

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

eSMP® Series



Top view

Bottom view

SMF (DO-219AB)

Cathode  Anode

LINKS TO ADDITIONAL RESOURCES



3D Models

PRIMARY CHARACTERISTICS

| | |
|--|----------------|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 45 V |
| I_{FSM} | 30 A |
| V_F at $I_F = 1$ A ($T_A = 125$ °C) | 0.36 V |
| T_J max. | 150 °C |
| Package | SMF (DO-219AB) |
| Circuit configuration | Single |

FEATURES

- Trench MOS Schottky technology
- Low profile package
- Ideal for automated placement
- Low forward voltage drop, low power losses
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Wave and reflow solderable
- AEC-Q101 qualified available
 - Automotive ordering code: base P/NHM3
- Compatible to SOD-123W package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: SMF (DO-219AB)

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 JESD 22-B102

M3 and HM3 suffix meet JESD 201 class 2 whisker test

Polarity: color band denotes the cathode end

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)

| PARAMETER | SYMBOL | V1FL45 | UNIT |
|--|----------------------------|-------------|------|
| Device marking code | | 1LE | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 45 | V |
| Maximum average forward rectified current (fig.1) | $I_{F(AV)}$ ⁽¹⁾ | 1.0 | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | I_{FSM} | 30 | A |
| Operating junction temperature range | T_J ⁽²⁾ | -40 to +150 | °C |
| Storage temperature range | T_{STG} | -55 to +150 | |

Notes

⁽¹⁾ Free air, mounted on FR4 PCB, 2 oz. standard footprint

⁽²⁾ The heat generated must be less than the 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 = 0.5 A | T _A = 25 °C | V _F ⁽¹⁾ | 0.41 | - | V |
| | I _F = 1.0 A | | | 0.45 | 0.53 | |
| | I _F = 0.5 A | T _A = 125 °C | | 0.30 | - | |
| | I _F = 1.0 A | | | 0.36 | 0.44 | |
| Reverse current | V _R = 45 V | T _A = 25 °C | I _R ⁽²⁾ | - | 0.25 | mA |
| | | T _A = 125 °C | | 2.0 | 10 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C _J | 190 | - | 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 noted)

| PARAMETER | SYMBOL | V1FL45 | UNIT |
|----------------------------|--------------------------|--------|----------------------|
| Typical thermal resistance | $R_{\theta JA}^{(1)(2)}$ | 125 | $^{\circ}\text{C/W}$ |
| | $R_{\theta JM}^{(2)}$ | 23 | |

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) Device mounted on FR4 PCB, 2 oz. standard footprint, thermal resistance $R_{\theta JA}$ – junction-to-ambient; thermal resistance $R_{\theta JM}$ – junction-to-mount**ORDERING INFORMATION** (Example)

| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|----------------------------|-----------------|------------------------|---------------|------------------------------------|
| V1FL45-M3/H | 0.015 | H | 3000 | 7" diameter plastic tape and reel |
| V1FL45-M3/I | 0.015 | I | 10 000 | 13" diameter plastic tape and reel |
| V1FL45HM3/H ⁽¹⁾ | 0.015 | H | 3000 | 7" diameter plastic tape and reel |
| V1FL45HM3/I ⁽¹⁾ | 0.015 | I | 10 000 | 13" diameter plastic tape and reel |

Note

(1) AEC-Q101 qualified

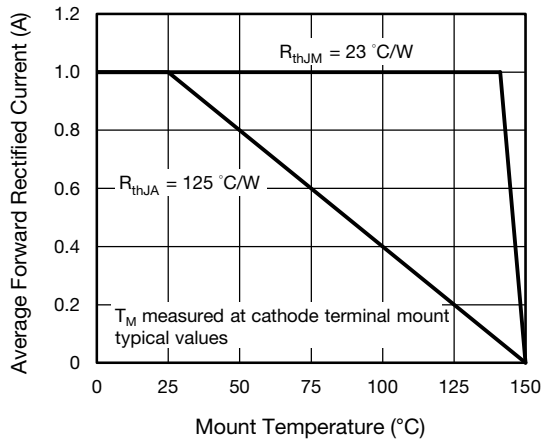
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

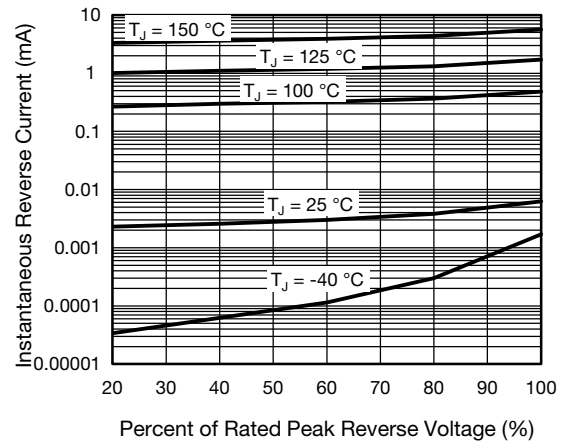


Fig. 4 - Typical Reverse Leakage Characteristics

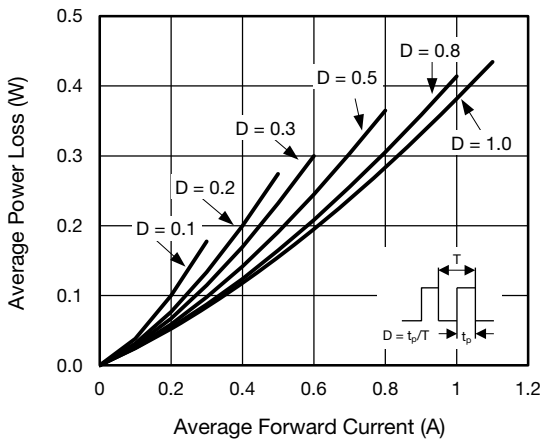


Fig. 2 - Average Power Loss Characteristics

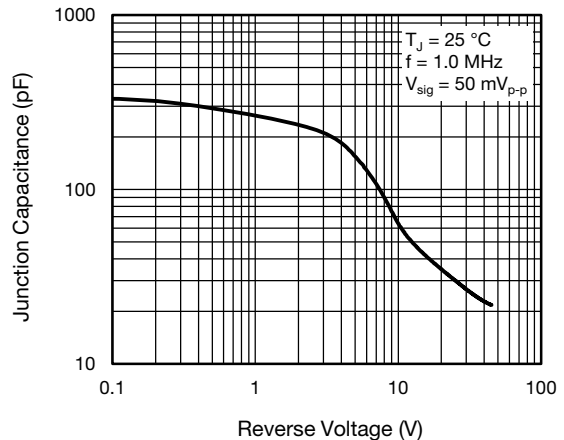


Fig. 5 - Typical Junction Capacitance

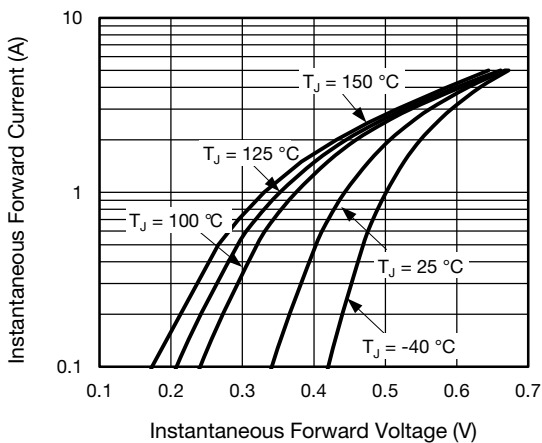


Fig. 3 - Typical Instantaneous Forward Characteristics

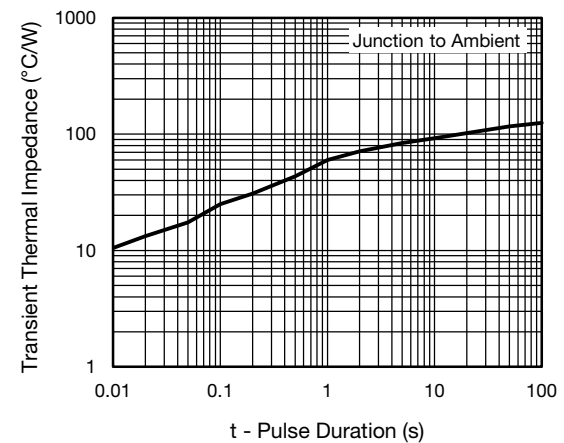
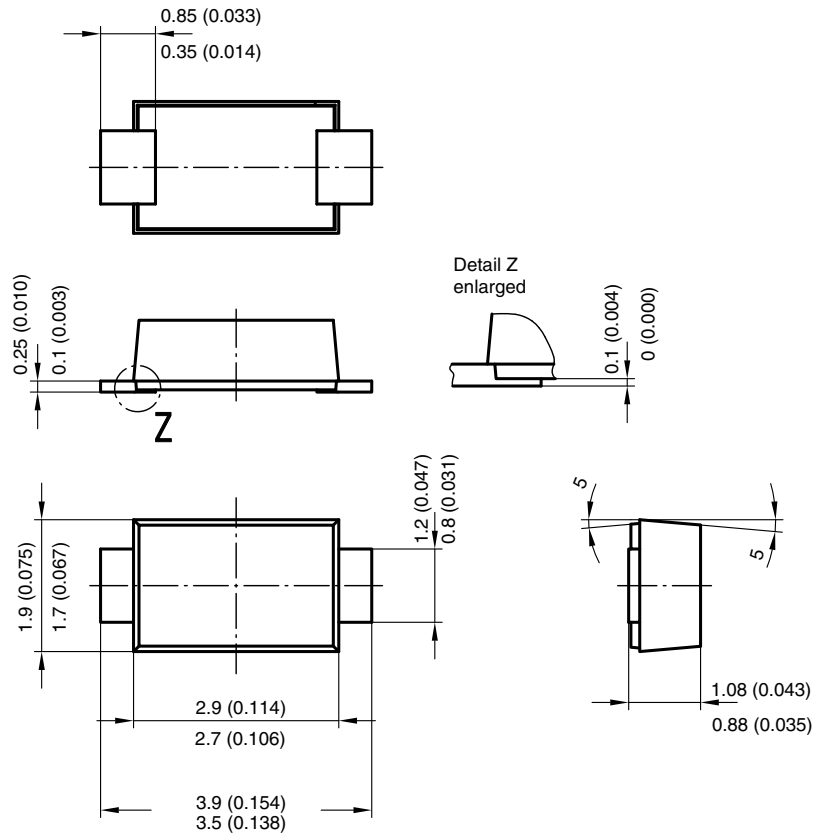
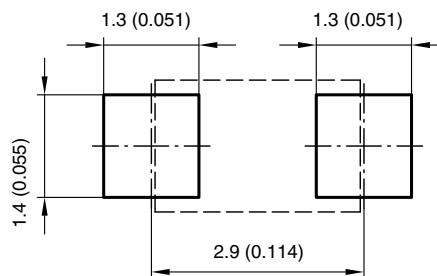


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters (inches)


Foot print recommendation:



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