

# SMH Series

- Downsized from current standard SMG series
- Endurance with ripple current : 2,000 hours at 85°C
- For input filtering of power supplies
- Non solvent-proof type
- RoHS Compliant

SMH

↑ Downsized  
Higher ripple  
Low profile  
SMG

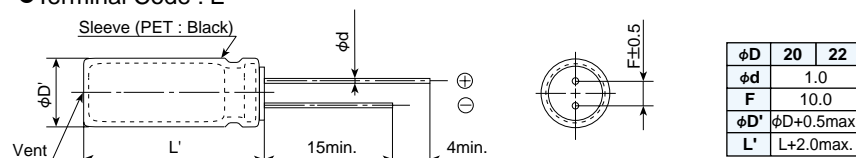


## SPECIFICATIONS

| 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=0.03CV or 3 mA, 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 (Max. Impedance Ratio) | Rated voltage (V <sub>dc</sub> )   | 160 to 250V                          | 400 & 450V |
|  | Z(-25°C)/Z(+20°C)  | 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 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.                            |                                      |            |
|  | Capacitance change   | ≤±20% of the initial value           |            |
|  | D.F. (tanδ)  | ≤200% of the initial specified value |            |
|  | Leakage current  | ≤500% of the initial specified value |            |

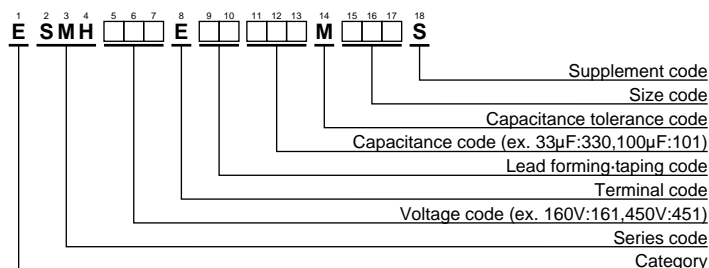
## DIMENSIONS [mm]

- Terminal Code : E



\*Note : The snap-in forming type, RC-type, is available upon request, RC-type fits two φ2mm holes and 10.5mm spacing.

## PART NUMBERING SYSTEM



Please refer to "A guide to global code (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.           | 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.           |
|-----------------------|----------|--------------------|------|---|--------------------|-----------------------|----------|--------------------|------|---|--------------------|
| 160                   | 180      | 20×20              | 0.15 | 900   | ESMH161E□□181MN20S | 250                   | 330      | 22×35              | 0.15 | 1,710   | ESMH251E□□331MP35S |
|                       | 180      | 22×20              | 0.15 | 950   | ESMH161E□□181MP20S |                       | 390      | 20×45              | 0.15 | 1,930   | ESMH251E□□391MN45S |
|                       | 220      | 20×25              | 0.15 | 1,070   | ESMH161E□□221MN25S |                       | 390      | 22×40              | 0.15 | 2,000   | ESMH251E□□391MP40S |
|                       | 220      | 22×25              | 0.15 | 1,160   | ESMH161E□□221MP25S |                       | 470      | 20×50              | 0.15 | 2,190   | ESMH251E□□471MN50S |
|                       | 270      | 20×30              | 0.15 | 1,290   | ESMH161E□□271MN30S |                       | 470      | 22×45              | 0.15 | 2,290   | ESMH251E□□471MP45S |
|                       | 270      | 22×25              | 0.15 | 1,290   | ESMH161E□□271MP25S | 400                   | 47       | 20×20              | 0.15 | 480   | ESMH401E□□470MN20S |
|                       | 330      | 20×30              | 0.15 | 1,430   | ESMH161E□□331MN30S |                       | 56       | 20×25              | 0.15 | 570   | ESMH401E□□560MN25S |
|                       | 330      | 22×30              | 0.15 | 1,530   | ESMH161E□□331MP30S |                       | 56       | 22×25              | 0.15 | 620   | ESMH401E□□560MP25S |
|                       | 390      | 20×30              | 0.15 | 1,550   | ESMH161E□□391MN30S |                       | 68       | 20×25              | 0.15 | 640   | ESMH401E□□680MN25S |
|                       | 390      | 22×30              | 0.15 | 1,670   | ESMH161E□□391MP30S |                       | 68       | 22×25              | 0.15 | 690   | ESMH401E□□680MP25S |
|                       | 470      | 20×35              | 0.15 | 1,780   | ESMH161E□□471MN35S |                       | 82       | 20×30              | 0.15 | 750   | ESMH401E□□820MN30S |
| 200                   | 470      | 22×30              | 0.15 | 1,830   | ESMH161E□□471MP30S |                       | 82       | 22×25              | 0.15 | 780   | ESMH401E□□820MP25S |
|                       | 150      | 20×20              | 0.15 | 820   | ESMH201E□□151MN20S |                       | 100      | 20×35              | 0.15 | 870   | ESMH401E□□101MN35S |
|                       | 150      | 22×20              | 0.15 | 870   | ESMH201E□□151MP20S |                       | 100      | 22×30              | 0.15 | 900   | ESMH401E□□101MP30S |
|                       | 180      | 20×25              | 0.15 | 970   | ESMH201E□□181MN25S |                       | 120      | 20×40              | 0.15 | 1,020   | ESMH401E□□121MN40S |
|                       | 180      | 22×25              | 0.15 | 1,050   | ESMH201E□□181MP25S |                       | 120      | 22×35              | 0.15 | 1,030   | ESMH401E□□121MP35S |
|                       | 220      | 20×25              | 0.15 | 1,070   | ESMH201E□□221MN25S |                       | 150      | 20×45              | 0.15 | 1,200   | ESMH401E□□151MN45S |
|                       | 220      | 22×25              | 0.15 | 1,160   | ESMH201E□□221MP25S |                       | 150      | 22×40              | 0.15 | 1,240   | ESMH401E□□151MP40S |
|                       | 270      | 20×30              | 0.15 | 1,290   | ESMH201E□□271MN30S |                       | 180      | 20×50              | 0.15 | 1,360   | ESMH401E□□181MN50S |
|                       | 270      | 22×30              | 0.15 | 1,390   | ESMH201E□□271MP30S |                       | 180      | 22×45              | 0.15 | 1,410   | ESMH401E□□181MP45S |
|                       | 330      | 20×35              | 0.15 | 1,490   | ESMH201E□□331MN35S |                       | 220      | 22×50              | 0.15 | 1,590   | ESMH401E□□221MP50S |
|                       | 330      | 22×30              | 0.15 | 1,530   | ESMH201E□□331MP30S | 450                   | 33       | 20×20              | 0.15 | 400   | ESMH451E□□330MN20S |
|                       | 390      | 20×35              | 0.15 | 1,620   | ESMH201E□□391MN35S |                       | 47       | 20×25              | 0.15 | 520   | ESMH451E□□470MN25S |
| 250                   | 390      | 22×30              | 0.15 | 1,670   | ESMH201E□□391MP30S |                       | 47       | 22×25              | 0.15 | 570   | ESMH451E□□470MP25S |
|                       | 470      | 20×40              | 0.15 | 1,900   | ESMH201E□□471MN40S |                       | 56       | 20×30              | 0.15 | 620   | ESMH451E□□560MN30S |
|                       | 470      | 22×35              | 0.15 | 1,920   | ESMH201E□□471MP35S |                       | 56       | 22×25              | 0.15 | 650   | ESMH451E□□560MP25S |
|                       | 100      | 20×20              | 0.15 | 670   | ESMH251E□□101MN20S |                       | 68       | 20×35              | 0.15 | 720   | ESMH451E□□680MN35S |
|                       | 120      | 20×25              | 0.15 | 850   | ESMH251E□□121MN25S |                       | 68       | 22×30              | 0.15 | 690   | ESMH451E□□680MP30S |
|                       | 120      | 22×20              | 0.15 | 830   | ESMH251E□□121MP20S |                       | 82       | 20×35              | 0.15 | 790   | ESMH451E□□820MN35S |
|                       | 150      | 20×25              | 0.15 | 940   | ESMH251E□□151MN25S |                       | 82       | 22×30              | 0.15 | 800   | ESMH451E□□820MP30S |
|                       | 150      | 22×25              | 0.15 | 1,030   | ESMH251E□□151MP25S |                       | 100      | 20×40              | 0.15 | 920   | ESMH451E□□101MN40S |
|                       | 180      | 20×30              | 0.15 | 1,120   | ESMH251E□□181MN30S |                       | 100      | 22×35              | 0.15 | 940   | ESMH451E□□101MP35S |
|                       | 180      | 22×25              | 0.15 | 1,120   | ESMH251E□□181MP25S |                       | 120      | 20×45              | 0.15 | 1,070   | ESMH451E□□121MN45S |
|                       | 220      | 20×30              | 0.15 | 1,240   | ESMH251E□□221MN30S |                       | 120      | 22×40              | 0.15 | 1,110   | ESMH451E□□121MP40S |
|                       | 220      | 22×30              | 0.15 | 1,330   | ESMH251E□□221MP30S |                       | 150      | 20×50              | 0.15 | 1,240   | ESMH451E□□151MN50S |
|                       | 270      | 20×35              | 0.15 | 1,440   | ESMH251E□□271MN35S |                       | 150      | 22×45              | 0.15 | 1,290   | ESMH451E□□151MP45S |
|                       | 270      | 22×30              | 0.15 | 1,470   | ESMH251E□□271MP30S |                       | 180      | 22×50              | 0.15 | 1,440   | ESMH451E□□181MP50S |
|                       | 330      | 20×40              | 0.15 | 1,700   | ESMH251E□□331MN40S |                       |          |                    |      |   |                    |

□□ : Lead forming / Taping code

### ◆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 |
| 400 & 450V <sub>dc</sub>  | 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.