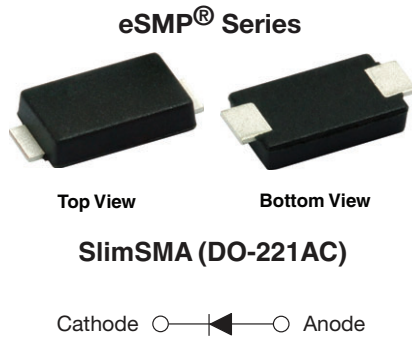


Surface-Mount TMBS[®] (Trench MOS Barrier Schottky) Rectifier



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
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

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

LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS | |
|-------------------------|--------------------|
| $I_{F(AV)}$ | 5.0 A |
| V_{RRM} | 50 V |
| I_{FSM} | 100 A |
| V_F at $I_F = 5.0$ A | 0.41 V |
| T_J max. | 150 °C |
| Package | SlimSMA (DO-221AC) |
| Circuit configuration | Single |

MECHANICAL DATA

Case: SlimSMA (DO-221AC)

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 | VSSAF5N50 | UNIT |
| Device marking code | | 5N5 | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 50 | V |
| Maximum DC forward current (fig. 1) | $I_F^{(1)}$ | 5.0 | A |
| | $I_F^{(2)}$ | 3.0 | |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 100 | A |
| Maximum DC reverse voltage | V_{DC} | 35 | V |
| Operating junction and storage temperature range | T_J, T_{STG} | -40 to +150 | °C |

Notes

(1) Mounted on 10 mm x 10 mm pad areas, 2 oz. FR4 PCB

(2) 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 | $I_F = 2.5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.41 | - | V |
| | $I_F = 5.0\text{ A}$ | | | 0.48 | 0.56 | |
| | $I_F = 2.5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.31 | - | |
| | $I_F = 5.0\text{ A}$ | | | 0.41 | 0.50 | |
| Reverse current | $V_R = 35\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 0.02 | - | mA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 12 | - | |
| | $V_R = 50\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | - | 1.4 | |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 19 | 50 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 850 | - | pF |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
 (2) Pulse test: Pulse width $\leq 40\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified) | | | |
|---|-----------------------|-----------|--------------------|
| PARAMETER | SYMBOL | VSSAF5N50 | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 115 | $^\circ\text{C/W}$ |
| | $R_{\theta JM}^{(1)}$ | 12 | |

Note

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

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| VSSAF5N50-M3/6A | 0.032 | 6A | 3500 | 7" diameter plastic tape and reel |
| VSSAF5N50-M3/6B | 0.032 | 6B | 14 000 | 13" diameter plastic tape and reel |

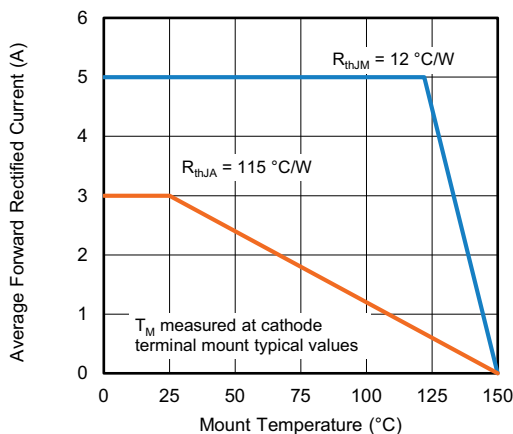
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

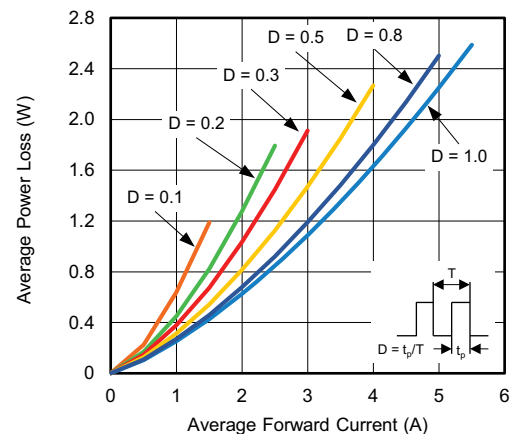


Fig. 2 - Average Power Loss Characteristics

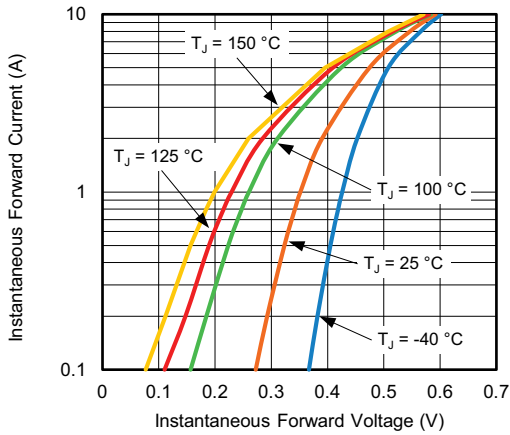


Fig. 3 - Typical Instantaneous Forward Characteristics

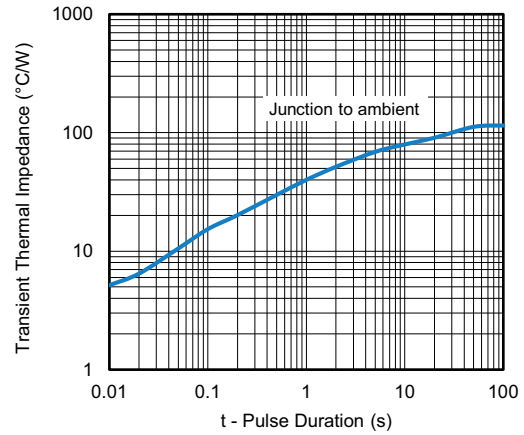


Fig. 6 - Typical Transient Thermal Impedance

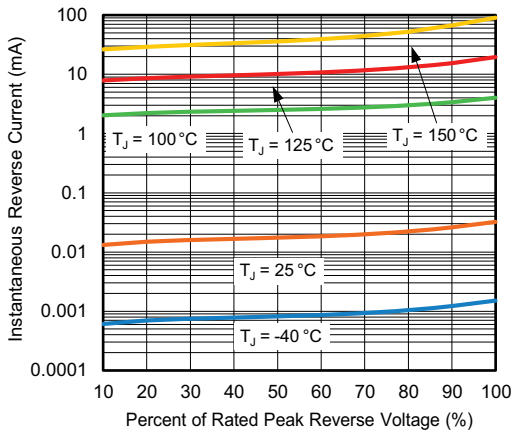


Fig. 4 - Typical Reverse Leakage Characteristics

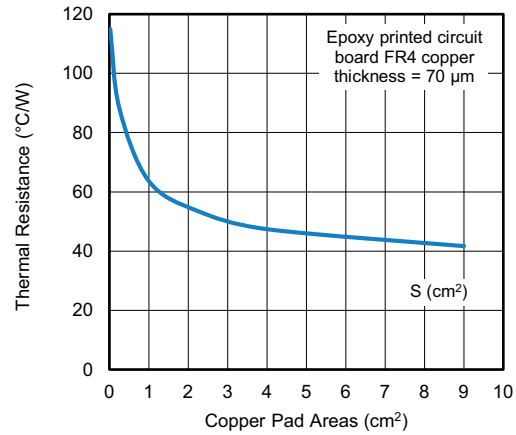


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

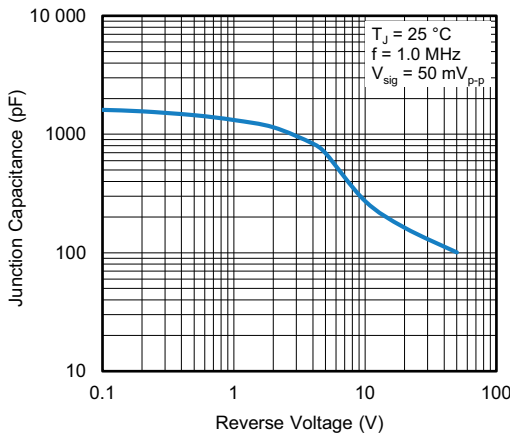
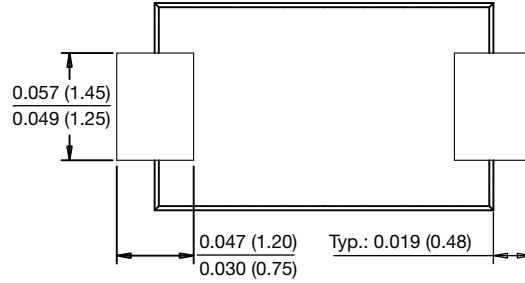
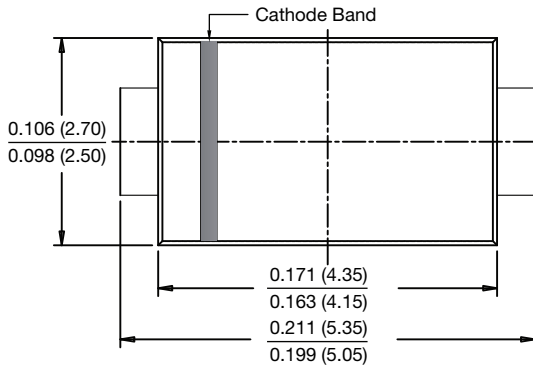


Fig. 5 - Typical Junction Capacitance

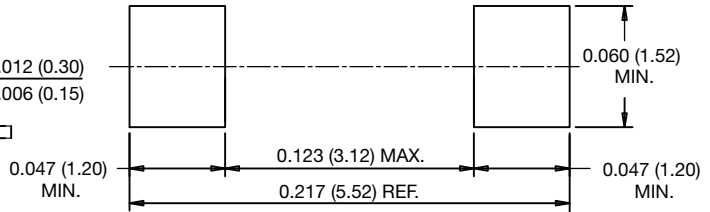
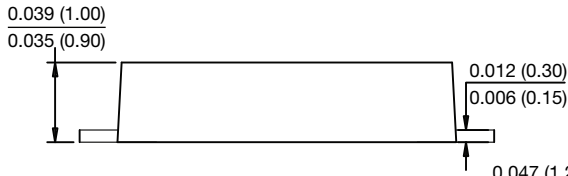


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMA (DO-221AC)



Mounting Pad Layout





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