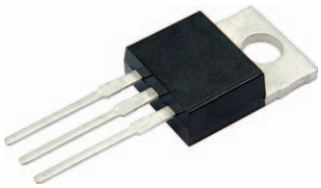
# Dual High Voltage Trench MOS Barrier Schottky Rectifier

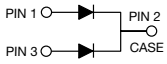
Ultra Low $V_F$ = 0.58 V at $I_F$ = 5 A

**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

Pb e3 **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 A ($T_A$ = 125 °C) | 0.68 V |
| $T_J$ max. | 175 °C |
| Package | TO-220AB |
| Diode variations | Common cathode |

| MAXIMUM RATINGS ($T_A$ = 25 °C unless otherwise noted) | | | | |
|---|---|---|---|---|
| **PARAMETER** | | **SYMBOL** | **V20M120M** | **UNIT** |
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 120 | V |
| Maximum average forward rectified current (fig. 1) | per device | $I_{F(AV)}$ | 20 | A |
| | per diode | | 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/µs |
| Operating junction and storage temperature range | | $T_J$, $T_{STG}$ | -55 to +175 | °C |

| ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage per diode | $I_F$ = 5 A | $T_A$ = 25 °C | $V_F$ (1) | 0.70 | - | V |
| | $I_F$ = 10 A | | | 0.93 | 1.01 | |
| | $I_F$ = 5 A | $T_A$ = 125 °C | | 0.58 | - | |
| | $I_F$ = 10 A | | | 0.68 | 0.76 | |
| Reverse current per diode | $V_R$ = 100 V | $T_A$ = 25 °C | $I_R$ (2) | 2.0 | - | μA |
| | | $T_A$ = 125 °C | | 1.5 | - | mA |
| | $V_R$ = 120 V | $T_A$ = 25 °C | | - | 500 | μA |
| | | $T_A$ = 125 °C | | 2.0 | 12 | mA |

**Notes**

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 5 ms

| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | |
|---|---|---|---|---|
| PARAMETER | | SYMBOL | V20M120M | UNIT |
| Typical thermal resistance | per diode | $R_{\theta JC}$ | 2.8 | °C/W |
| | 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 °C unless otherwise noted)

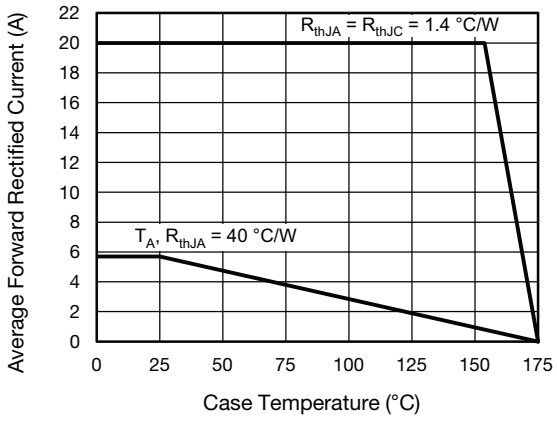



Fig. 1 - Maximum Forward Current Derating Curve

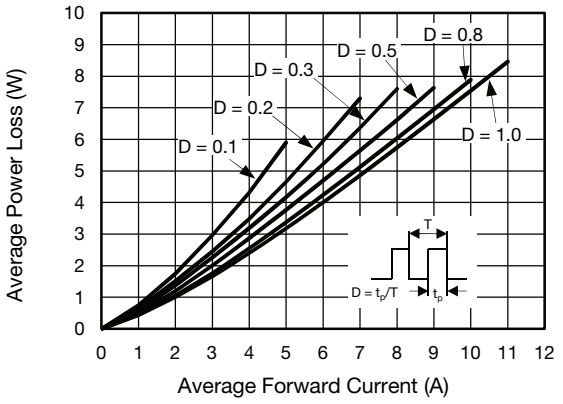



Fig. 2 - Forward Power Loss Characteristics Per Diode

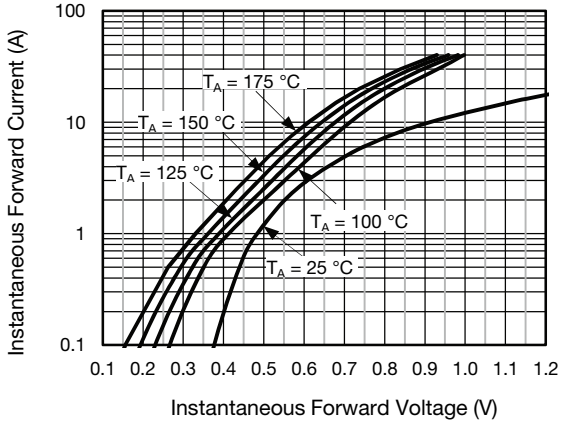



Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

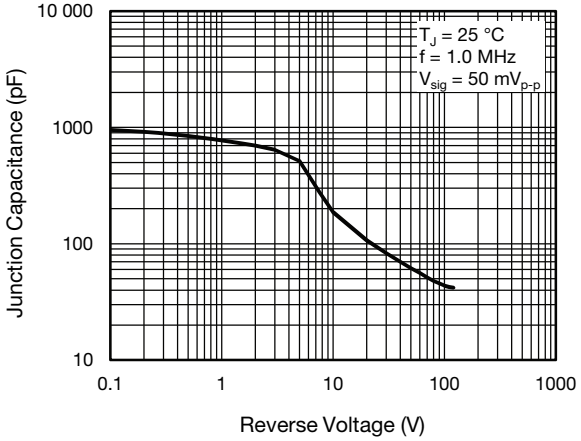



Fig. 5 - Typical Junction Capacitance Per Diode

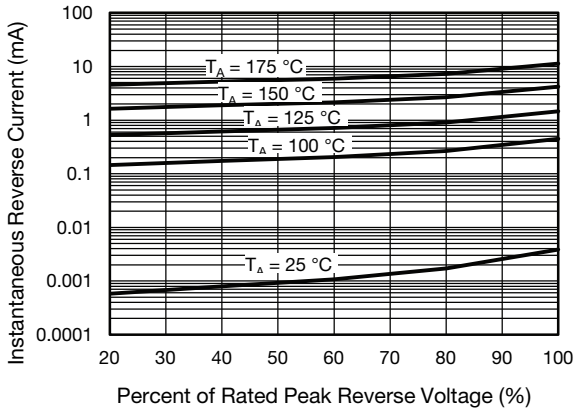



Fig. 4 - Typical Reverse Characteristics Per Diode

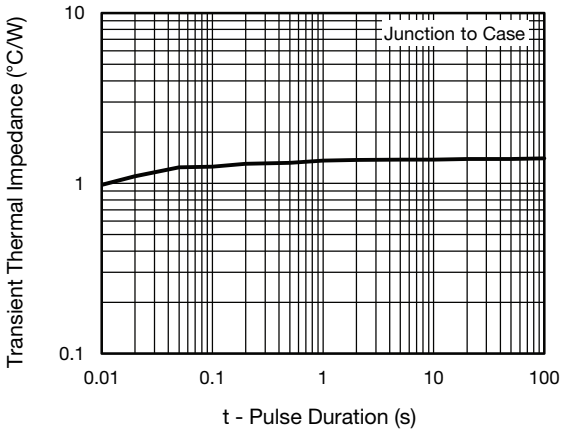
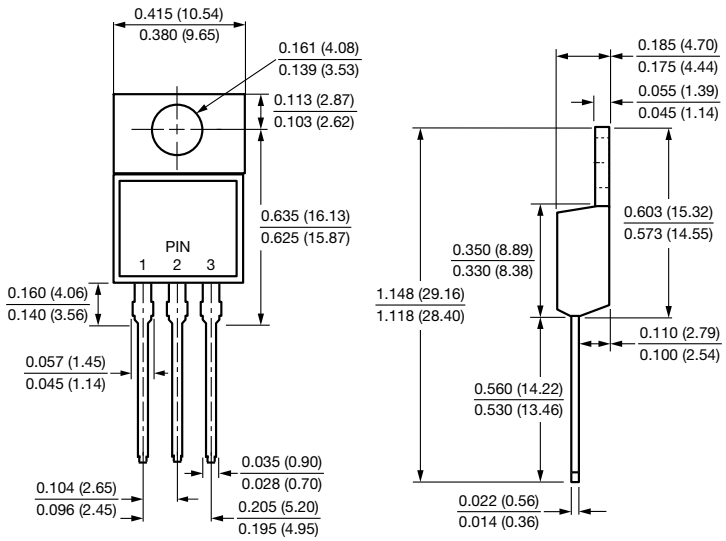



Fig. 6 - Typical Transient Thermal Impedance Per Device

## **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**TO-220AB**



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