

Three Phase Bridge, 160 A (Power Modules)


MTC
FEATURES

- Blocking voltage up to 1800 V
- High surge capability
- High thermal conductivity package, electrically insulated case
- Excellent power volume ratio
- 3600 V_{RMS} isolating voltage
- UL approved file E78996
- Designed for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

PRIMARY CHARACTERISTICS

| | |
|-----------------------|--------------------|
| I_o | 160 A at 118 °C |
| V_{RRM} | 1600 V to 1800 V |
| Package | MTC |
| 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 | UNITS |
|----------------------|-----------------|--------------|-------------------|
| I_o ⁽¹⁾ | | 257 | A |
| | T_c | 85 | °C |
| I_{FSM} | 50 Hz | 1540 | A |
| | 60 Hz | 1610 | |
| I^2t | 50 Hz | 11 860 | A ² s |
| | 60 Hz | 10 825 | |
| $I^2\sqrt{t}$ | | 118 580 | A ² √s |
| V_{RRM} | Range | 1600 to 1800 | V |
| T_{Stg} | Range | -40 to +125 | °C |
| T_J | Range | -40 to +150 | °C |

Note

⁽¹⁾ Maximum output current must be limited to 220 A to do not exceed the maximum temperature of terminals

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-161MT...C | 160 | 1600 | 1700 | 12 |
| | 180 | 1800 | 1900 | |



| FORWARD CONDUCTION | | | | | | |
|---|----------------------|--|----------------------------------|---|---------|-------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | | VALUES | UNITS |
| Maximum DC output current at case temperature | I _O | 120° rect. conduction angle | | | 160 | A |
| | | | | | 118 | °C |
| Maximum peak, one-cycle forward, non-repetitive surge current | I _{FSM} | t = 10 ms | No voltage reapplied | Initial T _J = T _J maximum | 1540 | A |
| | | t = 8.3 ms | | | | |
| | | t = 10 ms | 100 % V _{RRM} reapplied | | 1295 | |
| | | t = 8.3 ms | | | 1355 | |
| Maximum I ² t for fusing | I ² t | t = 10 ms | No voltage reapplied | Initial T _J = T _J maximum | 11 860 | A ² s |
| | | t = 8.3 ms | | | | |
| | | t = 10 ms | 100 % V _{RRM} reapplied | | 8385 | |
| | | t = 8.3 ms | | | 7620 | |
| Maximum I ² √t for fusing | I ² √t | t = 0.1 ms to 10 ms, no voltage reapplied | | | 118 580 | A ² √s |
| Low level value of threshold voltage | V _{FT(TO)1} | (16.7 % × π × I _{F(AV)}) < I < π × I _{F(AV)} , T _J maximum | | | 0.81 | V |
| High level value of threshold voltage | V _{FT(TO)2} | (I > π × I _{F(AV)}), T _J maximum | | | 0.98 | |
| Low level value of forward slope resistance | r _{f1} | 16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)} , T _J maximum | | | 3.89 | mΩ |
| High level of forward slope resistance | r _{f2} | (I > π × I _{F(AV)}), T _J maximum | | | 3.68 | |
| Maximum forward voltage drop | V _{FM} | I _{pk} = 300 A, T _J = 25 °C, per junction | | | 1.85 | V |
| RMS isolation voltage | V _{ISOL} | T _J = 25 °C, all terminal shorted f = 50 Hz, t = 1 s | | | 3600 | |

| THERMAL AND MECHANICAL SPECIFICATIONS | | | | | | |
|--|-------------------|--|--|--|-------------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | | VALUES | UNITS |
| Maximum junction operating | T _J | | | | -40 to +150 | °C |
| Maximum storage temperature | T _{Stg} | | | | -40 to +125 | |
| Maximum thermal resistance, junction to case | R _{thJC} | DC operation per module | | | 0.058 | °C/W |
| | | DC operation per junction | | | 0.35 | |
| Typical thermal resistance, case to heatsink | R _{thCS} | Per module Mounting surface smooth, flat, and greased | | | 0.03 | |
| Mounting torque ± 15 % | 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. | | | 5 | Nm |
| | to terminal | | | | 5 | |
| Approximate weight | | | | | 235 | g |

| ΔR CONDUCTION PER JUNCTION | | | | | | | | | | | |
|----------------------------|---------------------------|-------|-------|-------|-------|-----------------------------|-------|-------|-------|-------|-------|
| DEVICES | SINE HALF WAVE CONDUCTION | | | | | RECTANGULAR WAVE CONDUCTION | | | | | UNITS |
| | 180° | 120° | 90° | 60° | 30° | 180° | 120° | 90° | 60° | 30° | |
| VS-161MT...C Series | 0.054 | 0.061 | 0.076 | 0.107 | 0.165 | 0.039 | 0.064 | 0.083 | 0.111 | 0.167 | °C/W |

Note

- Table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC

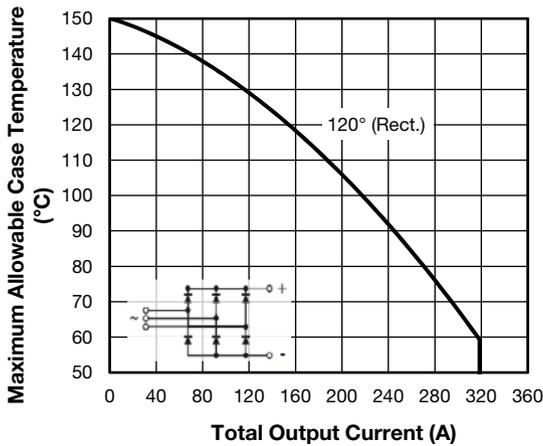


Fig. 1 - Current Ratings Characteristics

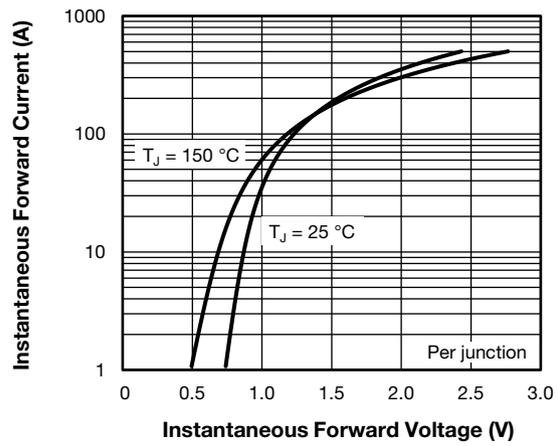


Fig. 2 - Forward Voltage Drop Characteristics

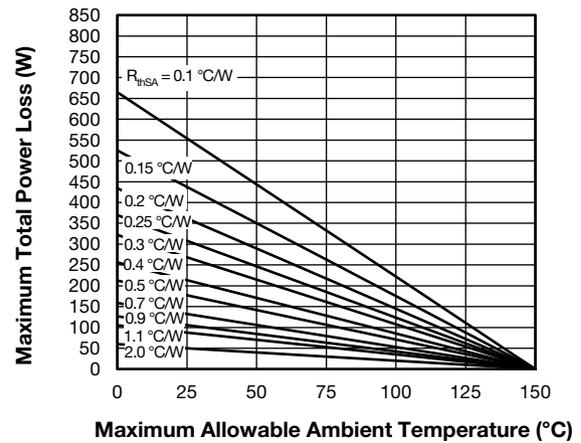
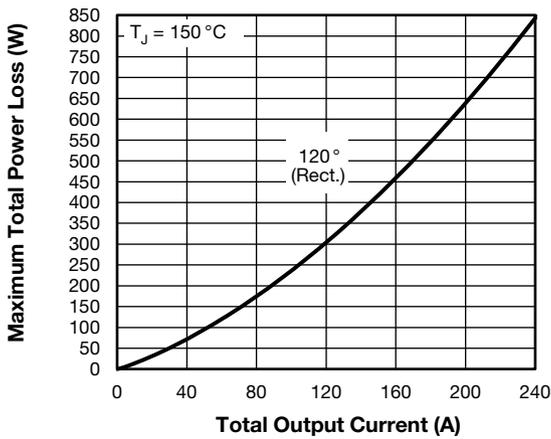


Fig. 3 - Total Power Loss Characteristics

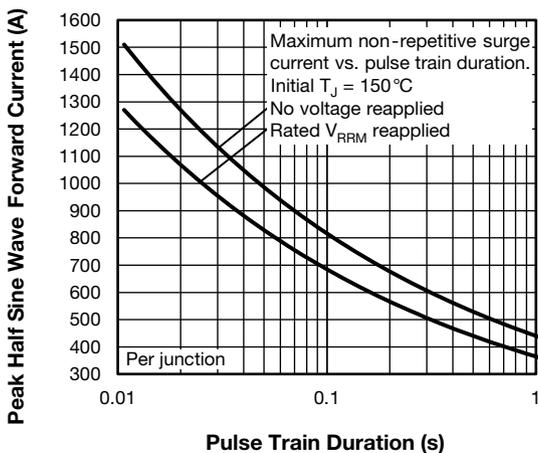


Fig. 4 - Maximum Non-Repetitive Surge Current

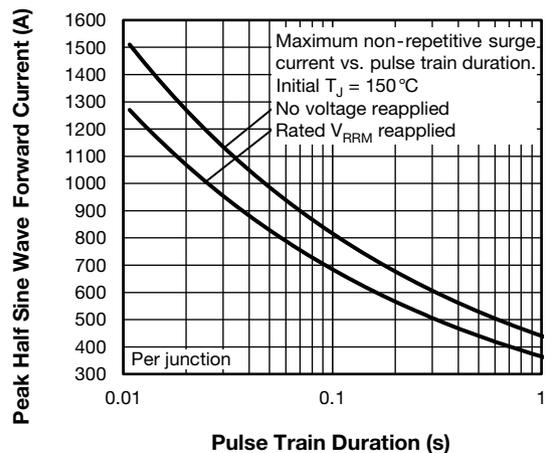


Fig. 5 - Maximum Non-Repetitive Surge Current

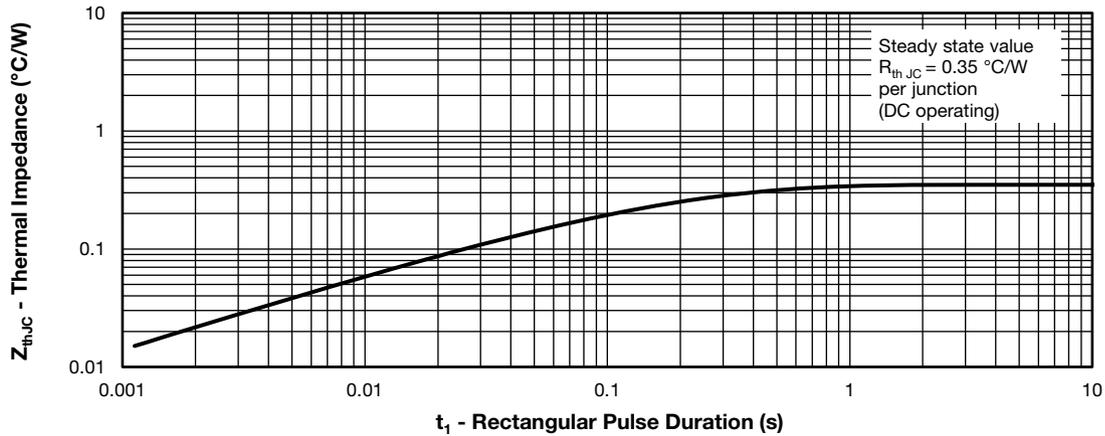
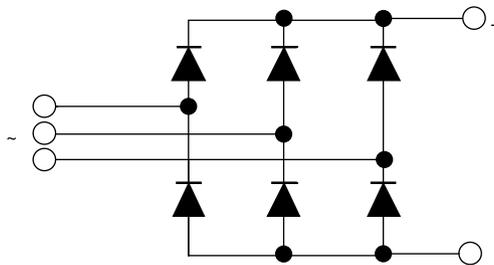


Fig. 6 - Thermal Impedance Z_{thJC} Characteristic

ORDERING INFORMATION TABLE

| | | | | | | |
|-------------|------------|-----------|---|-----------|------------|----------|
| Device code | VS- | 16 | 1 | MT | 160 | C |
| | ① | ② | ③ | ④ | ⑤ | |
| | 1 | - | Vishay Semiconductors product | | | |
| | 2 | - | Current rating code: 16 = 160 A (average) | | | |
| | 3 | - | Circuit configuration (three phase diodes bridge) | | | |
| | 4 | - | Package indicator | | | |
| | 5 | - | Voltage code x 10 = V_{RRM} (see Voltage Ratings table) | | | |

CIRCUIT CONFIGURATION



LINKS TO RELATED DOCUMENTS

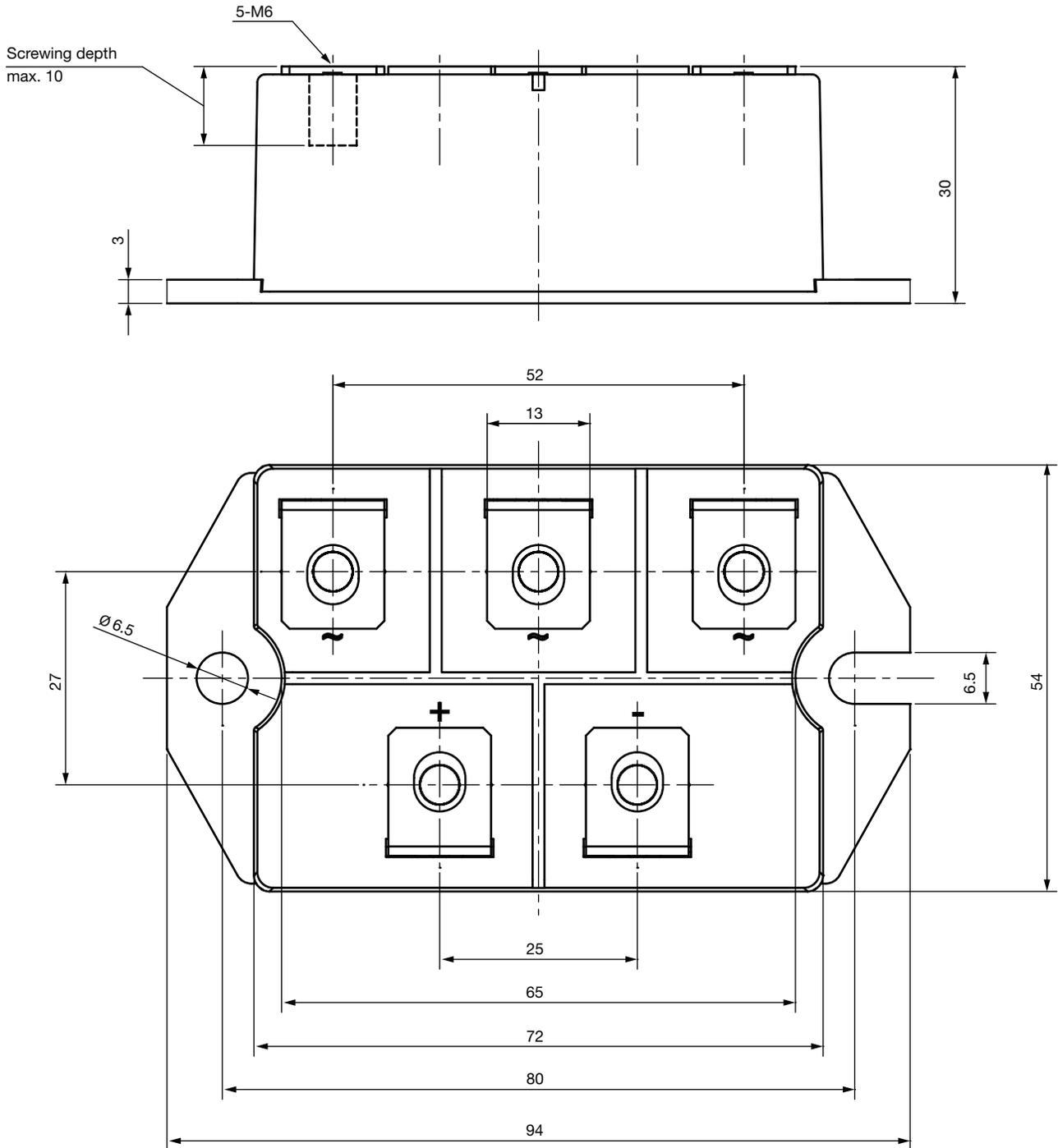
Dimensions

www.vishay.com/doc?96003



MTC

DIMENSIONS in millimeters





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