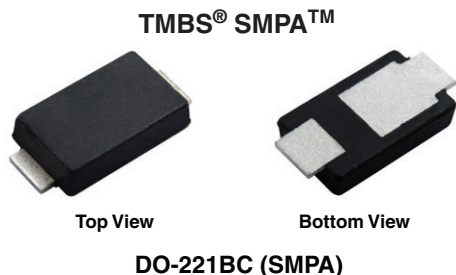


# Surface Mount Trench MOS Barrier Schottky Rectifier



## FEATURES

- Very low profile - typical height of 0.95 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- Low power losses, high efficiency
- Low forward voltage drop
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



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

## TYPICAL APPLICATIONS

For use in high frequency inverters, freewheeling, DC/DC converters, and polarity protection in commercial and automotive applications.

## MECHANICAL DATA

**Case:** DO-221BC (SMPA)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

M3 and HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

| PRIMARY CHARACTERISTICS                  |                 |
|------------------------------------------|-----------------|
| $I_{F(AV)}$                              | 8.0 A           |
| $V_{RRM}$                                | 120 V           |
| $I_{FSM}$                                | 100 A           |
| $V_F$ at $I_F = 8.0$ A ( $T_A = 125$ °C) | 0.64 V          |
| $T_J$ max.                               | 150 °C          |
| Package                                  | DO-221BC (SMPA) |
| Diode variation                          | Single die      |

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                            |                   |             |      |
|------------------------------------------------------------------------------------|-------------------|-------------|------|
| PARAMETER                                                                          | SYMBOL            | V8PA12      | UNIT |
| Device marking code                                                                |                   | V812        |      |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$         | 120         | V    |
| Maximum DC forward current                                                         | $I_{F(AV)}^{(1)}$ | 8.0         | A    |
|                                                                                    | $I_{F(AV)}^{(2)}$ | 2.5         |      |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$         | 100         | A    |
| Operating junction and storage temperature range                                   | $T_J, T_{STG}$    | -40 to +150 | °C   |

### Notes

(1) Units mounted on 3 cm x 3 cm aluminum PCB

(2) Free air, mounted on recommended copper pad area

| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                               |      |      |      |
|----------------------------------------------------------------------------|------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS        |                         | SYMBOL                        | TYP. | MAX. | UNIT |
| Instantaneous forward voltage                                              | I <sub>F</sub> = 4.0 A | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.60 | -    | V    |
|                                                                            | I <sub>F</sub> = 8.0 A |                         |                               | 0.79 | 0.87 |      |
|                                                                            | I <sub>F</sub> = 4.0 A | T <sub>A</sub> = 125 °C |                               | 0.53 | -    |      |
|                                                                            | I <sub>F</sub> = 8.0 A |                         |                               | 0.64 | 0.72 |      |
| Reverse current                                                            | V <sub>R</sub> = 90 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 0.01 | -    | mA   |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 5    | -    |      |
|                                                                            | V <sub>R</sub> = 120 V | T <sub>A</sub> = 25 °C  |                               | -    | 0.6  |      |
|                                                                            |                        | T <sub>A</sub> = 125 °C |                               | 10   | 20   |      |
| Typical junction capacitance                                               | 4.0 V, 1 MHz           |                         | C <sub>J</sub>                | 700  | -    | pF   |

**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 specified) |                          |        |                      |
|-------------------------------------------------------------------------------------------------|--------------------------|--------|----------------------|
| PARAMETER                                                                                       | SYMBOL                   | V8PA12 | UNIT                 |
| Typical thermal resistance                                                                      | $R_{\theta JA}^{(1)(2)}$ | 100    | $^{\circ}\text{C/W}$ |
|                                                                                                 | $R_{\theta JM}^{(3)}$    | 5      |                      |

**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, mounted on recommended PCB, 2 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient  
(3) Units mounted on 3 cm x 3 cm aluminum PCB; thermal resistance  $R_{\theta JM}$  - junction to mount

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| V8PA12-M3/I                           | 0.032           | I                      | 14 000        | 13" diameter plastic tape and reel |
| V8PA12HM3/I <sup>(1)</sup>            | 0.032           | I                      | 14 000        | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified

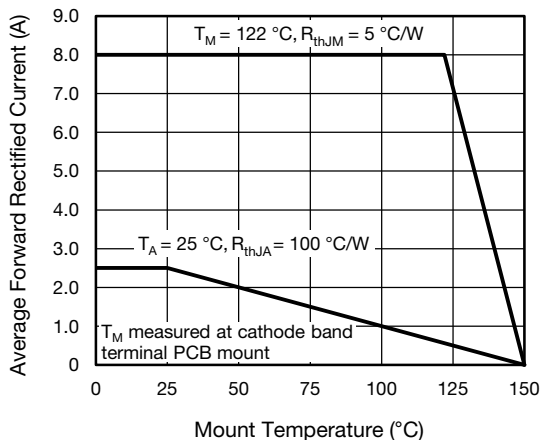
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

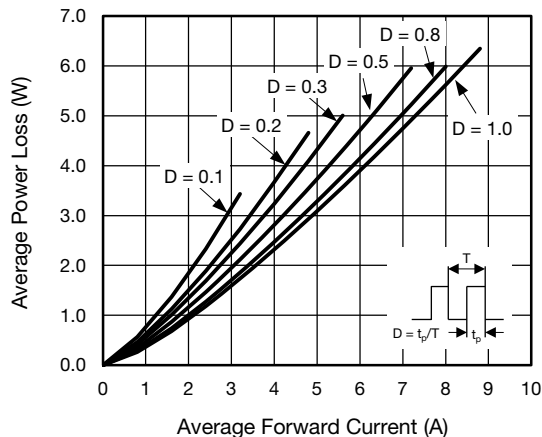


Fig. 2 - Forward Power Loss Characteristics

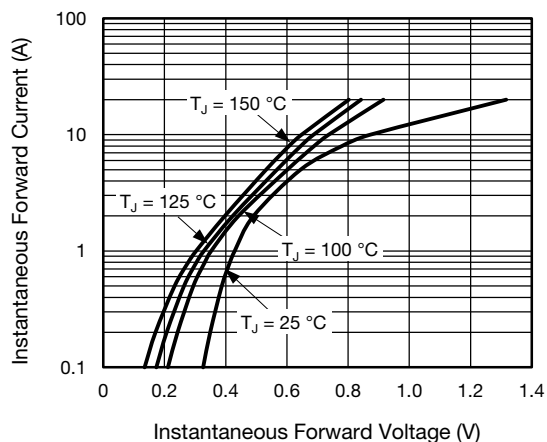


Fig. 3 - Typical Instantaneous Forward Characteristics

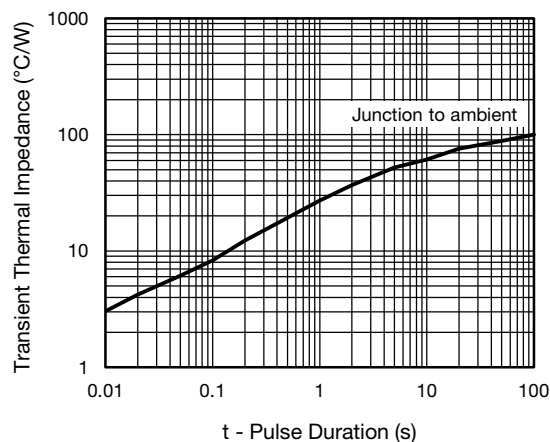


Fig. 6 - Typical Transient Thermal Impedance

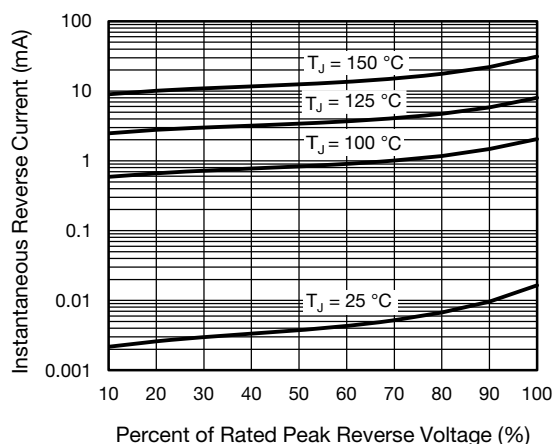


Fig. 4 - Typical Reverse Leakage Characteristics

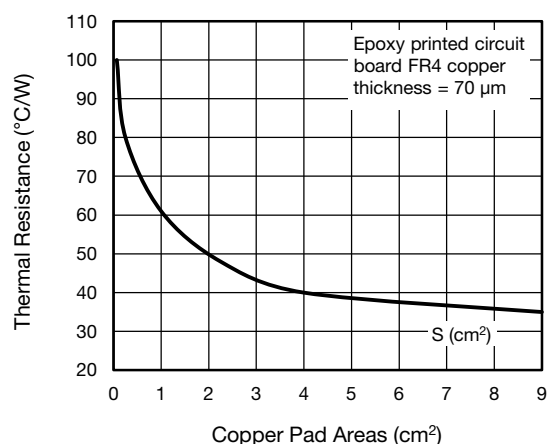


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

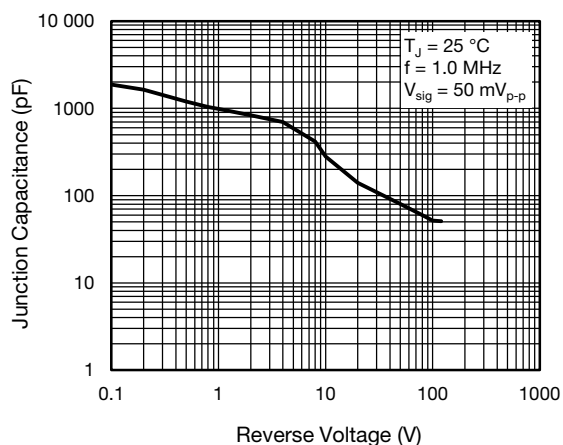
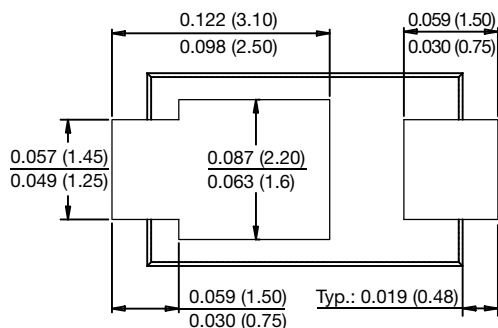
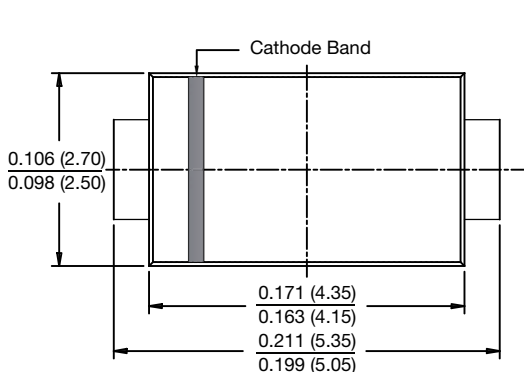


Fig. 5 - Typical Junction Capacitance

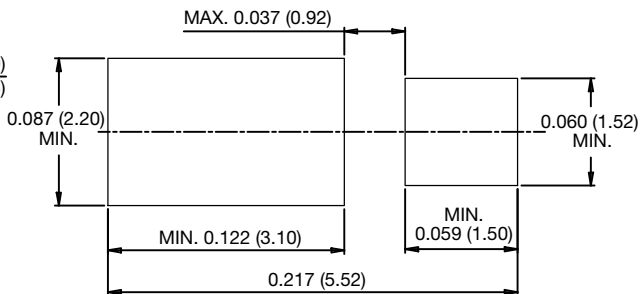
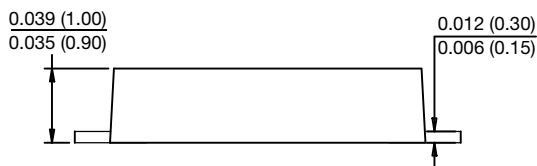


**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**DO-221BC (SMPA)**



**Mounting Pad Layout**





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