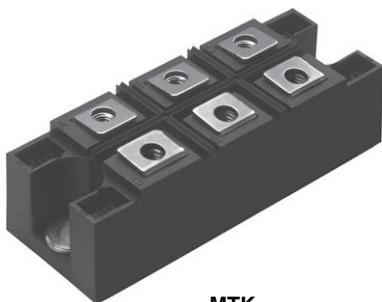


Three Phase Bridge (Power Modules), 60/70 A


MTK

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


RoHS
COMPLIANT

| PRIMARY CHARACTERISTICS | |
|-------------------------|--------------------|
| I _O | 60 A to 70 A |
| V _{RRM} | 800 V to 1600 V |
| Package | MTK |
| Circuit configuration | Three phase bridge |

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 ² t | 50 Hz | 870 | 1150 | kA ² s |
| | 60 Hz | 790 | 1050 | |
| I ² √t | | 8700 | 11 500 | kA ² √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 V | V _{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V | I _{RRM} MAXIMUM AT T _J MAXIMUM mA |
| VS-60MT..K 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_O | 120° rect. conduction angle | | | 60 (75) | 70 (90) | A | |
| | | | | | 85 (61) | 85 (57) | °C | |
| Maximum peak, one-cycle forward, non-repetitive surge current | I_{FSM} | $t = 10 \text{ ms}$ | No voltage reapplied | Initial $T_J = T_{J_{\text{max}}}$ | 420 | 480 | A | |
| | | $t = 8.3 \text{ ms}$ | | | 440 | 500 | | |
| | | $t = 10 \text{ ms}$ | 100 % V_{RRM} reapplied | | 350 | 400 | | |
| | | $t = 8.3 \text{ ms}$ | | | 370 | 420 | | |
| Maximum I^2t for fusing | I^2t | $t = 10 \text{ ms}$ | No voltage reapplied | Initial $T_J = T_{J_{\text{max}}}$ | 870 | 1150 | kA^2s | |
| | | $t = 8.3 \text{ ms}$ | | | 790 | 1050 | | |
| | | $t = 10 \text{ ms}$ | 100 % V_{RRM} reapplied | | 610 | 800 | | |
| | | $t = 8.3 \text{ ms}$ | | | 560 | 730 | | |
| Maximum $I^2\sqrt{t}$ for fusing | $I^2\sqrt{t}$ | $t = 0.1 \text{ ms to } 10 \text{ ms, no voltage reapplied}$ | | | 8700 | 11 300 | $\text{A}^2\sqrt{\text{s}}$ | |
| Low level value of threshold voltage | $V_{F(TO)1}$ | $(16.7 \% \times \pi \times I_{F(AV)} < I < \pi \cdot I_{F(AV)}, T_J \text{ maximum})$ | | | 0.85 | 0.86 | V | |
| High level value of threshold voltage | $V_{F(TO)2}$ | $(I > \pi \times I_{F(AV)}, T_J \text{ maximum})$ | | | 1.07 | 1.08 | | |
| Low level value of forward slope resistance | r_{f1} | $(16.7 \% \times \pi \times I_{F(AV)} < I < \pi \cdot I_{F(AV)}, T_J \text{ maximum})$ | | | 8.04 | 7.35 | $\text{m}\Omega$ | |
| High level value of forward slope resistance | r_{f2} | $(I > \pi \times I_{F(AV)}, T_J \text{ maximum})$ | | | 7.08 | 6.53 | | |
| Maximum forward voltage drop | V_{FM} | $I_{pk} = 100 \text{ A, } T_J = 25 \text{ °C, } t_p = 400 \mu\text{s single junction}$ | | | 1.75 | 1.55 | V | |
| RMS isolation voltage | V_{ISOL} | $T_J = 25 \text{ °C, all terminal shorted}$ $f = 50 \text{ Hz, } t = 1 \text{ s}$ | | | 4000 | | | |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | | | | |
|--|----------------|---|--|--|----------------|----------------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | | VALUES 60MT..K | VALUES 70MT..K | UNITS |
| Maximum junction operating and storage temperature range | T_J, T_{Stg} | | | | -40 to 150 | | °C |
| Maximum thermal resistance, junction to case | R_{thJC} | 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_{thCS} | Mounting surface smooth, flat and greased | | | 0.03 | | |
| Mounting torque $\pm 10 \%$ | 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. Lubricated threads. | | | 4 to 6 | | Nm |
| | | | | | 3 to 4 | | |
| Approximate weight | | | | | 176 | | g |

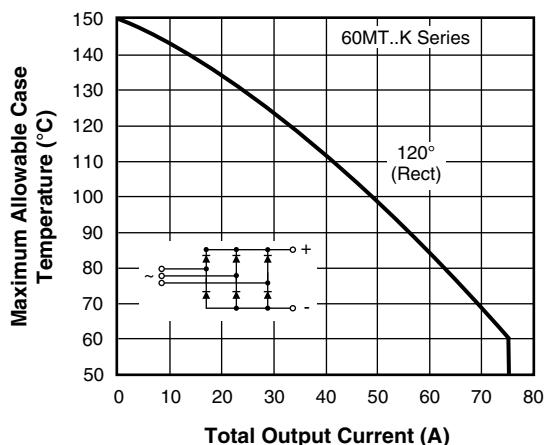


Fig. 1 - Current Ratings Characteristics

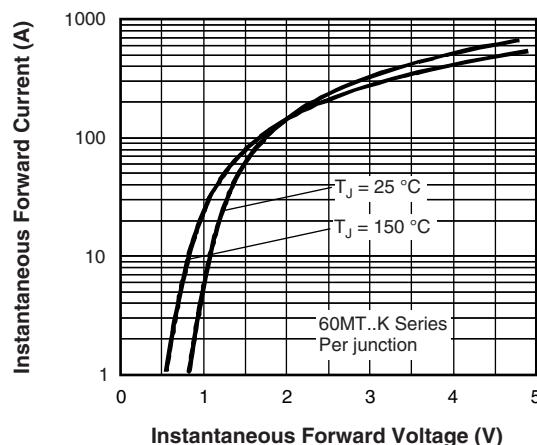


Fig. 2 - Forward Voltage Drop Characteristics

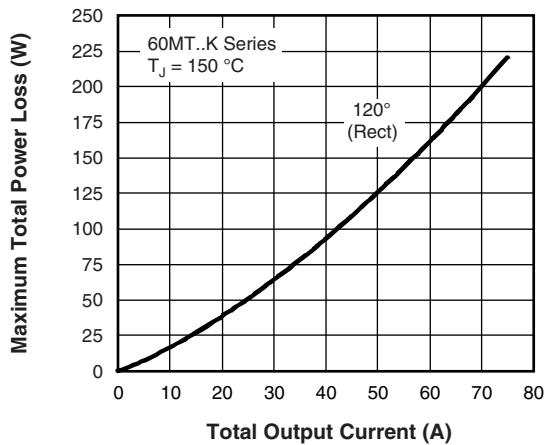


Fig. 3 - Total Power Loss Characteristics

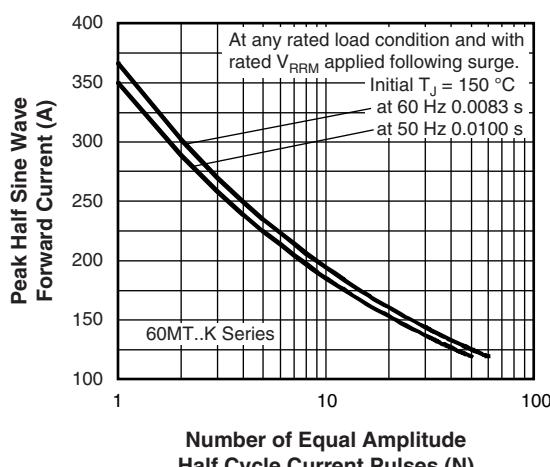
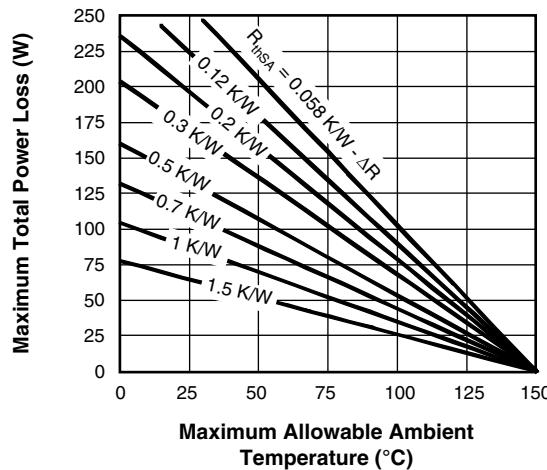


Fig. 4 - Maximum Non-Repetitive Surge Current

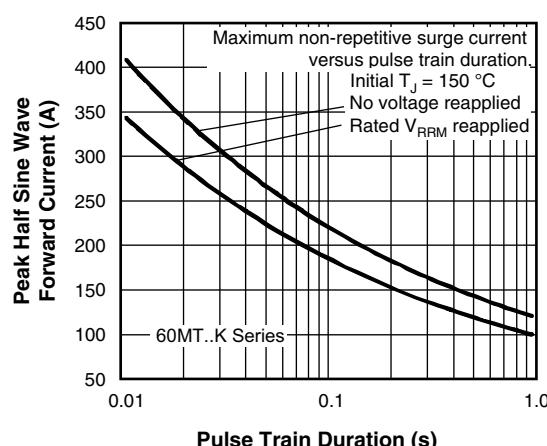


Fig. 5 - Maximum Non-Repetitive Surge Current

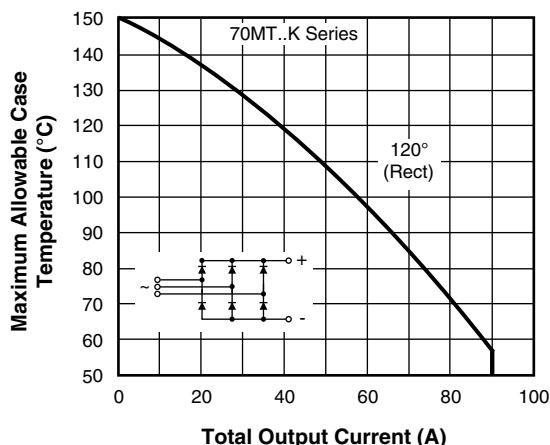


Fig. 6 - Current Ratings Characteristics

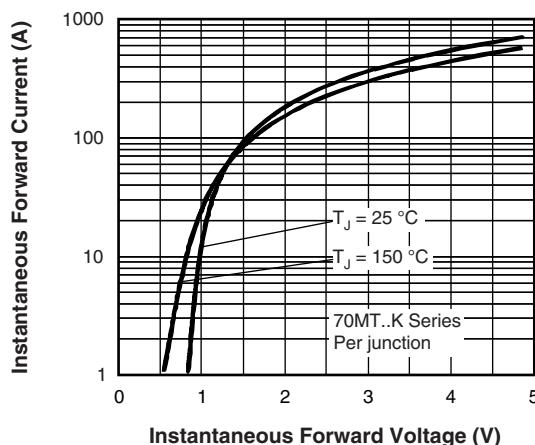


Fig. 7 - Forward Voltage Drop Characteristics

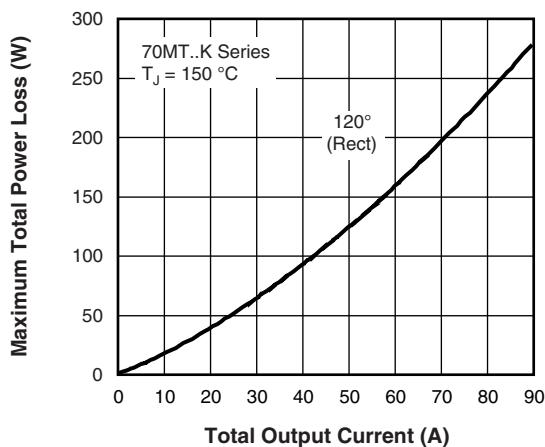


Fig. 8 - Total Power Loss Characteristics

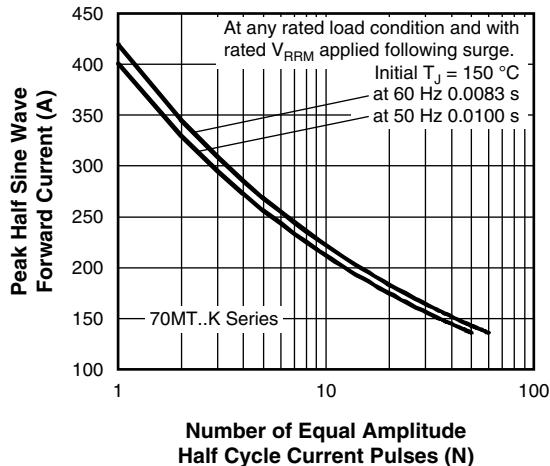
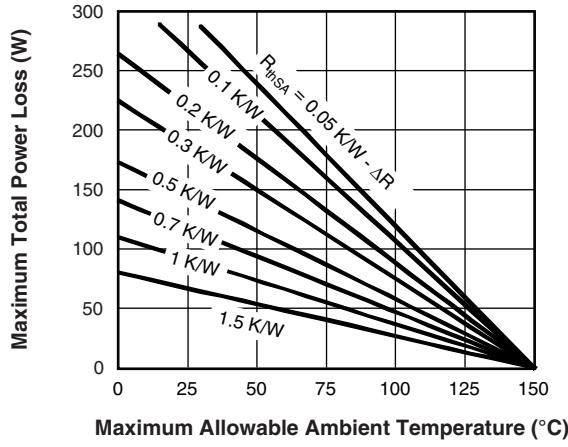


Fig. 9 - Maximum Non-Repetitive Surge Current

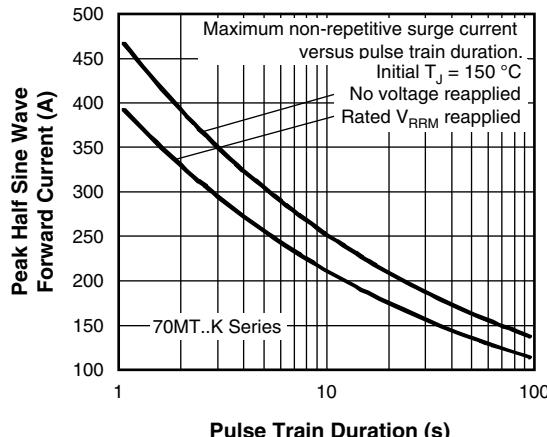


Fig. 10 - Maximum Non-Repetitive Surge Current

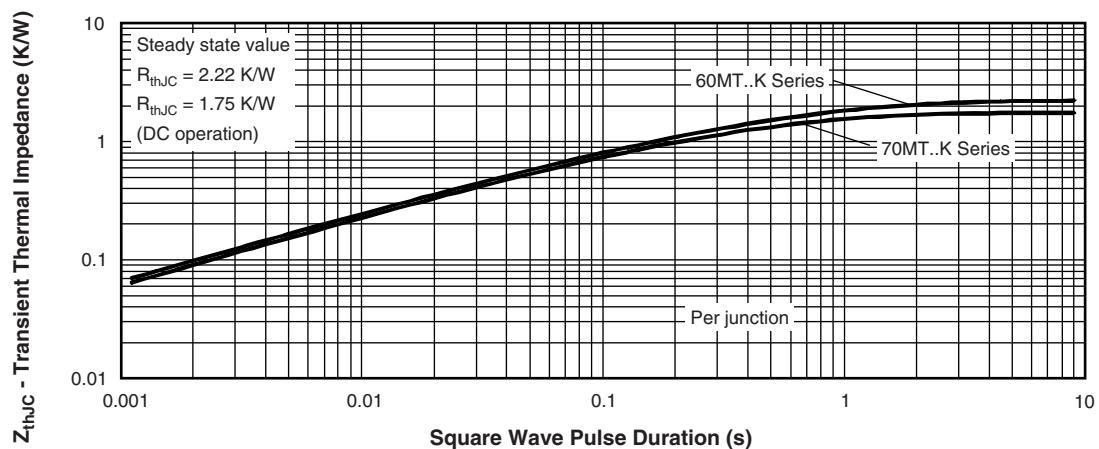


Fig. 11 - Thermal Impedance Z_{thJC} Characteristics

ORDERING INFORMATION TABLE

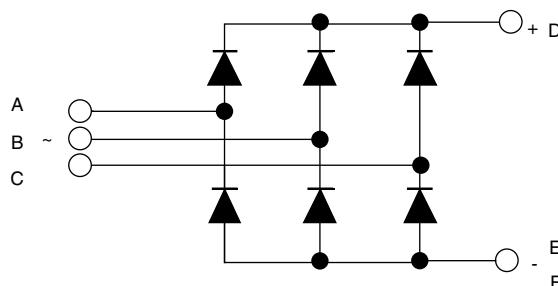
| | | | | | | | |
|-------------|-----|---|---|----|-----|---|-----|
| Device code | VS- | 7 | 0 | MT | 160 | K | PbF |
| | 1 | 2 | 3 | 4 | 5 | | 6 |

- 1** - Vishay Semiconductors product
- 2** - Current rating code: 6 = 60 A (average)
7 = 70 A (average)
- 3** - Three phase diodes bridge
- 4** - Essential part number
- 5** - Voltage code $\times 10 = V_{RRM}$ (see Voltage Ratings table)
- 6** - PbF = Lead (Pb)-free

Note

- To order the optional hardware go to www.vishay.com/doc?95172

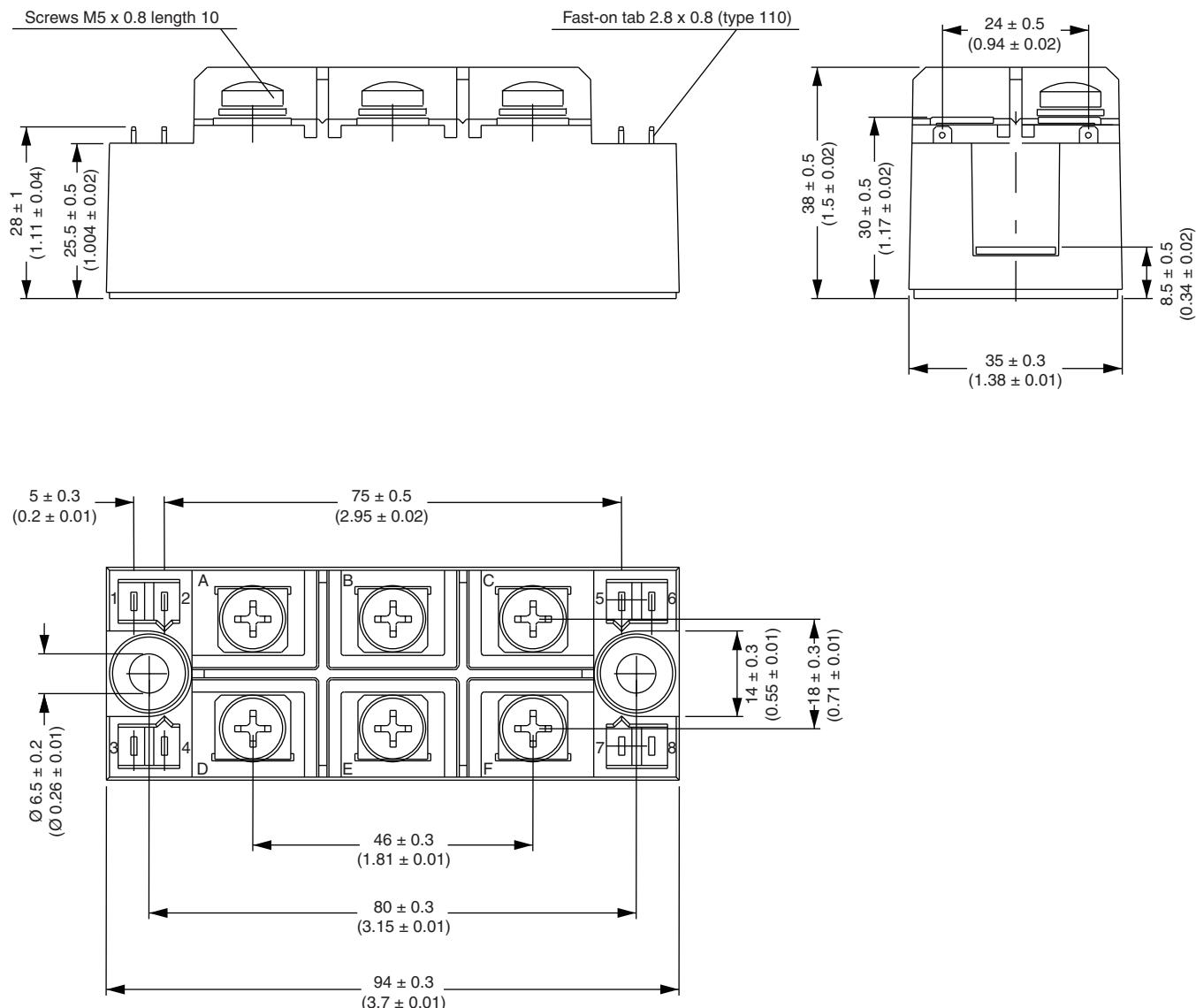
CIRCUIT CONFIGURATION



| LINKS TO RELATED DOCUMENTS | |
|----------------------------|--|
| Dimensions | www.vishay.com/doc?95004 |

MTK (with and without optional barrier)

DIMENSIONS WITH OPTIONAL BARRIERS in millimeters (inches)

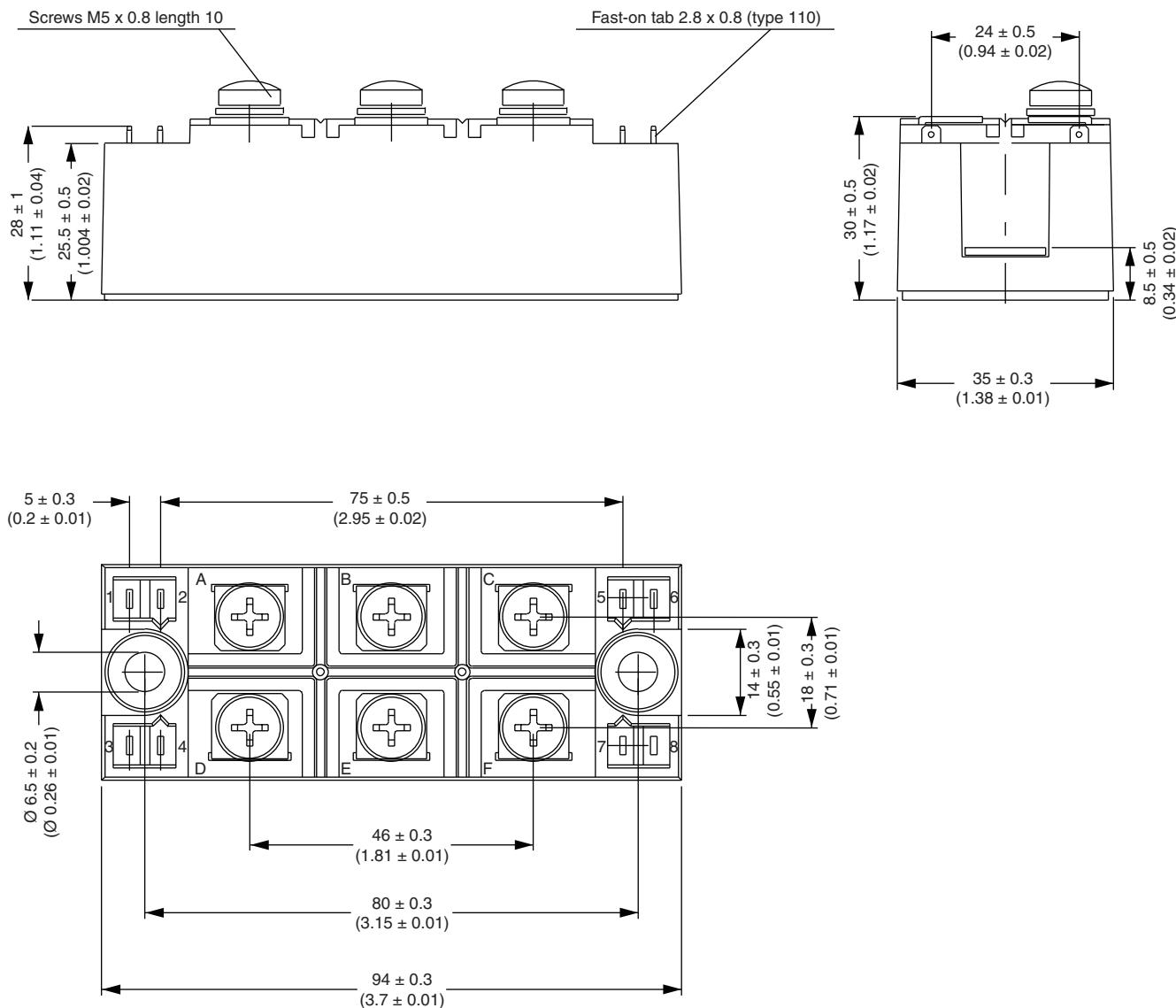


Outline Dimensions

Vishay Semiconductors MTK (with and without optional barrier)



DIMENSIONS WITHOUT OPTIONAL BARRIERS in millimeters (inches)



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