

# 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
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?999912](http://www.vishay.com/doc?999912)



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

## TYPICAL APPLICATIONS

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

## PRIMARY CHARACTERISTICS

|                                          |                 |
|------------------------------------------|-----------------|
| $I_{F(AV)}$                              | 3.0 A           |
| $V_{RRM}$                                | 50 V            |
| $I_{FSM}$                                | 80 A            |
| $V_F$ at $I_F = 3.0$ A ( $T_A = 125$ °C) | 0.40 V          |
| $T_J$ max.                               | 150 °C          |
| Package                                  | DO-221BC (SMPA) |
| Diode variation                          | Single die      |

## MECHANICAL DATA

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

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 JESD22-B102

M3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

## MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)

| PARAMETER                                                                         | SYMBOL         | V3PAN50       | UNIT |
|-----------------------------------------------------------------------------------|----------------|---------------|------|
| Device marking code                                                               |                | 3N5           |      |
| Maximum repetitive peak reverse voltage                                           | $V_{RRM}$      | 50            | V    |
| Maximum DC forward current                                                        | $I_F^{(1)}$    | 3.0           | A    |
| Maximum DC reverse voltage                                                        | $V_{DC}$       | 35            | V    |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 80            | A    |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | - 40 to + 150 | °C   |

### Note

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

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

| PARAMETER                     | TEST CONDITIONS      | SYMBOL      | TYP. | MAX. | UNIT          |
|-------------------------------|----------------------|-------------|------|------|---------------|
| Instantaneous forward voltage | $I_F = 1.5\text{ A}$ | $V_F^{(1)}$ | 0.40 | -    | V             |
|                               | $I_F = 3.0\text{ A}$ |             | 0.47 | 0.54 |               |
|                               | $I_F = 1.5\text{ A}$ |             | 0.30 | -    |               |
|                               | $I_F = 3.0\text{ A}$ |             | 0.40 | 0.48 |               |
| Reverse current               | $V_R = 35\text{ V}$  | $I_R^{(2)}$ | 8    | -    | $\mu\text{A}$ |
|                               |                      |             | 8.8  | -    | $\text{mA}$   |
|                               | $V_R = 50\text{ V}$  |             | -    | 600  | $\mu\text{A}$ |
|                               |                      |             | 12   | 35   | $\text{mA}$   |
| Typical junction capacitance  | 4.0 V, 1 MHz         | $C_J$       | 480  | -    | pF            |

**Notes**

(1) Pulse test: 300  $\mu\text{s}$  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 specified)

| PARAMETER                  | SYMBOL                | V3PAN50 | UNIT                 |
|----------------------------|-----------------------|---------|----------------------|
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 100     | $^{\circ}\text{C/W}$ |
|                            | $R_{\theta JM}^{(1)}$ | 9       |                      |

**Note**

(1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient;  $R_{\theta JM}$  - junction to mount

**ORDERING INFORMATION** (Example)

| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|---------------|-----------------|------------------------|---------------|------------------------------------|
| V3PAN50-M3/I  | 0.032           | I                      | 14 000        | 13" diameter plastic tape and reel |

**RATINGS AND CHARACTERISTICS CURVES**

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

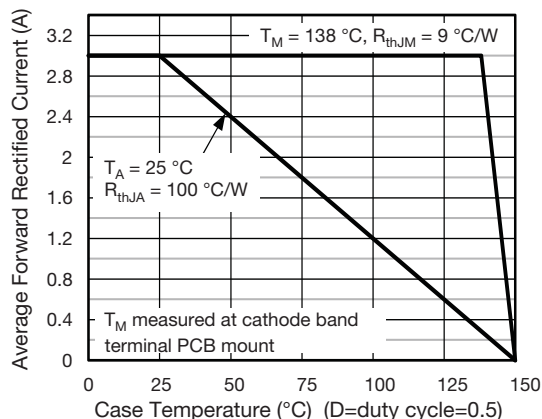


Fig. 1 - Maximum Forward Current Derating Curve

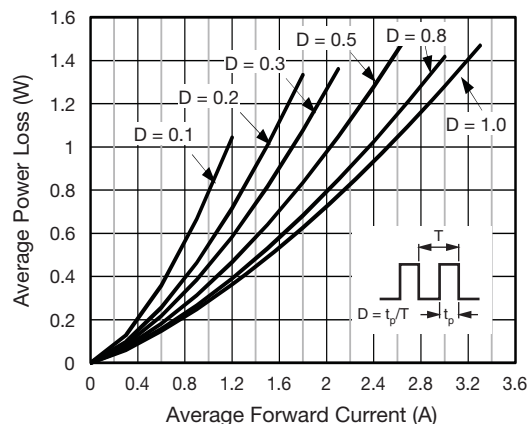


Fig. 2 - Forward Power Loss Characteristics

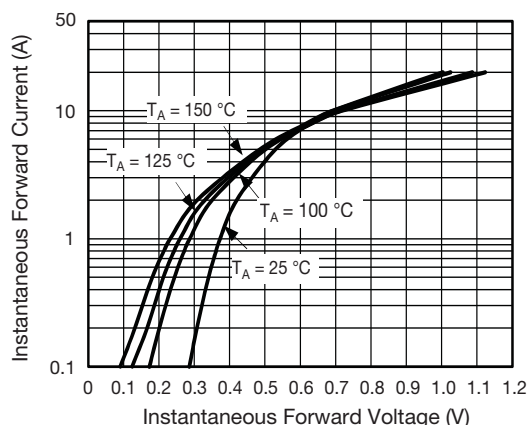


Fig. 3 - Typical Instantaneous Forward Characteristics

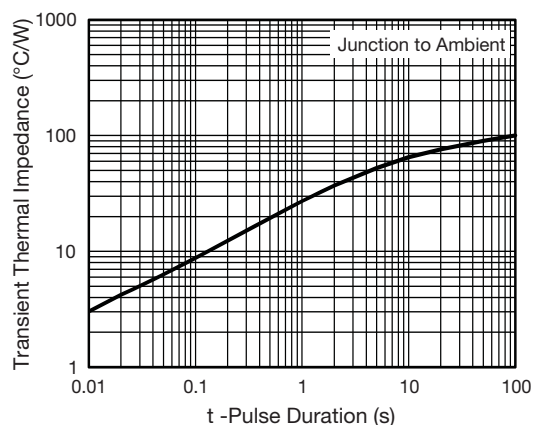


Fig. 6 - Typical Transient Thermal Impedance

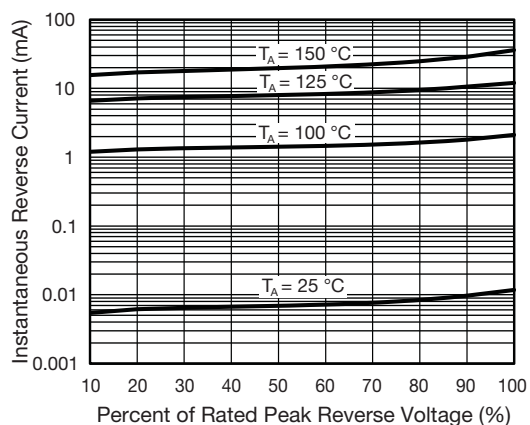


Fig. 4 - Typical Reverse Leakage Characteristics

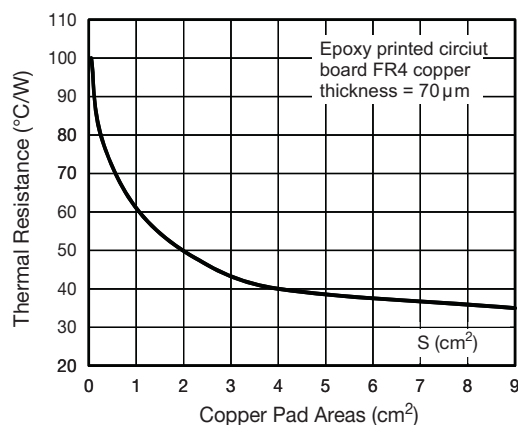


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

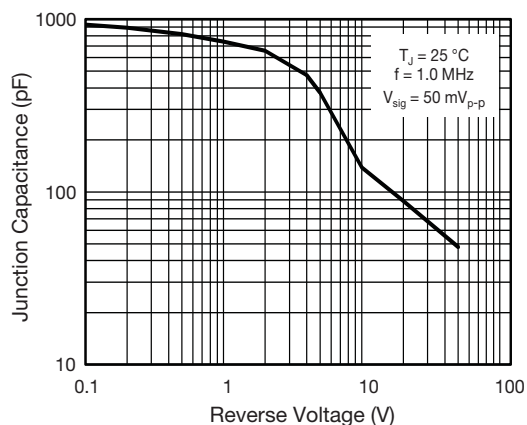
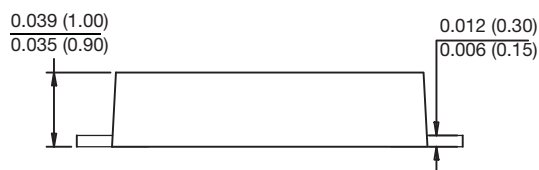


Fig. 5 - Typical Junction Capacitance

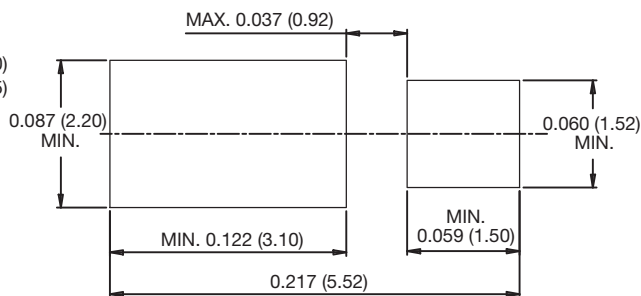


**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**DO-221BC (SMPA)**



**Mounting Pad Layout**





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