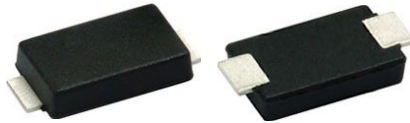


Surface Mount Trench MOS Barrier Schottky Rectifier

TMBS® eSMP® Series


Top View

Bottom View

SlimSMA (DO-221AC)

Cathode Anode

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


RoHS
 COMPLIANT
 HALOGEN
FREE
DESIGN SUPPORT TOOLS
[click logo to get started](#)
3D
 Models
 Available

TYPICAL APPLICATIONS

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

| PRIMARY CHARACTERISTICS | |
|-------------------------|--------------------|
| $I_{F(AV)}$ | 5.0 A |
| V_{RRM} | 60 V |
| I_{FSM} | 100 A |
| V_F at $I_F = 5.0$ A | 0.48 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

 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 1A 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 | VSSAF56 | UNIT |
| Device marking code | | V56 | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 60 | V |
| Maximum DC forward current | $I_F^{(1)}$ | 5.0 | A |
| | $I_F^{(2)}$ | 2.6 | |
| Peak forward surge current 10 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 +150 | °C |

Notes

- (1) Mounted on 30 mm x 30 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 | $I_F = 2.5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.47 | - | V |
| | $I_F = 5.0\text{ A}$ | | | 0.54 | 0.62 | |
| | $I_F = 2.5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.38 | - | |
| | $I_F = 5.0\text{ A}$ | | | 0.48 | 0.56 | |
| Reverse current | $V_R = 60\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | - | 0.4 | mA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 4.5 | 15 | |
| Typical junction capacitance | 4.0 V, 1 MHz | C_J | 540 | - | 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 | VSSAF56 | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 115 | $^\circ\text{C/W}$ |
| | $R_{\theta JM}^{(2)}$ | 12 | |

Notes

- (1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta JA}$ - junction to ambient
 (2) Mounted on 30 mm x 30 mm pad areas, 2 oz. FR4 PCB; $R_{\theta JM}$ - junction to mount

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| VSSAF56-M3/6A | 0.032 | 6A | 3500 | 7" diameter plastic tape and reel |
| VSSAF56-M3/6B | 0.032 | 6B | 14 000 | 13" diameter plastic tape and reel |
| VSSAF56HM3_A/H ⁽¹⁾ | 0.032 | H | 3500 | 7" diameter plastic tape and reel |
| VSSAF56HM3_A/I ⁽¹⁾ | 0.032 | I | 14 000 | 13" diameter plastic tape and reel |

Note

- (1) AEC-Q101 qualified

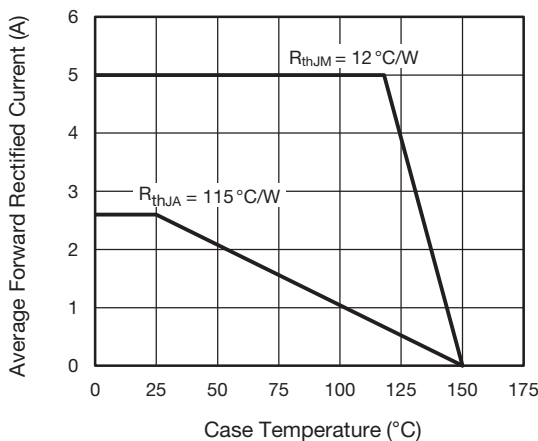
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

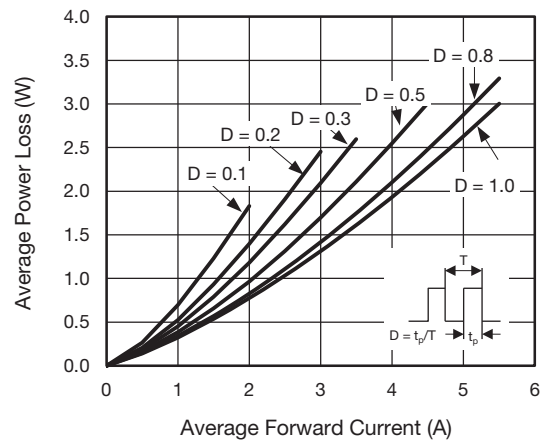


Fig. 2 - Average Power Loss Characteristics

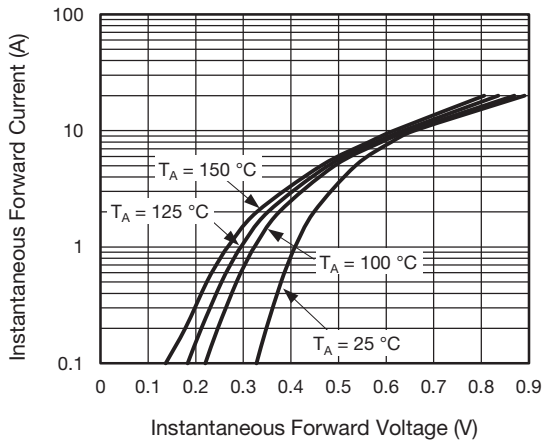


Fig. 3 - Typical Instantaneous Forward Characteristics

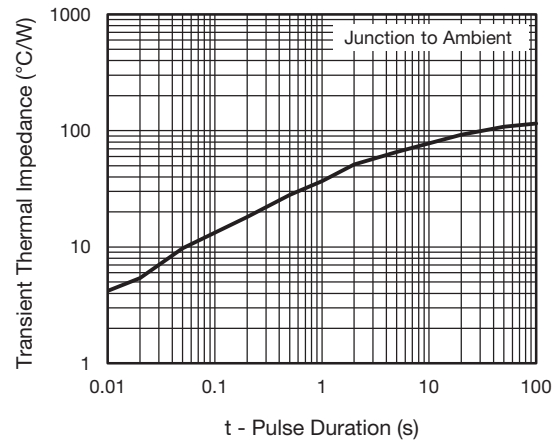


Fig. 6 - Typical Transient Thermal Impedance

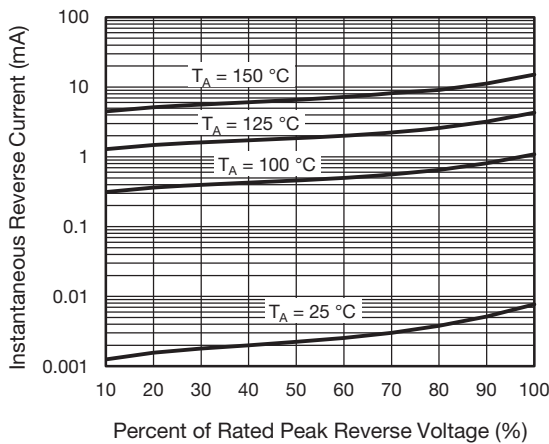


Fig. 4 - Typical Reverse Leakage Characteristics

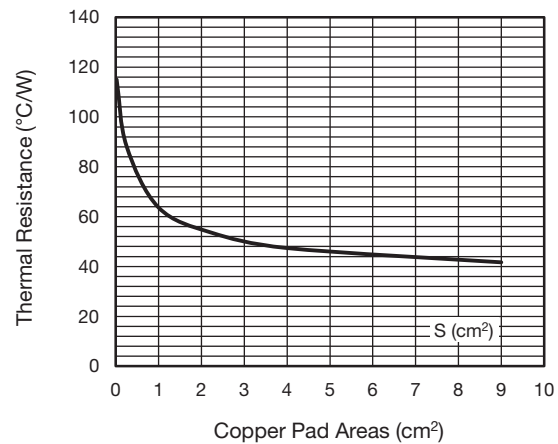


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

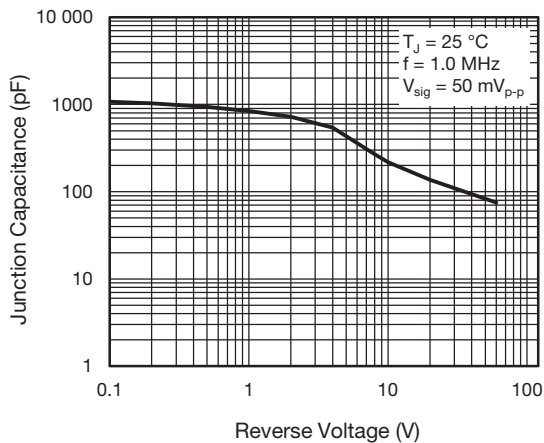
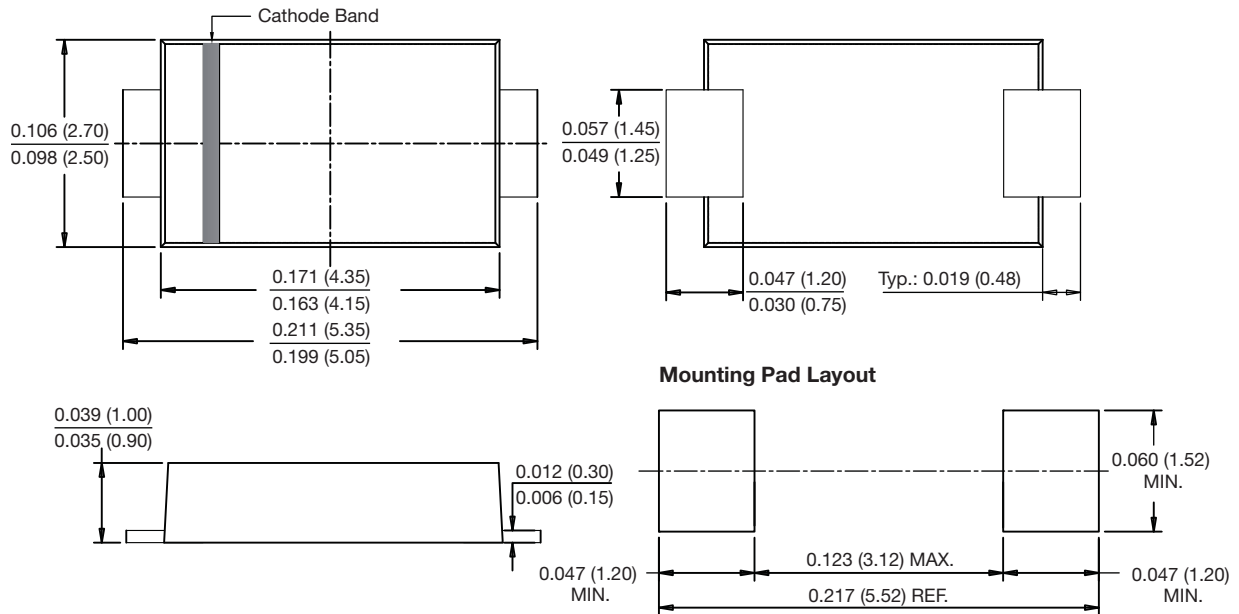


Fig. 5 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMA (DO-221AC)





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