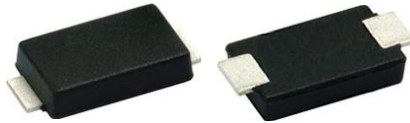


# Surface Mount Trench MOS Barrier Schottky Rectifier

**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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://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.

**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

| PRIMARY CHARACTERISTICS |                    |
|-------------------------|--------------------|
| $I_{F(AV)}$             | 3.0 A              |
| $V_{RRM}$               | 50 V               |
| $I_{FSM}$               | 80 A               |
| $V_F$ at $I_F = 3.0$ A  | 0.40 V             |
| $T_J$ max.              | 150 °C             |
| Package                 | SlimSMA (DO-221AC) |
| Circuit configuration   | Single             |

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                           |                |             |      |
|---|----------------|-------------|------|
| PARAMETER   | SYMBOL         | VSSAF3N50   | UNIT |
| Device marking code   |                | 3N5         |      |
| Maximum repetitive peak reverse voltage   | $V_{RRM}$      | 50          | V    |
| Maximum DC forward current (fig. 1)   | $I_F^{(1)}$    | 3.0         | A    |
|   | $I_F^{(2)}$    | 2.7         |      |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 80          | A    |
| Maximum DC reserve voltage  | $V_{DC}$       | 35          | V    |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$ | -40 to +150 | °C   |

**Note**

(1) Mounted on 5 mm x 5 mm copper pad areas, 2 oz. FR4 PCB

(2) Free air, mounted on recommended copper pad area



| ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted) |                        |                         |                               |      |      |      |
|--|------------------------|-------------------------|-------------------------------|------|------|------|
| PARAMETER  | TEST CONDITIONS        |                         | SYMBOL                        | TYP. | MAX. | UNIT |
| Instantaneous forward voltage  | I <sub>F</sub> = 1.5 A | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.40 | -    | V    |
|  | I <sub>F</sub> = 3.0 A |                         |                               | 0.47 | 0.54 |      |
|  | I <sub>F</sub> = 1.5 A | T <sub>A</sub> = 125 °C |                               | 0.30 | -    |      |
|  | I <sub>F</sub> = 3.0 A |                         |                               | 0.40 | 0.48 |      |
| Reverse current  | V <sub>R</sub> = 35 V  | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | 0.01 | -    | mA   |
|  |                        | T <sub>A</sub> = 125 °C |                               | 8    | -    |      |
|  | V <sub>R</sub> = 50 V  | T <sub>A</sub> = 25 °C  |                               | -    | 1    |      |
|  |                        | T <sub>A</sub> = 125 °C |                               | 12.5 | 35   |      |
| Typical junction capacitance   | 4.0 V, 1 MHz           |                         | C <sub>J</sub>                | 570  | -    | pF   |

Notes

- <sup>(1)</sup> Pulse test: 300 μs pulse width, 1 % duty cycle
- <sup>(2)</sup> Pulse test: Pulse width ≤ 5 ms

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified) |                                 |           |      |
|---|---------------------------------|-----------|------|
| PARAMETER   | SYMBOL                          | VSSAF3N50 | UNIT |
| Typical thermal resistance  | R <sub>θJA</sub> <sup>(1)</sup> | 115       | °C/W |
|   | R <sub>θJM</sub> <sup>(1)</sup> | 12        |      |

Note

- <sup>(1)</sup> Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance R<sub>θJA</sub> - junction to ambient, R<sub>θJM</sub> - junction to mount

| ORDERING INFORMATION (Example) |                 |                        |               |                                    |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| VSSAF3N50-M3/6A                | 0.032           | 6A                     | 3500          | 7" diameter plastic tape and reel  |
| VSSAF3N50-M3/6B                | 0.032           | 6B                     | 14 000        | 13" diameter plastic tape and reel |



RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

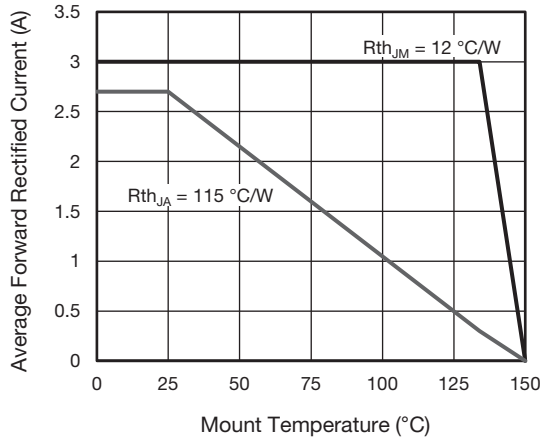


Fig. 1 - Maximum Forward Current Derating Curve

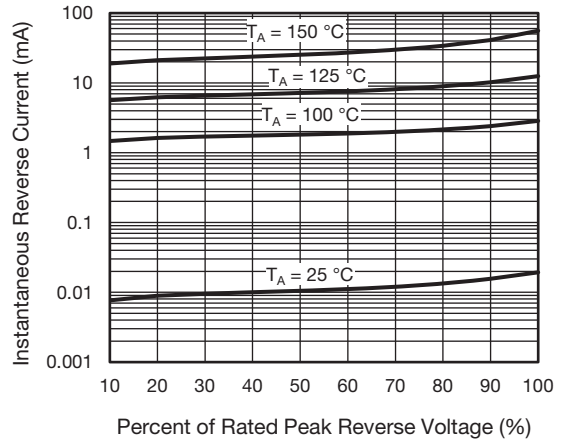


Fig. 4 - Typical Reverse Leakage Characteristics

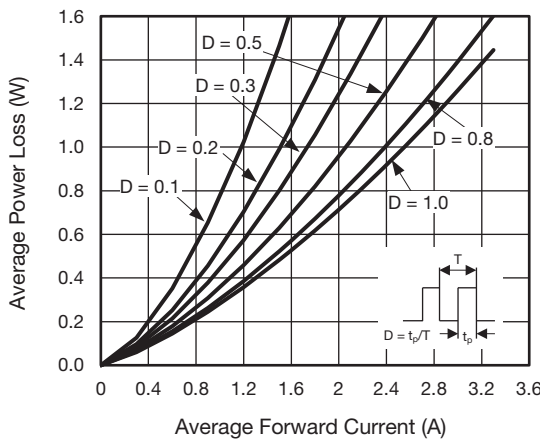


Fig. 2 - Forward Power Loss Characteristics

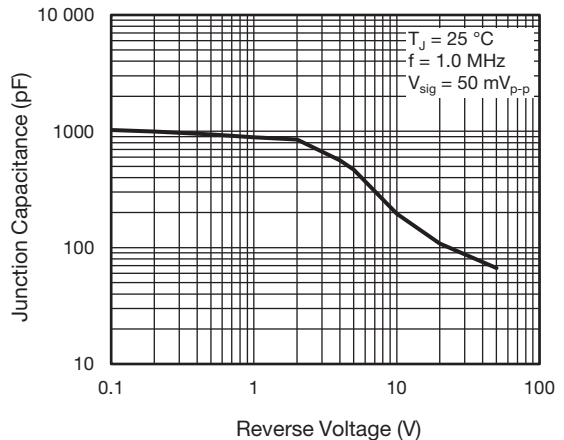


Fig. 5 - Typical Junction Capacitance

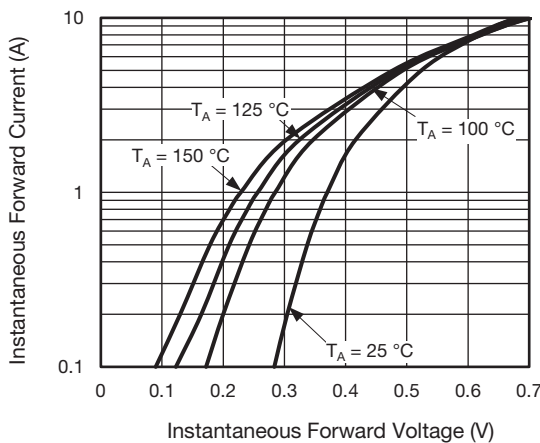


Fig. 3 - Typical Instantaneous Forward Characteristics

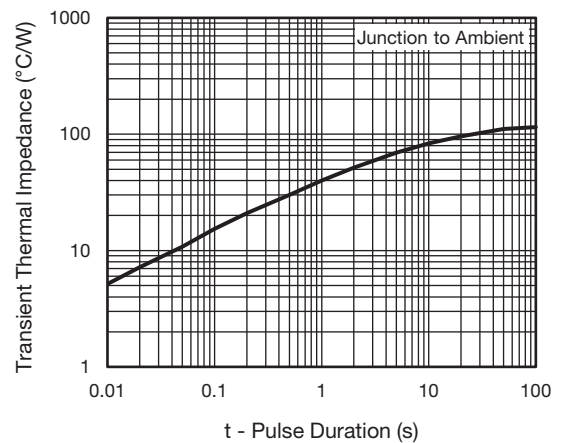


Fig. 6 - Typical Transient Thermal Impedance

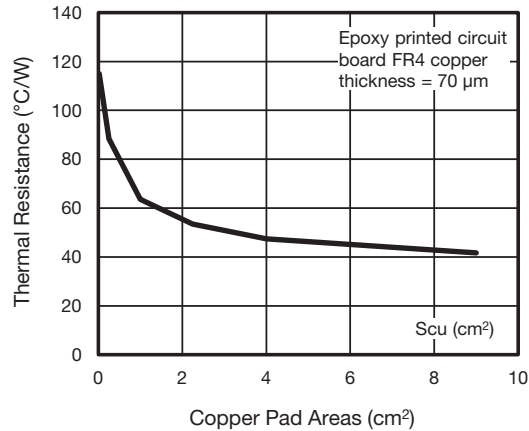
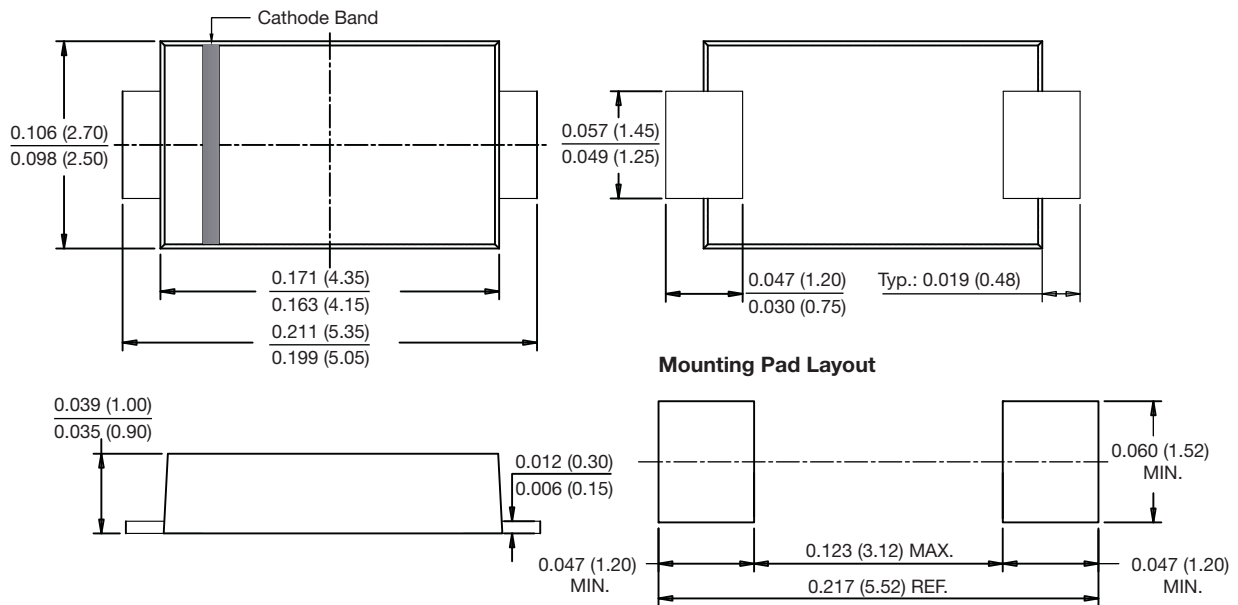


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Area

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

**SlimSMA (DO-221AC)**





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