




Three Phase Bridge (Power Modules), 90 A/110 A



MT-K

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

| PRODUCT SUMMARY | |
|------------------|--------------------|
| I _O | 90 A to 110 A |
| V _{RRM} | 800 V to 1600 V |
| Package | MT-K |
| Circuit | 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 | 90MT.K | 110MT.K | UNITS |
| I _O | | 90 (120) | 110 (150) | A |
| | T _C | 90 (61) | 90 (57) | °C |
| I _{FSM} | 50 Hz | 770 | 950 | A |
| | 60 Hz | 810 | 1000 | |
| I ² t | 50 Hz | 3000 | 4500 | A ² s |
| | 60 Hz | 2700 | 4100 | |
| I ² √t | | 30 000 | 45 000 | A ² √s |
| V _{RRM} | Range | 800 to 1600 | | V |
| T _{Stg} | Range | -40 to 150 | | °C |
| T _J | | | | |

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-90-110MT..K | 80 | 800 | 900 | 10 |
| | 100 | 1000 | 1100 | |
| | 120 | 1200 | 1300 | |
| | 140 | 1400 | 1500 | |
| | 160 | 1600 | 1700 | |



| FORWARD CONDUCTION | | | | | | | |
|---|---------------------|--|-----------------------------------|--|-----------|-------------------|------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | 90MT.K | 110MT.K | UNITS | |
| Maximum DC output current at case temperature | I _O | 120° rect. conduction angle | | 90 (120) | 110 (150) | A | |
| | | | | 90 (61) | 90 (57) | °C | |
| Maximum peak, one-cycle forward, non-repetitive surge current | I _{FSM} | t = 10 ms | No voltage reappplied | Initial T _J = T _J maximum | 770 | 950 | A |
| | | t = 8.3 ms | | | 810 | 1000 | |
| | | t = 10 ms | 100 % V _{RRM} reappplied | | 650 | 800 | |
| | | t = 8.3 ms | | | 680 | 840 | |
| Maximum I ² t for fusing | I ² t | t = 10 ms | No voltage reappplied | Initial T _J = T _J maximum | 3000 | 4500 | A ² s |
| | | t = 8.3 ms | | | 2700 | 4100 | |
| | | t = 10 ms | 100 % V _{RRM} reappplied | | 2100 | 3200 | |
| | | t = 8.3 ms | | | 1900 | 2900 | |
| Maximum I ² √t for fusing | I ² √t | t = 0.1 ms to 10 ms, no voltage reappplied | | 30 000 | 45 000 | A ² √s | |
| Low level value of threshold voltage | V _{F(TO)1} | (16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J maximum | | 0.89 | 0.81 | V | |
| High level value of threshold voltage | V _{F(TO)2} | (I > π × I _{F(AV)}), T _J maximum | | 1.05 | 0.99 | | |
| Low level value of forward slope resistance | r _{f1} | (16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J maximum | | 5.11 | 4.37 | mΩ | |
| High level value of forward slope resistance | r _{f2} | (I > π × I _{F(AV)}), T _J maximum | | 4.64 | | | |
| Maximum forward voltage drop | V _{FM} | I _{pk} = 150 A, T _J = 25 °C t _p = 400 μs single junction | | 1.6 | 1.4 | V | |
| RMS isolation voltage | V _{ISOL} | T _J = 25 °C, all terminal shorted f = 50 Hz, t = 1 s | | 4000 | | | |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | | | |
|--|-----------------------------------|--|--|------------|---------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | 90MT.K | 110MT.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 | | 0.21 | 0.18 | °C/W |
| | | DC operation per junction | | 1.26 | 1.07 | |
| | | 120° rect. conduction angle per module | | 0.25 | 0.21 | |
| | | 120° rect. conduction angle per junction | | 1.47 | 1.25 | |
| Maximum thermal resistance, case to heatsink per module | R _{thCS} | Mounting surface smooth, flat and greased | | 0.03 | | |
| Mounting torque ± 10 % | to heatsink to terminal | 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. Lubricated threads. | | 4 to 6 | | Nm |
| | | | | 3 to 4 | | |
| Approximate weight | | | | 176 | | g |

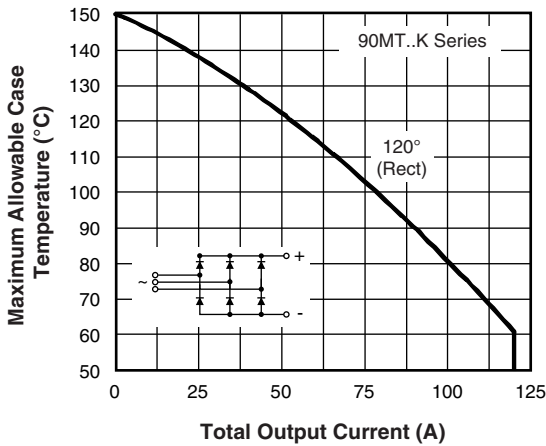


Fig. 1 - Current Ratings Characteristics

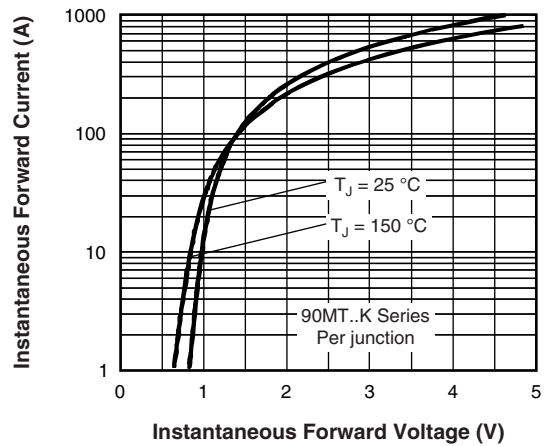


Fig. 2 - Forward Voltage Drop Characteristics

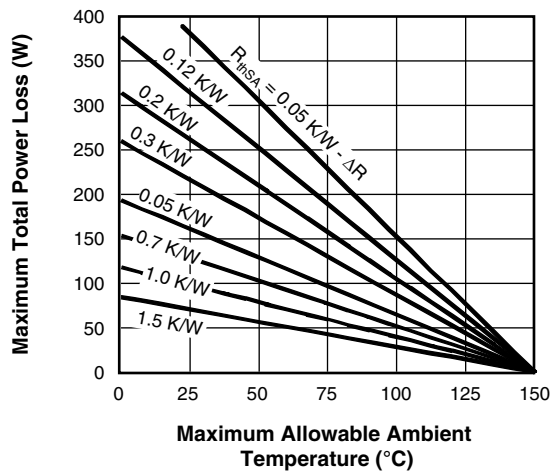
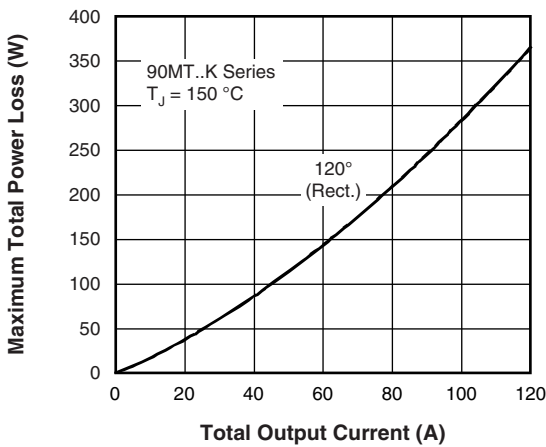


Fig. 3 - Total Power Loss Characteristics

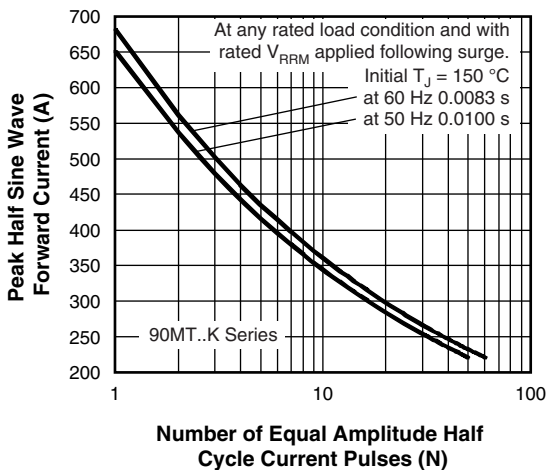


Fig. 4 - Maximum Non-Repetitive Surge Current

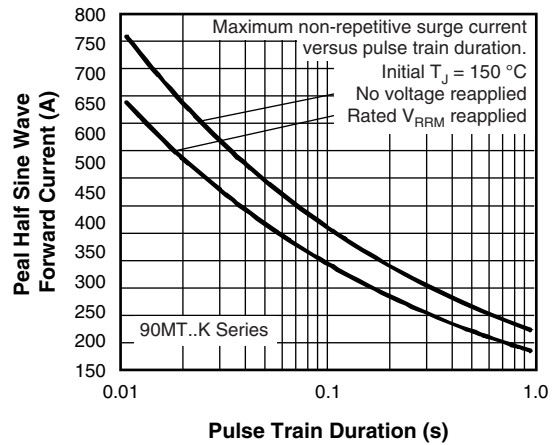


Fig. 5 - Maximum Non-Repetitive Surge Current

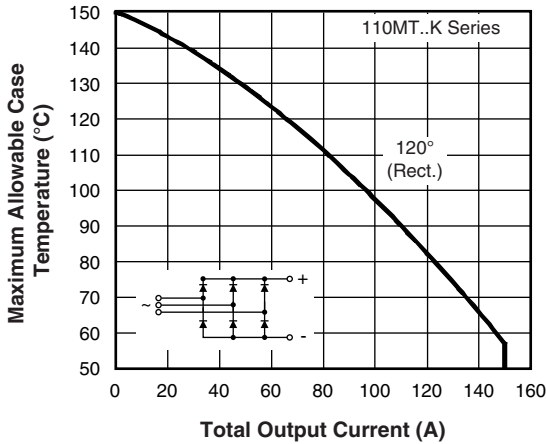


Fig. 6 - Current Ratings Characteristics

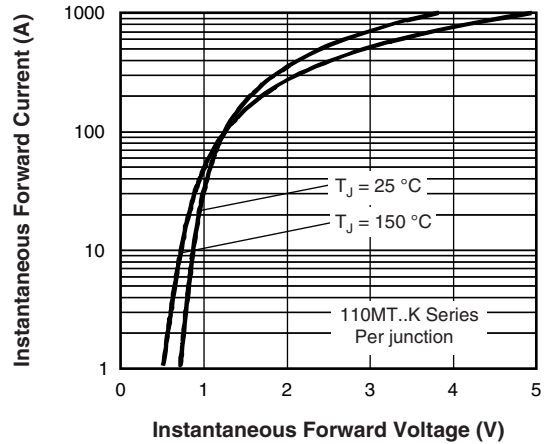


Fig. 7 - Forward Voltage Drop Characteristics

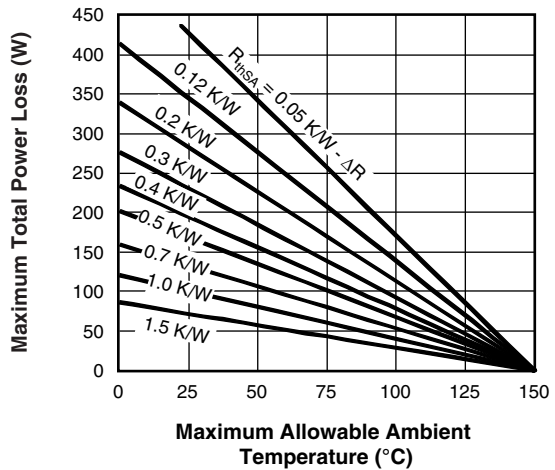
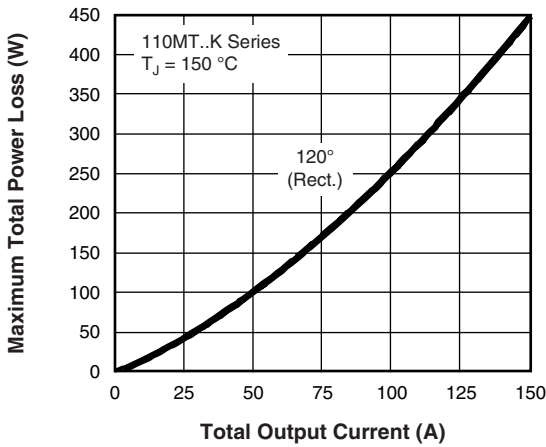


Fig. 8 - Total Power Loss Characteristics

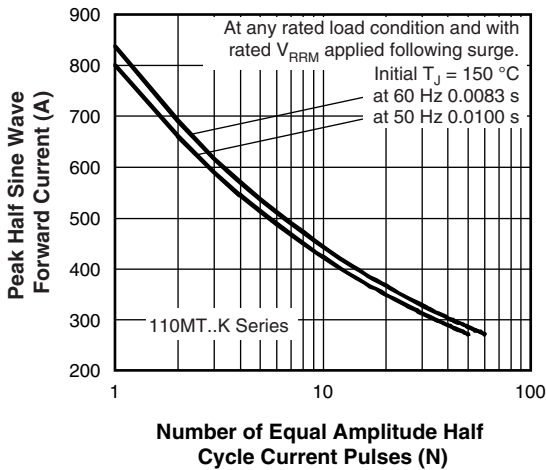


Fig. 9 - Maximum Non-Repetitive Surge Current

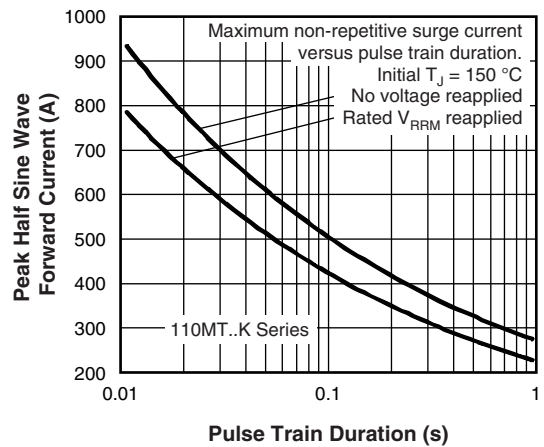


Fig. 10 - Maximum Non-Repetitive Surge Current

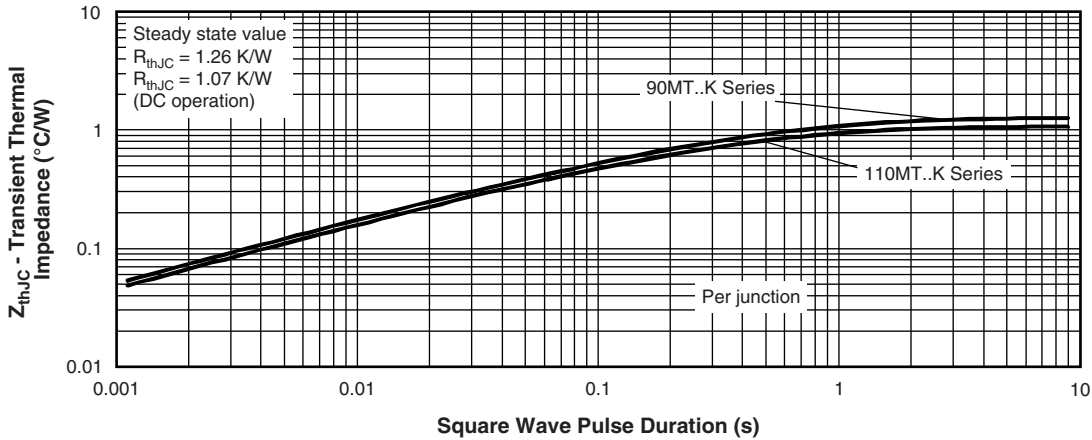


Fig. 11 - Thermal Impedance Z_{thJC} Characteristic

ORDERING INFORMATION TABLE

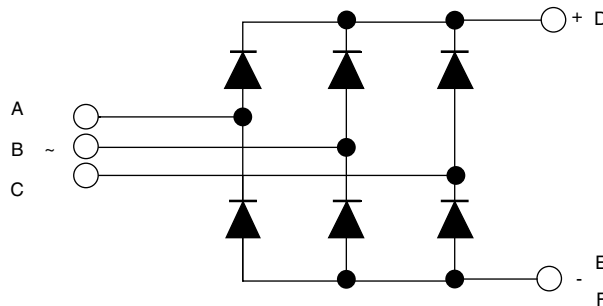
| | | | | | | | |
|-------------|------------|-----------|----------|-----------|------------|----------|------------|
| Device code | VS- | 11 | 0 | MT | 160 | K | PbF |
| | ① | ② | ③ | ④ | ⑤ | ⑥ | |

- 1** - Vishay Semiconductors product
- 2** - Current rating code: 9 = 90 A (average)
11 = 110 A (average)
- 3** - Three phase diodes bridge
- 4** - Essential part number
- 5** - Voltage code x 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

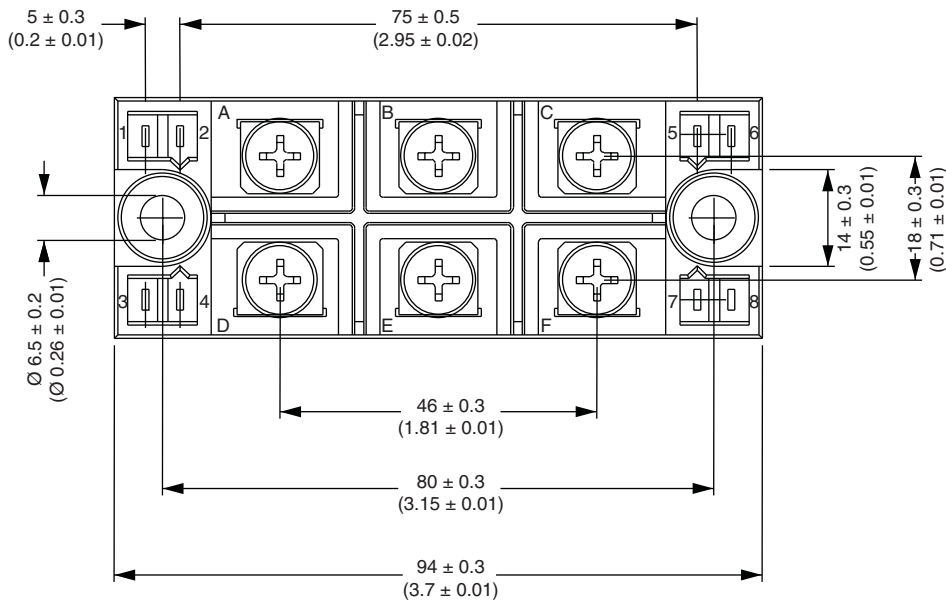
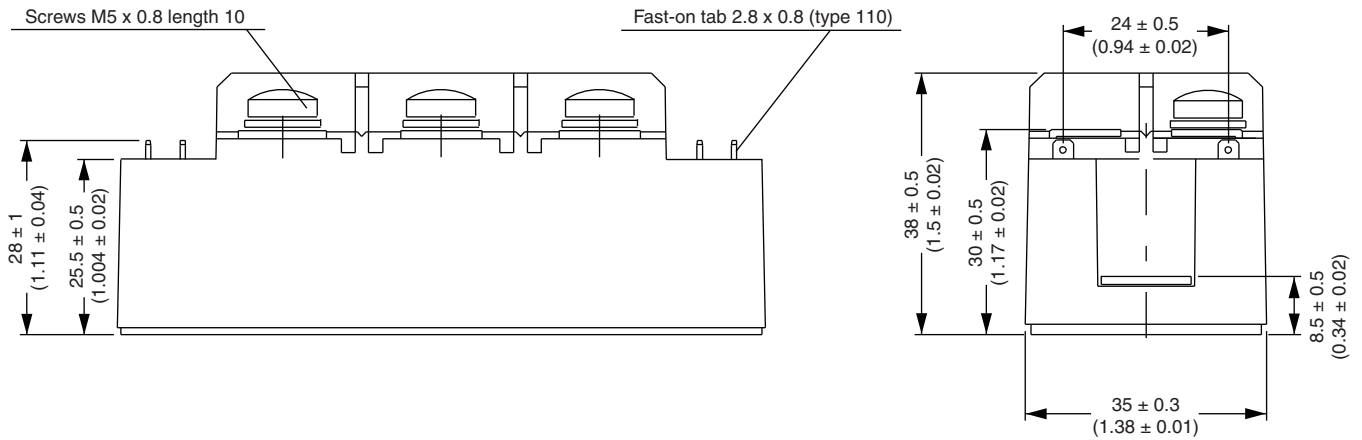
CIRCUIT CONFIGURATION



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

MTK (with and without optional barrier)

DIMENSIONS WITH OPTIONAL BARRIERS in millimeters (inches)

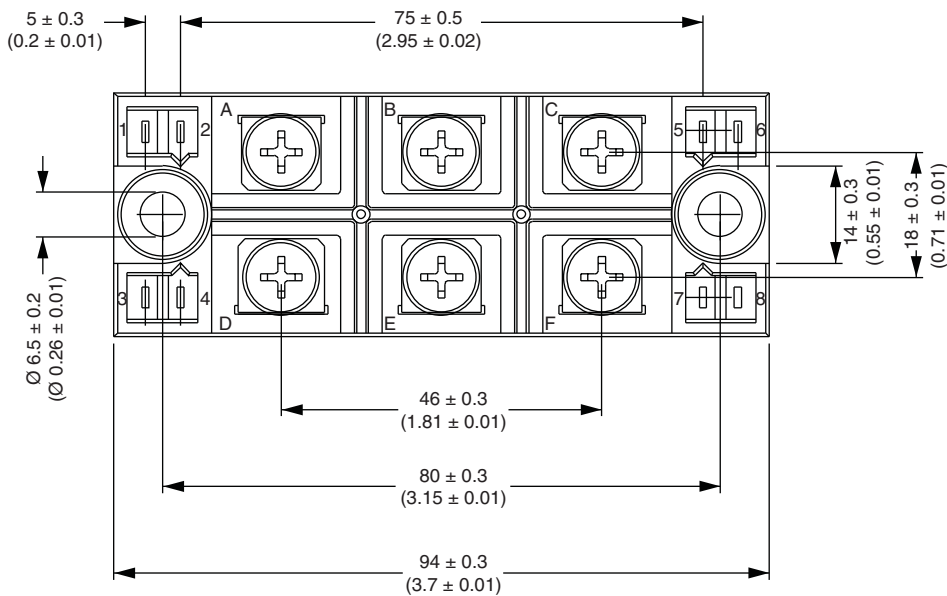
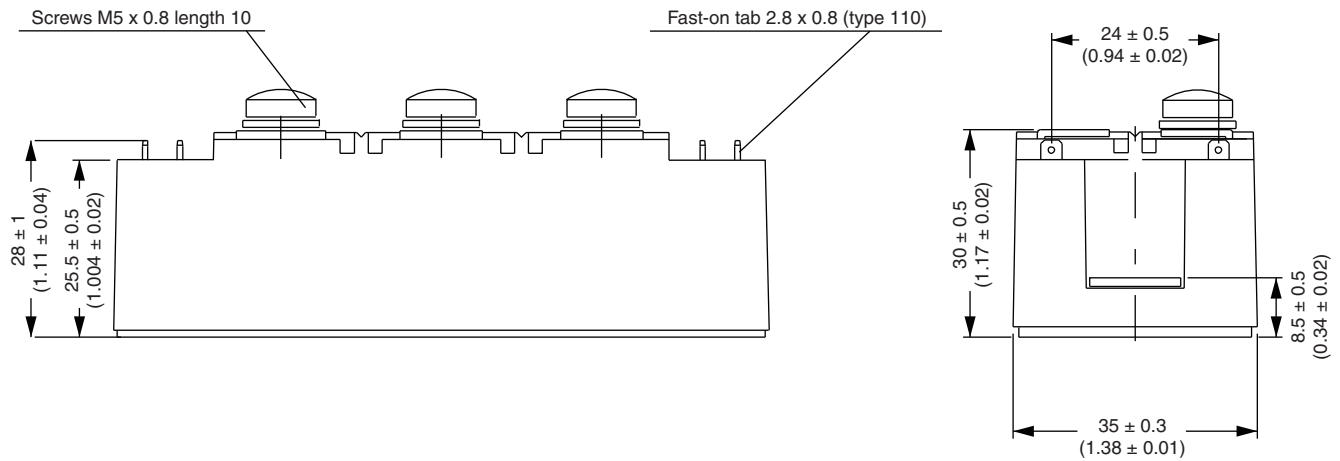


Outline Dimensions

Vishay Semiconductors MTK (with and without optional barrier)



DIMENSIONS WITHOUT OPTIONAL BARRIERS in millimeters (inches)





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JONHON

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