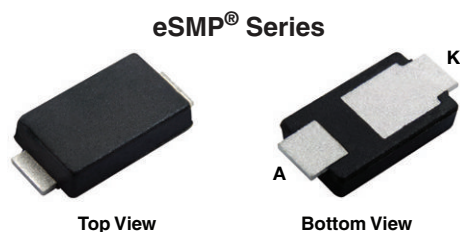


Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier



SMPA (DO-221BC)

Anode  Cathode

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

AUTOMOTIVE GRADE
Available



RoHS COMPLIANT
HALOGEN FREE

LINKS TO ADDITIONAL RESOURCES



| 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) | 0.65 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 | V8PAM12 | UNIT |
| Device marking code | | 8M12 | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 120 | V |
| Maximum DC forward current | $I_{F(AV)}^{(1)}$ | 8.0 | A |
| | $I_{F(AV)}^{(2)}$ | 2.7 | |
| 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 +175 | °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 _A = 25 °C unless otherwise noted) | | | | | | |
|--|------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | I _F = 4.0 A | T _A = 25 °C | V _F ⁽¹⁾ | 0.63 | - | V |
| | I _F = 8.0 A | | | 0.8 | 0.88 | |
| | I _F = 4.0 A | T _A = 125 °C | | 0.54 | - | |
| | I _F = 8.0 A | | | 0.65 | 0.73 | |
| Reverse current | V _R = 90 V | T _A = 25 °C | I _R ⁽²⁾ | 0.01 | - | mA |
| | | T _A = 125 °C | | 1.5 | - | |
| | V _R = 120 V | T _A = 25 °C | | - | 0.5 | |
| | | T _A = 125 °C | | 3 | 10 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C _J | 730 | - | pF |

Notes

(1) Pulse test: 300 μs 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 | V8PAM12 | 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 |
| V8PAM12-M3/I | 0.032 | I | 14 000 | 13" diameter plastic tape and reel |
| V8PAM12HM3/I ⁽¹⁾ | 0.032 | I | 14 000 | 13" diameter plastic tape and reel |

Note

(1) AEC-Q101 qualified

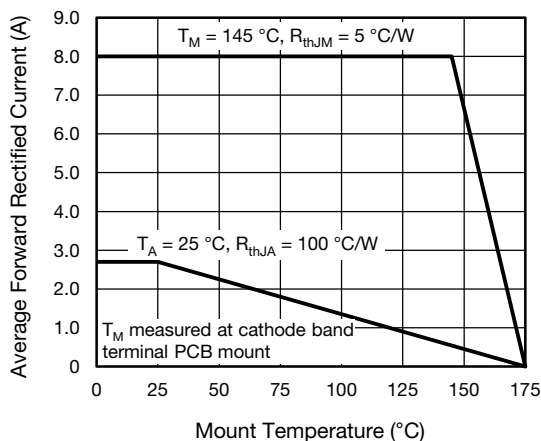
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

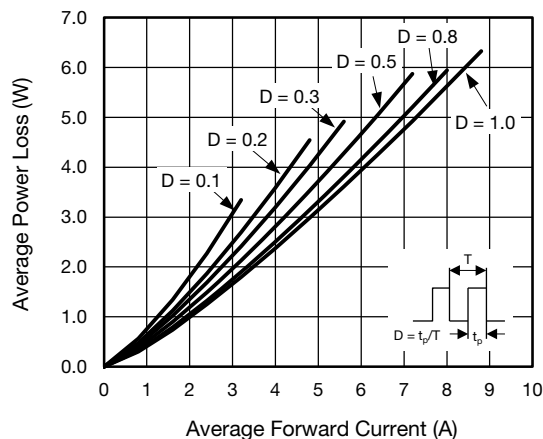


Fig. 2 - Forward Power Loss Characteristics

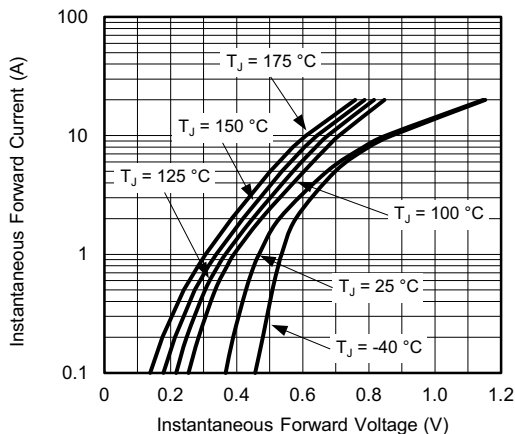


Fig. 3 - Typical Instantaneous Forward Characteristics

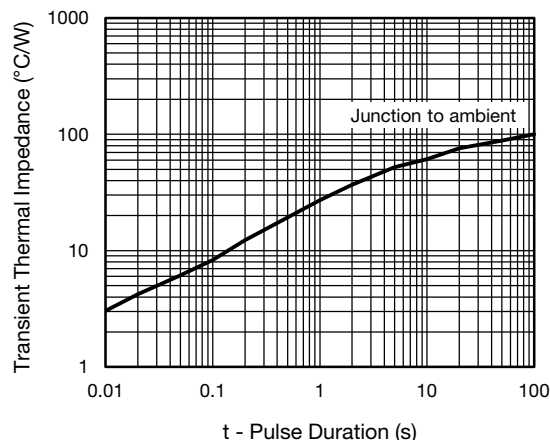


Fig. 6 - Typical Transient Thermal Impedance

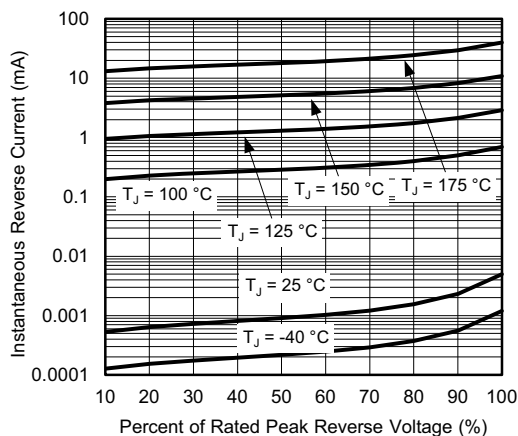


Fig. 4 - Typical Reverse Leakage Characteristics

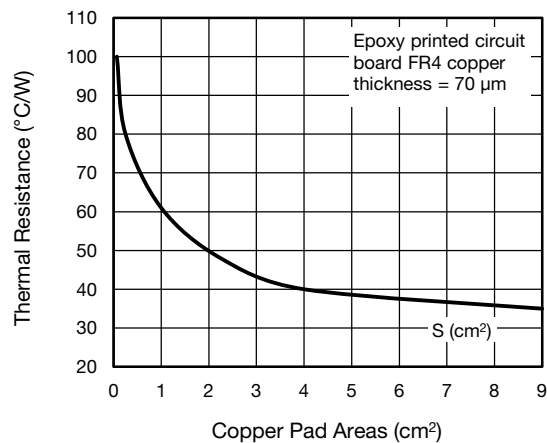


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

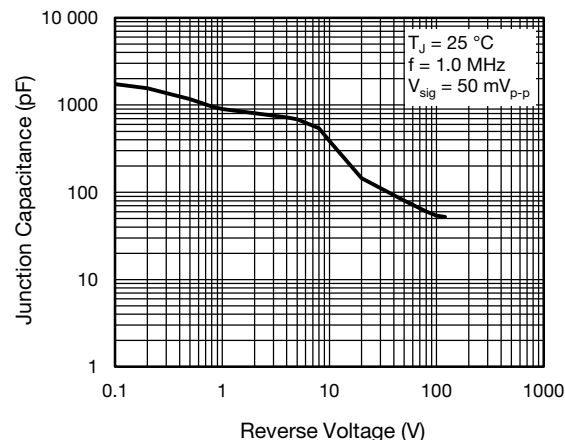
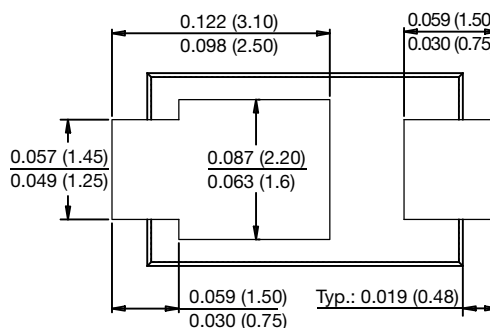
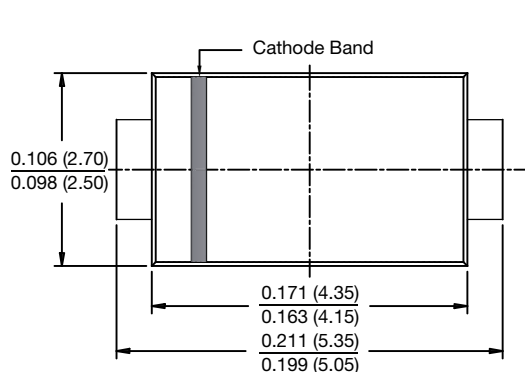
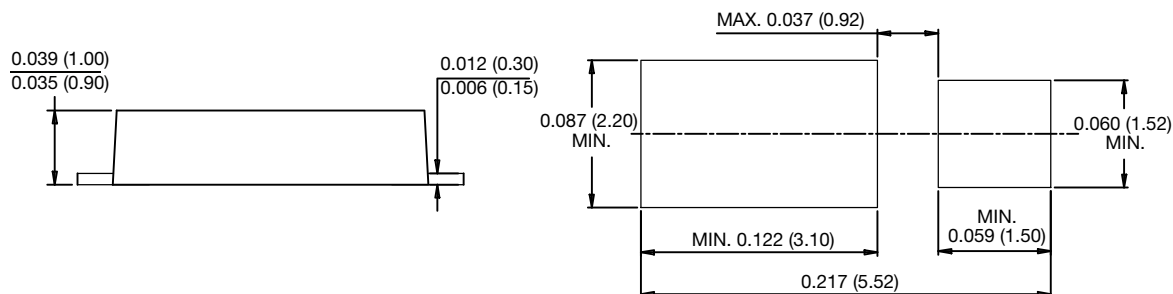


Fig. 5 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPA (DO-221BC)

Mounting Pad Layout




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