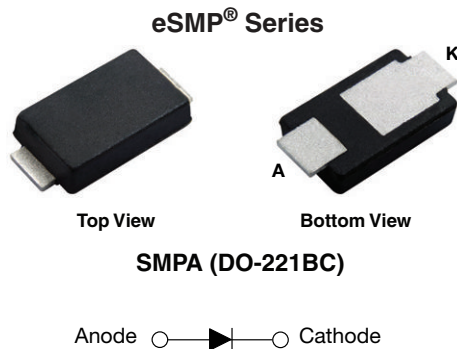


# Surface-Mount TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifier



## 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; base P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

 AUTOMOTIVE  
GRADE  
Available

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

## LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

| PRIMARY CHARACTERISTICS                  |                 |
|--|-----------------|
| $I_{F(AV)}$                              | 3.0 A           |
| $V_{RRM}$                                | 45 V            |
| $I_{FSM}$                                | 80 A            |
| $V_F$ at $I_F = 3.0$ A ( $T_A = 125$ °C) | 0.37 V          |
| $T_J$ max.                               | 150 °C          |
| Package                                  | SMPA (DO-221BC) |
| Circuit configuration                    | Single          |

## TYPICAL APPLICATIONS

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

## MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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

("\_X" denotes revision code e.g. A, B,.....)

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

M3 suffix meets JESD 201 class 2 whisker test, HM3 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               | V3PAL45     | UNIT |
| Device marking code   |                      | 3L45        |      |
| Maximum repetitive peak reverse voltage   | $V_{RRM}$            | 45          | V    |
| Maximum DC forward current  | $I_F$ <sup>(1)</sup> | 3.0         | A    |
| 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

<sup>(1)</sup> Free air, mounted on recommended copper pad area

| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                      |                                   |             |                      |      |               |
|--|----------------------|-----------------------------------|-------------|----------------------|------|---------------|
| PARAMETER  | TEST CONDITIONS      |                                   | SYMBOL      | TYP.                 | MAX. | UNIT          |
| Instantaneous forward voltage  | $I_F = 1.5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$  | $V_F^{(1)}$ | 0.41                 | -    | V             |
|  |                      |                                   |             | $I_F = 3.0\text{ A}$ | 0.46 |               |
|  | $I_F = 1.5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ |             | 0.30                 | -    |               |
|  |                      |                                   |             | $I_F = 3.0\text{ A}$ | 0.37 |               |
| Reverse current  | $V_R = 45\text{ V}$  | $T_A = 25\text{ }^\circ\text{C}$  | $I_R^{(2)}$ | -                    | 450  | $\mu\text{A}$ |
|  |                      | $T_A = 125\text{ }^\circ\text{C}$ |             | 5                    | 15   | mA            |
| Typical junction capacitance   | 4.0 V, 1 MHz         |                                   | $C_J$       | 450                  | -    | 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                | V3PAL45 | 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

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| V3PAL45-M3/I                          | 0.032           | I                      | 14 000        | 13" diameter plastic tape and reel |
| V3PAL45HM3_A/I (1)                    | 0.032           | I                      | 14 000        | 13" diameter plastic tape and reel |

**Note**

- (1) AEC-Q101 qualified

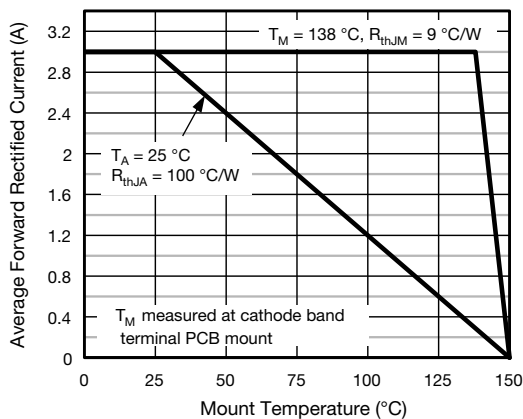
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

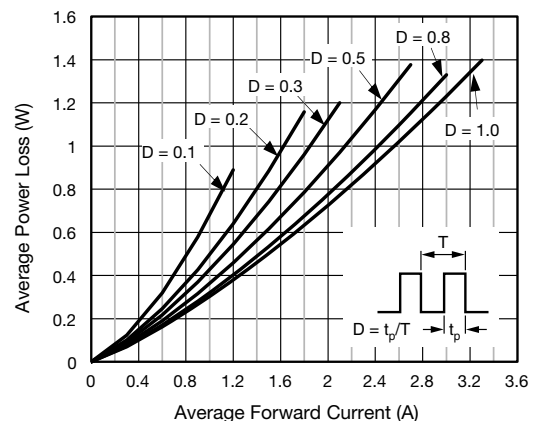


Fig. 2 - Forward Power Loss Characteristics

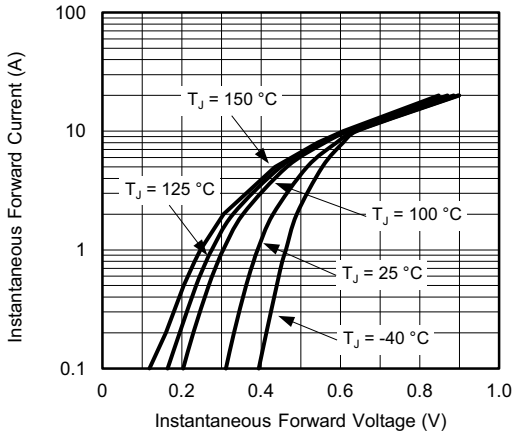


Fig. 3 - Typical Instantaneous Forward Characteristics

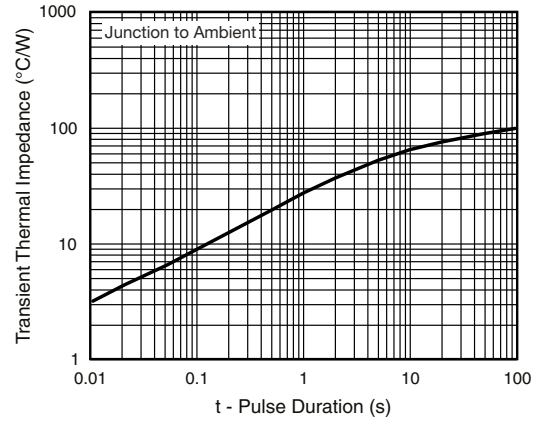


Fig. 6 - Typical Transient Thermal Impedance

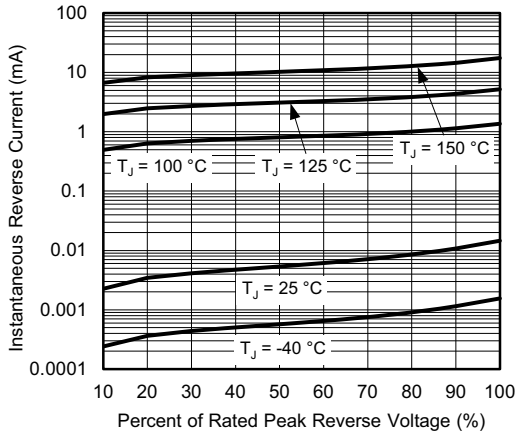


Fig. 4 - Typical Reverse Leakage Characteristics

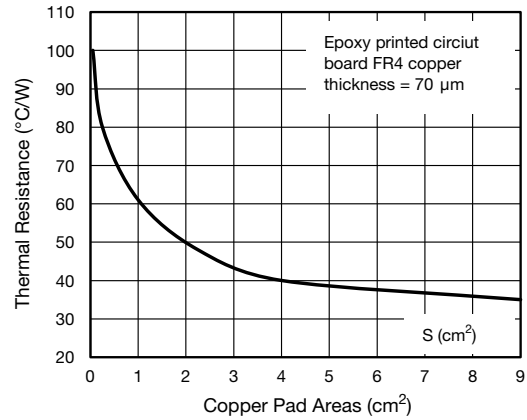


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

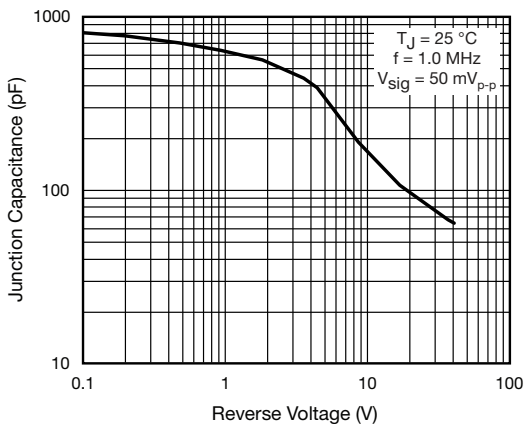
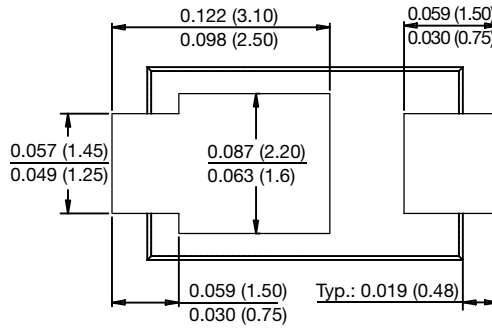
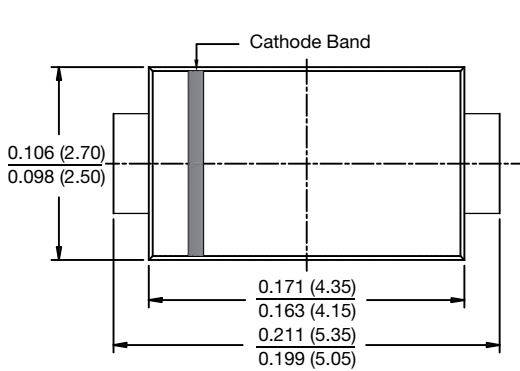


Fig. 5 - Typical Junction Capacitance

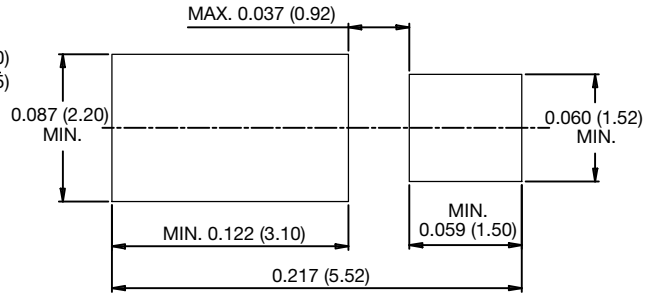


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPA (DO-221BC)



Mounting Pad Layout





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