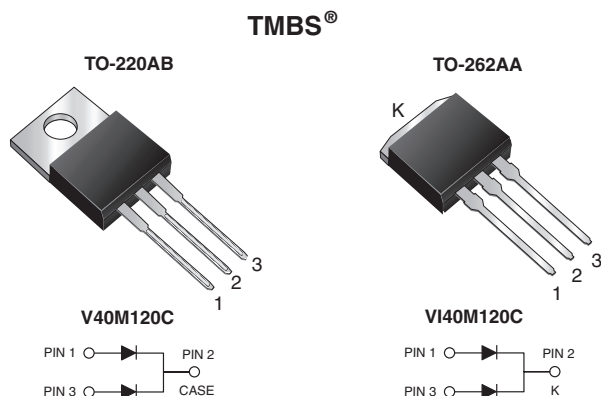




## Dual High-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.46\text{ V}$  at  $I_F = 5\text{ A}$



### FEATURES

- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection.

### MECHANICAL DATA

**Case:** TO-220AB and TO-262AA

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS compliant, and commercial grade

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs maximum

### PRIMARY CHARACTERISTICS

|                              |          |
|------------------------------|----------|
| $I_{F(AV)}$                  | 2 x 20 A |
| $V_{RRM}$                    | 120 V    |
| $I_{FSM}$                    | 250 A    |
| $V_F$ at $I_F = 20\text{ A}$ | 0.64 V   |
| $T_J$ max.                   | 150 °C   |

### MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER  | SYMBOL         | V40M120C      | VI40M120C | UNIT       |
|--|----------------|---------------|-----------|------------|
| Maximum repetitive peak reverse voltage  | $V_{RRM}$      | 120           |           | V          |
| Maximum average forward rectified current (fig. 1)   | $I_{F(AV)}$    | per device    | 40        | A          |
|  |                | per diode     | 20        |            |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$      | 250           |           |            |
| Voltage rate of change (rated $V_R$ )  | $dV/dt$        | 10 000        |           | V/ $\mu$ s |
| Operating junction and storage temperature range   | $T_J, T_{STG}$ | - 40 to + 150 |           | °C         |



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                    |      |      |      |
|--|------------------------|-------------------------|--------------------|------|------|------|
| PARAMETER  | TEST CONDITIONS        |                         | SYMBOL             | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode                                    | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> (1) | 0.54 | -    | V    |
|  | I <sub>F</sub> = 10 A  |                         |                    | 0.64 | -    |      |
|  | I <sub>F</sub> = 20 A  |                         |                    | 0.79 | 0.89 |      |
|  | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                    | 0.46 | -    |      |
|  | I <sub>F</sub> = 10 A  |                         |                    | 0.54 | -    |      |
|  | I <sub>F</sub> = 20 A  |                         |                    | 0.64 | 0.72 |      |
| Reverse current per diode  | V <sub>R</sub> = 90 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> (2) | 4    | -    | μA   |
|  |                        | T <sub>A</sub> = 125 °C |                    | 3    | -    | mA   |
|  | V <sub>R</sub> = 120 V | T <sub>A</sub> = 25 °C  |                    | -    | 500  | μA   |
|  |                        | T <sub>A</sub> = 125 °C |                    | 6    | 32   | mA   |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 20 ms

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                  |          |           |      |
|---|------------------|----------|-----------|------|
| PARAMETER   | SYMBOL           | V40M120C | VI40M120C | UNIT |
| Typical thermal resistance per diode                                    | R <sub>θJC</sub> | 1.8      |           | °C/W |

| ORDERING INFORMATION (Example) |                 |                 |              |               |               |
|--------------------------------|-----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                        | PREFERRED P/N   | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                       | V40M120C-M3/4W  | 1.88            | 4W           | 50/tube       | Tube          |
| TO-262AA                       | VI40M120C-M3/4W | 1.45            | 4W           | 50/tube       | Tube          |

RATINGS AND CHARACTERISTICS CURVES

(T<sub>A</sub> = 25 °C unless otherwise noted)

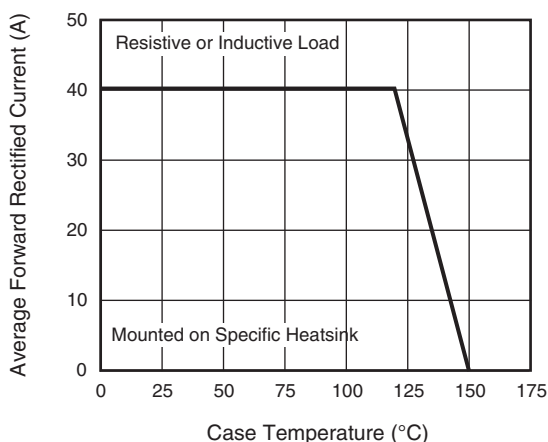


Fig. 1 - Maximum Forward Current Derating Curve

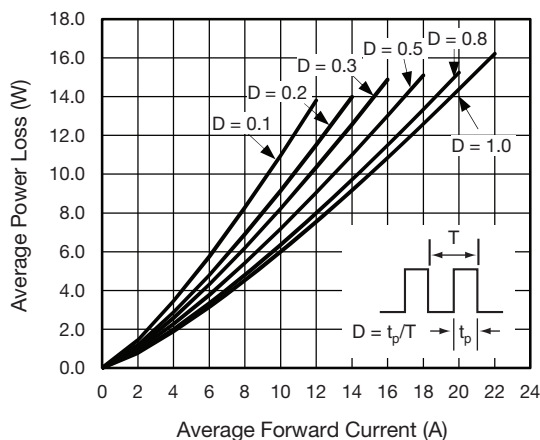


Fig. 2 - Forward Power Loss Characteristics Per Diode



# V40M120C, VI40M120C

Vishay General Semiconductor

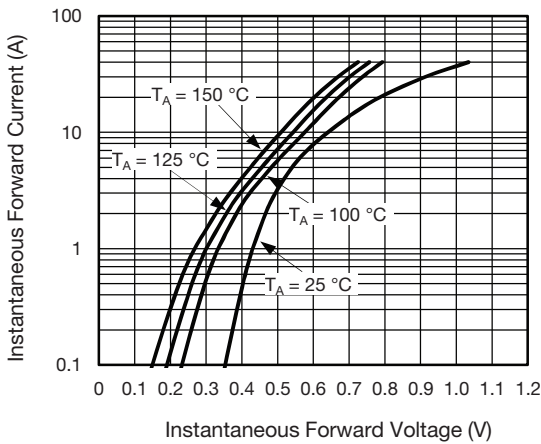


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

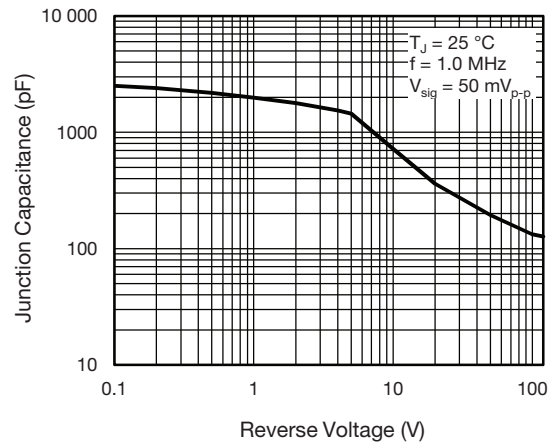


Fig. 5 - Typical Junction Capacitance Per Diode

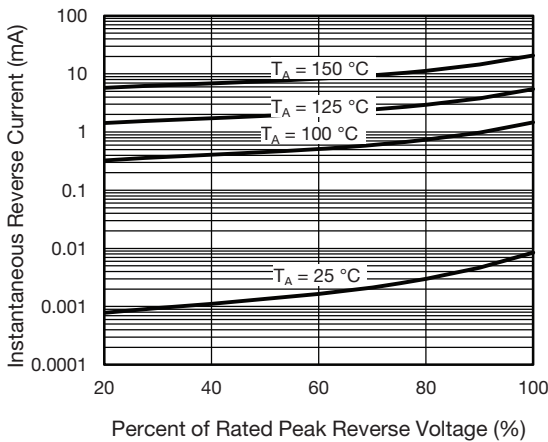


Fig. 4 - Typical Reverse Characteristics Per Diode

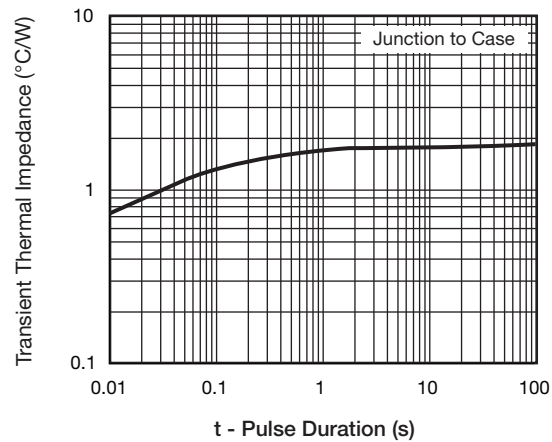
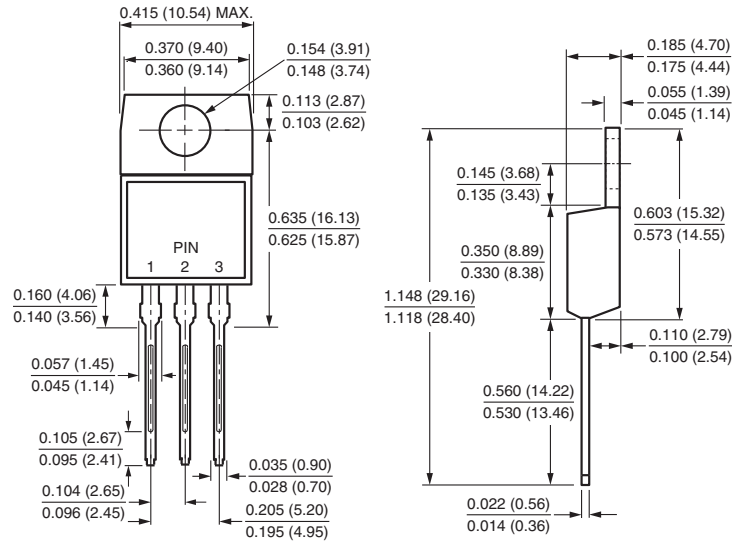


Fig. 6 - Typical Transient Thermal Impedance Per Diode

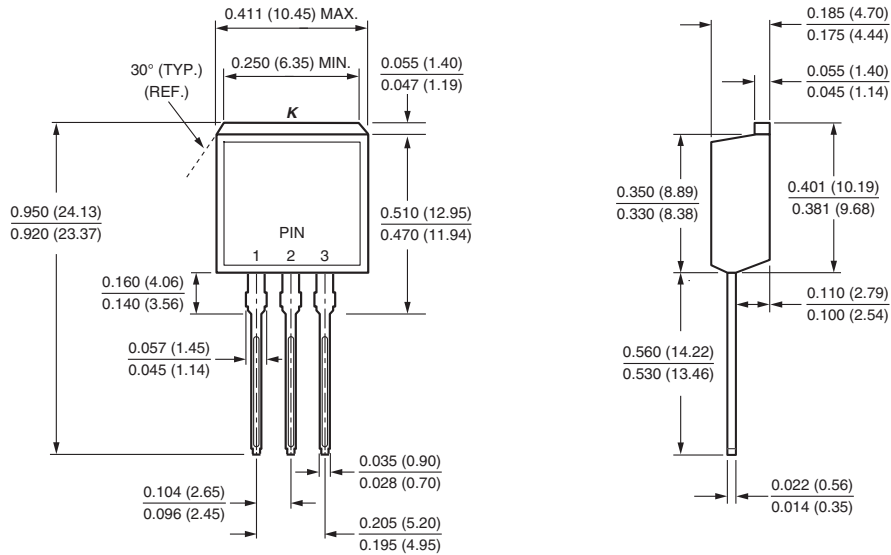


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB



TO-262AA





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