


Three Phase Bridge, 130 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

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.

PRIMARY CHARACTERISTICS

| | |
|-----------------------|--------------------|
| I_O | 130 A at 120 °C |
| V_{RRM} | 1600 V to 1800 V |
| Package | MTC |
| Circuit configuration | Three phase bridge |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|----------------------|-----------------|--------------|-------------------|
| I_O ⁽¹⁾ | | 218 | A |
| | T_C | 85 | °C |
| I_{FSM} | 50 Hz | 1270 | A |
| | 60 Hz | 1330 | |
| I^2t | 50 Hz | 8095 | A ² s |
| | 60 Hz | 7390 | |
| $I^2\sqrt{t}$ | | 80 955 | 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-131MT...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 | | | 130 | A |
| | | | | | 120 | °C |
| Maximum peak, one-cycle forward, non-repetitive surge current | I _{FSM} | t = 10 ms | No voltage reapplied | Initial T _J = T _J maximum | 1270 | A |
| | | t = 8.3 ms | | | 1330 | |
| | | t = 10 ms | 100 % V _{RRM} reapplied | | 1070 | |
| | | t = 8.3 ms | | | 1120 | |
| Maximum I ² t for fusing | I ² t | t = 10 ms | No voltage reapplied | | 8095 | A ² s |
| | | t = 8.3 ms | | | 7390 | |
| | | t = 10 ms | 100 % V _{RRM} reapplied | | 5725 | |
| | | t = 8.3 ms | | | 5225 | |
| Maximum I ² /t for fusing | I ² /t | t = 0.1 ms to 10 ms, no voltage reapplied | | | 80 955 | 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 | | | 0.79 | V |
| High level value of threshold voltage | V _{FT(TO)2} | (I > π × I _{F(AV)}), T _J maximum | | | 0.96 | |
| Low level value of forward slope resistance | r _{f1} | 16.7 % × π × I _{F(AV)} < I < π × I _{F(AV)} , T _J maximum | | | 4.97 | mΩ |
| High level of forward slope resistance | r _{f2} | (I > π × I _{F(AV)}), T _J maximum | | | 4.63 | |
| Maximum forward voltage drop | V _{FM} | I _{pk} = 300 A, T _J = 25 °C, per junction | | | 2.05 | 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 | 0.068 | °C/W |
| | | DC operation per junction | 0.41 | |
| 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-131MT...C Series | 0.052 | 0.06 | 0.075 | 0.106 | 0.164 | 0.038 | 0.063 | 0.081 | 0.109 | 0.165 | °C/W |

Note

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

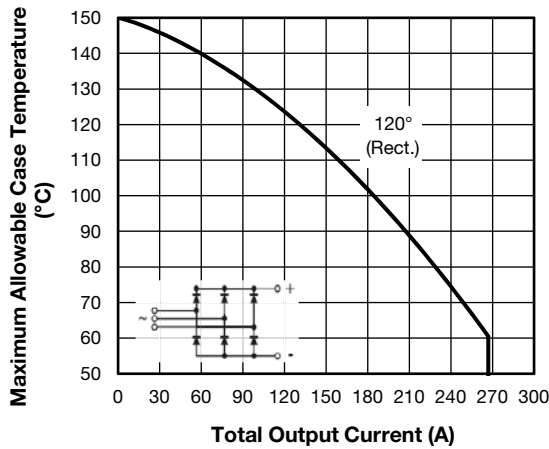


Fig. 1 - Current Ratings Characteristics

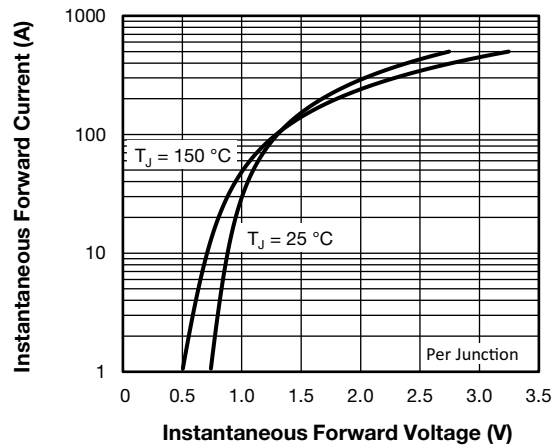


Fig. 2 - Forward Voltage Drop Characteristics

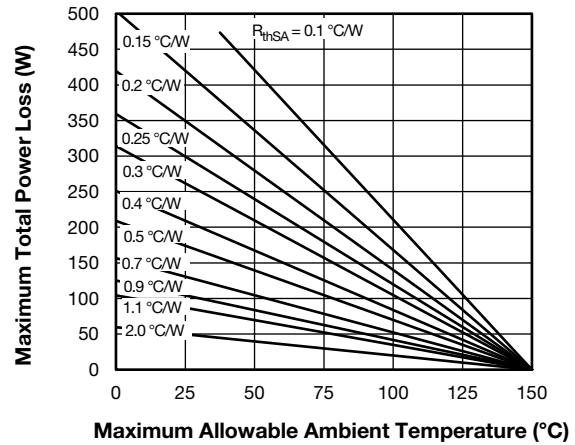
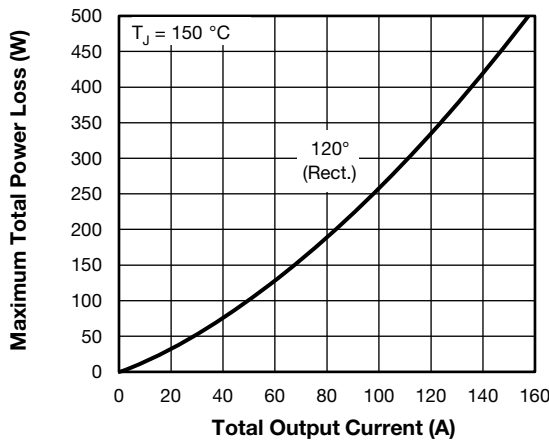


Fig. 3 - Total Power Loss Characteristics

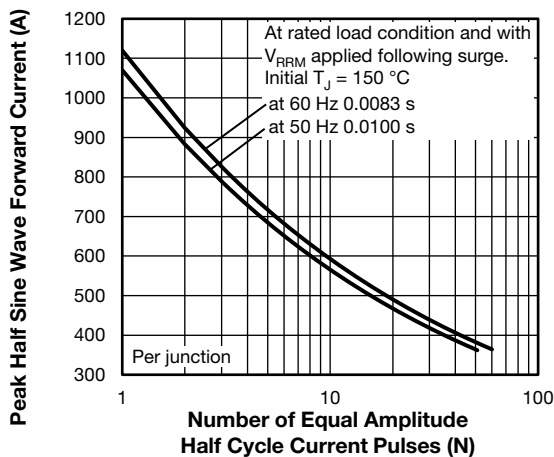


Fig. 4 - Maximum Non-Repetitive Surge Current

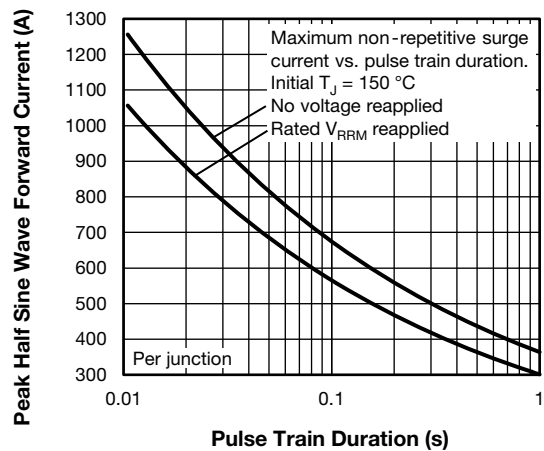
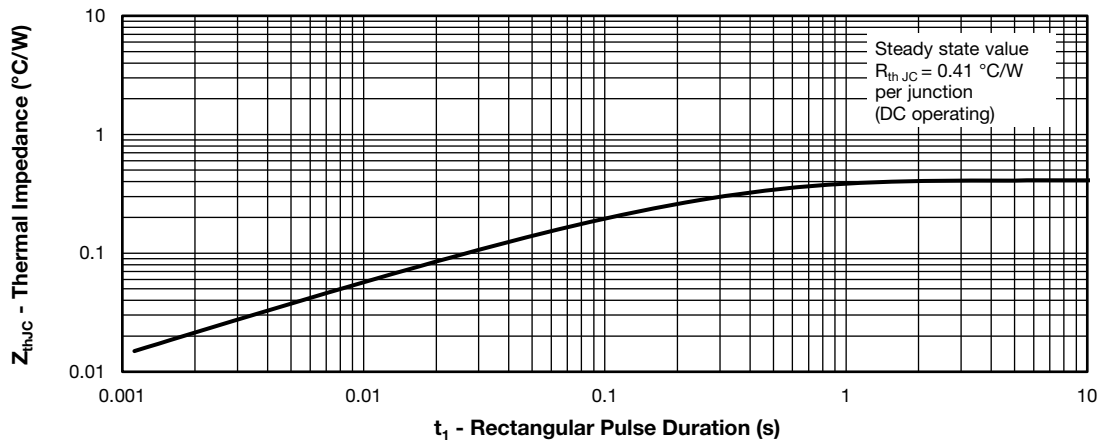


Fig. 5 - Maximum Non-Repetitive Surge Current


Fig. 6 - Thermal Impedance Z_{thJC} Characteristic

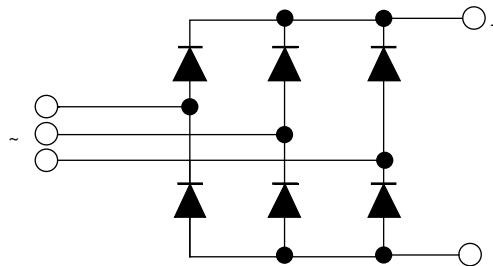
ORDERING INFORMATION TABLE

Device code

| VS- | 13 | 1 | MT | 160 | C |
|-----|----|---|----|-----|---|
| ① | ② | ③ | ④ | ⑤ | |

- 1** - Vishay Semiconductors product
- 2** - Current rating code: 13 = 130 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

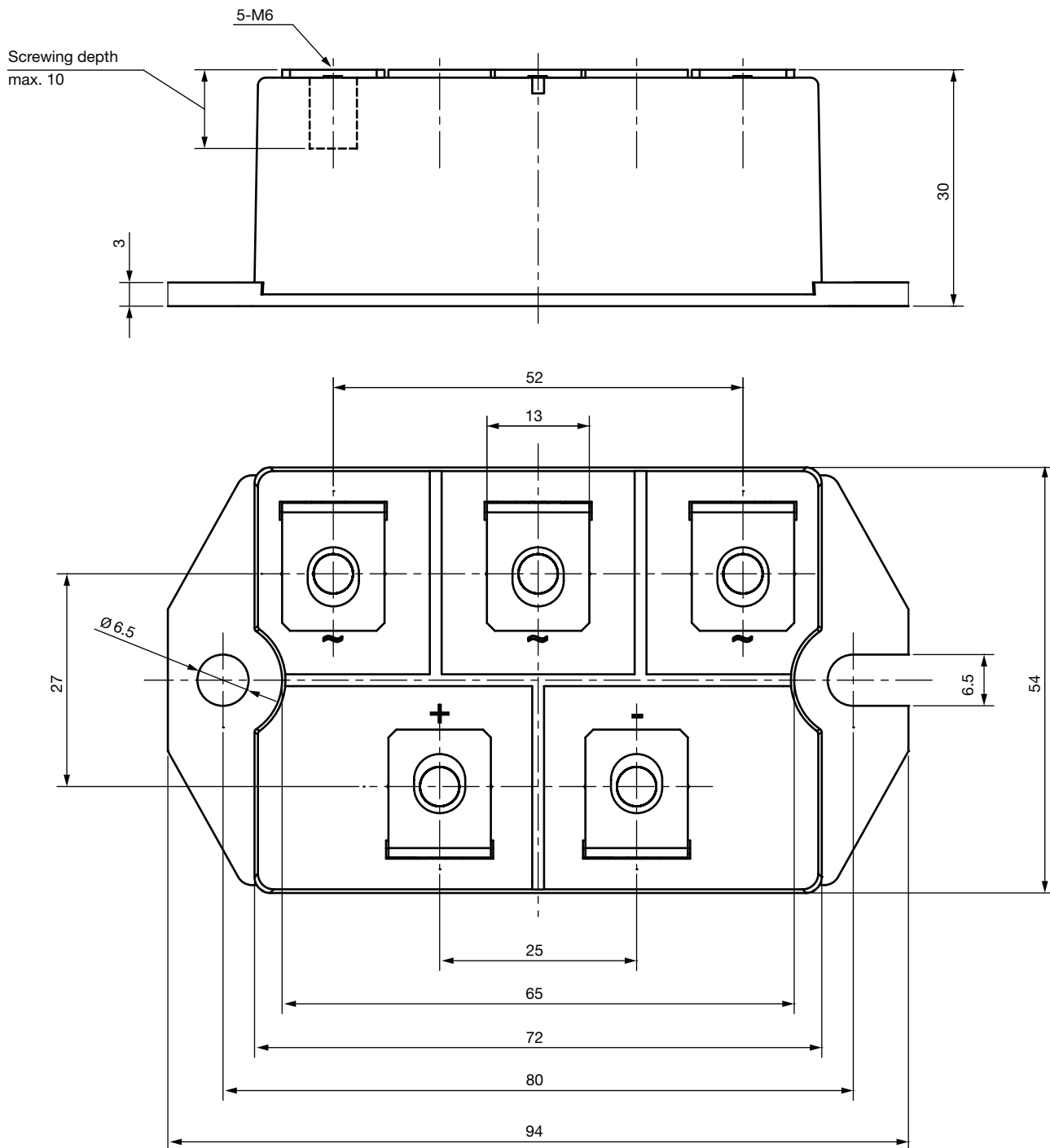
Dimensions

www.vishay.com/doc?96003



MTC

DIMENSIONS in millimeters





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