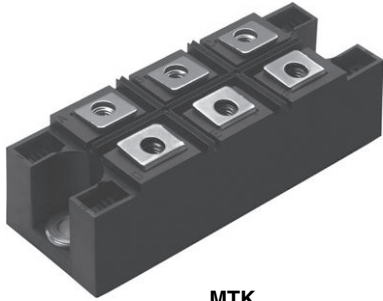


## Three Phase Bridge (Power Modules), 60/70 A



MTK

| PRIMARY CHARACTERISTICS |                    |
|-------------------------|--------------------|
| $I_o$                   | 60 A to 70 A       |
| $V_{RRM}$               | 800 V to 1600 V    |
| Package                 | MTK                |
| Circuit configuration   | Three phase bridge |

### FEATURES

- Package fully compatible with the industry standard INT-A-PAK power modules series
- High thermal conductivity package, electrically insulated case
- Excellent power volume ratio, outline for easy connections to power transistor and IGBT modules
- 4000  $V_{RMS}$  isolating voltage
- UL E78996 approved
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### DESCRIPTION

A range of extremely compact, encapsulated three phase bridge rectifiers offering efficient and reliable operation. They are intended for use in general purpose and heavy duty applications.

| MAJOR RATINGS AND CHARACTERISTICS |                 |                |                |                    |
|-----------------------------------|-----------------|----------------|----------------|--------------------|
| SYMBOL                            | CHARACTERISTICS | VALUES 60MT..K | VALUES 70MT..K | UNITS              |
| $I_o$                             |                 | 60 (75)        | 70 (90)        | A                  |
|                                   | $T_c$           | 85 (61)        | 85 (57)        | °C                 |
| $I_{FSM}$                         | 50 Hz           | 420            | 480            | A                  |
|                                   | 60 Hz           | 440            | 500            |                    |
| $I^2t$                            | 50 Hz           | 870            | 1150           | kA <sup>2</sup> s  |
|                                   | 60 Hz           | 790            | 1050           |                    |
| $I^2\sqrt{t}$                     |                 | 8700           | 11 500         | kA <sup>2</sup> √s |
| $V_{RRM}$                         | Range           | 800 to 1600    |                | V                  |
| $T_{Stg}$                         | Range           | -40 to 150     |                | °C                 |
| $T_J$                             |                 | -40 to 150     |                |                    |

### ELECTRICAL SPECIFICATIONS

| VOLTAGE RATINGS          |              |  |  |  |
|--------------------------|--------------|--|--|--|
| TYPE NUMBER              | VOLTAGE CODE | $V_{RRM}$ , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE<br>V | $V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE<br>V | $I_{RRM}$ MAXIMUM AT $T_J$ MAXIMUM<br>mA |
| VS-60MT..K<br>VS-70MT..K | 80           | 800  | 900  | 10                                       |
|                          | 100          | 1000   | 1100   |  |
|                          | 120          | 1200   | 1300   |  |
|                          | 140          | 1400   | 1500   |  |
|                          | 160          | 1600   | 1700   |  |



| FORWARD CONDUCTION  |                     |  |                                  |   |                |                   |                   |
|---|---------------------|--|----------------------------------|---|----------------|-------------------|-------------------|
| PARAMETER   | SYMBOL              | TEST CONDITIONS  |                                  | VALUES 60MT..K                                  | VALUES 70MT..K | UNITS             |                   |
| Maximum DC output current at case temperature                 | I <sub>O</sub>      | 120° rect. conduction angle  |                                  | 60 (75)   | 70 (90)        | A                 |                   |
|   |                     |  |                                  | 85 (61)   | 85 (57)        | °C                |                   |
| Maximum peak, one-cycle forward, non-repetitive surge current | I <sub>FSM</sub>    | t = 10 ms  | No voltage reapplied             | Initial T <sub>J</sub> = T <sub>J</sub> maximum | 420            | 480               | A                 |
|   |                     | t = 8.3 ms   |                                  |   | 440            | 500               |                   |
|   |                     | t = 10 ms  | 100 % V <sub>RRM</sub> reapplied |   | 350            | 400               |                   |
|   |                     | t = 8.3 ms   |                                  |   | 370            | 420               |                   |
| Maximum I <sup>2</sup> t for fusing                           | I <sup>2</sup> t    | t = 10 ms  | No voltage reapplied             | Initial T <sub>J</sub> = T <sub>J</sub> maximum | 870            | 1150              | kA <sup>2</sup> s |
|   |                     | t = 8.3 ms   |                                  |   | 790            | 1050              |                   |
|   |                     | t = 10 ms  | 100 % V <sub>RRM</sub> reapplied |   | 610            | 800               |                   |
|   |                     | t = 8.3 ms   |                                  |   | 560            | 730               |                   |
| Maximum I <sup>2</sup> √t for fusing                          | I <sup>2</sup> √t   | t = 0.1 ms to 10 ms, no voltage reapplied  |                                  | 8700  | 11 300         | A <sup>2</sup> √s |                   |
| Low level value of threshold voltage                          | V <sub>F(TO)1</sub> | (16.7 % × π × I <sub>F(AV)</sub> < I < π · I <sub>F(AV)</sub> ), T <sub>J</sub> maximum  |                                  | 0.85  | 0.86           | V                 |                   |
| High level value of threshold voltage                         | V <sub>F(TO)2</sub> | (I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> maximum                                    |                                  | 1.07  | 1.08           |                   |                   |
| Low level value of forward slope resistance                   | r <sub>f1</sub>     | (16.7 % × π × I <sub>F(AV)</sub> < I < π · I <sub>F(AV)</sub> ), T <sub>J</sub> maximum  |                                  | 8.04  | 7.35           | mΩ                |                   |
| High level value of forward slope resistance                  | r <sub>f2</sub>     | (I > π × I <sub>F(AV)</sub> ), T <sub>J</sub> maximum                                    |                                  | 7.08  | 6.53           |                   |                   |
| Maximum forward voltage drop                                  | V <sub>FM</sub>     | I <sub>pk</sub> = 100 A, T <sub>J</sub> = 25 °C, t <sub>p</sub> = 400 μs single junction |                                  | 1.75  | 1.55           | V                 |                   |
| RMS isolation voltage   | V <sub>ISOL</sub>   | T <sub>J</sub> = 25 °C, all terminal shorted<br>f = 50 Hz, t = 1 s                       |                                  | 4000  |                |                   |                   |

| THERMAL AND MECHANICAL SPECIFICATIONS                    |                                   |  |  |                |                |       |
|--|-----------------------------------|--|--|----------------|----------------|-------|
| PARAMETER  | SYMBOL                            | TEST CONDITIONS  |  | VALUES 60MT..K | VALUES 70MT..K | UNITS |
| Maximum junction operating and storage temperature range | T <sub>J</sub> , T <sub>Stg</sub> |  |  | -40 to 150     |                | °C    |
| Maximum thermal resistance, junction to case             | R <sub>thJC</sub>                 | DC operation per module  |  | 0.37           | 0.29           | K/W   |
|  |                                   | DC operation per junction  |  | 2.22           | 1.75           |       |
|  |                                   | 120° rect. conduction angle per module   |  | 0.40           | 0.34           |       |
|  |                                   | 120° rect. conduction angle per junction   |  | 2.42           | 2.01           |       |
| Maximum thermal resistance, case to heatsink per module  | R <sub>thCS</sub>                 | Mounting surface smooth, flat and greased  |  | 0.03           |                |       |
| Mounting torque ± 10 %                                   | to heatsink                       | A mounting compound is recommended and the torque should be rechecked after a period of 3 h to allow for the spread of the compound. |  | 4 to 6         |                | Nm    |
|  | to terminal                       |  |  | 3 to 4         |                |       |
| Approximate weight                                       |                                   | Lubricated threads.  |  | 176            |                | g     |

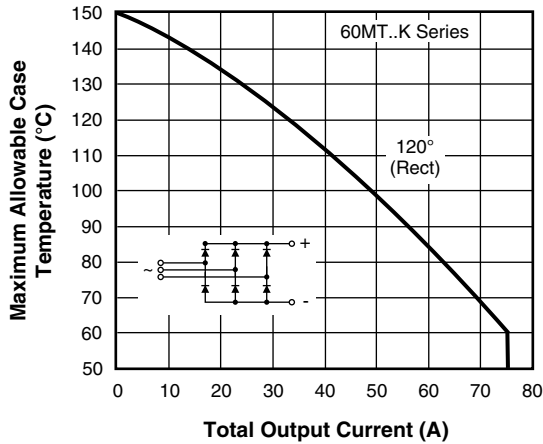


Fig. 1 - Current Ratings Characteristics

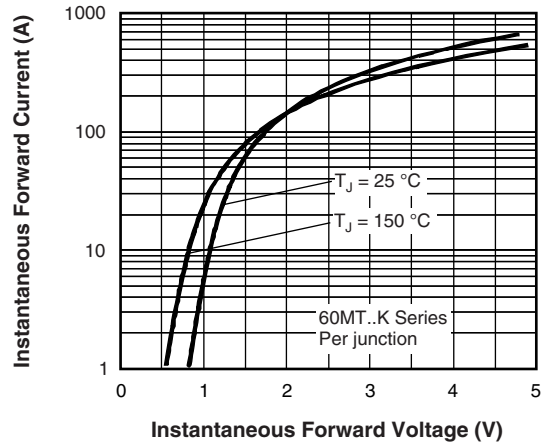


Fig. 2 - Forward Voltage Drop Characteristics

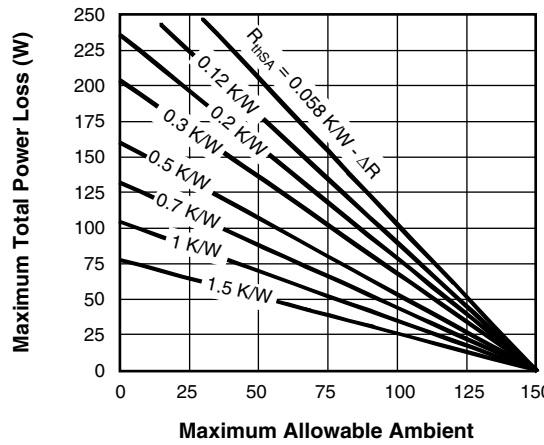
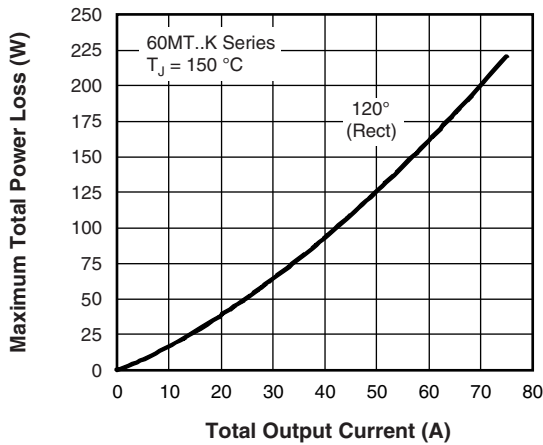


Fig. 3 - Total Power Loss Characteristics

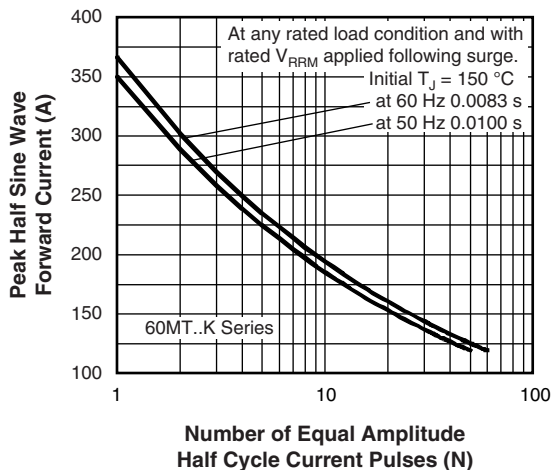


Fig. 4 - Maximum Non-Repetitive Surge Current

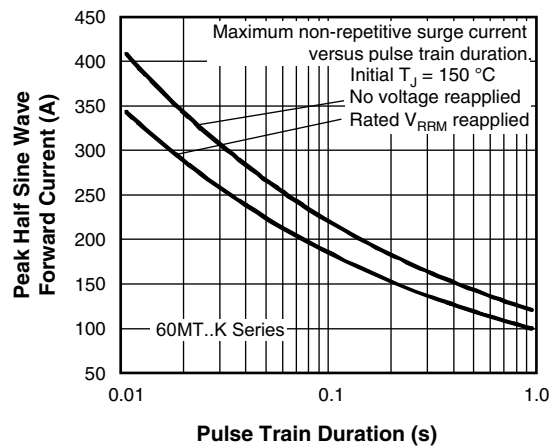


Fig. 5 - Maximum Non-Repetitive Surge Current

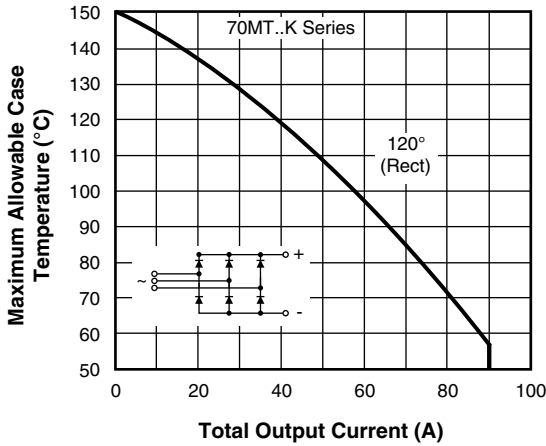


Fig. 6 - Current Ratings Characteristics

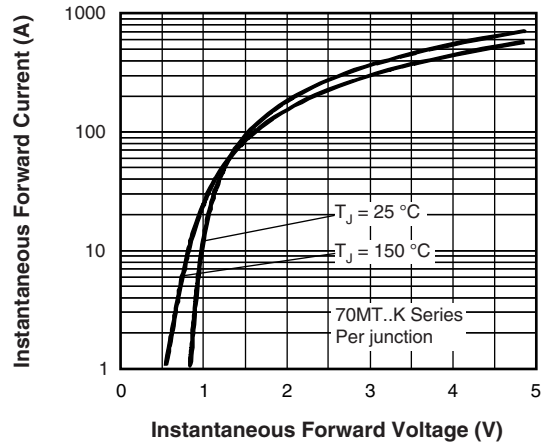


Fig. 7 - Forward Voltage Drop Characteristics

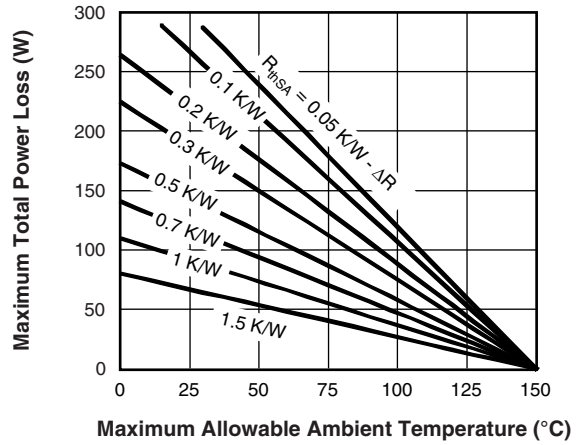
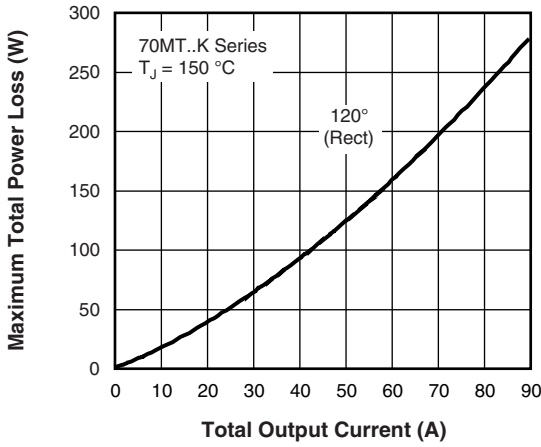


Fig. 8 - Total Power Loss Characteristics

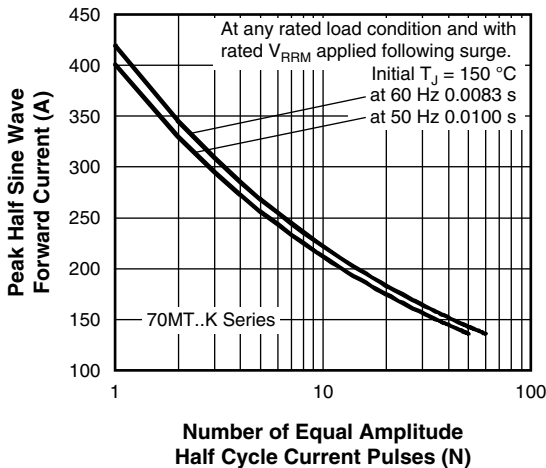


Fig. 9 - Maximum Non-Repetitive Surge Current

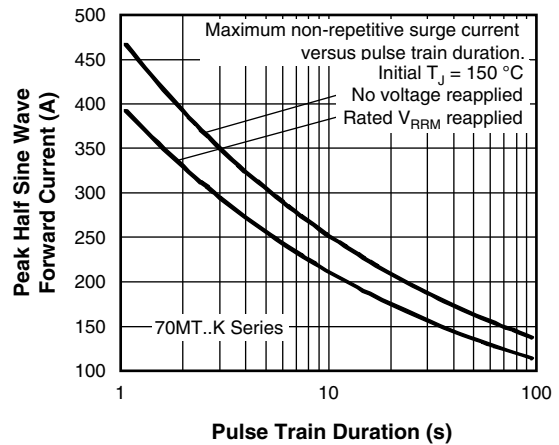
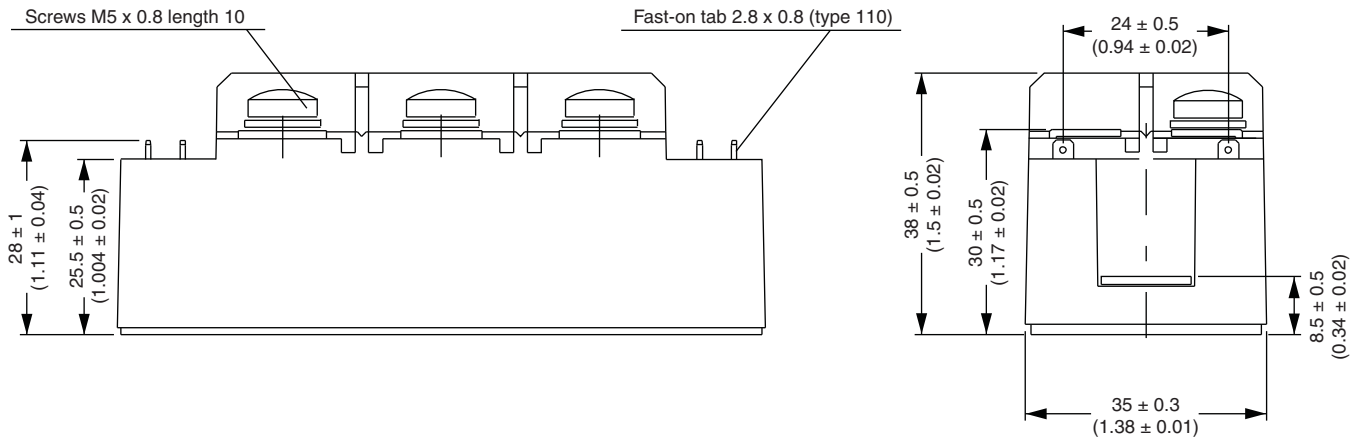


Fig. 10 - Maximum Non-Repetitive Surge Current



## MTK (with and without optional barrier)

### DIMENSIONS WITH OPTIONAL BARRIERS in millimeters (inches)

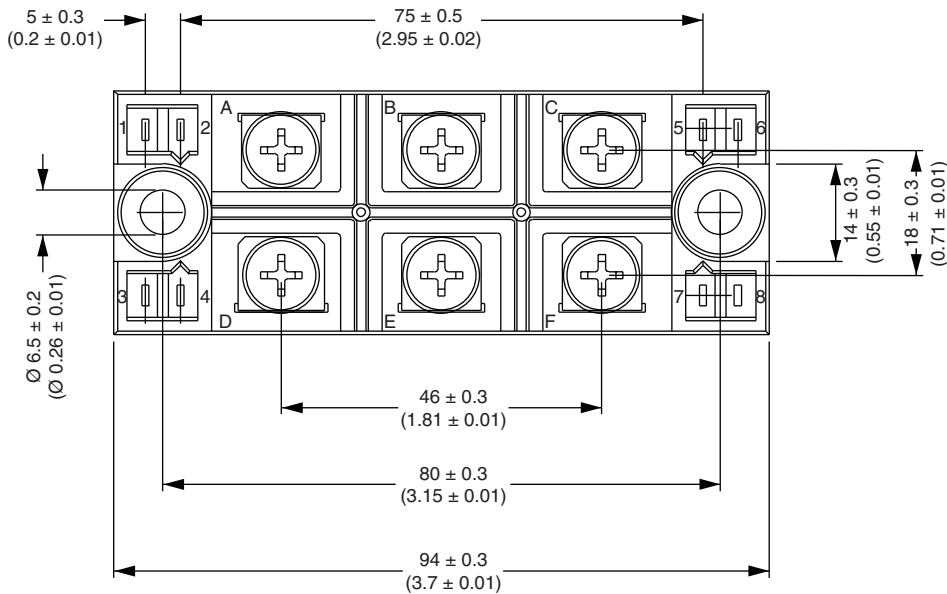
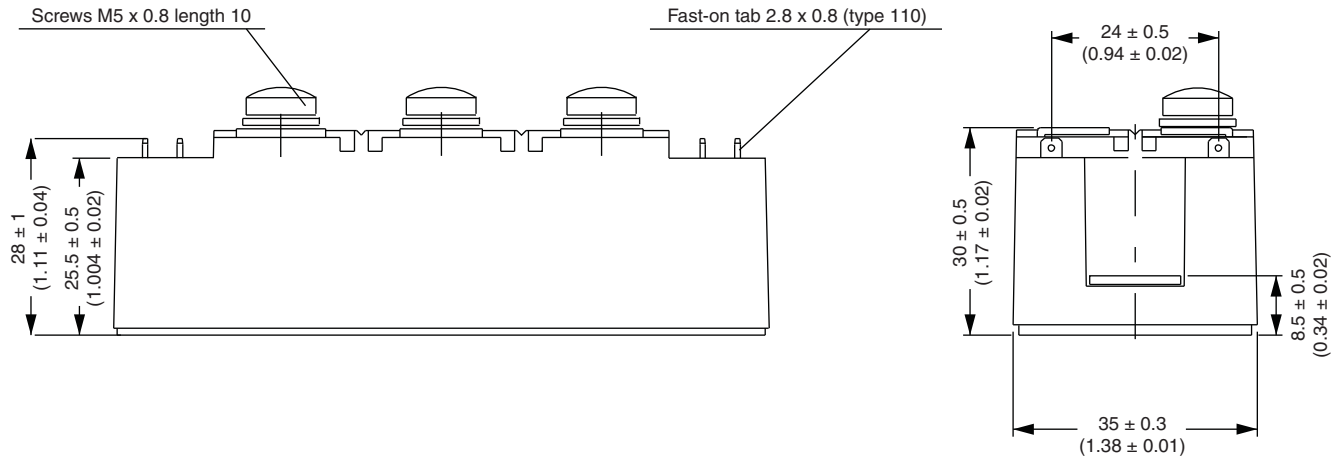


# Outline Dimensions

Vishay Semiconductors MTK (with and without optional barrier)



## DIMENSIONS WITHOUT OPTIONAL BARRIERS in millimeters (inches)





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