0.20 | 7.30                                              | ELXA401LGC222MD85M |
|             | 4,700       | 50×120                | 0.15 | 4.20                                              | ELXA161LGC472TCC0M |             | 2,700       | 50×145                | 0.20 | 8.90                                              | ELXA401LGC272MCE5M |
|             | 5,600       | 50×120                | 0.15 | 4.70                                              | ELXA161LGC562TCC0M |             | 2,700       | 63.5×105              | 0.20 | 8.80                                              | ELXA401LGC272MDA5M |
|             | 6,800       | 63.5×120              | 0.15 | 5.70                                              | ELXA161LGC682TDC0M |             | 3,300       | 63.5×125              | 0.20 | 10.5                                              | ELXA401LGC332MDC5M |
|             | 8,200       | 76.2×100              | 0.20 | 6.40                                              | ELXA161LGC822TEA0M |             | 3,300       | 76.2×85               | 0.20 | 9.90                                              | ELXA401LGC332ME85M |
|             | 10,000      | 76.2×120              | 0.20 | 6.60                                              | ELXA161LGC103TEC0M |             | 4,700       | 63.5×145              | 0.20 | 13.4                                              | ELXA401LGC472MDE5M |
|             | 12,000      | 76.2×140              | 0.20 | 7.80                                              | ELXA161LGC123TEE0M |             | 4,700       | 76.2×125              | 0.20 | 13.9                                              | ELXA401LGC472MEC5M |
|             | 15,000      | 89×140                | 0.20 | 9.50                                              | ELXA161LGC153TFE0M |             | 6,800       | 76.2×145              | 0.20 | 17.9                                              | ELXA401LGC682MEE5M |
| 200         | 470         | 35×50                 | 0.15 | 0.90                                              | ELXA201LGB471TA50M | 450         | 6,800       | 89×125                | 0.20 | 17.2                                              | ELXA401LGC682MFC5M |
|             | 560         | 35×80                 | 0.15 | 1.00                                              | ELXA201LGB561TA80M |             | 8,200       | 76.2×190              | 0.20 | 20.8                                              | ELXA401LGC822MEK0M |
|             | 680         | 35×80                 | 0.15 | 1.10                                              | ELXA201LGB681TA80M |             | 8,200       | 89×145                | 0.20 | 20.1                                              | ELXA401LGC822MFE5M |
|             | 820         | 35×80                 | 0.15 | 1.30                                              | ELXA201LGB821TA80M |             | 12,000      | 89×190                | 0.20 | 27.4                                              | ELXA401LGC123MFK0M |
|             | 1,000       | 35×100                | 0.15 | 1.50                                              | ELXA201LGB102TAA0M |             | 18,000      | 89×270                | 0.20 | 39.4                                              | ELXA401LGC183MFT0M |
|             | 1,200       | 35×120                | 0.15 | 1.70                                              | ELXA201LGB122TAC0M | 500         | 560         | 50×60                 | 0.20 | 2.60                                              | ELXA451LGC561MC60M |
|             | 1,500       | 35×120                | 0.15 | 1.90                                              | ELXA201LGB152TAC0M |             | 1,000       | 50×85                 | 0.20 | 4.00                                              | ELXA451LGC102MC85M |
|             | 1,800       | 50×80                 | 0.15 | 2.20                                              | ELXA201LGC182TC80M |             | 1,200       | 50×105                | 0.20 | 4.80                                              | ELXA451LGC122MCA5M |
|             | 2,200       | 50×100                | 0.15 | 2.70                                              | ELXA201LGC222TCA0M |             | 1,800       | 50×125                | 0.20 | 6.40                                              | ELXA451LGC182MCC5M |
|             | 2,700       | 50×120                | 0.15 | 3.20                                              | ELXA201LGC272TCC0M |             | 1,800       | 63.5×85               | 0.20 | 6.20                                              | ELXA451LGC182MD85M |
|             | 3,300       | 50×120                | 0.15 | 3.50                                              | ELXA201LGC332TCC0M |             | 2,200       | 50×145                | 0.20 | 7.60                                              | ELXA451LGC222MCE5M |
|             | 3,900       | 63.5×100              | 0.15 | 4.00                                              | ELXA201LGC392TDA0M |             | 2,200       | 63.5×105              | 0.20 | 7.50                                              | ELXA451LGC222MDA5M |
|             | 4,700       | 63.5×120              | 0.15 | 4.70                                              | ELXA201LGC472TDC0M |             | 2,700       | 63.5×125              | 0.20 | 8.90                                              | ELXA451LGC272MDC5M |
|             | 5,600       | 76.2×100              | 0.15 | 5.30                                              | ELXA201LGC562TEA0M |             | 2,700       | 76.2×85               | 0.20 | 8.40                                              | ELXA451LGC272ME85M |
|             | 6,800       | 76.2×120              | 0.15 | 6.30                                              | ELXA201LGC682TEC0M |             | 3,300       | 63.5×145              | 0.20 | 10.6                                              | ELXA451LGC332MDE5M |
|             | 8,200       | 76.2×140              | 0.20 | 6.40                                              | ELXA201LGC822TEE0M |             | 3,300       | 76.2×105              | 0.20 | 10.2                                              | ELXA451LGC332MEA5M |
|             | 10,000      | 89×140                | 0.20 | 7.70                                              | ELXA201LGC103TFE0M |             | 3,900       | 76.2×125              | 0.20 | 11.9                                              | ELXA451LGC392MEC5M |
| 250         | 330         | 35×50                 | 0.15 | 0.70                                              | ELXA251LGB331TA50M |             | 4,700       | 76.2×145              | 0.20 | 14.0                                              | ELXA451LGC472MDE5M |
|             | 390         | 35×80                 | 0.15 | 0.80                                              | ELXA251LGB391TA80M | 525         | 5,600       | 89×125                | 0.20 | 14.2                                              | ELXA451LGC562MFC5M |
|             | 470         | 35×80                 | 0.15 | 0.90                                              | ELXA251LGB471TA80M |             | 6,800       | 76.2×190              | 0.20 | 17.3                                              | ELXA451LGC682MEK0M |
|             | 560         | 35×80                 | 0.15 | 1.00                                              | ELXA251LGB561TA80M |             | 6,800       | 89×145                | 0.20 | 16.7                                              | ELXA451LGC682MFE5M |
|             | 680         | 35×100                | 0.15 | 1.20                                              | ELXA251LGB681TAA0M |             | 10,000      | 89×190                | 0.20 | 22.8                                              | ELXA451LGC103MFK0M |
|             | 820         | 35×100                | 0.15 | 1.40                                              | ELXA251LGB821TAA0M |             | 15,000      | 89×270                | 0.20 | 32.8                                              | ELXA451LGC153MFT0M |
|             | 1,000       | 35×120                | 0.15 | 1.60                                              | ELXA251LGB102TAC0M | 500         | 470         | 50×60                 | 0.20 | 2.40                                              | ELXA501LGC471MC60M |
|             | 1,200       | 50×80                 | 0.15 | 1.80                                              | ELXA251LGC122TC80M |             | 820         | 50×85                 | 0.20 | 3.60                                              | ELXA501LGC821MC85M |
|             | 1,500       | 50×100                | 0.15 | 2.20                                              | ELXA251LGC152TCA0M |             | 1,000       | 50×105                | 0.20 | 4.40                                              | ELXA501LGC102MCA5M |
|             | 1,800       | 50×120                | 0.15 | 2.60                                              | ELXA251LGC182TCC0M |             | 1,200       | 50×125                | 0.20 | 5.20                                              | ELXA501LGC122MCC5M |
|             | 2,200       | 50×120                | 0.15 | 2.80                                              | ELXA251LGC222TCC0M |             | 1,200       | 63.5×85               | 0.20 | 5.00                                              | ELXA501LGC122MD85M |
|             | 2,700       | 63.5×100              | 0.15 | 3.30                                              | ELXA251LGC272TDA0M |             | 1,500       | 50×145                | 0.20 | 6.30                                              | ELXA501LGC152MCE5M |
|             | 3,300       | 63.5×120              | 0.15 | 4.00                                              | ELXA251LGC332TDC0M |             | 1,800       | 63.5×105              | 0.20 | 6.80                                              | ELXA501LGC182MDA5M |
|             | 3,900       | 76.2×100              | 0.15 | 4.40                                              | ELXA251LGC392TEA0M |             | 2,700       | 63.5×145              | 0.20 | 9.60                                              | ELXA501LGC272MDE5M |
|             | 4,700       | 76.2×120              | 0.15 | 5.20                                              | ELXA251LGC472TEC0M |             | 2,700       | 76.2×105              | 0.20 | 9.20                                              | ELXA501LGC272MEA5M |
|             | 5,600       | 76.2×140              | 0.15 | 6.10                                              | ELXA251LGC562TEE0M |             | 3,900       | 76.2×145              | 0.20 | 12.7                                              | ELXA501LGC392MEE5M |
|             | 6,800       | 89×140                | 0.15 | 7.40                                              | ELXA251LGC682TFE0M |             | 3,900       | 89×125                | 0.20 | 11.9                                              | ELXA501LGC392MFC5M |
| 350         | 820         | 50×60                 | 0.20 | 3.30                                              | ELXA351LGC821MC60M |             | 6,800       | 89×190                | 0.20 | 18.8                                              | ELXA501LGC682MFK0M |
|             | 1,500       | 50×85                 | 0.20 | 5.20                                              | ELXA351LGC152MC85M |             | 10,000      | 89×270                | 0.20 | 26.8                                              | ELXA501LGC103MFT0M |
|             | 2,200       | 50×105                | 0.20 | 7.00                                              | ELXA351LGC222MCA5M | 525         | 390         | 50×60                 | 0.20 | 2.20                                              | ELXA5C1LGC391MC60M |
|             | 2,700       | 50×125                | 0.20 | 8.40                                              | ELXA351LGC272MCC5M |             | 680         | 50×85                 | 0.20 | 3.30                                              | ELXA5C1LGC681MC85M |
|             | 2,700       | 63.5×85               | 0.20 | 8.10                                              | ELXA351LGC272MD85M |             | 1,000       | 50×125                | 0.20 | 4.80                                              | ELXA5C1LGC102MCC5M |
|             | 3,300       | 50×145                | 0.20 | 9.90                                              | ELXA351LGC332MCE5M |             | 1,500       | 63.5×105              | 0.20 | 6.20                                              | ELXA5C1LGC152MDA5M |
|             | 3,300       | 63.5×105              | 0.20 | 9.80                                              | ELXA351LGC332MDA5M |             | 1,800       | 63.5×125              | 0.20 | 7.30                                              | ELXA5C1LGC182MDC5M |
|             | 3,900       | 63.5×125              | 0.20 | 11.5                                              | ELXA351LGC392MDC5M |             | 2,200       | 63.5×145              | 0.20 | 8.60                                              | ELXA5C1LGC222MDE5M |
|             | 3,900       | 76.2×85               | 0.20 | 10.8                                              | ELXA351LGC392ME85M |             | 2,200       | 76.2×105              | 0.20 | 8.30                                              | ELXA5C1LGC222MEA5M |
|             | 5,600       | 63.5×145              | 0.20 | 14.7                                              | ELXA351LGC562MDE5M |             | 2,700       | 76.2×125              | 0.20 | 9.90                                              | ELXA5C1LGC272MEC5M |
|             | 6,800       | 76.2×125              | 0.20 | 16.8                                              | ELXA351LGC682MEC5M |             | 3,300       | 76.2×145              | 0.20 | 11.7                                              | ELXA5C1LGC332MEE5M |
|             | 8,200       | 76.2×145              | 0.20 | 19.6                                              | ELXA351LGC822MEE5M |             | 4,700       | 76.2×190              | 0.20 | 14.4                                              | ELXA5C1LGC472MEK0M |
|             | 8,200       | 89×125                | 0.20 | 18.9                                              | ELXA351LGC822MFC5M |             | 4,700       | 89×145                | 0.20 | 13.9                                              | ELXA5C1LGC472MFE5M |
|             | 10,000      | 76.2×190              | 0.20 | 23.0                                              | ELXA351LGC103MEK0M |             | 5,600       | 89×190                | 0.20 | 17.1                                              | ELXA5C1LGC562MFK0M |
|             | 10,000      | 89×145                | 0.20 | 22.2                                              | ELXA351LGC103MFE5M |             |             |                       |      |                                                   |                    |
|             | 15,000      | 89×190                | 0.20 | 30.6                                              | ELXA351LGC153MFK0M |             |             |                       |      |                                                   |                    |
|             | 22,000      | 89×270                | 0.20 | 43.5                                              | ELXA351LGC223MFT0M |             |             |                       |      |                                                   |                    |



# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS long life screw terminals ,105°C

## LXA Series

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency (Hz)            | 50   | 120  | 300  | 1k   | 3k   | 10k  | 50k  |
|---------------------------|------|------|------|------|------|------|------|
| 10 to 50V <sub>dc</sub>   | 0.95 | 1.00 | 1.03 | 1.05 | —    | 1.09 | 1.12 |
| 63 to 80V <sub>dc</sub>   | 0.90 | 1.00 | 1.06 | 1.10 | —    | 1.18 | 1.22 |
| 100 to 250V <sub>dc</sub> | 0.80 | 1.00 | 1.12 | 1.22 | —    | 1.30 | 1.33 |
| 350 to 525V <sub>dc</sub> | 0.80 | 1.00 | 1.20 | 1.50 | 1.60 | —    | —    |

Note : The endurance of capacitors is reduced with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10°C rise. When long life performance is requested in actual use, the rms ripple current has to be reduced. Also, for the LXA series capacitors (350 to 525V<sub>dc</sub> products), using them at operating voltage can extend their lifetime. For details, please contact a representative of Nippon Chemi-con.

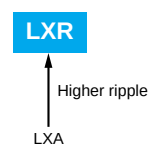


# LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Inverter-use screw terminal, 105°C

## LXR Series

- Higher ripple capability than LXA series
- Endurance with ripple current : 5,000 hours at 105°C
- RoHS Compliant



### ◆SPECIFICATIONS

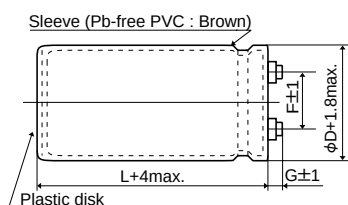
| Items                           | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-------------|--------------------------------------|-----------------|------------------------------|
| Category                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |
| Temperature Range               | -25 to +105°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| Rated Voltage Range             | 350 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |
| Capacitance Tolerance           | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |
| Leakage Current                 | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                                                                                                                                                                                                                                                    |                    |                            |             |                                      |                 |                              |
| Dissipation Factor (tanδ)       | 0.15max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |
| Low Temperature Characteristics | Capacitance change $C(-25^{\circ}\text{C})/C(+20^{\circ}\text{C}) \geq 0.7$ (at 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                    |                            |             |                                      |                 |                              |
| Insulation Resistance           | When measured between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500V <sub>dc</sub> , the insulation resistance shall not be less than 100MΩ.                                                                                                                                                                                                                                                                                |                    |                            |             |                                      |                 |                              |
| Insulation Withstanding Voltage | When a voltage of 2,000V <sub>ac</sub> is applied for 1 minute between the terminals that are connected to each other and to the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.                                                                                                                                                                                                                                                                                                                |                    |                            |             |                                      |                 |                              |
| Endurance                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 105°C. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                                                               | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |                            |             |                                      |                 |                              |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |             |                                      |                 |                              |
| Shelf Life                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                    |                            |             |                                      |                 |                              |
| D.F. (tanδ)                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |                            |             |                                      |                 |                              |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |             |                                      |                 |                              |

### ◆DIMENSIONS (Screw-Mount) [mm]

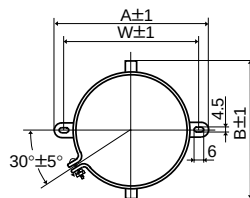
● Terminal Code : LG

● Mounting Clamp Code : B

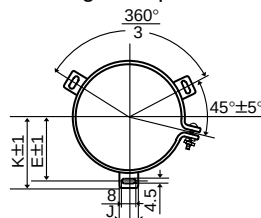
● Mounting Clamp Code : C



φ63.5 & φ76.2 : G=6  
 φ89 : G=4  
 φ100 : G=10



| φD   | A     | B  | W    | F    |
|------|-------|----|------|------|
| 63.5 | 90    | 76 | 80   | 28.0 |
| 76.2 | 104.5 | 90 | 93.5 | 31.5 |



| φD   | E    | K    | F    | J    |
|------|------|------|------|------|
| 63.5 | 38.1 | 43.5 | 28.0 | 14.0 |
| 76.2 | 44.5 | 50.0 | 31.5 | 14.0 |
| 89   | 50.8 | 56.5 | 31.5 | 16.0 |
| 100  | 56.5 | 63.4 | 41.5 | 18.0 |

&lt;Screw specifications&gt;

φ63.5 to φ89

Plus hexagon-headed screw :  
M5×0.8×10Maximum screw tightening torque :  
3.23Nm

φ100

Cross-recessed head (Phillips) screw :  
M8×1.25×16

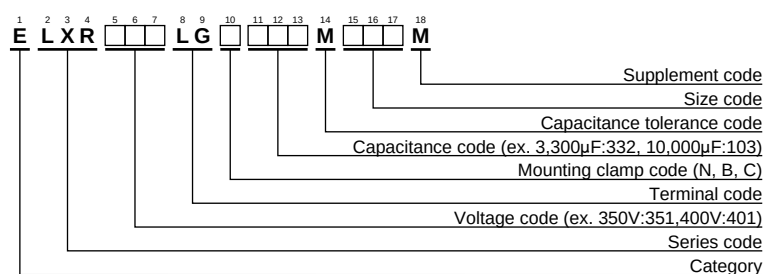
Spring washer

Washer

Maximum screw tightening torque :  
6.31Nm

\* The screw and the mounting clamp are separately supplied and not attached to the product.

### ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"


**LXR**Series

### ◆STANDARD RATINGS

| WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C, 120Hz) | Part No.           | WV<br>(V <sub>dc</sub> ) | Cap<br>(μF) | Case size<br>φD×L(mm) | tanδ | Rated ripple<br>current<br>(Arms/<br>105°C, 120Hz) | Part No.           |
|--------------------------|-------------|-----------------------|------|----------------------------------------------------|--------------------|--------------------------|-------------|-----------------------|------|----------------------------------------------------|--------------------|
| 350                      | 3,300       | 63.5×115              | 0.15 | 14.4                                               | ELXR351LGC332MDB5M | 400                      | 6,800       | 76.2×170              | 0.15 | 27.3                                               | ELXR401LGC682MEH0M |
|                          | 3,900       | 63.5×130              | 0.15 | 16.6                                               | ELXR351LGC392MDD0M |                          | 6,800       | 89×155                | 0.15 | 26.6                                               | ELXR401LGC682MFF5M |
|                          | 4,700       | 63.5×155              | 0.15 | 19.8                                               | ELXR351LGC472MDF5M |                          | 8,200       | 89×170                | 0.15 | 30.5                                               | ELXR401LGC822MFH0M |
|                          | 4,700       | 76.2×115              | 0.15 | 19.1                                               | ELXR351LGC472MEB5M |                          | 10,000      | 100×190               | 0.15 | 34.5                                               | ELXR401LGC103MGK0M |
|                          | 5,600       | 63.5×170              | 0.15 | 22.5                                               | ELXR351LGC562MDH0M |                          | 12,000      | 100×220               | 0.15 | 40.2                                               | ELXR401LGC123MGN0M |
|                          | 5,600       | 76.2×130              | 0.15 | 21.9                                               | ELXR351LGC562MED0M | 450                      | 2,200       | 63.5×115              | 0.15 | 11.8                                               | ELXR451LGC222MDB5M |
|                          | 6,800       | 76.2×155              | 0.15 | 26.2                                               | ELXR351LGC682MEF5M |                          | 2,700       | 63.5×130              | 0.15 | 13.7                                               | ELXR451LGC272MDD0M |
|                          | 8,200       | 76.2×170              | 0.15 | 30.0                                               | ELXR351LGC822MEH0M |                          | 2,700       | 76.2×115              | 0.15 | 14.5                                               | ELXR451LGC272MEB5M |
|                          | 8,200       | 89×155                | 0.15 | 29.2                                               | ELXR351LGC822MFF5M |                          | 3,300       | 63.5×155              | 0.15 | 16.5                                               | ELXR451LGC332MDF5M |
|                          | 10,000      | 89×170                | 0.15 | 33.7                                               | ELXR351LGC103MFH0M |                          | 3,300       | 76.2×130              | 0.15 | 16.9                                               | ELXR451LGC332MED0M |
|                          | 12,000      | 100×190               | 0.15 | 37.8                                               | ELXR351LGC123MGK0M |                          | 3,900       | 63.5×170              | 0.15 | 18.7                                               | ELXR451LGC392MDH0M |
|                          | 15,000      | 100×250               | 0.15 | 47.7                                               | ELXR351LGC153MGR0M |                          | 4,700       | 76.2×155              | 0.15 | 21.7                                               | ELXR451LGC472MEF5M |
| 400                      | 2,700       | 63.5×115              | 0.15 | 13.1                                               | ELXR401LGC272MDB5M |                          | 5,600       | 76.2×190              | 0.15 | 26.1                                               | ELXR451LGC562MEK0M |
|                          | 3,300       | 63.5×130              | 0.15 | 15.2                                               | ELXR401LGC332MDD0M |                          | 5,600       | 89×155                | 0.15 | 24.1                                               | ELXR451LGC562MFF5M |
|                          | 3,900       | 63.5×155              | 0.15 | 17.9                                               | ELXR401LGC392MDF5M |                          | 6,800       | 89×170                | 0.15 | 27.8                                               | ELXR451LGC682MFH0M |
|                          | 3,900       | 76.2×115              | 0.15 | 18.2                                               | ELXR401LGC392MEB5M |                          | 8,200       | 89×190                | 0.15 | 32.0                                               | ELXR451LGC822MFK0M |
|                          | 4,700       | 63.5×170              | 0.15 | 20.5                                               | ELXR401LGC472MDH0M |                          | 10,000      | 100×220               | 0.15 | 36.8                                               | ELXR451LGC103MGN0M |
|                          | 4,700       | 76.2×130              | 0.15 | 20.1                                               | ELXR401LGC472MED0M |                          | 12,000      | 100×250               | 0.15 | 42.7                                               | ELXR451LGC123MGR0M |
|                          | 5,600       | 76.2×155              | 0.15 | 23.8                                               | ELXR401LGC562MEF5M |                          |             |                       |      |                                                    |                    |

### ◆RATED RIPPLE CURRENT MULTIPLIERS

#### ●Frequency Multipliers

| Frequency (Hz) | 120 | 300 | 1k  | 3k  |
|----------------|-----|-----|-----|-----|
| Coefficient    | 1.0 | 1.1 | 1.3 | 1.4 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5 to 10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for the LXR series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For details, please contact a representative of Nippon Chemi-Con.



## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Screw terminals, 85°C

New!

## RWV Series

- For frequently change of regenerative voltage from AC servo amplifier and inverter control
- Improved the resistance for charge and discharge from same dimension of RWF series
- Endurance with ripple current : 5,000 hours at 85°C
- Rated voltage range : 350 to 450V<sub>dc</sub>, Capacitance 820 to 18,000μF
- RoHS Compliant



## ◆SPECIFICATIONS

| Items                           | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------|-------------|--------------------------------------|-----------------|------------------------------|-----------|-----|------------------|------------------|
| Category                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Temperature Range               | -25 to +85°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Rated Voltage Range             | 350 to 450V <sub>dc</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Capacitance Tolerance           | ±20% (M) (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Leakage Current                 | I=0.02CV or 5mA, whichever is smaller.<br>Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 5 minutes)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Dissipation Factor (tanδ)       | 0.25 max. (at 20°C, 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Low Temperature Characteristics | Capacitance change $C(-25^{\circ}\text{C})/C(+20^{\circ}\text{C}) \geq 0.7$ (at 120Hz)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Insulation Resistance           | When measured between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case by using an insulation resistance meter of 500V <sub>dc</sub> , the insulation resistance shall not be less than 100MΩ.                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Insulation Withstanding Voltage | When a voltage of 2,000Vac is applied for 1 minute between the terminals shorted each other and the mounting clamp on the insulating sleeve covering the case, there shall not be electrical damage.                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Charge and Discharge            | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to charge and discharge test with the voltage waveform shown below at room temperature (15 to 35°C). <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table> <table border="1"> <tr> <td>Frequency</td><td>3Hz</td></tr> <tr> <td>Number of cycles</td><td>50 million times</td></tr> </table> <div style="text-align: center;"> </div> | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value | Frequency | 3Hz | Number of cycles | 50 million times |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| D.F. (tanδ)                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Frequency                       | 3Hz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Number of cycles                | 50 million times                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Endurance                       | The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 5,000 hours at 85°C. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                                                                                                                                                                 | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |           |     |                  |                  |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| D.F. (tanδ)                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Shelf Life                      | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 500 hours at 85°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4. <table border="1"> <tr> <td>Capacitance change</td><td>≤±20% of the initial value</td></tr> <tr> <td>D.F. (tanδ)</td><td>≤200% of the initial specified value</td></tr> <tr> <td>Leakage current</td><td>≤The initial specified value</td></tr> </table>                                                                                                     | Capacitance change | ≤±20% of the initial value | D.F. (tanδ) | ≤200% of the initial specified value | Leakage current | ≤The initial specified value |           |     |                  |                  |
| Capacitance change              | ≤±20% of the initial value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| D.F. (tanδ)                     | ≤200% of the initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                            |             |                                      |                 |                              |           |     |                  |                  |
| Leakage current                 | ≤The initial specified value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                            |             |                                      |                 |                              |           |     |                  |                  |

\*Please consult with us about charge and discharge conditions.

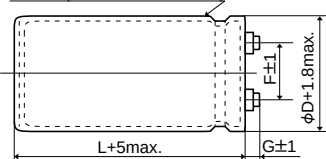
## ◆DIMENSIONS (Screw-Mount) [mm]

●Terminal Code : LG

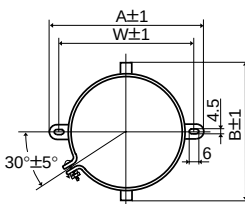
●Mounting Clamp Code : B

●Mounting Clamp Code : C

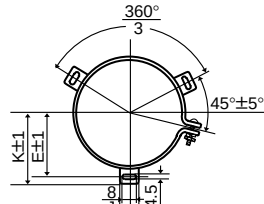
Sleeve (Pb-free PVC : Black)



φ50 & φ63.5 : G=6  
φ76.2 & φ89 : G=5



| φD   | A     | B    | W    | F    |
|------|-------|------|------|------|
| 50   | 78.0  | 64.0 | 68.0 | 22.4 |
| 63.5 | 90.0  | 76.0 | 80.0 | 28.0 |
| 76.2 | 104.5 | 90.0 | 93.5 | 31.5 |



| φD   | E    | K    | F    | J    |
|------|------|------|------|------|
| 50   | 32.5 | 37.0 | 22.4 | 14.0 |
| 63.5 | 38.1 | 43.5 | 28.0 | 14.0 |
| 76.2 | 44.5 | 50.0 | 31.5 | 14.0 |
| 89   | 50.8 | 56.5 | 31.5 | 16.0 |

&lt;Screw specifications&gt;

Plus hexagon-headed screw :  
M5X0.8X10Maximum screw tightening torque :  
3.23Nm

\* The screw and the mounting clamp are separately supplied and not attached to the product.



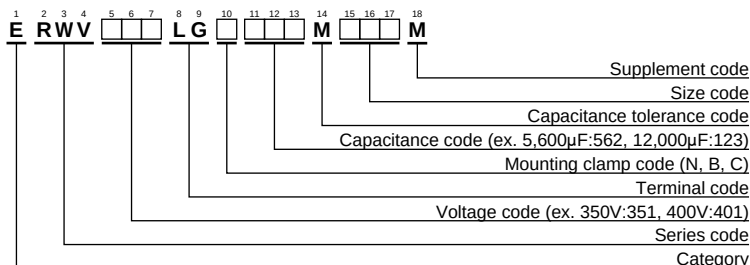
## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Screw terminals, 85°C

New!

RWV Series

## ◆PART NUMBERING SYSTEM



Please refer to "Product code guide (screw-mount terminal type)"

## ◆STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Case size φD×L(mm) | Rated ripple current (Arms/ 85°C,120Hz) | Max. charge current and Max. discharge current (Arms/ 3Hz) | Part No.           |
|----------|----------|--------------------|-----------------------------------------|------------------------------------------------------------|--------------------|
| 350      | 1,200    | 50 × 60            | 4.70                                    | 1.56                                                       | ERWV351LGC122MC60M |
|          | 1,500    | 50 × 70            | 5.50                                    | 1.83                                                       | ERWV351LGC152MC70M |
|          | 1,800    | 50 × 80            | 6.40                                    | 2.13                                                       | ERWV351LGC182MC80M |
|          | 2,200    | 50 × 96            | 7.60                                    | 2.53                                                       | ERWV351LGC222MC96M |
|          | 2,700    | 50 × 105           | 8.80                                    | 2.94                                                       | ERWV351LGC272MCA5M |
|          | 2,700    | 50 × 115           | 9.20                                    | 3.06                                                       | ERWV351LGC272MCB5M |
|          | 3,300    | 50 × 130           | 10.8                                    | 3.58                                                       | ERWV351LGC332MCD0M |
|          | 4,700    | 63.5 × 115         | 13.2                                    | 4.61                                                       | ERWV351LGC472MDB5M |
|          | 5,600    | 63.5 × 130         | 15.2                                    | 5.30                                                       | ERWV351LGC562MDD0M |
|          | 5,600    | 76.2 × 105         | 15.2                                    | 5.36                                                       | ERWV351LGC562MEA5M |
|          | 6,800    | 63.5 × 155         | 18.1                                    | 6.32                                                       | ERWV351LGC682MDF5M |
|          | 8,200    | 63.5 × 170         | 20.7                                    | 7.25                                                       | ERWV351LGC822MDH0M |
|          | 8,200    | 76.2 × 130         | 20.2                                    | 6.57                                                       | ERWV351LGC822MED0M |
|          | 10,000   | 76.2 × 155         | 24.2                                    | 8.47                                                       | ERWV351LGC103MEF5M |
|          | 10,000   | 89 × 115           | 23.1                                    | 8.10                                                       | ERWV351LGC103MFB5M |
|          | 12,000   | 76.2 × 170         | 27.6                                    | 9.66                                                       | ERWV351LGC123MEH0M |
|          | 12,000   | 89 × 130           | 26.6                                    | 9.33                                                       | ERWV351LGC123MFD0M |
|          | 15,000   | 89 × 155           | 32.1                                    | 11.2                                                       | ERWV351LGC153MFF5M |
|          | 15,000   | 89 × 170           | 33.5                                    | 11.7                                                       | ERWV351LGC153MFH0M |
|          | 18,000   | 89 × 190           | 38.5                                    | 13.5                                                       | ERWV351LGC183MFK0M |
| 375      | 1,000    | 50 × 60            | 4.30                                    | 1.42                                                       | ERWV3H1LGC102MC60M |
|          | 1,200    | 50 × 70            | 4.90                                    | 1.64                                                       | ERWV3H1LGC122MC70M |
|          | 1,500    | 50 × 80            | 5.80                                    | 1.94                                                       | ERWV3H1LGC152MC80M |
|          | 2,200    | 50 × 96            | 7.60                                    | 2.54                                                       | ERWV3H1LGC222MC96M |
|          | 2,200    | 50 × 105           | 8.00                                    | 2.65                                                       | ERWV3H1LGC222MCA5M |
|          | 2,700    | 50 × 115           | 9.20                                    | 3.06                                                       | ERWV3H1LGC272MCB5M |
|          | 3,300    | 50 × 130           | 10.8                                    | 3.58                                                       | ERWV3H1LGC332MCD0M |
|          | 4,700    | 63.5 × 115         | 13.2                                    | 4.61                                                       | ERWV3H1LGC472MDB5M |
|          | 5,600    | 63.5 × 130         | 15.2                                    | 5.30                                                       | ERWV3H1LGC562MDD0M |
|          | 5,600    | 76.2 × 105         | 15.2                                    | 5.36                                                       | ERWV3H1LGC562MEA5M |
|          | 6,800    | 63.5 × 155         | 18.1                                    | 6.32                                                       | ERWV3H1LGC682MDF5M |
|          | 6,800    | 63.5 × 170         | 18.9                                    | 6.60                                                       | ERWV3H1LGC682MDH0M |
|          | 8,200    | 76.2 × 130         | 20.2                                    | 7.09                                                       | ERWV3H1LGC822MED0M |
|          | 8,200    | 89 × 115           | 20.9                                    | 7.35                                                       | ERWV3H1LGC822MFB5M |
|          | 10,000   | 76.2 × 155         | 24.2                                    | 8.48                                                       | ERWV3H1LGC103MEF5M |
|          | 10,000   | 76.2 × 170         | 25.2                                    | 8.85                                                       | ERWV3H1LGC103MEH0M |
|          | 10,000   | 89 × 130           | 24.3                                    | 8.54                                                       | ERWV3H1LGC103MFD0M |
|          | 12,000   | 89 × 155           | 28.7                                    | 10.0                                                       | ERWV3H1LGC123MFF5M |
|          | 15,000   | 89 × 170           | 33.5                                    | 11.7                                                       | ERWV3H1LGC153MFH0M |
|          | 15,000   | 89 × 190           | 35.2                                    | 12.3                                                       | ERWV3H1LGC153MFK0M |
| 400      | 1,000    | 50 × 60            | 4.30                                    | 1.42                                                       | ERWV401LGC102MC60M |
|          | 1,200    | 50 × 70            | 4.90                                    | 1.64                                                       | ERWV401LGC122MC70M |
|          | 1,500    | 50 × 80            | 5.80                                    | 1.95                                                       | ERWV401LGC152MC80M |
|          | 1,800    | 50 × 96            | 6.90                                    | 2.29                                                       | ERWV401LGC182MC96M |
|          | 2,200    | 50 × 105           | 8.00                                    | 2.65                                                       | ERWV401LGC222MCA5M |
|          | 2,200    | 50 × 115           | 8.30                                    | 2.77                                                       | ERWV401LGC222MCB5M |
|          | 2,700    | 50 × 130           | 9.80                                    | 3.23                                                       | ERWV401LGC272MCD0M |
|          | 3,900    | 63.5 × 115         | 12.0                                    | 4.21                                                       | ERWV401LGC392MDB5M |
|          | 4,700    | 63.5 × 130         | 13.9                                    | 4.86                                                       | ERWV401LGC472MDD0M |
|          | 5,600    | 63.5 × 155         | 16.4                                    | 5.75                                                       | ERWV401LGC562MDF5M |
| 400      | 5,600    | 63.5 × 170         | 17.1                                    | 5.99                                                       | ERWV401LGC562MDH0M |
|          | 5,600    | 76.2 × 105         | 15.2                                    | 5.35                                                       | ERWV401LGC562MEA5M |
|          | 6,800    | 76.2 × 130         | 18.4                                    | 6.47                                                       | ERWV401LGC682MED0M |
|          | 8,200    | 76.2 × 155         | 21.9                                    | 7.68                                                       | ERWV401LGC822MEF5M |
|          | 8,200    | 76.2 × 170         | 22.8                                    | 8.02                                                       | ERWV401LGC822MEH0M |
|          | 8,200    | 89 × 115           | 20.9                                    | 7.35                                                       | ERWV401LGC822MFB5M |
|          | 10,000   | 89 × 130           | 24.3                                    | 8.26                                                       | ERWV401LGC103MFD0M |
|          | 12,000   | 89 × 155           | 28.7                                    | 10.0                                                       | ERWV401LGC123MFF5M |
|          | 12,000   | 89 × 170           | 29.9                                    | 10.5                                                       | ERWV401LGC123MFH0M |
|          | 15,000   | 89 × 190           | 35.2                                    | 12.3                                                       | ERWV401LGC153MFK0M |
| 420      | 820      | 50 × 60            | 3.80                                    | 1.29                                                       | ERWV421LGC821MC60M |
|          | 1,000    | 50 × 70            | 4.40                                    | 1.50                                                       | ERWV421LGC102MC70M |
|          | 1,200    | 50 × 80            | 5.20                                    | 1.75                                                       | ERWV421LGC122MC80M |
|          | 1,800    | 50 × 96            | 6.80                                    | 2.30                                                       | ERWV421LGC152MC96M |
|          | 1,800    | 50 × 105           | 7.10                                    | 2.40                                                       | ERWV421LGC182MCA5M |
|          | 2,200    | 50 × 115           | 8.20                                    | 2.77                                                       | ERWV421LGC222MCB5M |
|          | 2,700    | 50 × 130           | 9.60                                    | 3.25                                                       | ERWV421LGC272MCD0M |
|          | 3,300    | 63.5 × 115         | 11.0                                    | 3.87                                                       | ERWV421LGC332MDB5M |
|          | 3,900    | 63.5 × 130         | 12.7                                    | 4.44                                                       | ERWV421LGC392MDD0M |
|          | 4,700    | 63.5 × 155         | 15.0                                    | 5.28                                                       | ERWV421LGC472MDF5M |
|          | 4,700    | 76.2 × 105         | 13.9                                    | 4.92                                                       | ERWV421LGC472MEA5M |
|          | 5,600    | 63.5 × 170         | 17.1                                    | 6.02                                                       | ERWV421LGC562MDH0M |
|          | 5,600    | 76.2 × 130         | 16.6                                    | 5.90                                                       | ERWV421LGC562MED0M |
|          | 6,800    | 76.2 × 155         | 19.8                                    | 7.02                                                       | ERWV421LGC682MEF5M |
|          | 6,800    | 89 × 115           | 19.0                                    | 6.73                                                       | ERWV421LGC682MFB5M |
|          | 8,200    | 76.2 × 170         | 22.7                                    | 8.04                                                       | ERWV421LGC822MEH0M |
|          | 8,200    | 89 × 130           | 22.0                                    | 7.78                                                       | ERWV421LGC822MFD0M |
|          | 10,000   | 89 × 155           | 26.2                                    | 9.24                                                       | ERWV421LGC103MFF5M |
|          | 12,000   | 89 × 170           | 29.9                                    | 10.5                                                       | ERWV421LGC123MFH0M |
|          | 12,000   | 89 × 190           | 31.5                                    | 11.0                                                       | ERWV421LGC123MFK0M |
| 450      | 820      | 50 × 60            | 3.80                                    | 1.29                                                       | ERWV451LGC821MC60M |
|          | 1,000    | 50 × 70            | 4.40                                    | 1.50                                                       | ERWV451LGC102MC70M |
|          | 1,200    | 50 × 80            | 5.20                                    | 1.74                                                       | ERWV451LGC122MC80M |
|          | 1,500    | 50 × 96            | 6.20                                    | 2.10                                                       | ERWV451LGC152MC96M |
|          | 1,800    | 50 × 105           | 7.10                                    | 2.41                                                       | ERWV451LGC182MCA5M |
|          | 1,800    | 50 × 115           | 7.40                                    | 2.51                                                       | ERWV451LGC182MCB5M |
|          | 2,200    | 50 × 130           | 8.70                                    | 2.93                                                       | ERWV451LGC222MCD0M |
|          | 3,300    | 63.5 × 115         | 11.0                                    | 3.88                                                       | ERWV451LGC332MDB5M |
|          | 3,900    | 63.5 × 130         | 12.7                                    | 4.44                                                       | ERWV451LGC392MDD0M |
|          | 3,900    | 76.2 × 105         | 13.2                                    | 4.49                                                       | ERWV451LGC392MEA5M |
|          | 4,700    | 63.5 × 155         | 15.0                                    | 5.27                                                       | ERWV451LGC472MDF5M |
|          | 4,700    | 63.5 × 170         | 15.6                                    | 5.50                                                       | ERWV451LGC472MDH0M |
|          | 5,600    | 76.2 × 130         | 16.6                                    | 5.88                                                       | ERWV451LGC562MED0M |
|          | 6,800    | 76.2 × 155         | 19.8                                    | 7.04                                                       | ERWV451LGC682MEF5M |
|          | 6,800    | 89 × 115           | 19.0                                    | 6.72                                                       | ERWV451LGC682MFB5M |
|          | 8,200    | 76.2 × 170         | 22.7                                    | 7.97                                                       | ERWV451LGC822MEH0M |
|          | 8,200    | 89 × 130           | 22.0                                    | 7.72                                                       | ERWV451LGC822MFD0M |
|          | 10,000   | 89 × 155           | 26.2                                    | 9.22                                                       | ERWV451LGC103MFF5M |
|          | 10,000   | 89 × 170           | 27.3                                    | 9.66                                                       | ERWV451LGC103MFH0M |
|          | 12,000   | 89 × 190           | 31.5                                    | 11.1                                                       | ERWV451LGC123MFK0M |



## LARGE CAPACITANCE ALUMINUM ELECTROLYTIC CAPACITORS

Screw terminals, 85°C

New!

**RWV** Series

## ◆RATED RIPPLE CURRENT MULTIPLIERS

## ●Frequency Multipliers

| Frequency (Hz) | 50  | 120 | 300 | 1k  | 3k  |
|----------------|-----|-----|-----|-----|-----|
| Coefficient    | 0.8 | 1.0 | 1.1 | 1.3 | 1.4 |

Note : The endurance of capacitors is shortened with internal heating produced by ripple currents at the rate of halving the lifetime with every 5 to 10°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced. Also, for the RWV series capacitors, using them at operating voltage less than their rated voltage can extend their lifetime. For the details, please contact a representative of Nippon Chemi-Con.



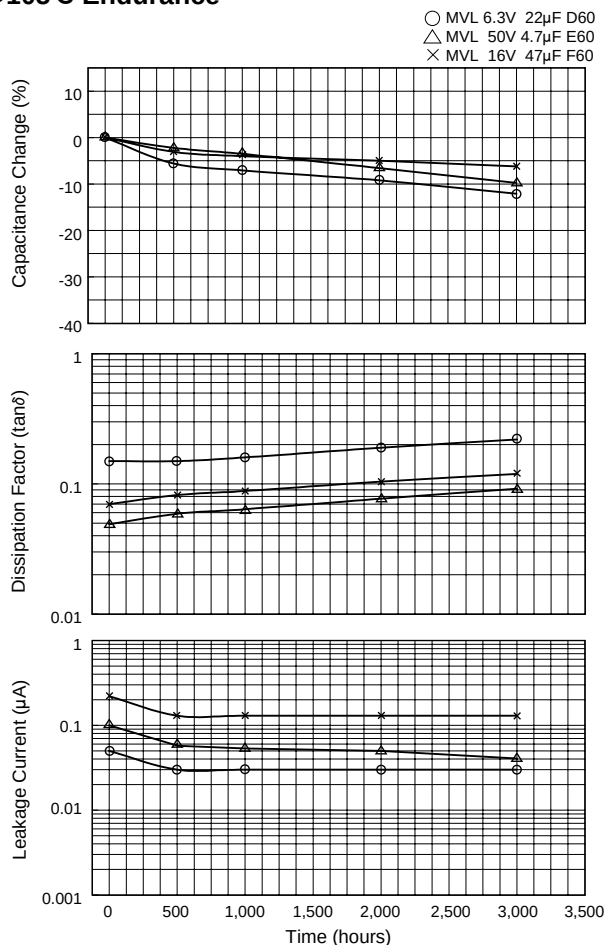
## RELIABILITY DATA

Surface Mount

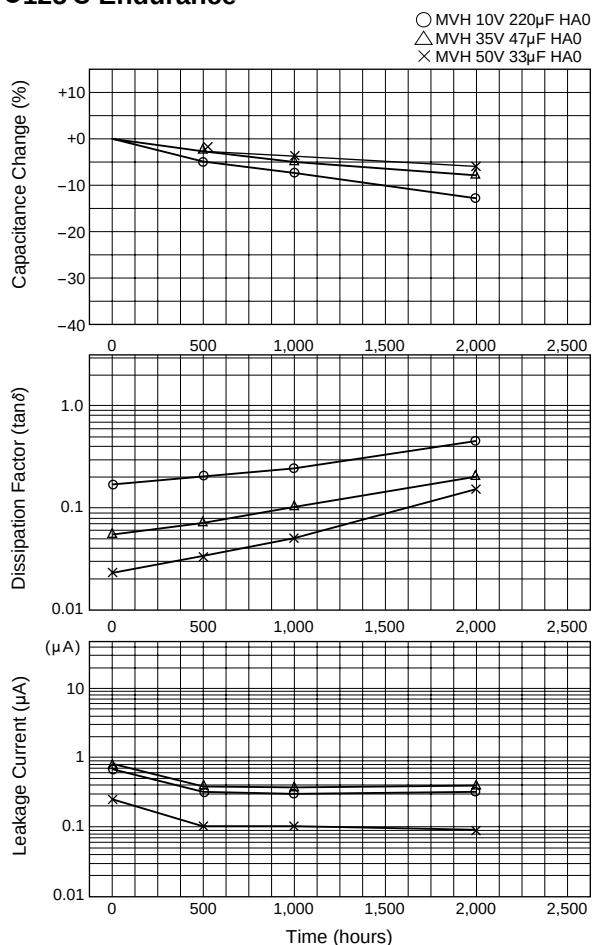
MVL Series

MVH Series

## ●105°C Endurance

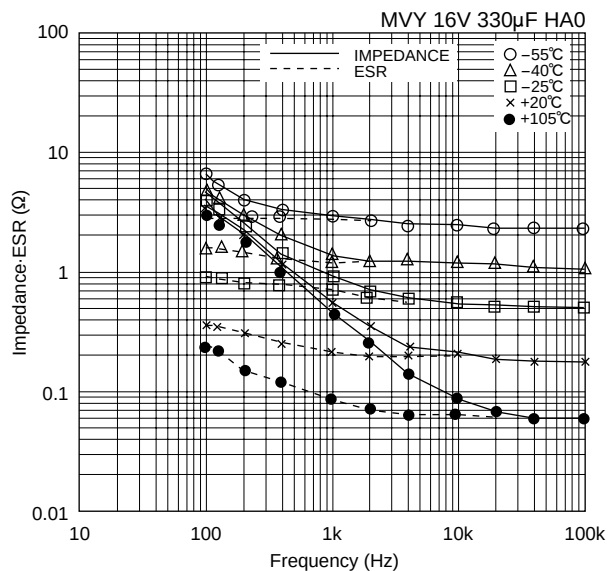
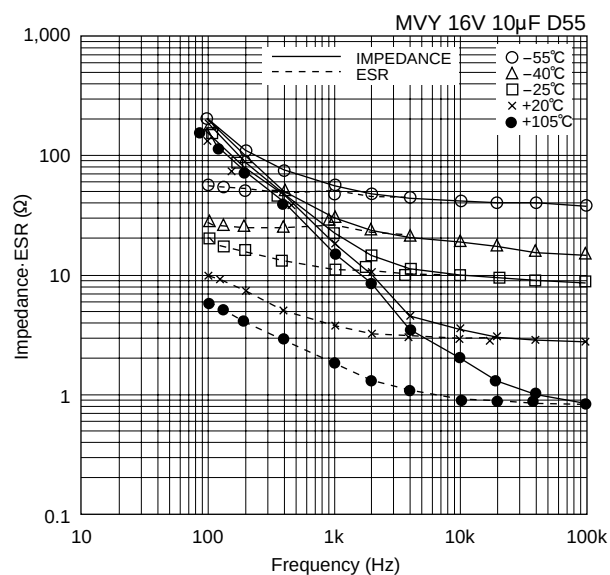


## ●125°C Endurance



MVY Series

## ●Impedance/ESR vs Frequency





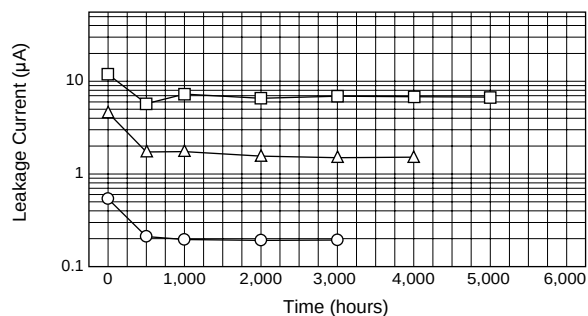
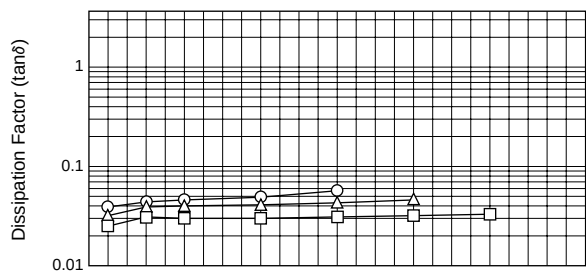
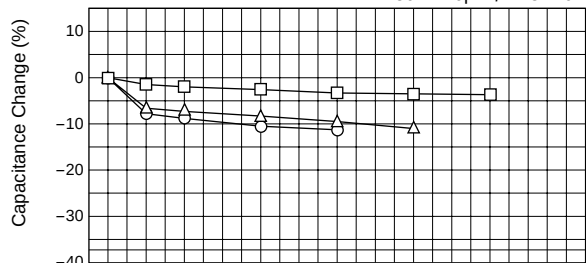
## RELIABILITY DATA

Radial

KZE Series

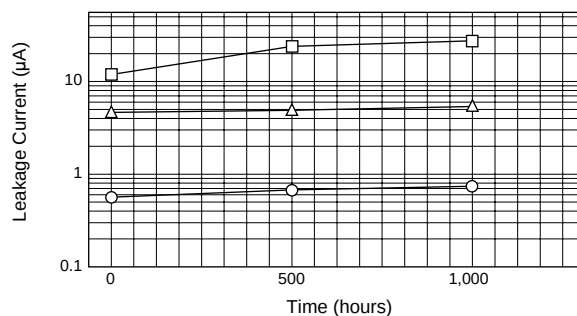
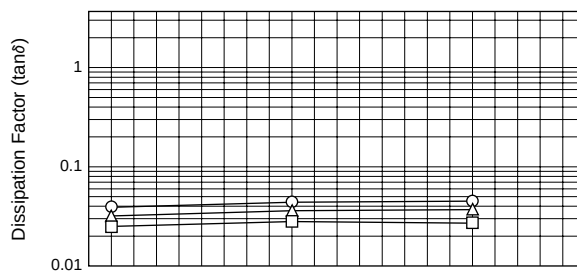
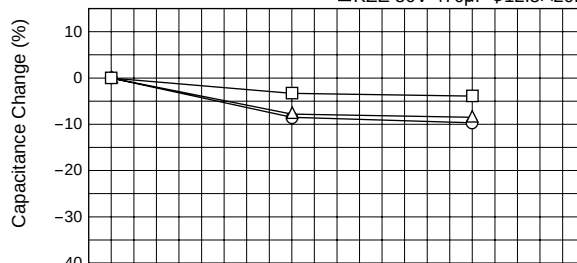
## ●105°C Endurance with Rated Ripple Current

○KZE 10V 220 $\mu$ F  $\phi$ 6.3 $\times$ 11L  
 $\Delta$ KZE 16V 680 $\mu$ F  $\phi$ 10 $\times$ 16L  
 $\square$ KZE 50V 470 $\mu$ F  $\phi$ 12.5 $\times$ 20L



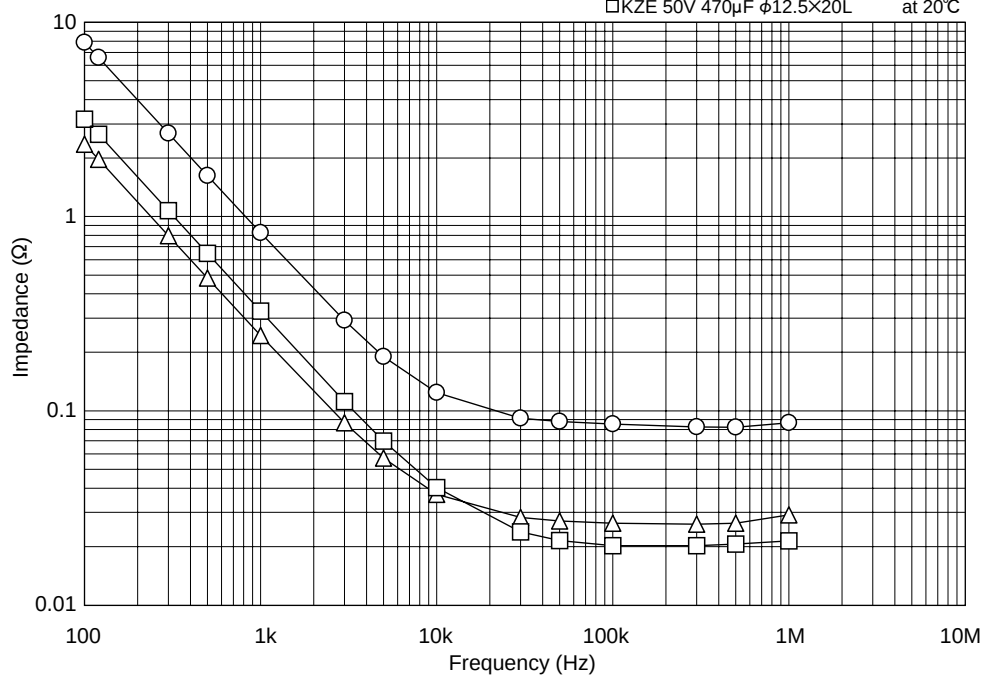
## ●105°C Shelf Life

○KZE 10V 220 $\mu$ F  $\phi$ 6.3 $\times$ 11L  
 $\Delta$ KZE 16V 680 $\mu$ F  $\phi$ 10 $\times$ 16L  
 $\square$ KZE 50V 470 $\mu$ F  $\phi$ 12.5 $\times$ 20L



## ●Impedance-Frequency Characteristics

○KZE 10V 220 $\mu$ F  $\phi$ 6.3 $\times$ 11L  
 $\Delta$ KZE 16V 680 $\mu$ F  $\phi$ 10 $\times$ 16L  
 $\square$ KZE 50V 470 $\mu$ F  $\phi$ 12.5 $\times$ 20L at 20°C





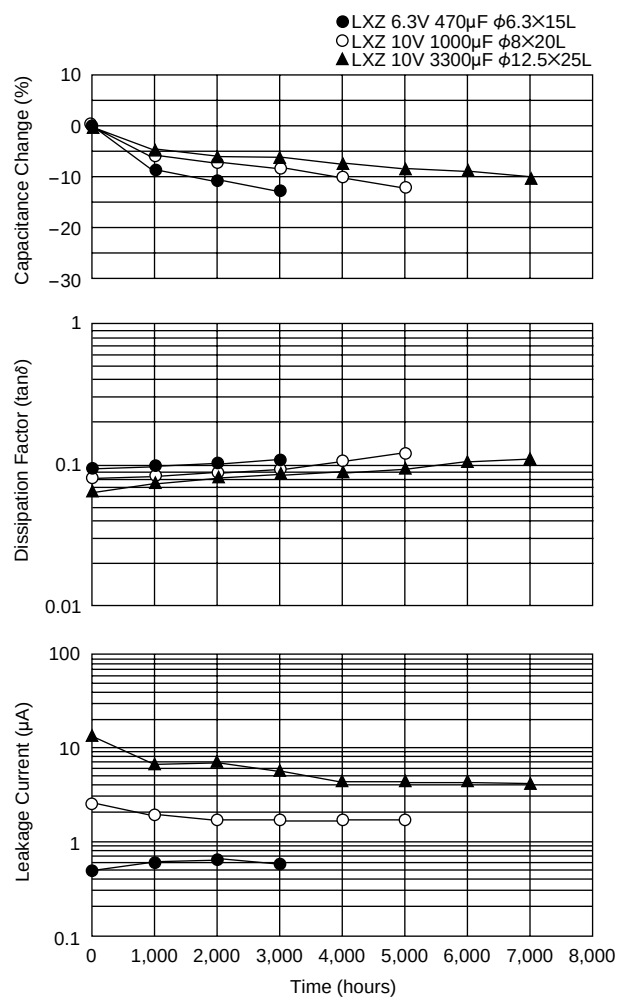
## RELIABILITY DATA

Low Impedance Radial

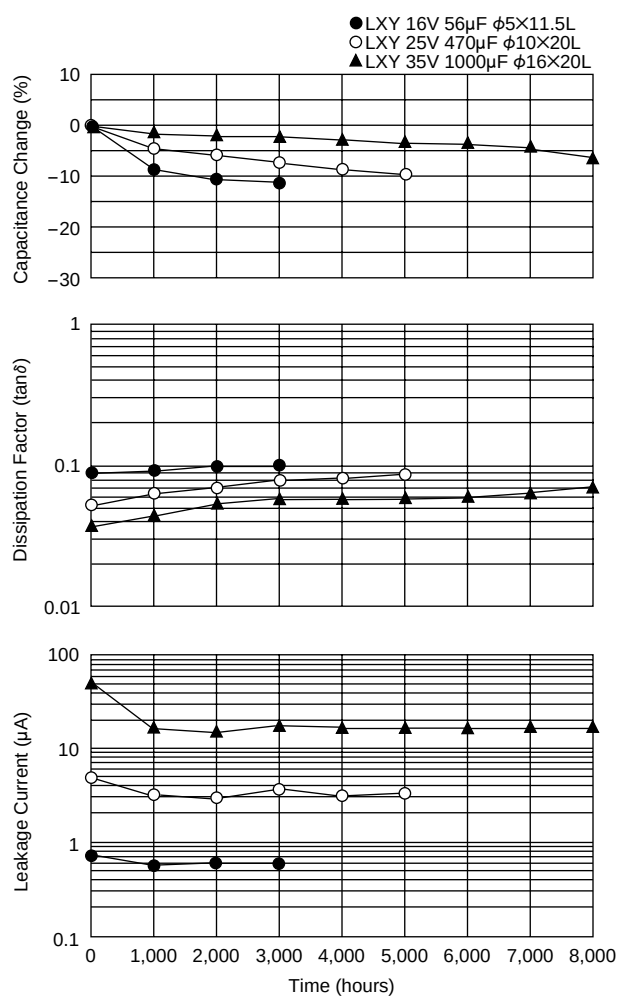
LXZ Series

LXY Series

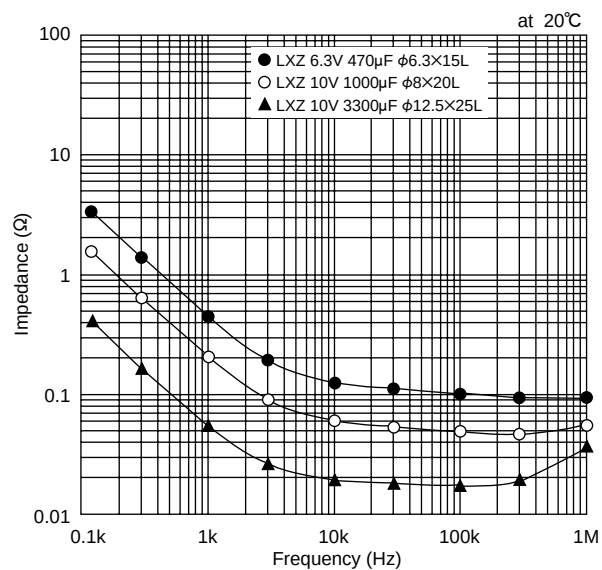
## ●105°C Endurance with Rated Ripple Current



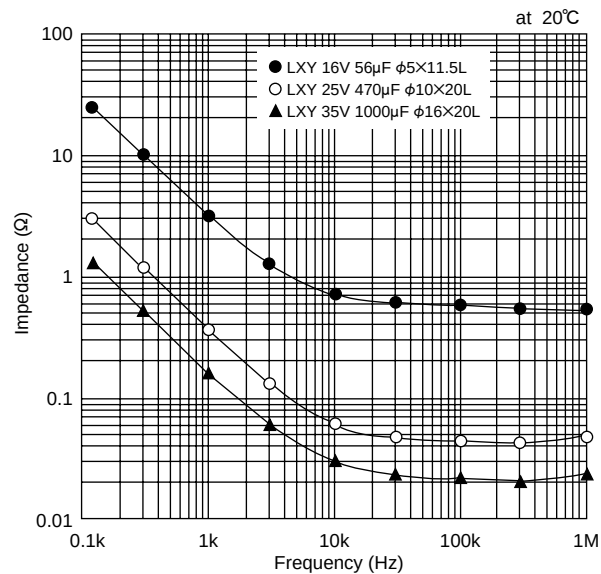
## ●105°C Endurance with Rated Ripple Current



## ●Impedance-Frequency Characteristics



## ●Impedance-Frequency Characteristics





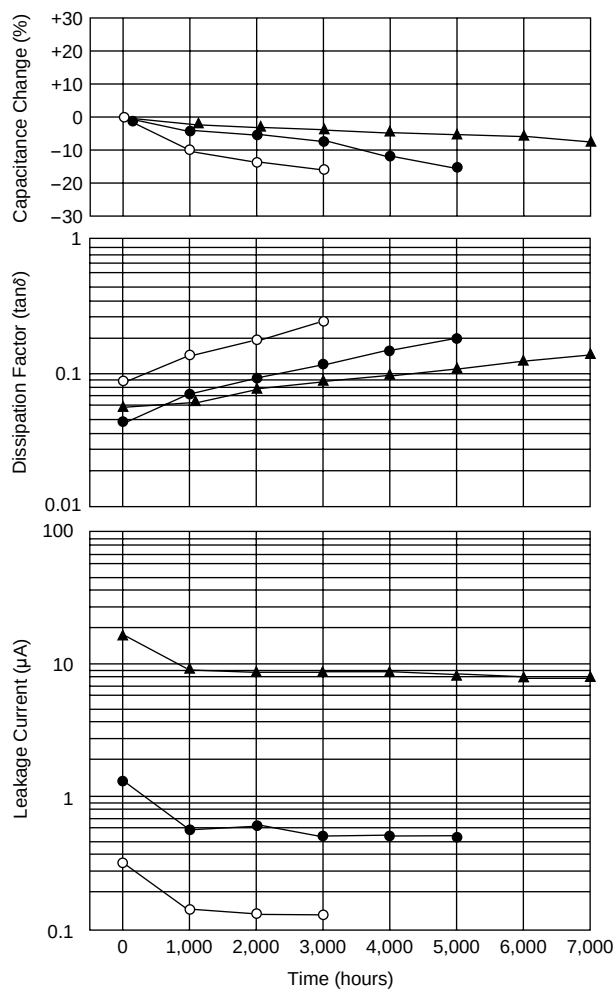
## RELIABILITY DATA

Low Impedance Radial

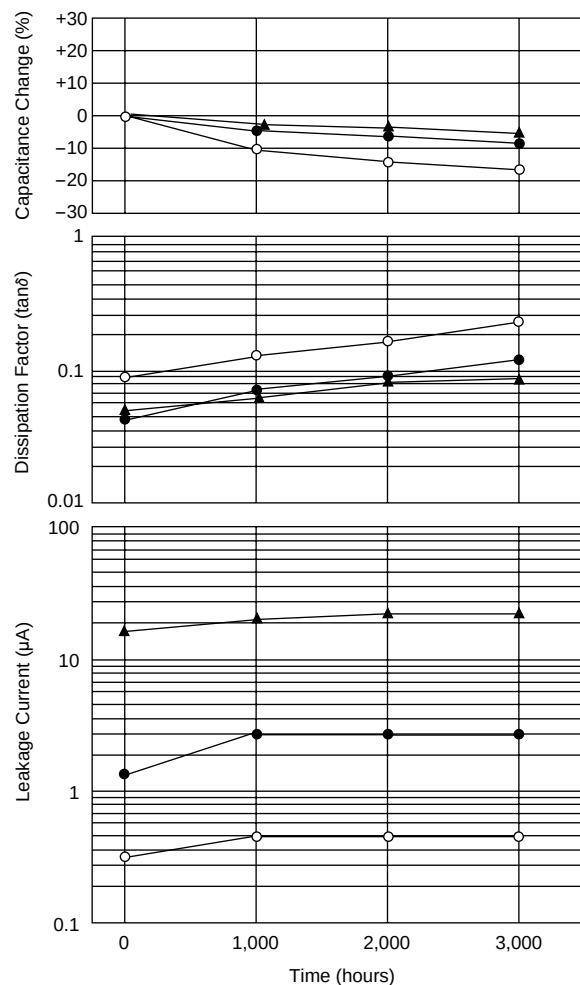
LXV Series

- LXV 10V 820 $\mu$ F  $\phi$ 5 $\times$ 11.5L  
 ● LXV 25V 220 $\mu$ F  $\phi$ 8 $\times$ 15L  
 ▲ LXV 35V 560 $\mu$ F  $\phi$ 12.5 $\times$ 20L

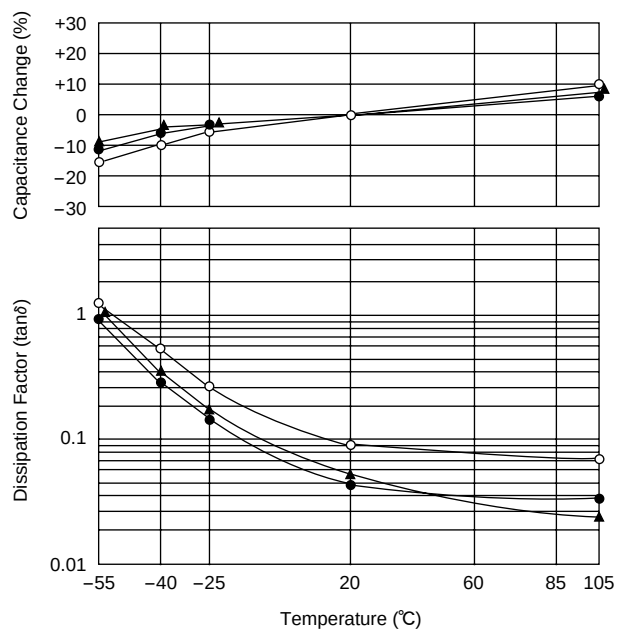
## ●105°C Endurance with Rated Ripple Current



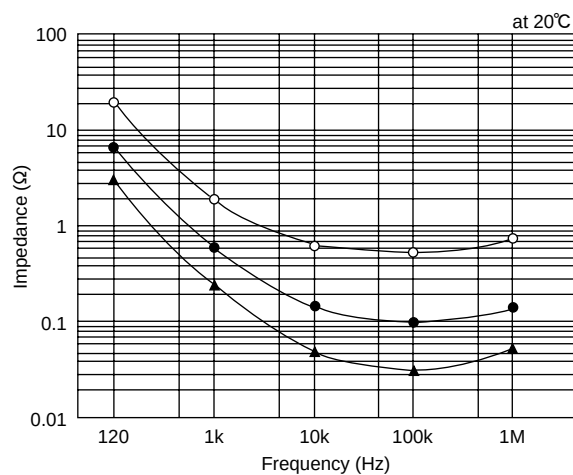
## ●105°C Shelf Life test



## ●Temperature Characteristics



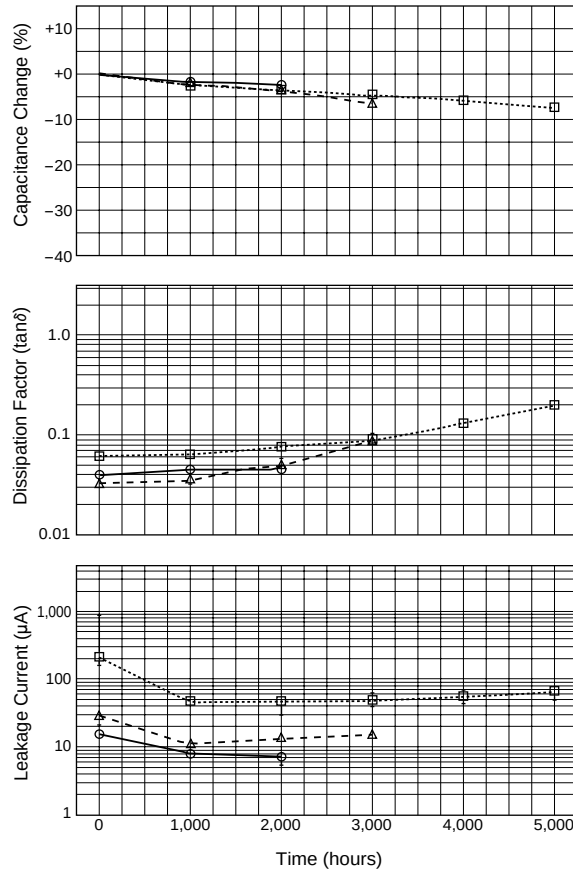
## ●Impedance-Frequency Characteristics



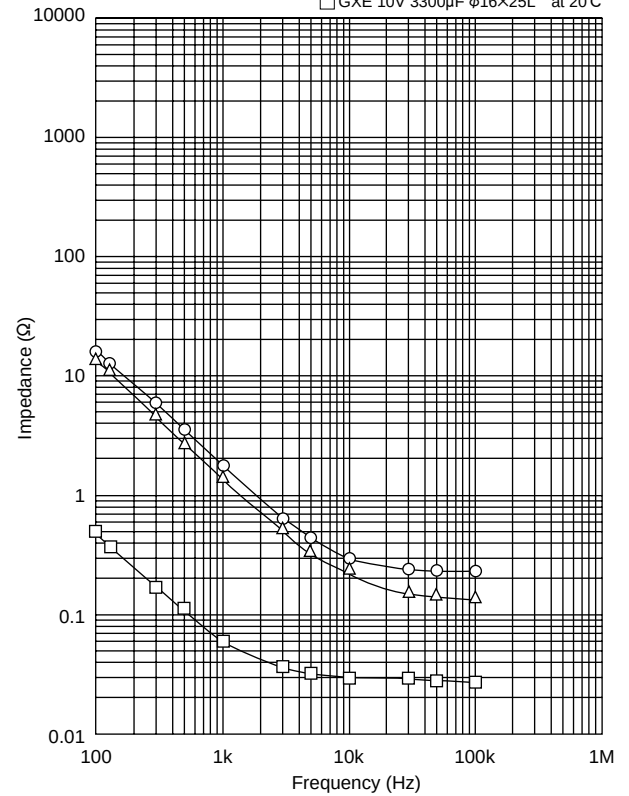

**GXE** Series

**●125°C Endurance with Rated Ripple Current**

- GXE 35V 100 $\mu$ F  $\phi$ 8 $\times$ 12L  
 △ GXE 50V 100 $\mu$ F  $\phi$ 10 $\times$ 12.5L  
 □ GXE 10V 3300 $\mu$ F  $\phi$ 16 $\times$ 25L


**●Impedance-Frequency Characteristics**

- GXE 35V 100 $\mu$ F  $\phi$ 8 $\times$ 12L  
 △ GXE 50V 100 $\mu$ F  $\phi$ 10 $\times$ 12.5L  
 □ GXE 10V 3300 $\mu$ F  $\phi$ 16 $\times$ 25L at 20°C



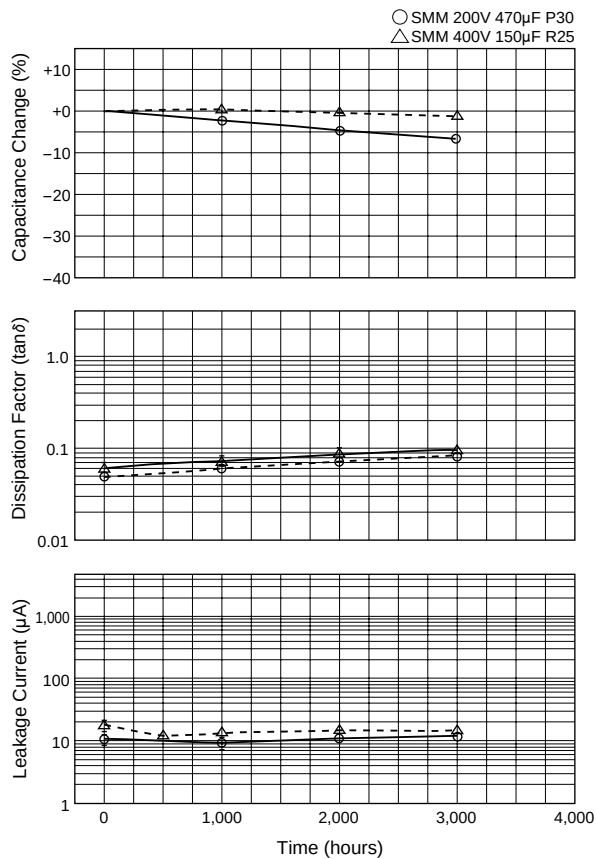


## RELIABILITY DATA

Snap-ins

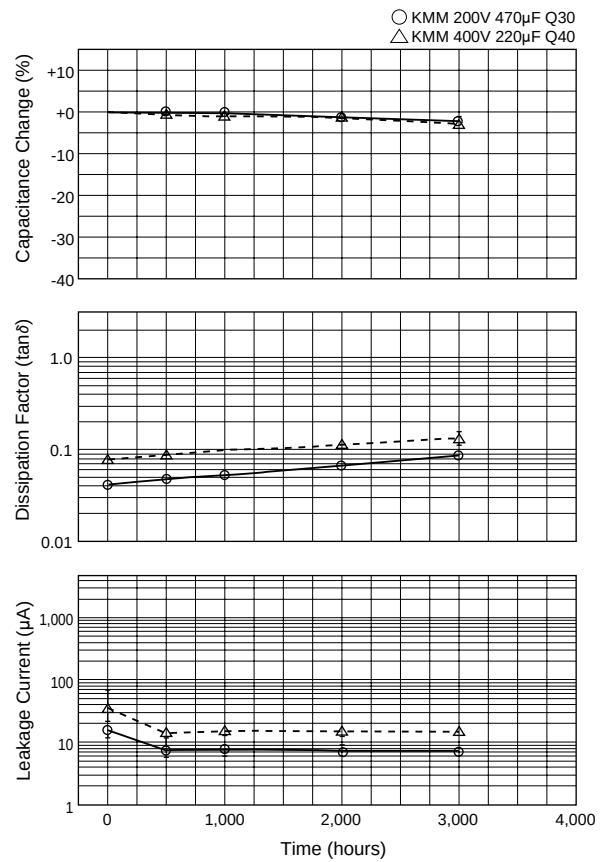
## SMM Series

## ●85°C Endurance with Rated Ripple Current



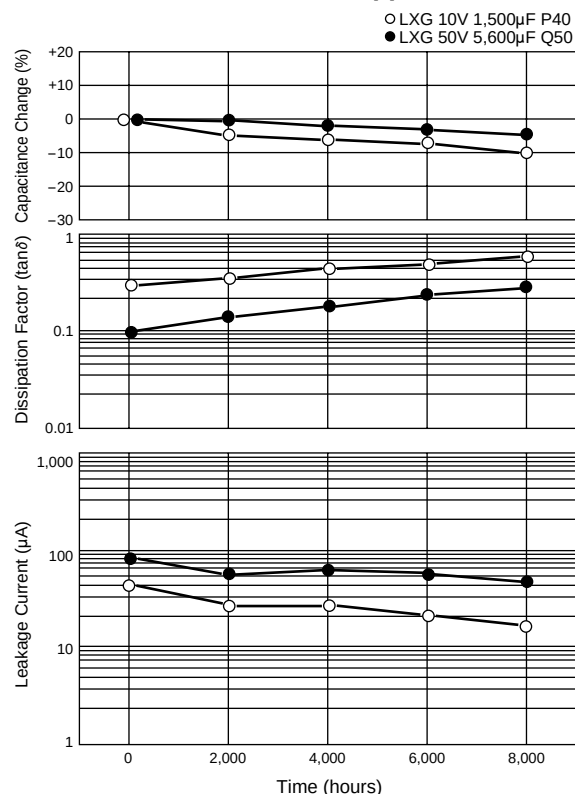
## KMM Series

## ●105°C Endurance with Rated Ripple Current



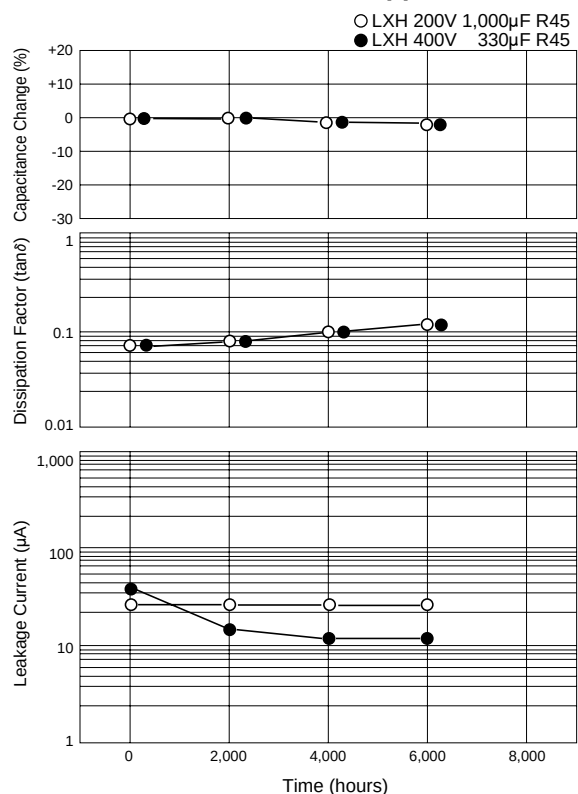
## LXG Series

## ●105°C Endurance with Rated Ripple Current



## LXH Series

## ●105°C Endurance with Rated Ripple Current





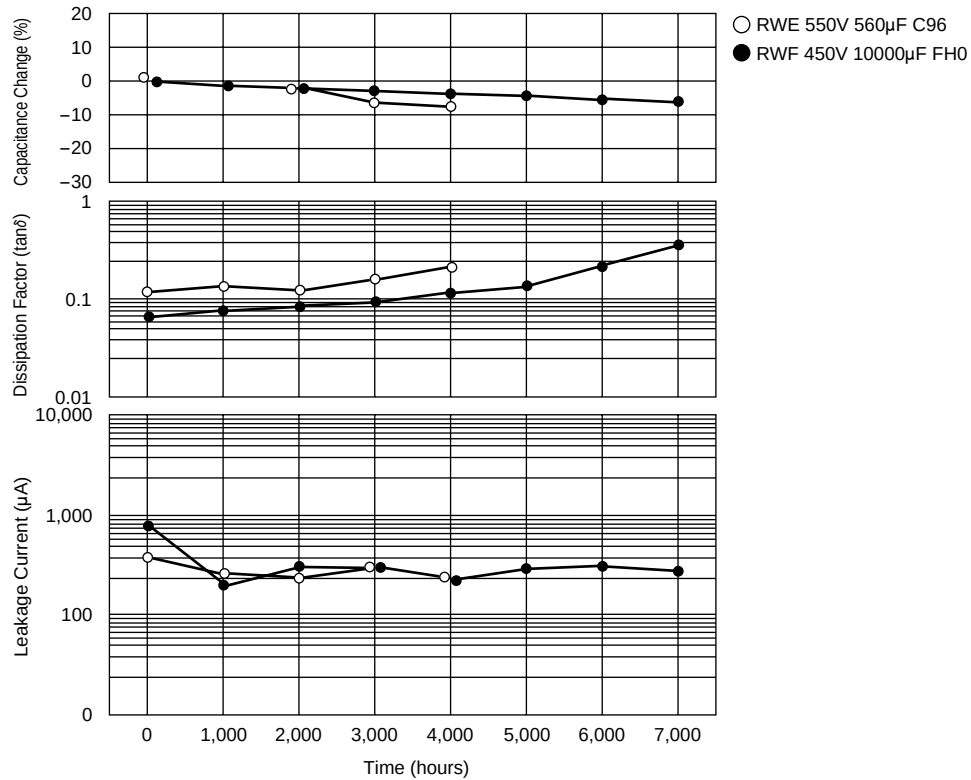
## RELIABILITY DATA

Screw-Mount

## RWE/RWF/RWL Series

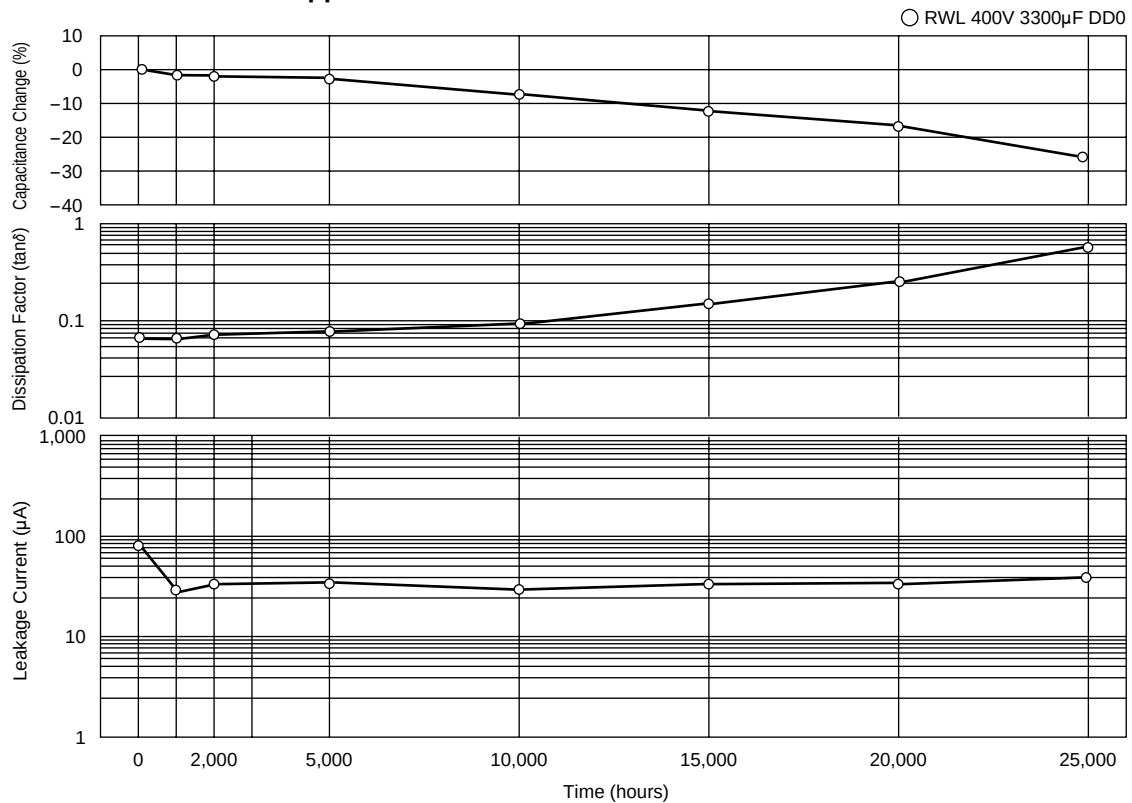
## RWE/RWF series

## ●85°C Endurance with Rated Ripple Current



## RWL series

## ●85°C Endurance with Rated Ripple Current





## PART NUMBERING SYSTEM

### Appendix (Part number)

#### ◆Capacitance code

\* How to use the table

| 1st        |
|------------|
| 2nd        |
| Cap. Value |

Capacitance value part

| 2nd | 1st  |      |      |      |      |      |      |      |      |
|-----|------|------|------|------|------|------|------|------|------|
|     | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |
| 0   | 10.0 | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 70.0 | 80.0 | 90.0 |
| A   | 10.5 | 20.5 | 30.5 | 40.5 | 50.5 | 60.5 | 70.5 | 80.5 | 90.5 |
| 1   | 11.0 | 21.0 | 31.0 | 41.0 | 51.0 | 61.0 | 71.0 | 81.0 | 91.0 |
| B   | 11.5 | 21.5 | 31.5 | 41.5 | 51.5 | 61.5 | 71.5 | 81.5 | 91.5 |
| 2   | 12.0 | 22.0 | 32.0 | 42.0 | 52.0 | 62.0 | 72.0 | 82.0 | 92.0 |
| C   | 12.5 | 22.5 | 32.5 | 42.5 | 52.5 | 62.5 | 72.5 | 82.5 | 92.5 |
| 3   | 13.0 | 23.0 | 33.0 | 43.0 | 53.0 | 63.0 | 73.0 | 83.0 | 93.0 |
| D   | 13.5 | 23.5 | 33.5 | 43.5 | 53.5 | 63.5 | 73.5 | 83.5 | 93.5 |
| 4   | 14.0 | 24.0 | 34.0 | 44.0 | 54.0 | 64.0 | 74.0 | 84.0 | 94.0 |
| E   | 14.5 | 24.5 | 34.5 | 44.5 | 54.5 | 64.5 | 74.5 | 84.5 | 94.5 |
| 5   | 15.0 | 25.0 | 35.0 | 45.0 | 55.0 | 65.0 | 75.0 | 85.0 | 95.0 |
| F   | 15.5 | 25.5 | 35.5 | 45.5 | 55.5 | 65.5 | 75.5 | 85.5 | 95.5 |
| 6   | 16.0 | 26.0 | 36.0 | 46.0 | 56.0 | 66.0 | 76.0 | 86.0 | 96.0 |
| G   | 16.5 | 26.5 | 36.5 | 46.5 | 56.5 | 66.5 | 76.5 | 86.5 | 96.5 |
| 7   | 17.0 | 27.0 | 37.0 | 47.0 | 57.0 | 67.0 | 77.0 | 87.0 | 97.0 |
| H   | 17.5 | 27.5 | 37.5 | 47.5 | 57.5 | 67.5 | 77.5 | 87.5 | 97.5 |
| 8   | 18.0 | 28.0 | 38.0 | 48.0 | 58.0 | 68.0 | 78.0 | 88.0 | 98.0 |
| J   | 18.5 | 28.5 | 38.5 | 48.5 | 58.5 | 68.5 | 78.5 | 88.5 | 98.5 |
| 9   | 19.0 | 29.0 | 39.0 | 49.0 | 59.0 | 69.0 | 79.0 | 89.0 | 99.0 |
| K   | 19.5 | 29.5 | 39.5 | 49.5 | 59.5 | 69.5 | 79.5 | 89.5 | 99.5 |

For less than 10 $\mu$ F, a decimal point position is displayed with R.

For 10 $\mu$ F or more, capacitance code is set to the first 2 digits and index (1digit).

Treatment of fraction (Refer to the table)

Example of conversion

| Real cap.        | The first 2 digits | Treatment of fraction | Code |      |      |
|------------------|--------------------|-----------------------|------|------|------|
|                  |                    |                       | 11th | 12th | 13th |
| 10.0 $\mu$ F →   | 10.0 →             | 10.0 →                | 1    | 0    | 0    |
| 10.1 $\mu$ F →   | 10.1 →             | 10.0 →                | 1    | 0    | 0    |
| 10.2 $\mu$ F →   | 10.2 →             | 10.0 →                | 1    | 0    | 0    |
| 10.3 $\mu$ F →   | 10.3 →             | 10.5 →                | 1    | A    | 0    |
| 10.4 $\mu$ F →   | 10.4 →             | 10.5 →                | 1    | A    | 0    |
| 10.5 $\mu$ F →   | 10.5 →             | 10.5 →                | 1    | A    | 0    |
| 10.6 $\mu$ F →   | 10.6 →             | 10.5 →                | 1    | A    | 0    |
| 10.7 $\mu$ F →   | 10.7 →             | 10.5 →                | 1    | A    | 0    |
| 10.8 $\mu$ F →   | 10.8 →             | 11.0 →                | 1    | 1    | 0    |
| 10.9 $\mu$ F →   | 10.9 →             | 11.0 →                | 1    | 1    | 0    |
| 11.0 $\mu$ F →   | 11.0 →             | 11.0 →                | 1    | 1    | 0    |
| 132 $\mu$ F →    | 13.2 →             | 13.0 →                | 1    | 3    | 1    |
| 133 $\mu$ F →    | 13.3 →             | 13.5 →                | 1    | D    | 1    |
| 167 $\mu$ F →    | 16.7 →             | 16.5 →                | 1    | G    | 1    |
| 168 $\mu$ F →    | 16.8 →             | 17.0 →                | 1    | 7    | 1    |
| 1110 $\mu$ F →   | 11.1 →             | 11.0 →                | 1    | 1    | 2    |
| 1340 $\mu$ F →   | 13.4 →             | 13.5 →                | 1    | D    | 2    |
| 13200 $\mu$ F →  | 13.2 →             | 13.0 →                | 1    | 3    | 3    |
| 13600 $\mu$ F →  | 13.6 →             | 13.5 →                | 1    | D    | 3    |
| 270000 $\mu$ F → | 27.0 →             | 27.0 →                | 2    | 7    | 4    |

#### ◆Case length (Radial lead type)

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 0.0              | —    | —    |
| 0.1              | 0    | B    |
| 0.2              | 0    | C    |
| 0.3              | 0    | D    |
| 0.4              | 0    | E    |
| 0.5              | 0    | F    |
| 0.6              | 0    | G    |
| 0.7              | 0    | H    |
| 0.8              | 0    | J    |
| 0.9              | 0    | K    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 1.0              | 0    | 1    |
| 1.1              | 1    | B    |
| 1.2              | 1    | C    |
| 1.3              | 1    | D    |
| 1.4              | 1    | E    |
| 1.5              | 1    | F    |
| 1.6              | 1    | G    |
| 1.7              | 1    | H    |
| 1.8              | 1    | J    |
| 1.9              | 1    | K    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 2.0              | 0    | 2    |
| 2.1              | 2    | B    |
| 2.2              | 2    | C    |
| 2.3              | 2    | D    |
| 2.4              | 2    | E    |
| 2.5              | 2    | F    |
| 2.6              | 2    | G    |
| 2.7              | 2    | H    |
| 2.8              | 2    | J    |
| 2.9              | 2    | K    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 3.0              | 0    | 3    |
| 3.1              | 3    | B    |
| 3.2              | 3    | C    |
| 3.3              | 3    | D    |
| 3.4              | 3    | E    |
| 3.5              | 3    | F    |
| 3.6              | 3    | G    |
| 3.7              | 3    | H    |
| 3.8              | 3    | J    |
| 3.9              | 3    | K    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 4.0              | 0    | 4    |
| 4.1              | 4    | B    |
| 4.2              | 4    | C    |
| 4.3              | 4    | D    |
| 4.4              | 4    | E    |
| 4.5              | 4    | F    |
| 4.6              | 4    | G    |
| 4.7              | 4    | H    |
| 4.8              | 4    | J    |
| 4.9              | 4    | K    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 5.0              | 0    | 5    |
| 5.1              | 5    | B    |
| 5.2              | 5    | C    |
| 5.3              | 5    | D    |
| 5.4              | 5    | E    |
| 5.5              | 5    | F    |
| 5.6              | 5    | G    |
| 5.7              | 5    | H    |
| 5.8              | 5    | J    |
| 5.9              | 5    | K    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 6.0              | 0    | 6    |
| 6.1              | 6    | B    |
| 6.2              | 6    | C    |
| 6.3              | 6    | D    |
| 6.4              | 6    | E    |
| 6.5              | 6    | F    |
| 6.6              | 6    | G    |
| 6.7              | 6    | H    |
| 6.8              | 6    | J    |
| 6.9              | 6    | K    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 7.0              | 0    | 7    |
| 7.1              | 7    | B    |
| 7.2              | 7    | C    |
| 7.3              | 7    | D    |
| 7.4              | 7    | E    |
| 7.5              | 7    | F    |
| 7.6              | 7    | G    |
| 7.7              | 7    | H    |
| 7.8              | 7    | J    |
| 7.9              | 7    | K    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 8.0              | 0    | 8    |
| 8.1              | 8    | B    |
| 8.2              | 8    | C    |
| 8.3              | 8    | D    |
| 8.4              | 8    | E    |
| 8.5              | 8    | F    |
| 8.6              | 8    | G    |
| 8.7              | 8    | H    |
| 8.8              | 8    | J    |
| 8.9              | 8    | K    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 9.0              | 0    | 9    |
| 9.1              | 9    | B    |
| 9.2              | 9    | C    |
| 9.3              | 9    | D    |
| 9.4              | 9    | E    |
| 9.5              | 9    | F    |
| 9.6              | 9    | G    |
| 9.7              | 9    | H    |
| 9.8              | 9    | J    |
| 9.9              | 9    | K    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 10.0             | 1    | 0    |
| 10.1             | A    | 1    |
| 10.2             | A    | 2    |
| 10.3             | A    | 3    |
| 10.4             | A    | 4    |
| 10.5             | A    | 5    |
| 10.6             | A    | 6    |
| 10.7             | A    | 7    |
| 10.8             | A    | 8    |
| 10.9             | A    | 9    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 11.0             | 1    | 1    |
| 11.1             | B    | 1    |
| 11.2             | B    | 2    |
| 11.3             | B    | 3    |
| 11.4             | B    | 4    |
| 11.5             | B    | 5    |
| 11.6             | B    | 6    |
| 11.7             | B    | 7    |
| 11.8             | B    | 8    |
| 11.9             | B    | 9    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 12.0             | 1    | 2    |
| 12.1             | C    | 1    |
| 12.2             | C    | 2    |
| 12.3             | C    | 3    |
| 12.4             | C    | 4    |
| 12.5             | C    | 5    |
| 12.6             | C    | 6    |
| 12.7             | C    | 7    |
| 12.8             | C    | 8    |
| 12.9             | C    | 9    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 13.0             | 1    | 3    |
| 13.1             | D    | 1    |
| 13.2             | D    | 2    |
| 13.3             | D    | 3    |
| 13.4             | D    | 4    |
| 13.5             | D    | 5    |
| 13.6             | D    | 6    |
| 13.7             | D    | 7    |
| 13.8             | D    | 8    |
| 13.9             | D    | 9    |

| Case length [mm] | 16th | 17th |
|------------------|------|------|
| 14.0             | 1    | 4    |
| 14.1             | E    | 1    |
| 14.2             | E    | 2    |
| 14.3             | E    | 3    |
| 14.4             | E    | 4    |
| 14.5             | E    | 5    |
| 14.6             | E    | 6    |
| 14.7             | E    | 7    |
| 14.8             | E    | 8    |
| 14.9             | E    | 9    |



## PART NUMBERING SYSTEM

| Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th |
|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|
| 15.0                | 1    | 5    | 16.0                | 1    | 6    | 17.0                | 1    | 7    | 18.0                | 1    | 8    | 19.0                | 1    | 9    |
| 15.1                | F    | 1    | 16.1                | G    | 1    | 17.1                | H    | 1    | 18.1                | J    | 1    | 19.1                | K    | 1    |
| 15.2                | F    | 2    | 16.2                | G    | 2    | 17.2                | H    | 2    | 18.2                | J    | 2    | 19.2                | K    | 2    |
| 15.3                | F    | 3    | 16.3                | G    | 3    | 17.3                | H    | 3    | 18.3                | J    | 3    | 19.3                | K    | 3    |
| 15.4                | F    | 4    | 16.4                | G    | 4    | 17.4                | H    | 4    | 18.4                | J    | 4    | 19.4                | K    | 4    |
| 15.5                | F    | 5    | 16.5                | G    | 5    | 17.5                | H    | 5    | 18.5                | J    | 5    | 19.5                | K    | 5    |
| 15.6                | F    | 6    | 16.6                | G    | 6    | 17.6                | H    | 6    | 18.6                | J    | 6    | 19.6                | K    | 6    |
| 15.7                | F    | 7    | 16.7                | G    | 7    | 17.7                | H    | 7    | 18.7                | J    | 7    | 19.7                | K    | 7    |
| 15.8                | F    | 8    | 16.8                | G    | 8    | 17.8                | H    | 8    | 18.8                | J    | 8    | 19.8                | K    | 8    |
| 15.9                | F    | 9    | 16.9                | G    | 9    | 17.9                | H    | 9    | 18.9                | J    | 9    | 19.9                | K    | 9    |

| Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th |
|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|
| 20.0                | 2    | 0    | 30.0                | 3    | 0    | 40.0                | 4    | 0    | 50.0                | 5    | 0    | 60.0                | 6    | 0    |
| 20.5                | L    | 1    | 30.5                | N    | 1    | 40.5                | Q    | 1    | 50.5                | S    | 1    | 60.5                | U    | 1    |
| 21.0                | 2    | 1    | 31.0                | 3    | 1    | 41.0                | 4    | 1    | 51.0                | 5    | 1    | 61.0                | 6    | 1    |
| 21.5                | L    | 3    | 31.5                | N    | 3    | 41.5                | Q    | 3    | 51.5                | S    | 3    | 61.5                | U    | 3    |
| 22.0                | 2    | 2    | 32.0                | 3    | 2    | 42.0                | 4    | 2    | 52.0                | 5    | 2    | 62.0                | 6    | 2    |
| 22.5                | L    | 5    | 32.5                | N    | 5    | 42.5                | Q    | 5    | 52.5                | S    | 5    | 62.5                | U    | 5    |
| 23.0                | 2    | 3    | 33.0                | 3    | 3    | 43.0                | 4    | 3    | 53.0                | 5    | 3    | 63.0                | 6    | 3    |
| 23.5                | L    | 7    | 33.5                | N    | 7    | 43.5                | Q    | 7    | 53.5                | S    | 7    | 63.5                | U    | 7    |
| 24.0                | 2    | 4    | 34.0                | 3    | 4    | 44.0                | 4    | 4    | 54.0                | 5    | 4    | 64.0                | 6    | 4    |
| 24.5                | L    | 9    | 34.5                | N    | 9    | 44.5                | Q    | 9    | 54.5                | S    | 9    | 64.5                | U    | 9    |
| 25.0                | 2    | 5    | 35.0                | 3    | 5    | 45.0                | 4    | 5    | 55.0                | 5    | 5    | 65.0                | 6    | 5    |
| 25.5                | M    | 1    | 35.5                | P    | 1    | 45.5                | R    | 1    | 55.5                | T    | 1    | 65.5                | V    | 1    |
| 26.0                | 2    | 6    | 36.0                | 3    | 6    | 46.0                | 4    | 6    | 56.0                | 5    | 6    | 66.0                | 6    | 6    |
| 26.5                | M    | 3    | 36.5                | P    | 3    | 46.5                | R    | 3    | 56.5                | T    | 3    | 66.5                | V    | 3    |
| 27.0                | 2    | 7    | 37.0                | 3    | 7    | 47.0                | 4    | 7    | 57.0                | 5    | 7    | 67.0                | 6    | 7    |
| 27.5                | M    | 5    | 37.5                | P    | 5    | 47.5                | R    | 5    | 57.5                | T    | 5    | 67.5                | V    | 5    |
| 28.0                | 2    | 8    | 38.0                | 3    | 8    | 48.0                | 4    | 8    | 58.0                | 5    | 8    | 68.0                | 6    | 8    |
| 28.5                | M    | 7    | 38.5                | P    | 7    | 48.5                | R    | 7    | 58.5                | T    | 7    | 68.5                | V    | 7    |
| 29.0                | 2    | 9    | 39.0                | 3    | 9    | 49.0                | 4    | 9    | 59.0                | 5    | 9    | 69.0                | 6    | 9    |
| 29.5                | M    | 9    | 39.5                | P    | 9    | 49.5                | R    | 9    | 59.5                | T    | 9    | 69.5                | V    | 9    |

| Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th |
|---------------------|------|------|---------------------|------|------|
| 70.0                | 7    | 0    | 80.0                | 8    | 0    |
| 70.5                | W    | 1    | 80.5                | Y    | 1    |
| 71.0                | 7    | 1    | 81.0                | 8    | 1    |
| 71.5                | W    | 3    | 81.5                | Y    | 3    |
| 72.0                | 7    | 2    | 82.0                | 8    | 2    |
| 72.5                | W    | 5    | 82.5                | Y    | 5    |
| 73.0                | 7    | 3    | 83.0                | 8    | 3    |
| 73.5                | W    | 7    | 83.5                | Y    | 7    |
| 74.0                | 7    | 4    | 84.0                | 8    | 4    |
| 74.5                | W    | 9    | 84.5                | Y    | 9    |
| 75.0                | 7    | 5    | 85.0                | 8    | 5    |
| 75.5                | X    | 1    | 85.5                | Z    | 1    |
| 76.0                | 7    | 6    | 86.0                | 8    | 6    |
| 76.5                | X    | 3    | 86.5                | Z    | 3    |
| 77.0                | 7    | 7    | 87.0                | 8    | 7    |
| 77.5                | X    | 5    | 87.5                | Z    | 5    |
| 78.0                | 7    | 8    | 88.0                | 8    | 8    |
| 78.5                | X    | 7    | 88.5                | Z    | 7    |
| 79.0                | 7    | 9    | 89.0                | 8    | 9    |
| 79.5                | X    | 9    | 89.5                | Z    | 9    |



## PART NUMBERING SYSTEM

## ◆Case length (Snap-in type / Screw mount terminal type)

|                     |      |      |                     |      |      |                     |      |      |                     |      |      |                     |      |      |
|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|
| Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th |
| 20                  | 2    | 0    | 30                  | 3    | 0    | 40                  | 4    | 0    | 50                  | 5    | 0    | 60                  | 6    | 0    |
| 21                  | 2    | 1    | 31                  | 3    | 1    | 41                  | 4    | 1    | 51                  | 5    | 1    | 61                  | 6    | 1    |
| 22                  | 2    | 2    | 32                  | 3    | 2    | 42                  | 4    | 2    | 52                  | 5    | 2    | 62                  | 6    | 2    |
| 23                  | 2    | 3    | 33                  | 3    | 3    | 43                  | 4    | 3    | 53                  | 5    | 3    | 63                  | 6    | 3    |
| 24                  | 2    | 4    | 34                  | 3    | 4    | 44                  | 4    | 4    | 54                  | 5    | 4    | 64                  | 6    | 4    |
| 25                  | 2    | 5    | 35                  | 3    | 5    | 45                  | 4    | 5    | 55                  | 5    | 5    | 65                  | 6    | 5    |
| 26                  | 2    | 6    | 36                  | 3    | 6    | 46                  | 4    | 6    | 56                  | 5    | 6    | 66                  | 6    | 6    |
| 27                  | 2    | 7    | 37                  | 3    | 7    | 47                  | 4    | 7    | 57                  | 5    | 7    | 67                  | 6    | 7    |
| 28                  | 2    | 8    | 38                  | 3    | 8    | 48                  | 4    | 8    | 58                  | 5    | 8    | 68                  | 6    | 8    |
| 29                  | 2    | 9    | 39                  | 3    | 9    | 49                  | 4    | 9    | 59                  | 5    | 9    | 69                  | 6    | 9    |

|                     |      |      |                     |      |      |                     |      |      |                     |      |      |                     |      |      |
|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|
| Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th |
| 70                  | 7    | 0    | 80                  | 8    | 0    | 90                  | 9    | 0    | 100                 | A    | 0    | 110                 | B    | 0    |
| 71                  | 7    | 1    | 81                  | 8    | 1    | 91                  | 9    | 1    | 101                 | A    | 1    | 111                 | B    | 1    |
| 72                  | 7    | 2    | 82                  | 8    | 2    | 92                  | 9    | 2    | 102                 | A    | 2    | 112                 | B    | 2    |
| 73                  | 7    | 3    | 83                  | 8    | 3    | 93                  | 9    | 3    | 103                 | A    | 3    | 113                 | B    | 3    |
| 74                  | 7    | 4    | 84                  | 8    | 4    | 94                  | 9    | 4    | 104                 | A    | 4    | 114                 | B    | 4    |
| 75                  | 7    | 5    | 85                  | 8    | 5    | 95                  | 9    | 5    | 105                 | A    | 5    | 115                 | B    | 5    |
| 76                  | 7    | 6    | 86                  | 8    | 6    | 96                  | 9    | 6    | 106                 | A    | 6    | 116                 | B    | 6    |
| 77                  | 7    | 7    | 87                  | 8    | 7    | 97                  | 9    | 7    | 107                 | A    | 7    | 117                 | B    | 7    |
| 78                  | 7    | 8    | 88                  | 8    | 8    | 98                  | 9    | 8    | 108                 | A    | 8    | 118                 | B    | 8    |
| 79                  | 7    | 9    | 89                  | 8    | 9    | 99                  | 9    | 9    | 109                 | A    | 9    | 119                 | B    | 9    |

|                     |      |      |                     |      |      |                     |      |      |                     |      |      |                     |      |      |
|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|
| Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th |
| 120                 | C    | 0    | 130                 | D    | 0    | 140                 | E    | 0    | 150                 | F    | 0    | 160                 | G    | 0    |
| 121                 | C    | 1    | 131                 | D    | 1    | 141                 | E    | 1    | 151                 | F    | 1    | 161                 | G    | 1    |
| 122                 | C    | 2    | 132                 | D    | 2    | 142                 | E    | 2    | 152                 | F    | 2    | 162                 | G    | 2    |
| 123                 | C    | 3    | 133                 | D    | 3    | 143                 | E    | 3    | 153                 | F    | 3    | 163                 | G    | 3    |
| 124                 | C    | 4    | 134                 | D    | 4    | 144                 | E    | 4    | 154                 | F    | 4    | 164                 | G    | 4    |
| 125                 | C    | 5    | 135                 | D    | 5    | 145                 | E    | 5    | 155                 | F    | 5    | 165                 | G    | 5    |
| 126                 | C    | 6    | 136                 | D    | 6    | 146                 | E    | 6    | 156                 | F    | 6    | 166                 | G    | 6    |
| 127                 | C    | 7    | 137                 | D    | 7    | 147                 | E    | 7    | 157                 | F    | 7    | 167                 | G    | 7    |
| 128                 | C    | 8    | 138                 | D    | 8    | 148                 | E    | 8    | 158                 | F    | 8    | 168                 | G    | 8    |
| 129                 | C    | 9    | 139                 | D    | 9    | 149                 | E    | 9    | 159                 | F    | 9    | 169                 | G    | 9    |

|                     |      |      |                     |      |      |                     |      |      |                     |      |      |                     |      |      |
|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|
| Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th |
| 170                 | H    | 0    | 180                 | J    | 0    | 190                 | K    | 0    | 200                 | L    | 0    | 210                 | M    | 0    |
| 171                 | H    | 1    | 181                 | J    | 1    | 191                 | K    | 1    | 201                 | L    | 1    | 211                 | M    | 1    |
| 172                 | H    | 2    | 182                 | J    | 2    | 192                 | K    | 2    | 202                 | L    | 2    | 212                 | M    | 2    |
| 173                 | H    | 3    | 183                 | J    | 3    | 193                 | K    | 3    | 203                 | L    | 3    | 213                 | M    | 3    |
| 174                 | H    | 4    | 184                 | J    | 4    | 194                 | K    | 4    | 204                 | L    | 4    | 214                 | M    | 4    |
| 175                 | H    | 5    | 185                 | J    | 5    | 195                 | K    | 5    | 205                 | L    | 5    | 215                 | M    | 5    |
| 176                 | H    | 6    | 186                 | J    | 6    | 196                 | K    | 6    | 206                 | L    | 6    | 216                 | M    | 6    |
| 177                 | H    | 7    | 187                 | J    | 7    | 197                 | K    | 7    | 207                 | L    | 7    | 217                 | M    | 7    |
| 178                 | H    | 8    | 188                 | J    | 8    | 198                 | K    | 8    | 208                 | L    | 8    | 218                 | M    | 8    |
| 179                 | H    | 9    | 189                 | J    | 9    | 199                 | K    | 9    | 209                 | L    | 9    | 219                 | M    | 9    |

|                     |      |      |                     |      |      |                     |      |      |                     |      |      |
|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|
| Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th | Case length<br>[mm] | 16th | 17th |
| 220                 | N    | 0    | 230                 | P    | 0    | 240                 | Q    | 0    | 250                 | R    | 0    |
| 221                 | N    | 1    | 231                 | P    | 1    | 241                 | Q    | 1    | 251                 | R    | 1    |
| 222                 | N    | 2    | 232                 | P    | 2    | 242                 | Q    | 2    | 252                 | R    | 2    |
| 223                 | N    | 3    | 233                 | P    | 3    | 243                 | Q    | 3    | 253                 | R    | 3    |
| 224                 | N    | 4    | 234                 | P    | 4    | 244                 | Q    | 4    | 254                 | R    | 4    |
| 225                 | N    | 5    | 235                 | P    | 5    | 245                 | Q    | 5    | 255                 | R    | 5    |
| 226                 | N    | 6    | 236                 | P    | 6    | 246                 | Q    | 6    | 256                 | R    | 6    |
| 227                 | N    | 7    | 237                 | P    | 7    | 247                 | Q    | 7    | 257                 | R    | 7    |
| 228                 | N    | 8    | 238                 | P    | 8    | 248                 | Q    | 8    | 258                 | R    | 8    |
| 229                 | N    | 9    | 239                 | P    | 9    | 249                 | Q    | 9    | 259                 | R    | 9    |



## PART NUMBERING SYSTEM

### ◆Supplement code

#### Conductive polymer Chip and Radial lead type / Electrolytec Chip type

|              | Terminal plating material |       |
|--------------|---------------------------|-------|
|              | Sn                        | Sn-Bi |
| Coating case | S                         | G     |

#### Radial lead type / Snap-in type

|              |              | Terminal plating material |       |
|--------------|--------------|---------------------------|-------|
|              |              | Sn                        | Sn-Bi |
| Outer sleeve | PET          | S                         | D     |
|              | Coating case | H                         | G     |
|              | Polyolefin   | L                         | —     |
|              | Pb-free PVC  | M                         | —     |

\* Pb-free snap-in type does not have a plastic disk.

We also produce Pb-free snap-in type with "Plastic disk, Pb-free PVC sleeve and Sn terminal plating".

In this case, supplement code (the 18th digit) is "T".

#### Screw mount terminal type

|             | Screw terminal |
|-------------|----------------|
| Pb-free PVC | M              |
| Polyolefin  | S              |
| PET         | C              |