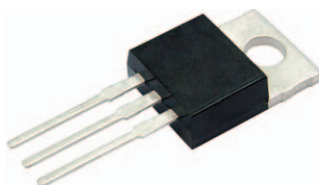


# Dual High Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low  $V_F = 0.57 \text{ V}$  at  $I_F = 5 \text{ A}$

**TMBS®**
**TO-220AB**

**V20M100M**


## 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](http://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.

## PRIMARY CHARACTERISTICS

|                                                          |                |
|----------------------------------------------------------|----------------|
| $I_{F(AV)}$                                              | 2 x 10 A       |
| $V_{RRM}$                                                | 100 V          |
| $I_{FSM}$                                                | 110 A          |
| $V_F$ at $I_F = 10 \text{ A}$ ( $T_A = 125 \text{ °C}$ ) | 0.67 V         |
| $T_J \text{ max.}$                                       | 175 °C         |
| Package                                                  | TO-220AB       |
| Diode variations                                         | Common cathode |

## 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 markedp

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

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

| PARAMETER                                                                          | SYMBOL         | V20M100M    | UNIT       |
|------------------------------------------------------------------------------------|----------------|-------------|------------|
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 100         | V          |
| Maximum average forward rectified current<br>(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/ $\mu$ s |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$ | -55 to +175 | °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> <sup>(1)</sup> | 0.65 | -    | V    |
|                                                                            | I <sub>F</sub> = 10 A  |                         |                               | 0.83 | 1.02 |      |
|                                                                            | I <sub>F</sub> = 5 A   | T <sub>A</sub> = 125 °C |                               | 0.57 | -    |      |
|                                                                            | I <sub>F</sub> = 10 A  |                         |                               | 0.67 | 0.75 |      |
| Reverse current per diode                                                  | V <sub>R</sub> = 70 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 1.5  | -    | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 0.8  | -    | mA   |
|                                                                            | V <sub>R</sub> = 100 V | T <sub>A</sub> = 25 °C  |                               | -    | 500  | μA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 1.5  | 10   | mA   |

**Notes**

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

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted) |            |                          |          |                      |
|---------------------------------------------------------------------------------------------|------------|--------------------------|----------|----------------------|
| PARAMETER                                                                                   |            | SYMBOL                   | V20M100M | UNIT                 |
| Typical thermal resistance                                                                  | per diode  | $R_{\theta JC}$          | 2.8      | $^{\circ}\text{C/W}$ |
|                                                                                             | 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

| <b>ORDERING INFORMATION</b> (Example) |                |                 |              |               |               |
|---------------------------------------|----------------|-----------------|--------------|---------------|---------------|
| PACKAGE                               | PREFERRED P/N  | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| TO-220AB                              | V20M100M-E3/4W | 1.88            | 4W           | 50/tube       | Tube          |

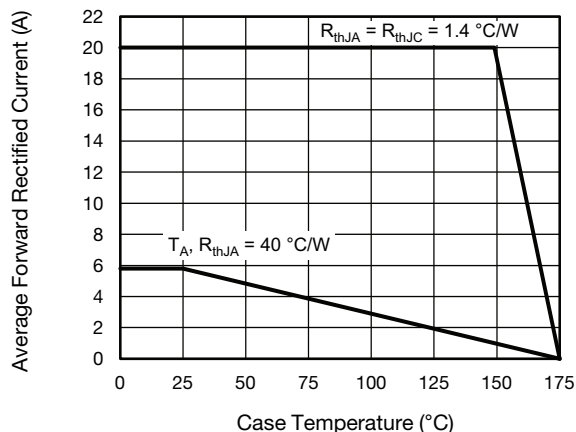
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

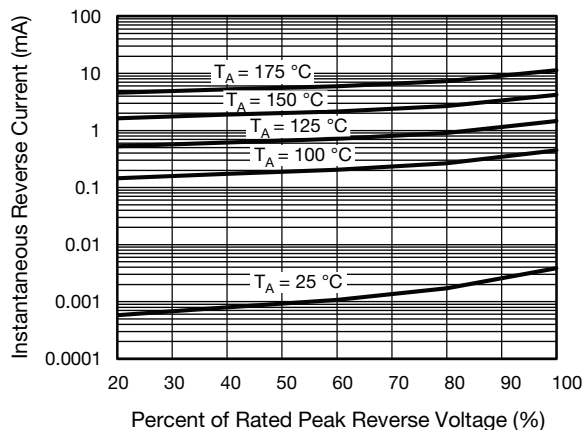


Fig. 4 - Typical Reverse Characteristics Per Diode

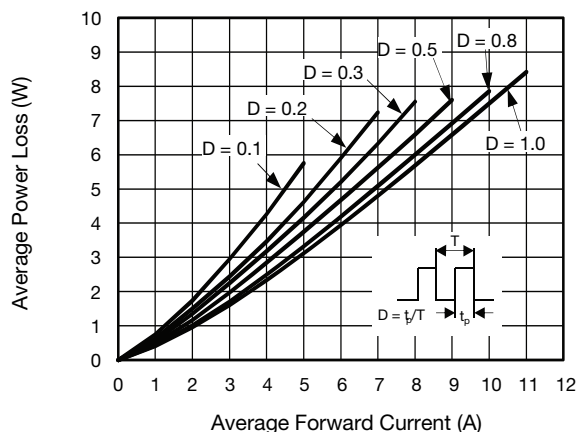


Fig. 2 - Forward Power Loss Characteristics Per Diode

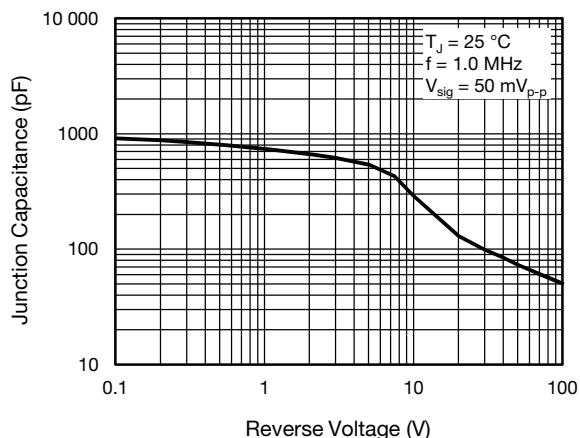


Fig. 5 - Typical Junction Capacitance Per Diode

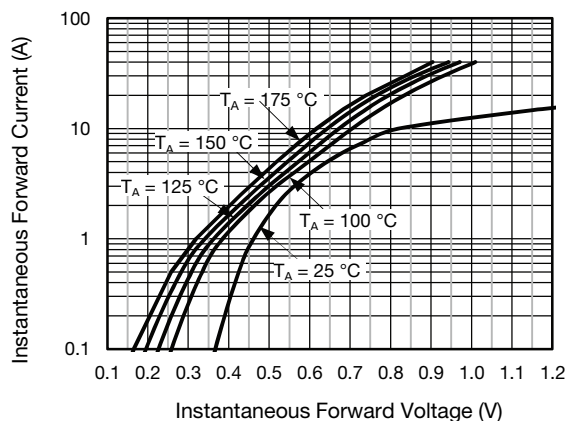


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

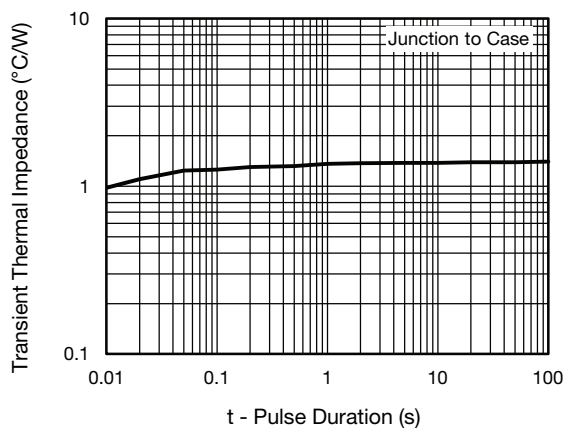
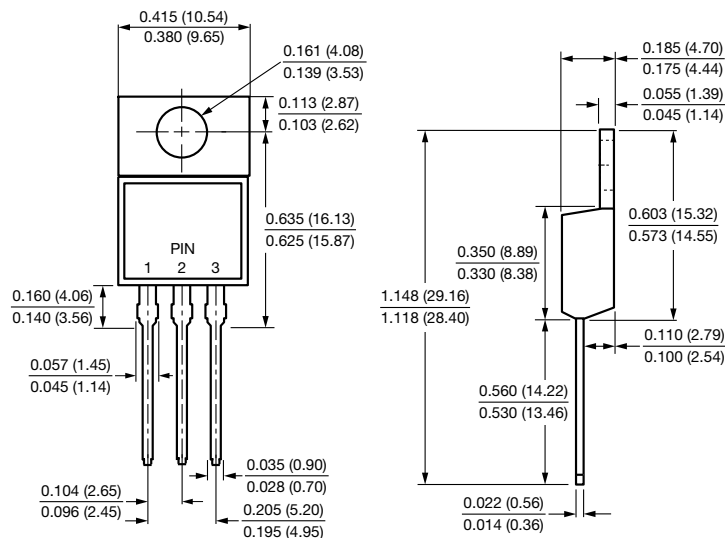


Fig. 6 - Typical Transient Thermal Impedance Per Device



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB





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