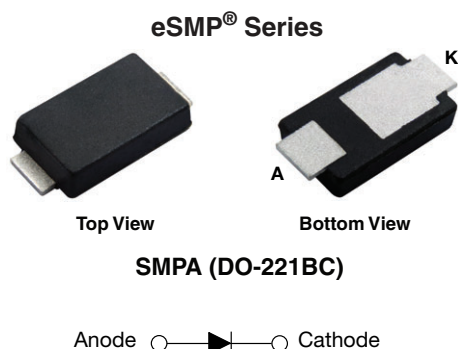


# Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



## 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)

**AUTOMOTIVE  
GRADE**  
Available



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

## LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS                  |                 |
|------------------------------------------|-----------------|
| $I_{F(AV)}$                              | 8.0 A           |
| $V_{RRM}$                                | 100 V           |
| $I_{FSM}$                                | 100 A           |
| $V_F$ at $I_F = 8.0$ A ( $T_J = 125$ °C) | 0.6 V           |
| $T_J$ max.                               | 175 °C          |
| Package                                  | SMPA (DO-221BC) |
| Circuit configuration                    | Single          |

## TYPICAL APPLICATIONS

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

## MECHANICAL DATA

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

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

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                            |                   |             |      |
|------------------------------------------------------------------------------------|-------------------|-------------|------|
| PARAMETER                                                                          | SYMBOL            | V8PAM103    | UNIT |
| Device marking code                                                                |                   | 8M13        |      |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$         | 100         | V    |
| Maximum DC forward current                                                         | $I_{F(AV)}^{(1)}$ | 8.0         | A    |
|                                                                                    | $I_{F(AV)}^{(2)}$ | 3.0         |      |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$         | 100         | A    |
| Operating junction temperature range                                               | $T_J^{(3)}$       | -40 to +175 | °C   |
| Storage temperature range                                                          | $T_{STG}$         | -55 to +175 | °C   |

## Notes

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

(2) Free air, mounted on recommended copper pad area, 2 oz., FR4 PCB

(3) The heat generated must be less than the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$



| ELECTRICAL CHARACTERISTICS (T <sub>J</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>J</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.57  | -    | V    |
|                                                                            | I <sub>F</sub> = 8.0 A |                         |                               | 0.68  | 0.75 |      |
|                                                                            | I <sub>F</sub> = 4.0 A | T <sub>J</sub> = 125 °C |                               | 0.5   | -    |      |
|                                                                            | I <sub>F</sub> = 8.0 A |                         |                               | 0.6   | 0.66 |      |
| Reverse current                                                            | V <sub>R</sub> = 70 V  | T <sub>J</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 0.002 | -    | mA   |
|                                                                            |                        | T <sub>J</sub> = 125 °C |                               | 1.5   | -    |      |
|                                                                            | V <sub>R</sub> = 100 V | T <sub>J</sub> = 25 °C  |                               | -     | 0.17 |      |
|                                                                            |                        | T <sub>J</sub> = 125 °C |                               | 3     | 12   |      |
| Typical junction capacitance                                               | 4.0 V, 1 MHz           |                         | C <sub>J</sub>                | 980   | -    | 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                   | V8PAM103 | 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

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| V8PAM103-M3/H                  | 0.032           | H                      | 3500          | 7" diameter plastic tape and reel  |
| V8PAM103-M3/I                  | 0.032           | I                      | 14 000        | 13" diameter plastic tape and reel |
| V8PAM103HM3/H <sup>(1)</sup>   | 0.032           | H                      | 3500          | 7" diameter plastic tape and reel  |
| V8PAM103HM3/I <sup>(1)</sup>   | 0.032           | I                      | 14 000        | 13" diameter plastic tape and reel |

**Note**

- <sup>(1)</sup> AEC-Q101 qualified

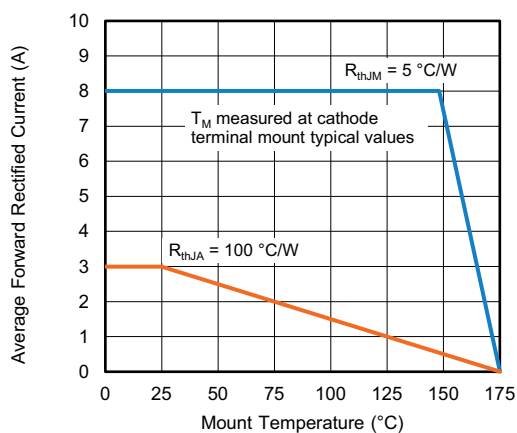
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

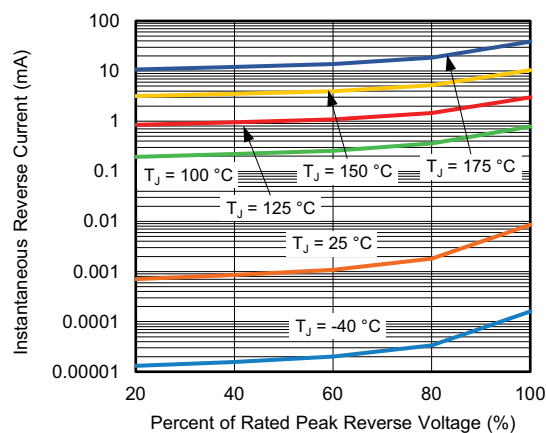


Fig. 4 - Typical Reverse Leakage Characteristics

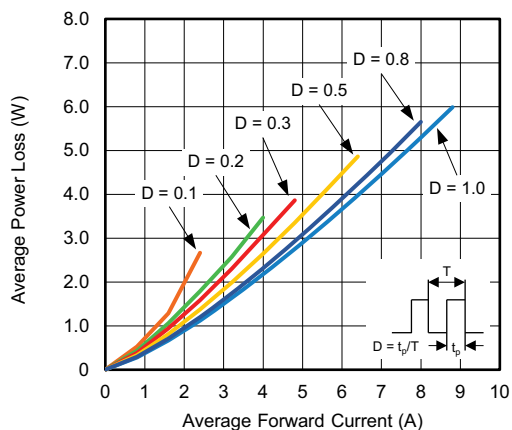


Fig. 2 - Forward Power Loss Characteristics

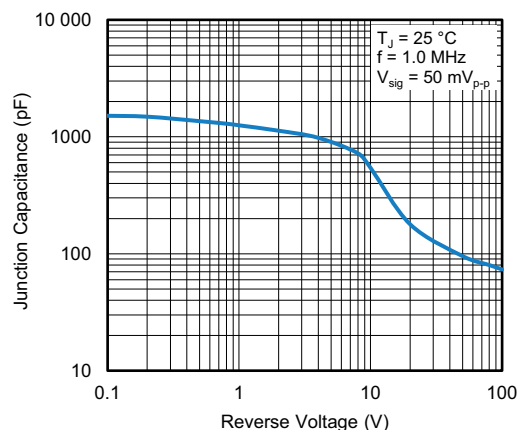


Fig. 5 - Typical Junction Capacitance

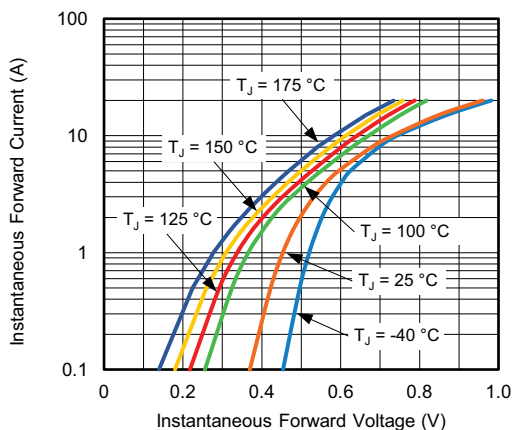


Fig. 3 - Typical Instantaneous Forward Characteristics

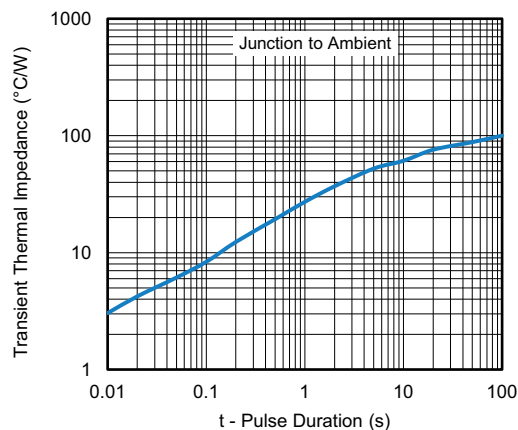


Fig. 6 - Typical Transient Thermal Impedance

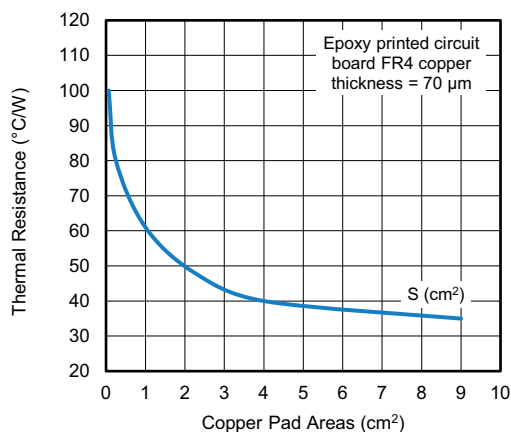
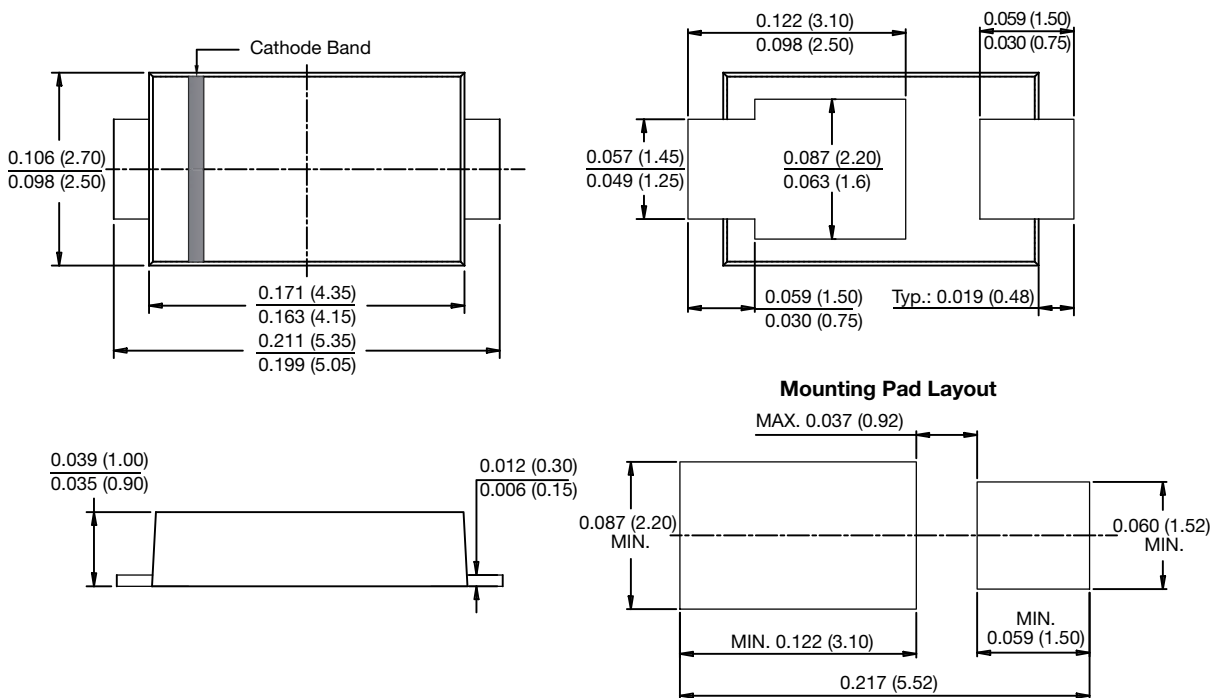


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

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

## **SMPA (DO-221BC)**





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