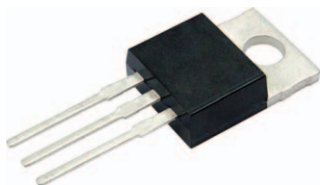


Dual High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low $V_F = 0.58 \text{ V}$ at $I_F = 5 \text{ A}$

TMBS®
TO-220AB



V20M120M



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
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

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

Molding compound meets UL 94 V-0 flammability rating
Base P/N-E3 - RoHS-compliant, commercial grade

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

E3 suffix meets JESD 201 class 1A whisker test

Polarity: As marked

Mounting Torque: 10 in-lbs maximum

PRIMARY CHARACTERISTICS

| | |
|--|----------------|
| $I_{F(AV)}$ | 2 x 10 A |
| V_{RRM} | 120 V |
| I_{FSM} | 110 A |
| V_F at $I_F = 10 \text{ A}$ ($T_A = 125 \text{ °C}$) | 0.68 V |
| T_J max. | 175 °C |
| Package | TO-220AB |
| Diode variations | Common cathode |

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

| PARAMETER | SYMBOL | V20M120M | UNIT |
|--|----------------|-------------|------------|
| Maximum repetitive peak reverse voltage | V_{RRM} | 120 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 20 | A |
| | | 10 | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 110 | A |
| Voltage rate of change (rated V_R) | dV/dt | 10 000 | V/ μ s |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +175 | °C |

| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) | | | | | |
|--|----------------------|-------------------------------------|------|------|---------------|
| PARAMETER | TEST CONDITIONS | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode | $I_F = 5\text{ A}$ | $T_A = 25\text{ }^{\circ}\text{C}$ | 0.70 | - | V |
| | $I_F = 10\text{ A}$ | | 0.93 | 1.01 | |
| | $I_F = 5\text{ A}$ | $T_A = 125\text{ }^{\circ}\text{C}$ | 0.58 | - | |
| | $I_F = 10\text{ A}$ | | 0.68 | 0.76 | |
| Reverse current per diode | $V_R = 100\text{ V}$ | $T_A = 25\text{ }^{\circ}\text{C}$ | 2.0 | - | μA |
| | | $T_A = 125\text{ }^{\circ}\text{C}$ | 1.5 | - | mA |
| | $V_R = 120\text{ V}$ | $T_A = 25\text{ }^{\circ}\text{C}$ | - | 500 | μA |
| | | $T_A = 125\text{ }^{\circ}\text{C}$ | 2.0 | 12 | mA |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width $\leq 5\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) | | | |
|---|------------|--------------------------|------|
| PARAMETER | SYMBOL | V20M120M | UNIT |
| Typical thermal resistance | per diode | $R_{\theta JC}$ | 2.8 |
| | per device | | 1.4 |
| | per device | $R_{\theta JA}^{(1)(2)}$ | 40 |

Notes

- (1) The heat generated must be less than the thermal conductivity from junction-to-ambient $dP_D/dT_J < 1/R_{\theta JA}$
(2) Free air, without heatsink

| ORDERING INFORMATION (Example) | | | | | |
|---------------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE | PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB | V20M120M-E3/4W | 1.88 | 4W | 50/tube | Tube |

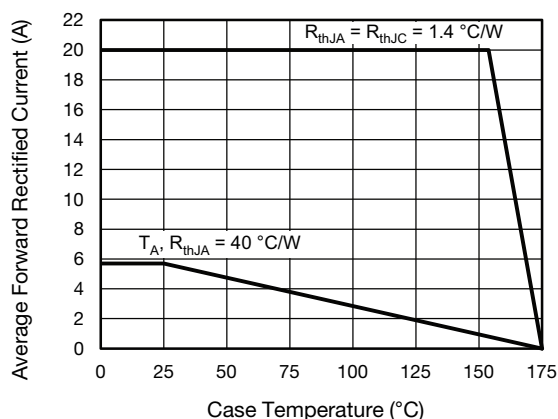
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

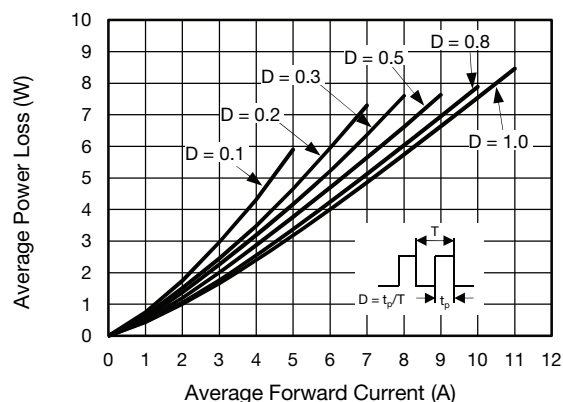


Fig. 2 - Forward Power Loss Characteristics Per Diode

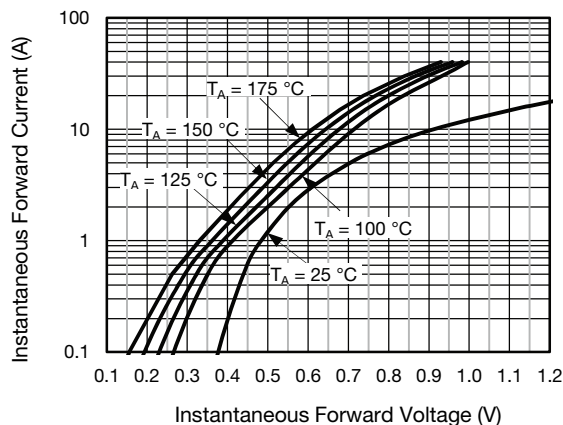


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

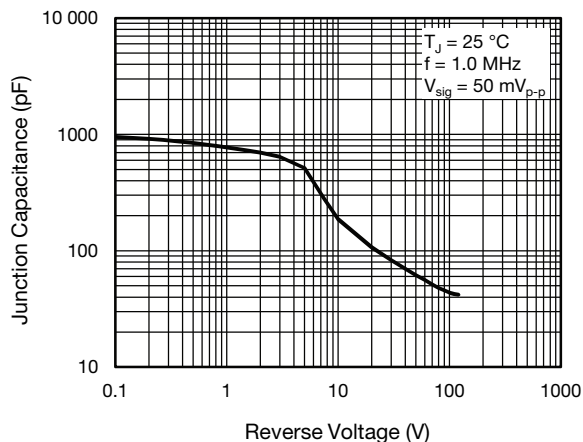


Fig. 5 - Typical Junction Capacitance Per Diode

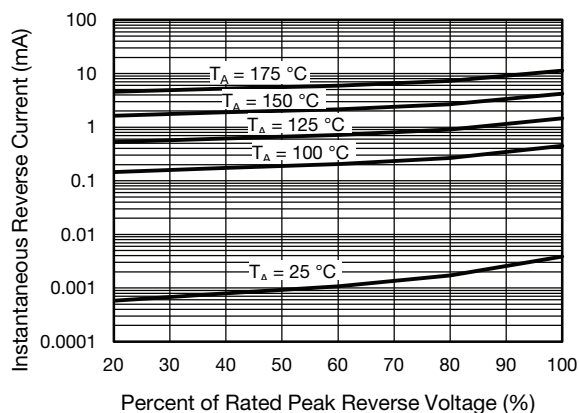


Fig. 4 - Typical Reverse Characteristics Per Diode

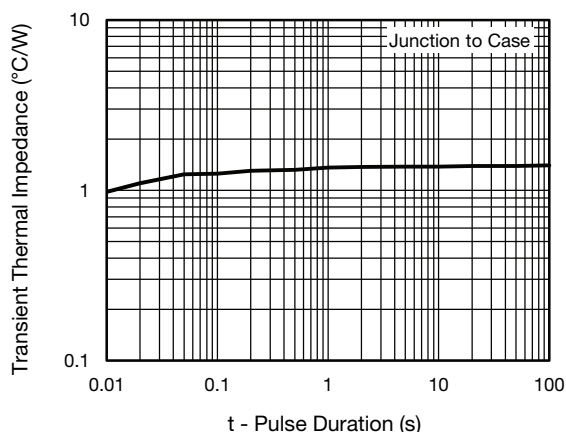
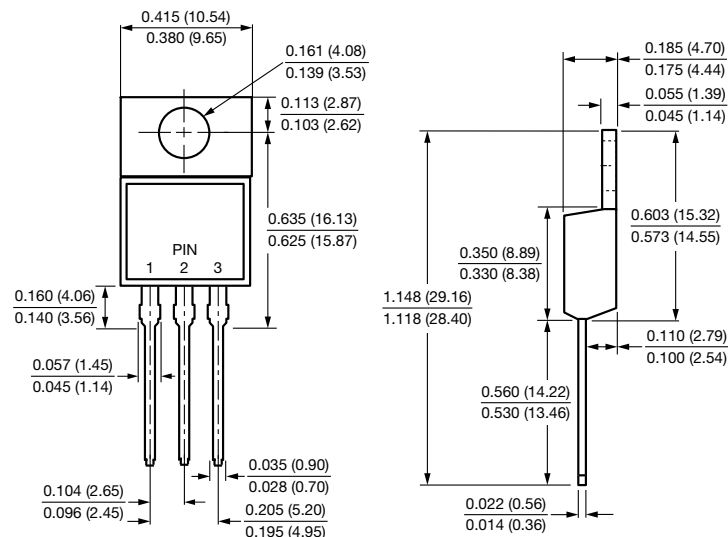


Fig. 6 - Typical Transient Thermal Impedance Per Device

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB





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