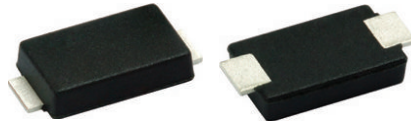


Surface-Mount TMBS[®] (Trench MOS Barrier Schottky) Rectifier

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

 AUTOMOTIVE
GRADE
Available

RoHS
COMPLIANT
HALOGEN
FREE

LINKS TO ADDITIONAL RESOURCES



3D Models

PRIMARY CHARACTERISTICS

| | |
|---------------------------------|--------------------|
| $I_{F(AV)}$ | 3.0 A |
| V_{RRM} | 45 V |
| I_{FSM} | 80 A |
| I_R at $V_R = 45$ V (125 °C) | 5 mA |
| V_F at $I_F = 3.0$ A (125 °C) | 0.37 V |
| T_J max. | 150 °C |
| Package | SlimSMA (DO-221AC) |
| Circuit configuration | Single |

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, DC/DC converters, and polarity protection in commercial, industrial, and automotive 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

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 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 | VSSAF3L45 | UNIT |
|---|----------------------------------|-------------|------|
| Device marking code | | 3L45 | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 45 | V |
| Maximum DC forward rectified current | $I_{F(AV)}$ ⁽¹⁾ | 3.0 | A |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 80 | A |
| Operating junction and storage temperature range | T_J ⁽²⁾ , T_{STG} | -40 to +150 | °C |

Note

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

⁽²⁾ The heat generated must be less than thermal conductivity from junction to ambient: $dP_D/DT_J < 1/R_{\theta JA}$

| ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | |
|--|----------------------|-----------------------------------|----------------------|------|---------------|
| PARAMETER | TEST CONDITIONS | SYMBOL | TYP. | MAX. | UNIT |
| Instantaneous forward voltage | $I_F = 1.5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | 0.41 | - | V |
| | | | $I_F = 3.0\text{ A}$ | 0.46 | |
| | $I_F = 1.5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | 0.31 | - | |
| | | | $I_F = 3.0\text{ A}$ | 0.37 | |
| Reverse current | $V_R = 45\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | - | 450 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | 5 | 25 | mA |
| Typical junction capacitance | 4.0 V, 1 MHz | C_J | 425 | - | 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 | VSSAF3L45 | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)(2)}$ | 115 | $^\circ\text{C/W}$ |
| | $R_{\theta JM}^{(2)(3)}$ | 12 | |

Notes

- (1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta JA}$ - junction to ambient
 (2) The heat generated must be less than thermal conductivity from junction to ambient: $dP_D/dT_J < 1/R_{\theta JA}$
 (3) Mounted on 10 mm x 10 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 |
| VSSAF3L45-M3/6A | 0.032 | 6A | 3500 | 7" diameter plastic tape and reel |
| VSSAF3L45-M3/6B | 0.032 | 6B | 14 000 | 13" diameter plastic tape and reel |
| VSSAF3L45HM3_A/H ⁽¹⁾ | 0.032 | H | 3500 | 7" diameter plastic tape and reel |
| VSSAF3L45HM3_A/I ⁽¹⁾ | 0.032 | I | 14 000 | 13" diameter plastic tape and reel |

Note

- (1) AEC-Q101 qualified

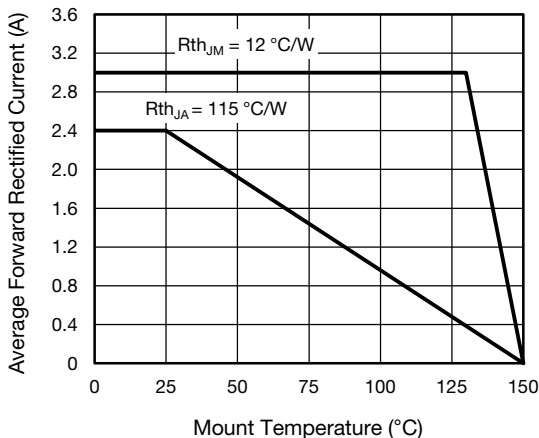
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

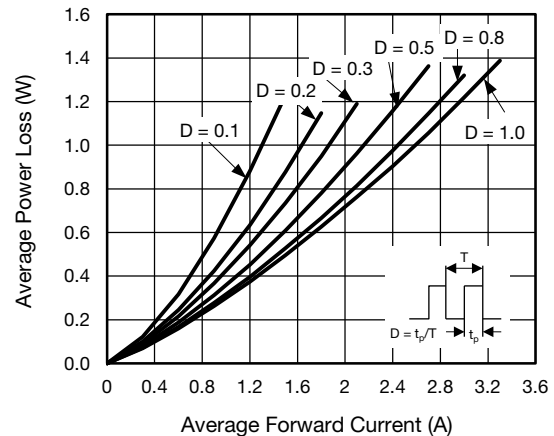


Fig. 2 - Average Power Loss Characteristics

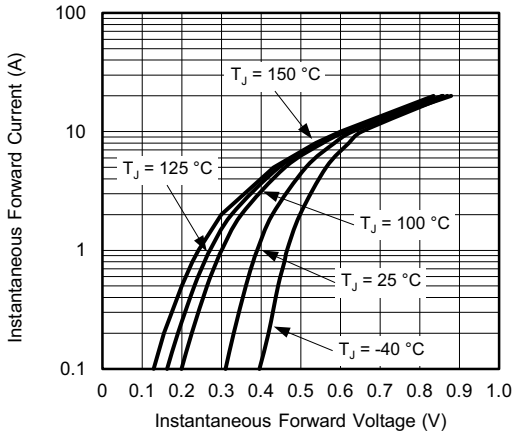


Fig. 3 - Typical Instantaneous Forward Characteristics

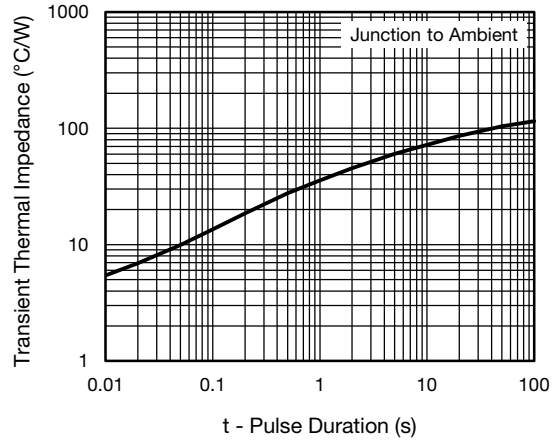


Fig. 6 - Typical Transient Thermal Impedance

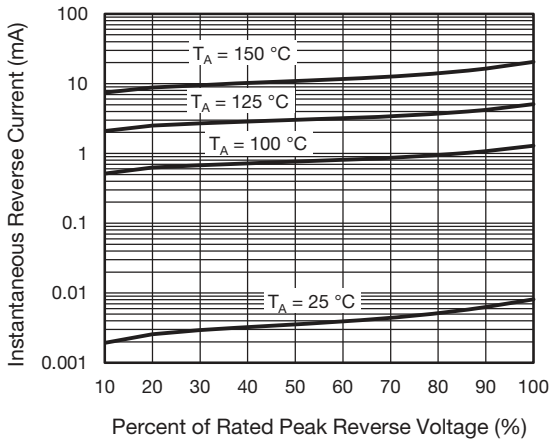


Fig. 4 - Typical Reverse Leakage Characteristics

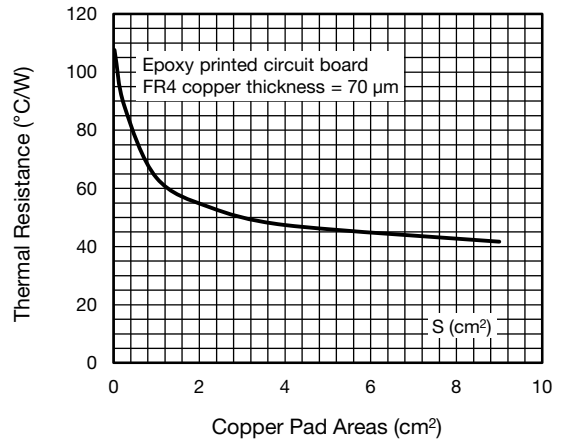


Fig. 7 - Thermal Resistance Junction to Ambient vs. Copper Pad Areas

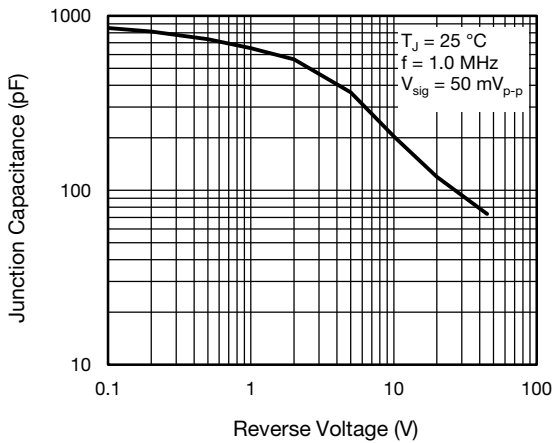
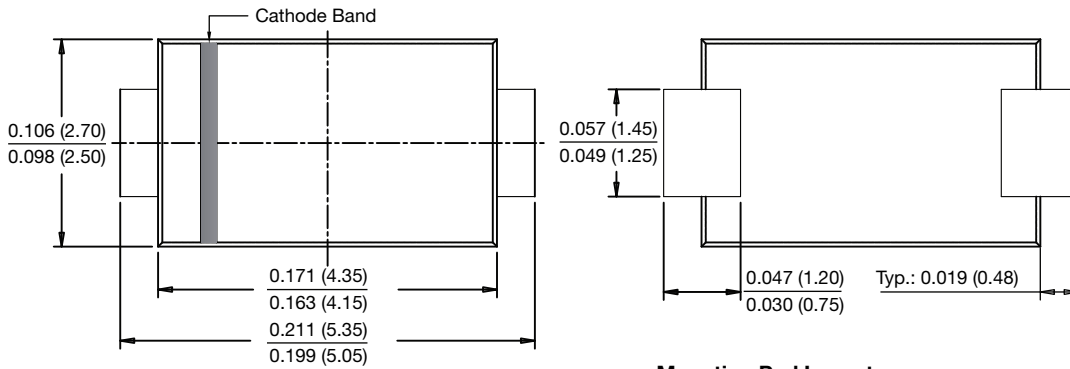


Fig. 5 - Typical Junction Capacitance

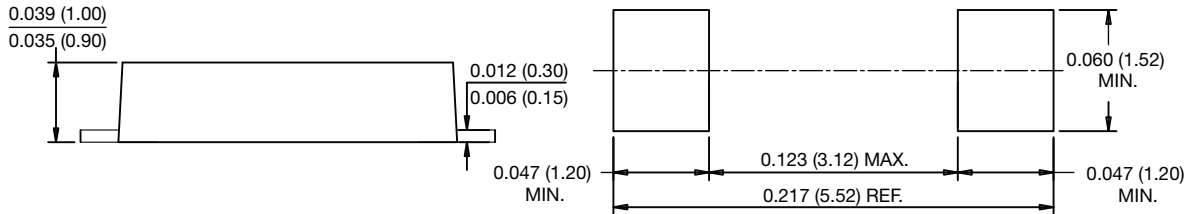


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimSMA (DO-221AC)



Mounting Pad Layout





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