



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

eSMP[®] Series



Top view Bottom view

SMF (DO-219AB)



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



RoHS COMPLIANT HALOGEN FREE

ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS | |
|----------------------------------------|----------------|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 150 V |
| I_{FSM} | 30 A |
| V_F at $I_F = 1$ A ($T_A = 125$ °C) | 0.64 V |
| T_J max. | 175 °C |
| Package | SMF (DO-219AB) |
| Circuit configuration | Single |

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 | V1FM15 | UNIT |
| Device marking code | | 1MC | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 150 | 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 +175 | °C |
| Storage temperature range | T_{STG} | -55 to +175 | |

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 | $I_F = 0.5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.77 | - | V |
| | $I_F = 1.0\text{ A}$ | | | 1.10 | 1.22 | |
| | $I_F = 0.5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.57 | - | |
| | $I_F = 1.0\text{ A}$ | | | 0.64 | 0.72 | |
| Reverse current | $V_R = 100\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | 0.20 | - | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 180 | - | |
| | $V_R = 150\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | | - | 50 | |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 350 | 1500 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 60 | - | 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 | V1FM15 | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)(2)}$ | 125 | $^\circ\text{C/W}$ |
| | $R_{\theta JM}^{(2)}$ | 30 | |

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 |
| V1FM15-M3/H | 0.015 | H | 3000 | 7" diameter plastic tape and reel |
| V1FM15-M3/I | 0.015 | I | 10 000 | 13" diameter plastic tape and reel |
| V1FM15HM3/H ⁽¹⁾ | 0.015 | H | 3000 | 7" diameter plastic tape and reel |
| V1FM15HM3/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)

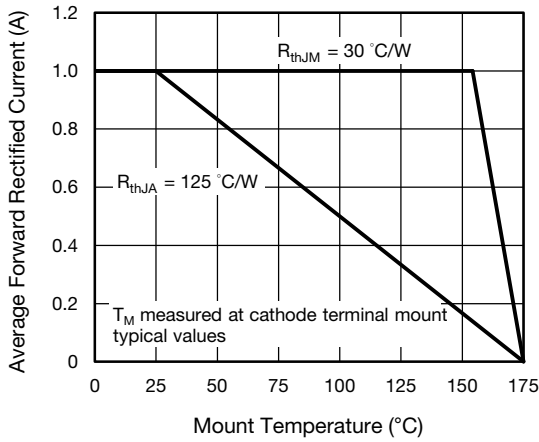


Fig. 1 - Maximum Forward Current Derating Curve

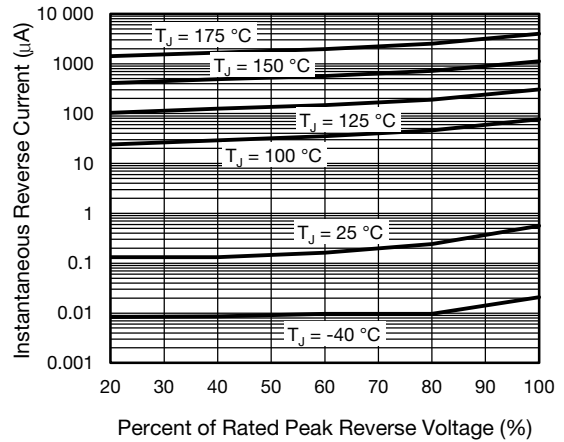


Fig. 4 - Typical Reverse Leakage Characteristics

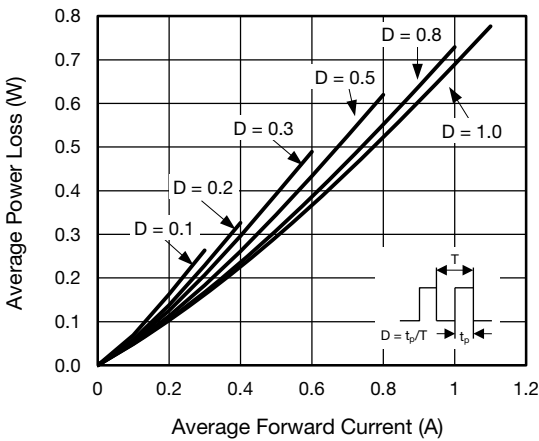


Fig. 2 - Average Power Loss Characteristics

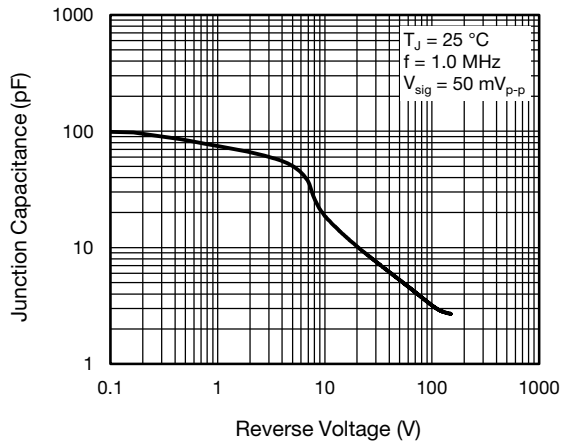


Fig. 5 - Typical Junction Capacitance

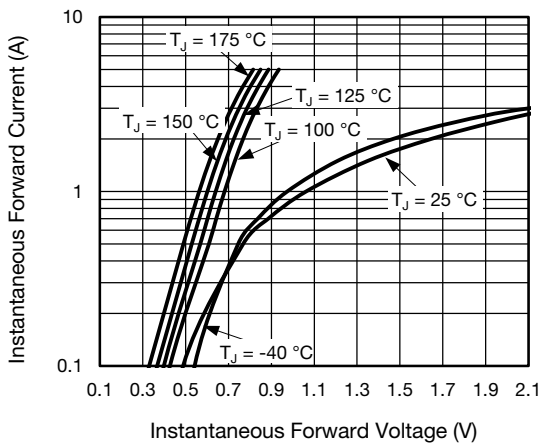


Fig. 3 - Typical Instantaneous Forward Characteristics

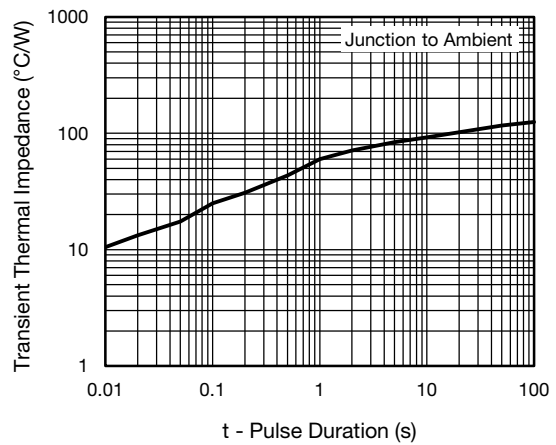
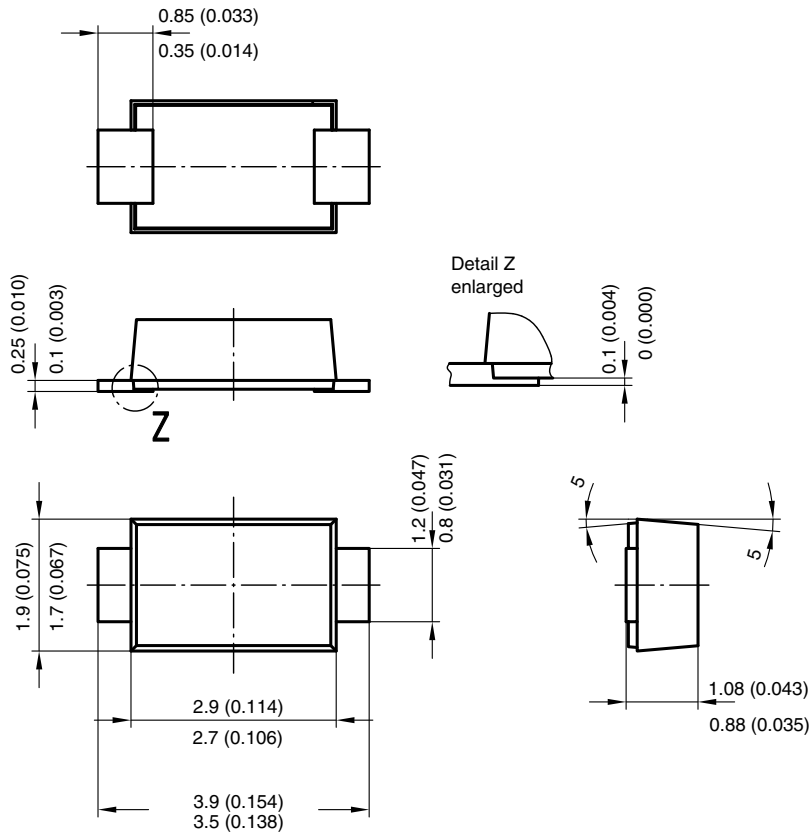


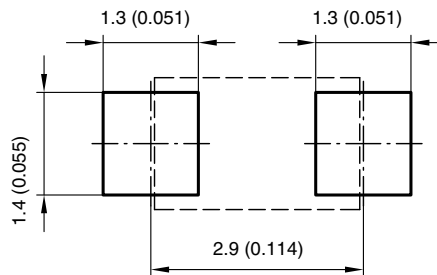
Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



Foot print recommendation:



Created - Date: 15. February 2005
Rev. 3 - Date: 13. March 2007
Document no.: S8-V-3915.01-001 (4)
17247



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