

**THREE PHASE BRIDGE**

**Power Module**

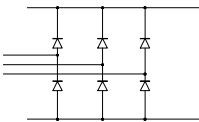
**Features**

- Low  $V_F$
- Low profile package
- Direct Mounting to heatsink
- Flat-Pin/ Round-Pin versions with PCB solderable terminals
- Low junction-to-case Thermal Resistance
- 3500 V<sub>RMS</sub> insulation voltage
- UL approval pending

**Applications: Power conversion machines**

- Welding
- UPS
- SMPS
- Motor Drives
- General Purpose & Heavy Duty Applications

45 A  
75 A  
100 A

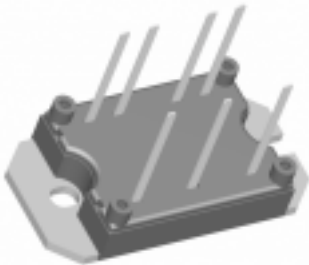


**Description**

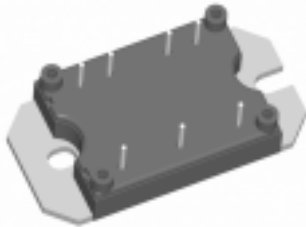
A range of extremely compact three-phase rectifier bridges offering efficient and reliable operation. The low profile package has been specifically conceived to maximize space saving and optimized electrical layout of application specific Power Supply.

**Major Ratings and Characteristics**

| Parameters      | 40MT        | 70MT | 100MT | Units             |
|-----------------|-------------|------|-------|-------------------|
| $I_O$           | 45          | 75   | 100   | A                 |
| $@ T_C$         | 100         | 80   | 80    | °C                |
| $I_{FSM}$       | 270         | 380  | 450   | A                 |
| $@ 50\text{Hz}$ | 280         | 398  | 470   |                   |
| $@ 60\text{Hz}$ | 365         | 724  | 1013  | A <sup>2</sup> s  |
| $i^2t$          | 325         | 660  | 920   |                   |
| $@ 50\text{Hz}$ | 3650        | 7240 | 10130 | A <sup>2</sup> √s |
| $@ 60\text{Hz}$ |             |      |       |                   |
| $i^2\sqrt{t}$   |             |      |       |                   |
| $V_{RRM}$       | 1400 & 1600 |      |       | V                 |
| $T_{STG}$ range | -40 to 125  |      |       | °C                |
| $T_J$ range     | -40 to 150  |      |       |                   |



MT...PA



MT...PB

**ELECTRICAL SPECIFICATIONS**

## Voltage Ratings

| Type number     | Voltage Code<br>reverse voltage<br>V | $V_{RRM}$ , maximum<br>repetitive peak<br>reverse voltage<br>V | $V_{RSM}$ , maximum<br>non-repetitive peak<br>V | $I_{RRM}$ max.<br>@ $T_J = 150^\circ\text{C}$<br>mA |
|-----------------|--------------------------------------|----------------------------------------------------------------|-------------------------------------------------|-----------------------------------------------------|
| 40-70-100MT140P | 140                                  | 1400                                                           | 1500                                            | 5                                                   |
| 40-70-100MT160P | 160                                  | 1600                                                           | 1700                                            |                                                     |

## Forward Conduction

| Parameter                                                                              | 40MT                   | 70MT                   | 100MT                   | Units             | Conditions                                                         |
|----------------------------------------------------------------------------------------|------------------------|------------------------|-------------------------|-------------------|--------------------------------------------------------------------|
| $I_O$ Maximum DC output current<br>@ Case temperature                                  | 45                     | 75                     | 100                     | A                 | 120° Rect conduction angle                                         |
|                                                                                        | 100                    | 80                     | 80                      | °C                |                                                                    |
| $I_{FSM}$ Maximum peak, one-cycle<br>forward, non-repetitive<br>on state surge current | 270                    | 380                    | 450                     | A                 | t = 10ms No voltage                                                |
|                                                                                        | 280                    | 398                    | 470                     |                   | t = 8.3ms reappplied                                               |
|                                                                                        | 225                    | 320                    | 380                     |                   | t = 10ms 100% $V_{RRM}$                                            |
|                                                                                        | 240                    | 335                    | 400                     |                   | t = 8.3ms reappplied                                               |
| $I^2t$ Maximum $I^2t$ for fusing                                                       | 365                    | 724                    | 1013                    | A <sup>2</sup> s  | t = 10ms No voltage                                                |
|                                                                                        | 325                    | 660                    | 920                     |                   | t = 8.3ms reappplied                                               |
|                                                                                        | 253                    | 512                    | 600                     |                   | t = 10ms 100% $V_{RRM}$                                            |
|                                                                                        | 240                    | 467                    | 665                     |                   | t = 8.3ms reappplied                                               |
| $I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing                                         | 3650                   | 7240                   | 10130                   | A <sup>2</sup> √s | t = 0.1 to 10ms, no voltage reappplied                             |
| $V_{F(TO)}$ Value of threshold voltage                                                 | 0.78                   | 0.82                   | 0.75                    | V                 | @ $T_J$ max.                                                       |
| $r_t$ Slope resistance                                                                 | 14.8                   | 9.5                    | 8.1                     | mΩ                |                                                                    |
| $V_{FM}$ Maximum forward voltage drop                                                  | 1.45<br>$I_{pk} = 40A$ | 1.45<br>$I_{pk} = 70A$ | 1.51<br>$I_{pk} = 100A$ | V                 | $T_J = 25^\circ\text{C}$<br>$t_p = 400\mu\text{s}$ single junction |

## Insulation Table

| Parameter                        | 40MT | 70MT | 100MT | Units | Conditions                                                        |
|----------------------------------|------|------|-------|-------|-------------------------------------------------------------------|
| $V_{INS}$ RMS insulation voltage |      | 3500 |       | V     | $T_J = 25^\circ\text{C}$ all terminal shorted<br>f = 50Hz, t = 1s |

### Thermal and Mechanical Specifications

| Parameter                                               | 40MT        | 70MT | 100MT | Units | Conditions                                                                                                                               |
|---------------------------------------------------------|-------------|------|-------|-------|------------------------------------------------------------------------------------------------------------------------------------------|
| $T_J$ Maximum junction operating temperature range      | - 40 to 150 |      |       | °C    |                                                                                                                                          |
| $T_{stg}$ Maximum storage temperature range             | -40 to 125  |      |       | °C    |                                                                                                                                          |
| $R_{thJC}$ Maximum thermal resistance, junction to case | 0.27        | 0.23 | 0.19  | K/W   | DC operation per module                                                                                                                  |
|                                                         | 1.6         | 1.38 | 1.14  |       | DC operation per junction                                                                                                                |
|                                                         | 0.38        | 0.29 | 0.22  |       | 120° Rect conduction angle per module                                                                                                    |
|                                                         | 2.25        | 1.76 | 1.29  |       | 120° Rect conduction angle per junction                                                                                                  |
| $R_{thCS}$ Maximum thermal resistance, case to heatsink | 0.1         |      |       | K/W   | Per module.<br>Mounting surface smooth, flat and greased.<br>Heatsink compound thermal conductivity = 0.42W/mK                           |
| T Mounting torque $\pm 10\%$ to heatsink                | 4           |      |       | Nm    | A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow for the spread of the compound. |
| wt Approximate weight                                   | 65          |      |       | g     | Lubricated threads.                                                                                                                      |

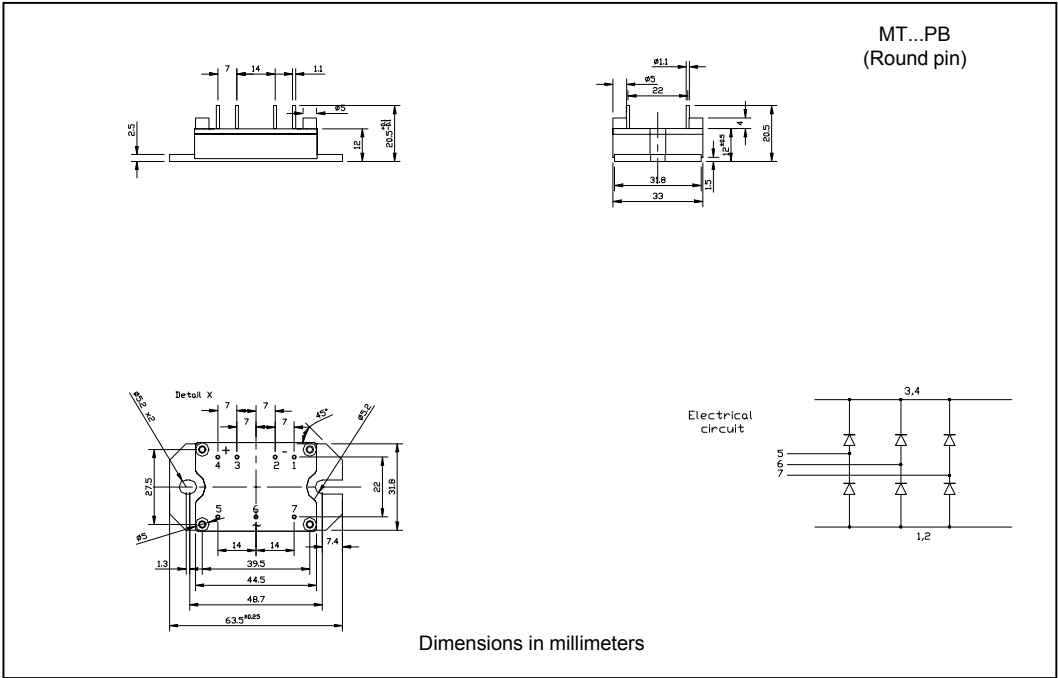
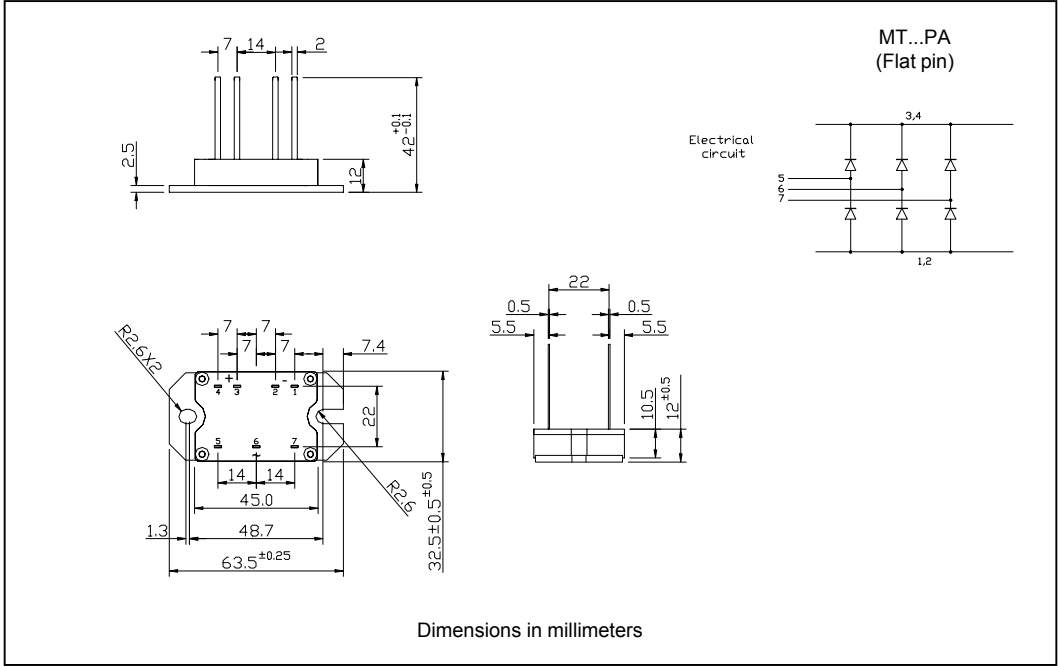
### Ordering Information Table

| Device Code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |                                                                 |                                                                                                                        |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|--|--|
| <div style="display: flex; justify-content: center; align-items: center;"> <div style="background-color: black; color: white; padding: 5px 10px; margin: 0 5px;">10</div> <div style="background-color: black; color: white; padding: 5px 10px; margin: 0 5px;">0</div> <div style="background-color: black; color: white; padding: 5px 10px; margin: 0 5px;">MT</div> <div style="background-color: black; color: white; padding: 5px 10px; margin: 0 5px;">160</div> <div style="background-color: black; color: white; padding: 5px 10px; margin: 0 5px;">P</div> <div style="background-color: black; color: white; padding: 5px 10px; margin: 0 5px;">B</div> </div> <div style="display: flex; justify-content: center; margin-top: 10px;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 10px;">1</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 10px;">2</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 10px;">3</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 10px;">4</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center; margin: 0 10px;">5</div> </div> |   |                                                                 |                                                                                                                        |  |  |
| <b>1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | - | Current rating code                                             | <div style="border: 1px solid black; padding: 5px; display: inline-block;"> 4 = 45A<br/> 7 = 75A<br/> 10 = 100A </div> |  |  |
| <b>2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | - | Circuit configuration code: 0 = 3-Phase Rectifier Bridge        |                                                                                                                        |  |  |
| <b>3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | - | Essential part number                                           |                                                                                                                        |  |  |
| <b>4</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | - | Voltage code: code x 10 = $V_{RRM}$ (See Voltage Ratings table) |                                                                                                                        |  |  |
| <b>5</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | - | Pinout code:                                                    | <div style="border: 1px solid black; padding: 5px; display: inline-block;"> A = Flat pins<br/> B = Round pins </div>   |  |  |

**MTP 3-Phase Rectifier Series**

Bulletin I27145 08/01

**Outline Table**



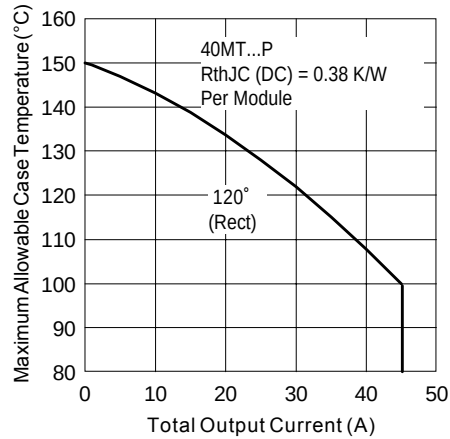


Fig. 1 - Current Rating Characteristics

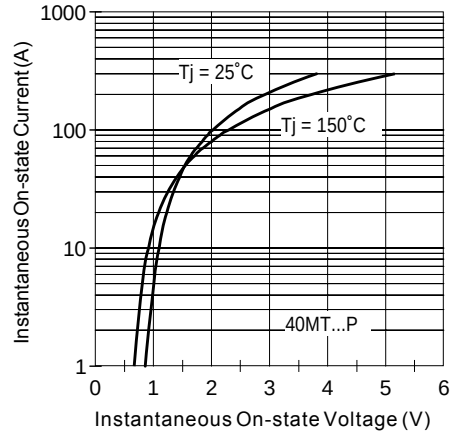


Fig. 2 - On-state Voltage Drop Characteristics

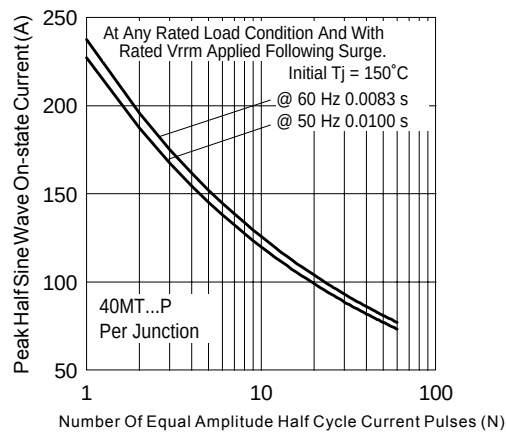


Fig. 3 - Maximum Non-Repetitive Surge Current

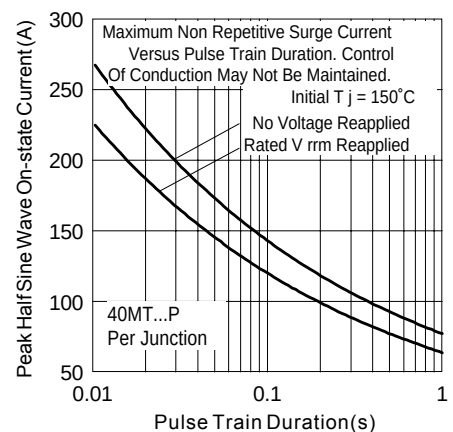


Fig. 4 - Maximum Non-Repetitive Surge Current

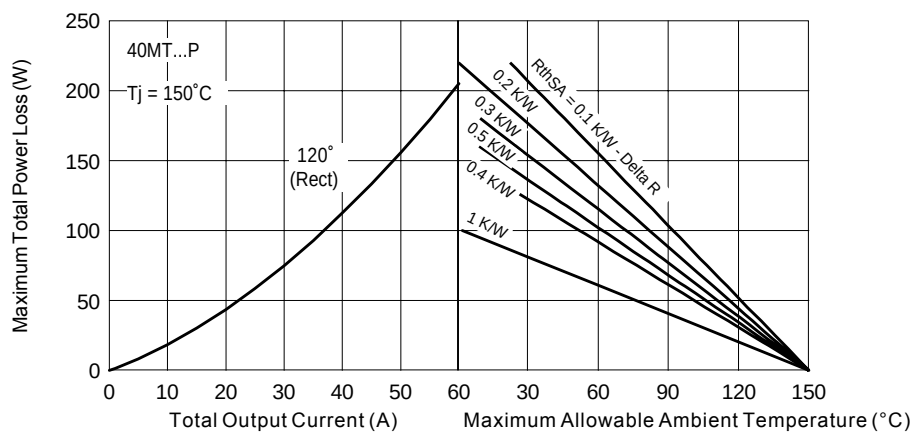


Fig. 5 - Current Rating Nomogram (1 Module Per Heatsink)

## MTP 3-Phase Rectifier Series

Bulletin I27145 08/01

International  
**IRF** Rectifier

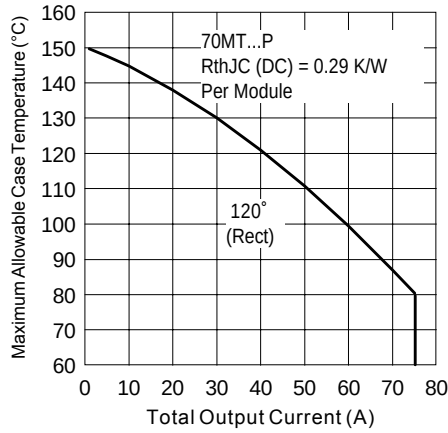


Fig. 6 - Current Rating Characteristics

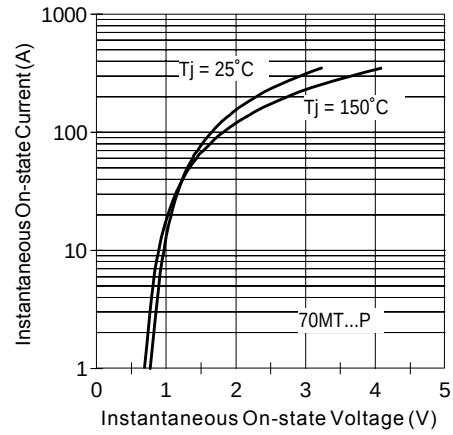


Fig. 7 - On-state Voltage Drop Characteristics

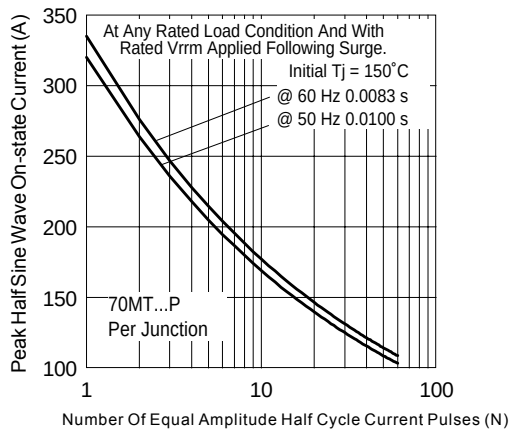


Fig. 8 - Maximum Non-Repetitive Surge Current

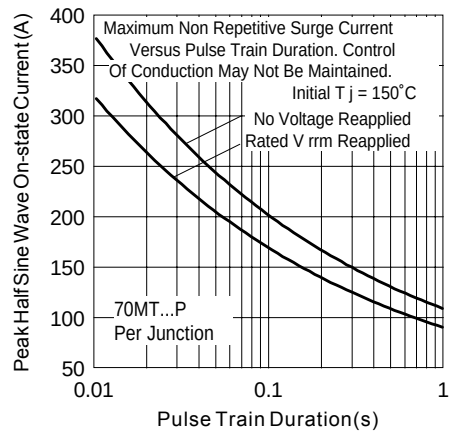


Fig. 9 - Maximum Non-Repetitive Surge Current

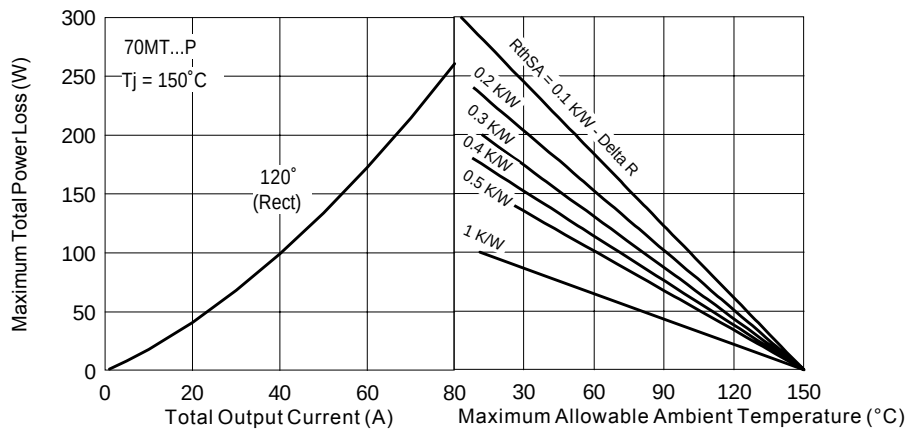


Fig. 10 - Current Rating Nomogram (1 Module Per Heatsink)

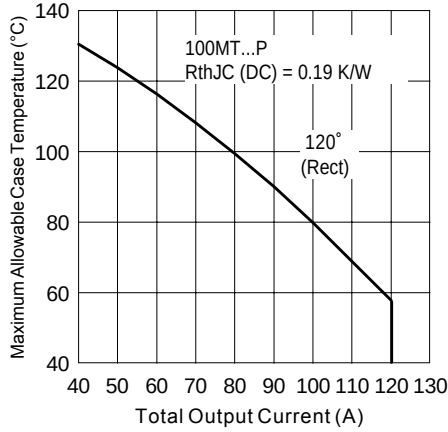


Fig. 11 - Current Rating Characteristics

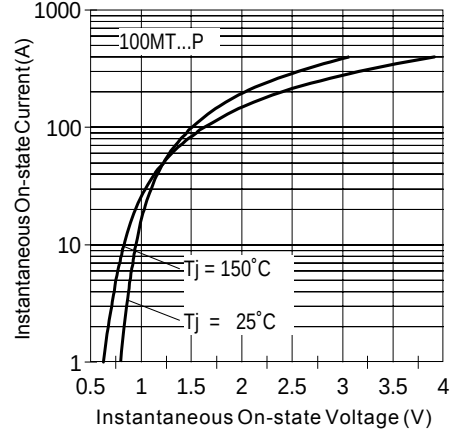


Fig. 12 - On-state Voltage Drop Characteristics

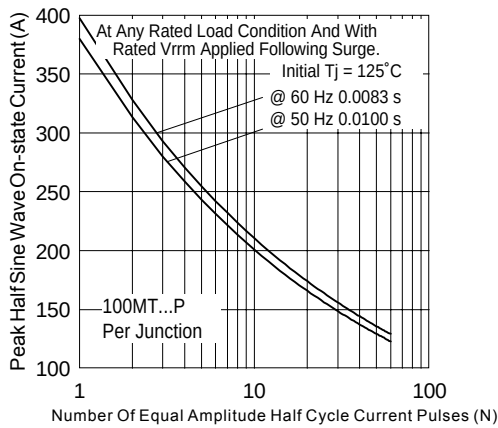


Fig. 13 - Maximum Non-Repetitive Surge Current

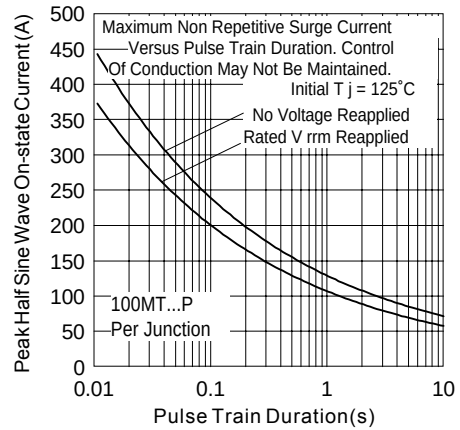


Fig. 14 - Maximum Non-Repetitive Surge Current

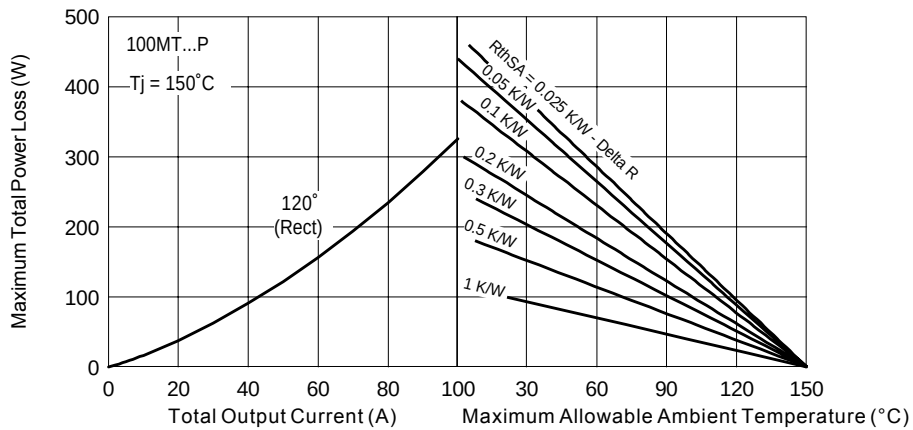


Fig. 15 - Current Rating Nomogram (1 Module Per Heatsink)

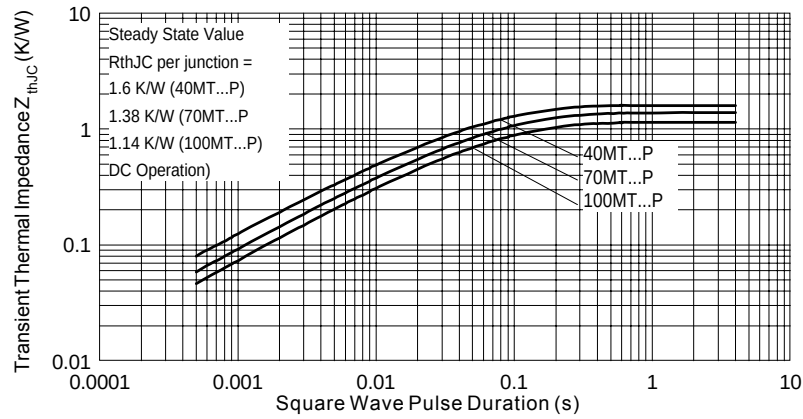


Fig. 16 - Thermal Impedance  $Z_{thJC}$  Characteristics

Data and specifications subject to change without notice.  
This product has been designed and qualified for Industrial Level.  
Qualification Standards can be found on IR's Web site.

International  
**IR** Rectifier

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