


MTP PressFit Power Module

Three Phase Bridge, 45 A to 100 A



MTP PressFit

FEATURES

- Low V_F
- Low profile package
- Direct mounting to heatsink
- PressFit pins technology
- Low junction to case thermal resistance
- 3500 V_{RMS} insulation voltage
- Designed and qualified for industrial level
- PressFit pins locking technology
PATENT(S): www.vishay.com/patents
- UL approved file E78996 
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

PRIMARY CHARACTERISTICS

| | |
|-----------------------|--------------------|
| I_O | 45 A to 100 A |
| V_{RRM} | 1600 V |
| Package | MTP PressFit |
| Circuit configuration | Three phase bridge |

APPLICATIONS

- Power conversion machines
- Welding
- UPS
- SMPS
- Motor drives
- General purpose and heavy duty application

DESCRIPTION

The new MTP module is easy to use thanks to solder less method for contacting PressFit pins to the PCB. The low profile package has been specifically conceived to maximize space saving and optimize the electrical layout of the application specific power supplies.

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES 40MT | VALUES 70MT | VALUES 100MT | UNITS |
|-------------------|-----------------|----------------|----------------|-----------------|-------------------|
| I _O | | 45 | 75 | 100 | A |
| | T _C | 100 | 80 | 80 | °C |
| I _{FSM} | 50 Hz | 270 | 380 | 450 | A |
| | 60 Hz | 280 | 398 | 470 | |
| I ² t | 50 Hz | 365 | 724 | 1013 | A ² s |
| | 60 Hz | 325 | 660 | 920 | |
| I ² √t | | 3650 | 7240 | 10 130 | A ² √s |
| V _{RRM} | | 1600 | | | V |
| T _{Stg} | Range | - 40 to + 150 | | | °C |
| T _J | | - 40 to + 150 | | | |

PATENT(S): www.vishay.com/patents

This Vishay product is protected by one or more United States and international patents.



ELECTRICAL SPECIFICATIONS

| VOLTAGE RATINGS | | | | |
|---|--------------------------------------|--|---|---|
| TYPE NUMBER | VOLTAGE CODE REVERSE VOLTAGE V | V_{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V | V_{RSM} , MAXIMUM NON-REPETITIVE PEAK V | I_{RRM} MAXIMUM AT $T_J = 150\text{ }^{\circ}\text{C}$ mA |
| VS-40MT160P-P, VS-70MT160P-P, VS-100MT160P-P | 160 | 1600 | 1700 | 5 |

| FORWARD CONDUCTION | | | | | | | | |
|--|--------------------|--|----------------------------------|--|----------------|----------------|-----------------|-------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | | VALUES 40MT | VALUES 70MT | VALUES 100MT | UNITS |
| Maximum DC output current at case temperature | I _O | 120° rect. to conduction angle | | | 45 | 75 | 100 | A |
| | | | | | 100 | 80 | 80 | °C |
| Maximum peak, one cycle forward, non-repetitive on state surge current | I _{FSM} | t = 10 ms | No voltage reapplied | Initial T _J = T _J maximum | 270 | 380 | 450 | A |
| | | t = 8.3 ms | | | 280 | 398 | 470 | |
| | | t = 10 ms | 100 % V _{RRM} reapplied | | 225 | 320 | 380 | |
| | | t = 8.3 ms | | | 240 | 335 | 400 | |
| Maximum I ² t for fusing | I ² t | t = 10 ms | No voltage reapplied | | 365 | 724 | 1013 | A ² s |
| | | t = 8.3 ms | | | 325 | 660 | 920 | |
| | | t = 10 ms | 100 % V _{RRM} reapplied | | 253 | 512 | 600 | |
| | | t = 8.3 ms | | | 240 | 467 | 665 | |
| Maximum I ² √t for fusing | I ² √t | t = 0.1 ms to 10 ms, no voltage reapplied | | | 3650 | 7240 | 10 130 | A ² √s |
| Value of threshold voltage | V _{F(TO)} | T _J maximum | | | 0.78 | 0.82 | 0.75 | V |
| Slope resistance | r _t | | | | 14.8 | 9.5 | 8.1 | mΩ |
| Maximum forward voltage drop | V _{FM} | T _J = 25 °C; t _p = 400 μs single junction (40MT, I _{pk} = 40 A) (70MT, I _{pk} = 70 A) (100MT, I _{pk} = 100 A) | | | 1.45 | 1.45 | 1.51 | V |

| INSULATION TABLE | | | | | | |
|------------------------|-----------|---|----------------|----------------|-----------------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES 40MT | VALUES 70MT | VALUES 100MT | UNITS |
| RMS insulation voltage | V_{INS} | $T_J = 25\text{ }^{\circ}\text{C}$, all terminal shorted, f = 50 Hz, t = 1 s | 3500 | | | V |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | | | |
|---|-------------------|---|----------------|----------------|-----------------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES 40MT | VALUES 70MT | VALUES 100MT | UNITS |
| Maximum junction operating temperature range | T _J | | - 40 to + 150 | | | °C |
| Maximum storage temperature range | T _{Stg} | | - 40 to + 150 | | | |
| Maximum thermal resistance, junction to case | R _{thJC} | DC operation per module | 0.27 | 0.23 | 0.19 | K/W |
| | | DC operation per junction | 1.6 | 1.38 | 1.14 | |
| | | 120° rect. conduction angle per module | 0.38 | 0.29 | 0.22 | |
| | | 120° rect. conduction angle per junction | 2.25 | 1.76 | 1.29 | |
| Maximum thermal resistance, case to heatsink per module | R _{thCS} | Mounting surface smooth, flat and greased heatsink compound thermal conductivity = 0.42 W/mK | 0.1 | | | |
| Mounting torque to heatsink± 10 % | | 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 | | | Nm |
| Approximate weight | | | 65 | | | g |



| CLEARANCE AND CREEPAGE DISTANCES | | | |
|----------------------------------|---|--------------|-------|
| PARAMETER | TEST CONDITIONS | MTP PressFit | UNITS |
| Clearance | External shortest distances in air between terminals which are not internally short circuited together | 10.2 | mm |
| Creepage distance | Shortest distance along external surface of the insulating material between terminals which are not internally short circuited together | 13 | |

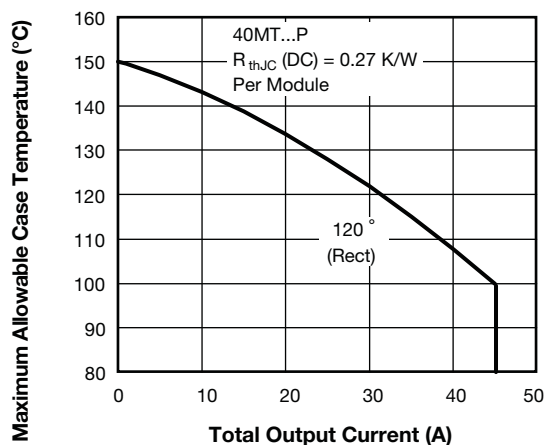


Fig. 1 - Current Rating Characteristics

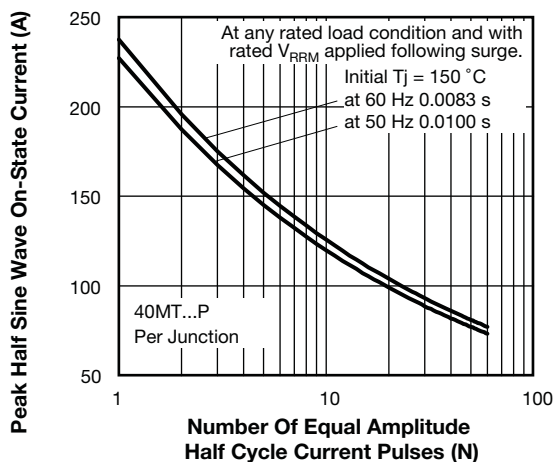


Fig. 3 - Maximum Non-Repetitive Surge Current

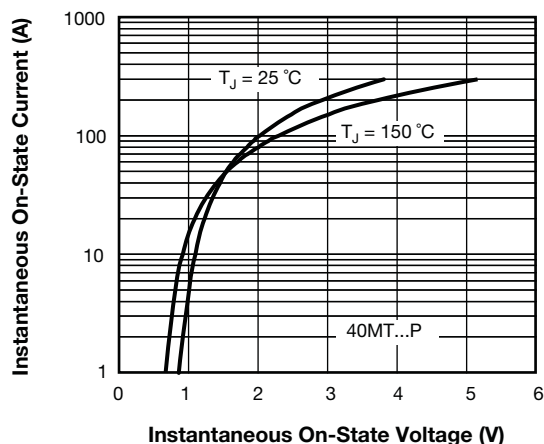


Fig. 2 - On-State Voltage Drop Characteristics

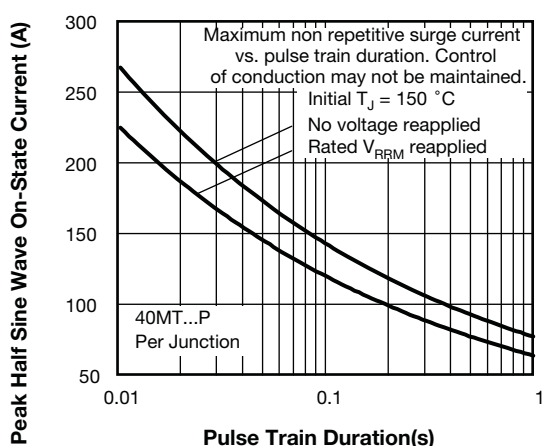


Fig. 4 - Maximum Non-Repetitive Surge Current

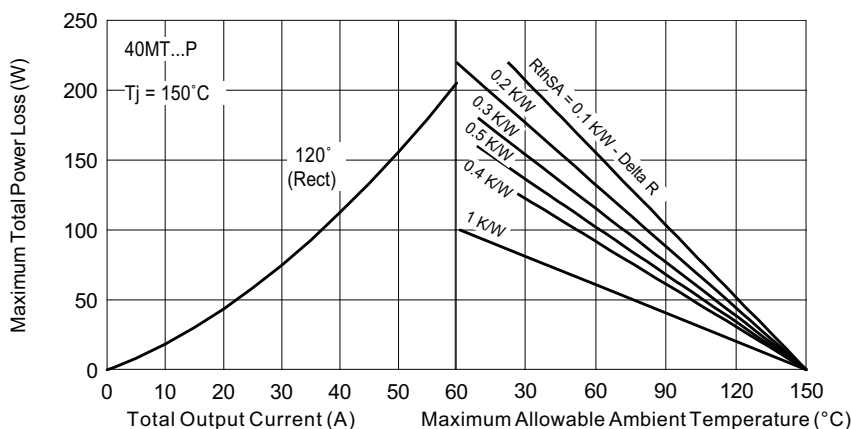


Fig. 5 - Current Rating Nomogram (1 Module Per Heatsink)

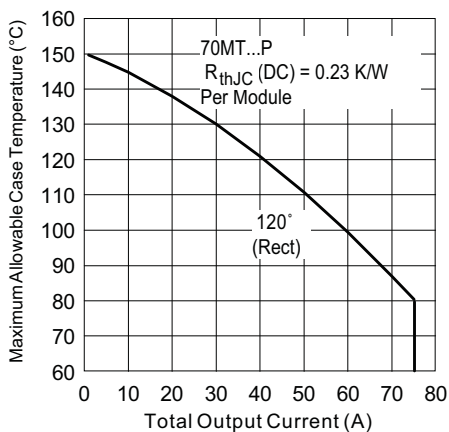


Fig. 6 - Current Rating Characteristics

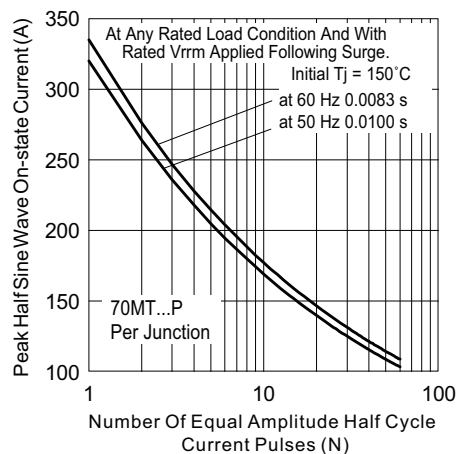


Fig. 8 - Maximum Non-Repetitive Surge Current

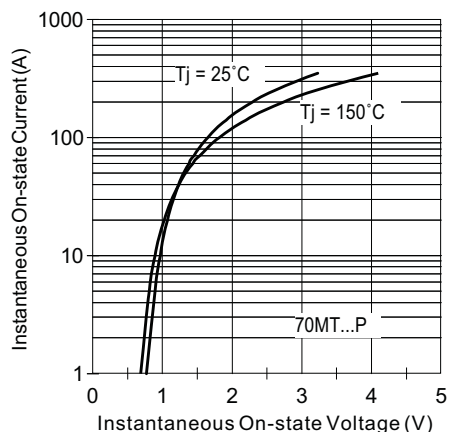


Fig. 7 - On-State Voltage Drop Characteristics

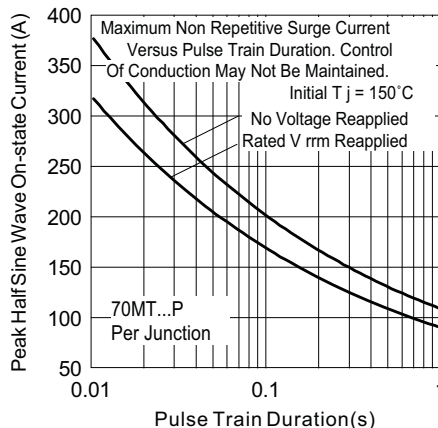


Fig. 9 - Maximum Non-Repetitive Surge Current

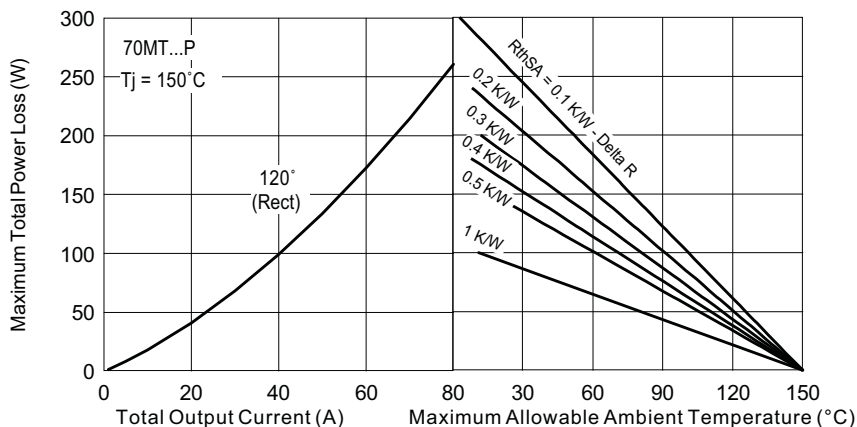


Fig. 10 - Current Rating Nomogram (1 Module Per Heatsink)

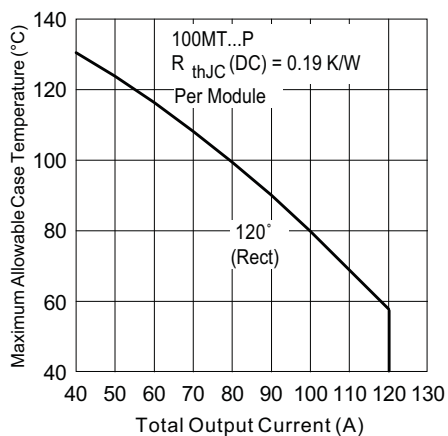


Fig. 11 - Current Rating Characteristics

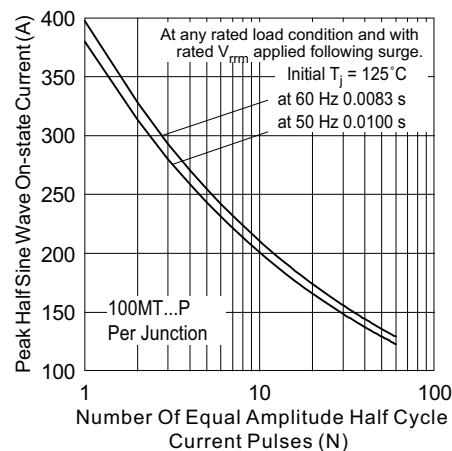


Fig. 13 - Maximum Non-Repetitive Surge Current

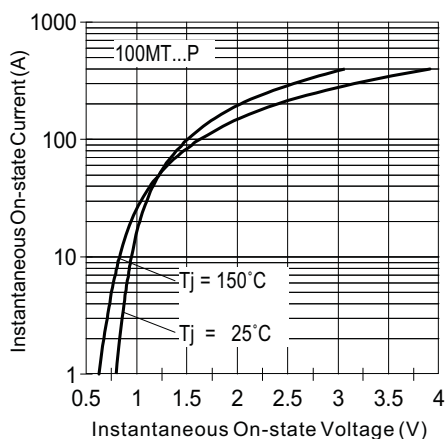


Fig. 12 - On-State Voltage Drop Characteristics

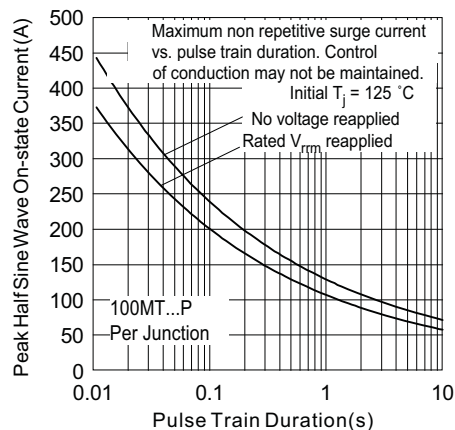


Fig. 14 - Maximum Non-Repetitive Surge Current

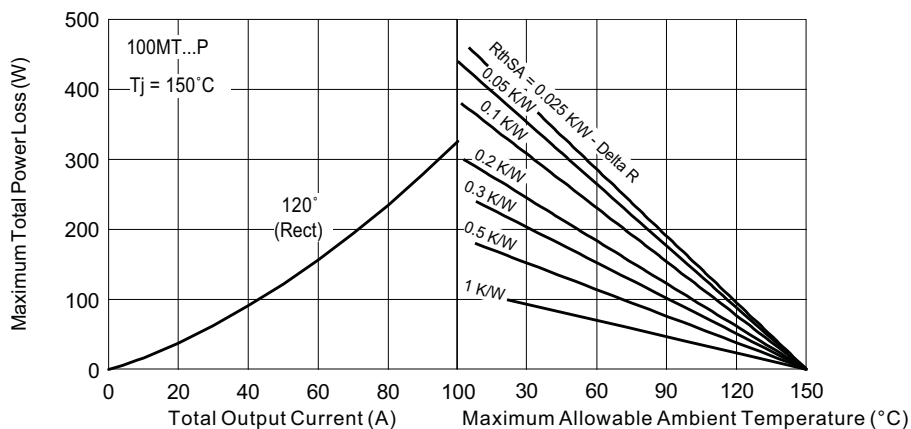


Fig. 15 - Current Rating Nomogram (1 Module Per Heatsink)

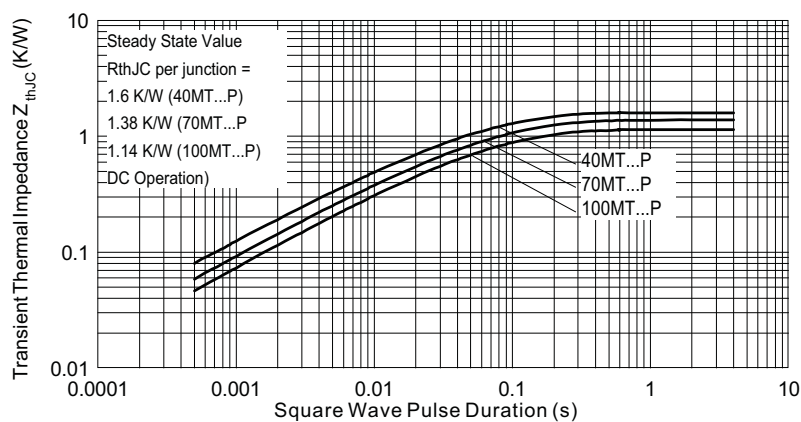


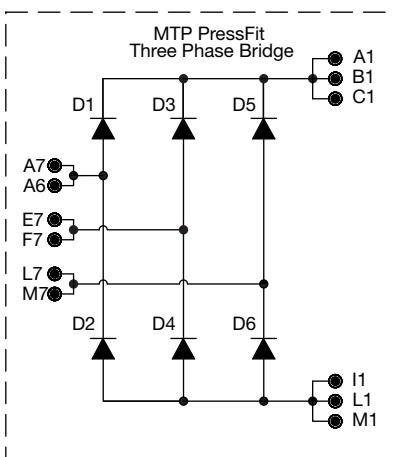
Fig. 16 - Thermal Impedance Z_{thJC} Characteristics



ORDERING INFORMATION TABLE

| Device code | VS- | 10 | 0 | MT | 160 | P | -P |
|-------------|---|----|---|----|-----|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| 1 | - Vishay Semiconductors product | | | | | | |
| 2 | - Current rating code | | | | | | |
| | <div> 4 = 45 A 7 = 75 A 10 = 100 A </div> | | | | | | |
| 3 | - Circuit configuration code: 0 = Three Phase Bridge | | | | | | |
| 4 | - Package indicator | | | | | | |
| 5 | - Voltage code x 10 = V_{RRM} (see Voltage Ratings table) | | | | | | |
| 6 | - Pinout code (PressFit pins) | | | | | | |

CIRCUIT CONFIGURATION



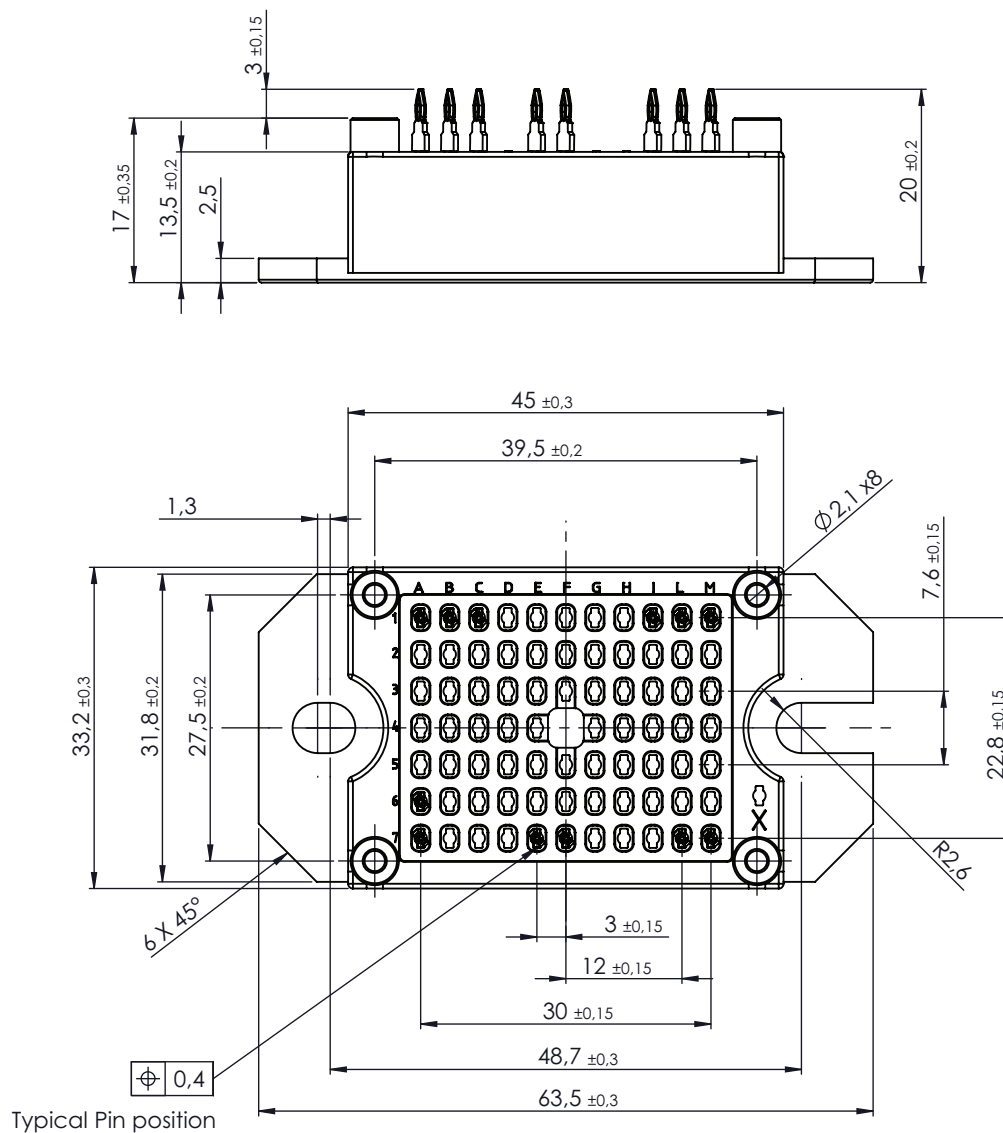
LINKS TO RELATED DOCUMENTS

Dimensions

www.vishay.com/doc?95595

MTP Three Phase PressFit

DIMENSIONS in millimeters





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