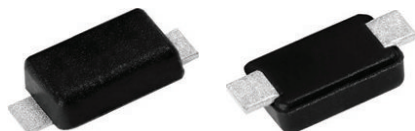


Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

eSMP® Series



Top view

Bottom view

SMF (DO-219AB)

Cathode Anode


RoHS
COMPLIANT
HALOGEN
FREE

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

LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS | |
|--|----------------|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 200 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_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 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 | V1F22 | UNIT |
| Device marking code | | V1D | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 200 | V |
| Maximum DC reverse voltage | V_{DC} | 160 | 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 recommended copper pad area

⁽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 °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⁾ | 0.73 | - | V |
| | I _F = 1.0 A | | | 0.80 | 0.88 | |
| | I _F = 0.5 A | T _A = 125 °C | | 0.57 | - | |
| | I _F = 1.0 A | | | 0.64 | 0.72 | |
| Reverse current | V _R = 160 V | T _A = 25 °C | I _R ⁽²⁾ | 0.1 | - | μA |
| | | T _A = 125 °C | | 100 | - | |
| | V _R = 200 V | T _A = 25 °C | | - | 35 | |
| | | T _A = 125 °C | | 300 | 1500 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C _J | 75 | - | 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 | V1F22 | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)(2)}$ | 125 | $^{\circ}\text{C/W}$ |
| | $R_{\theta JM}^{(3)}$ | 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) Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ - junction to ambient
 (3) Mounted on recommended copper pad area; thermal resistance $R_{\theta JM}$ - junction to mount

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| V1F22-M3/H | 0.015 | H | 3000 | 7" diameter plastic tape and reel |
| V1F22-M3/I | 0.015 | I | 10 000 | 13" diameter plastic tape and reel |
| V1F22HM3_A/H ⁽¹⁾ | 0.015 | H | 3000 | 7" diameter plastic tape and reel |
| V1F22HM3_A/I ⁽¹⁾ | 0.015 | I | 10 000 | 13" diameter plastic tape and reel |

Note

- (1) AEC-Q101 qualified

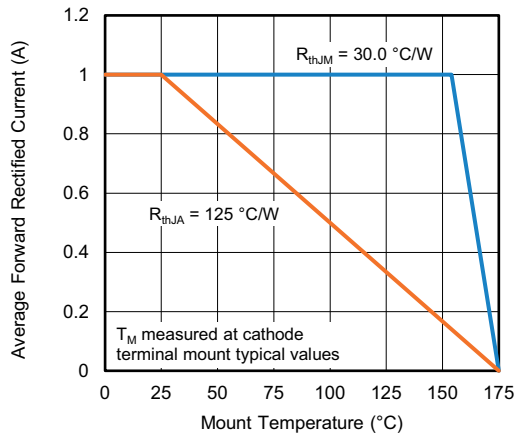
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

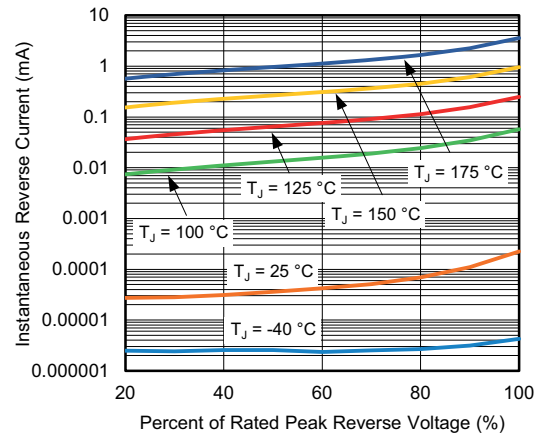


Fig. 4 - Typical Reverse Leakage Characteristics

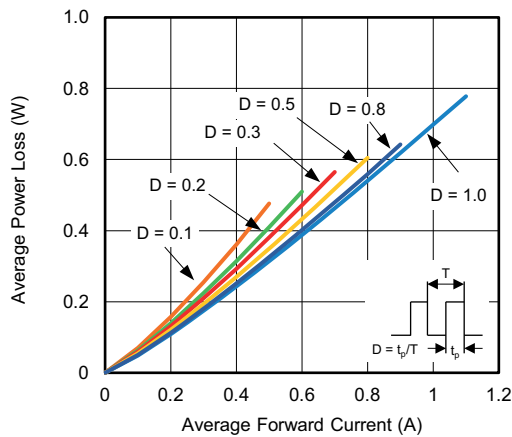


Fig. 2 - Average Power Loss Characteristics

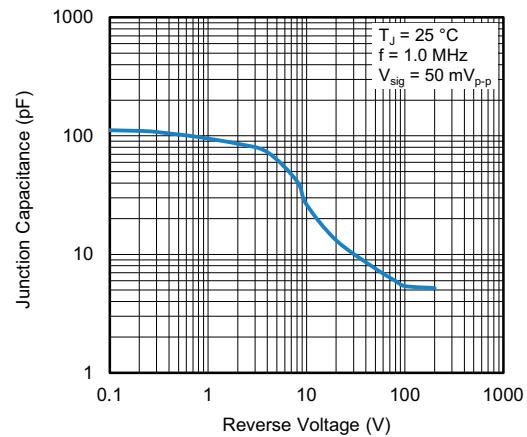


Fig. 5 - Typical Junction Capacitance

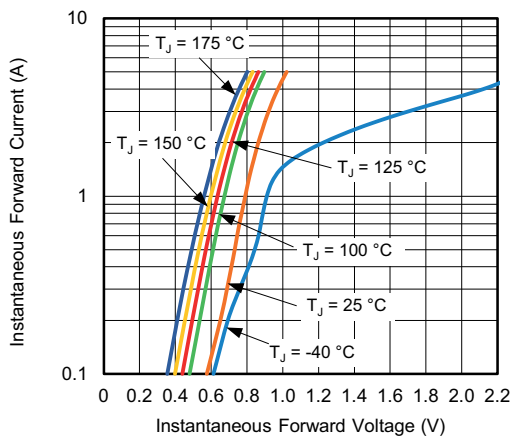


Fig. 3 - Typical Instantaneous Forward Characteristics

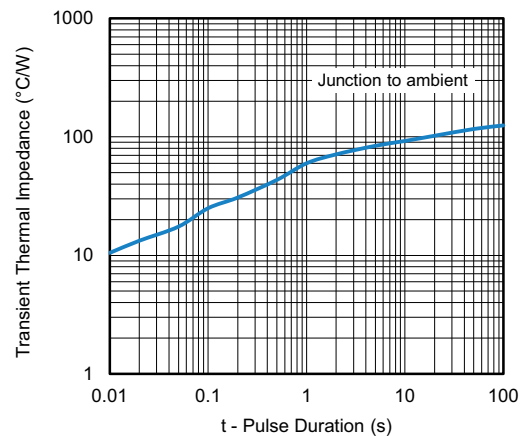
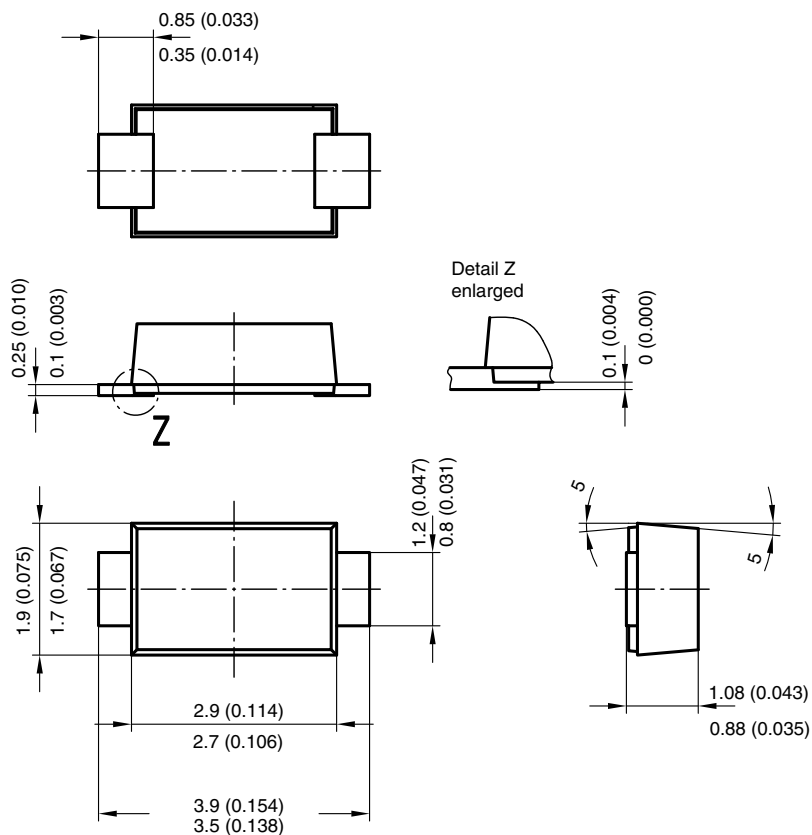
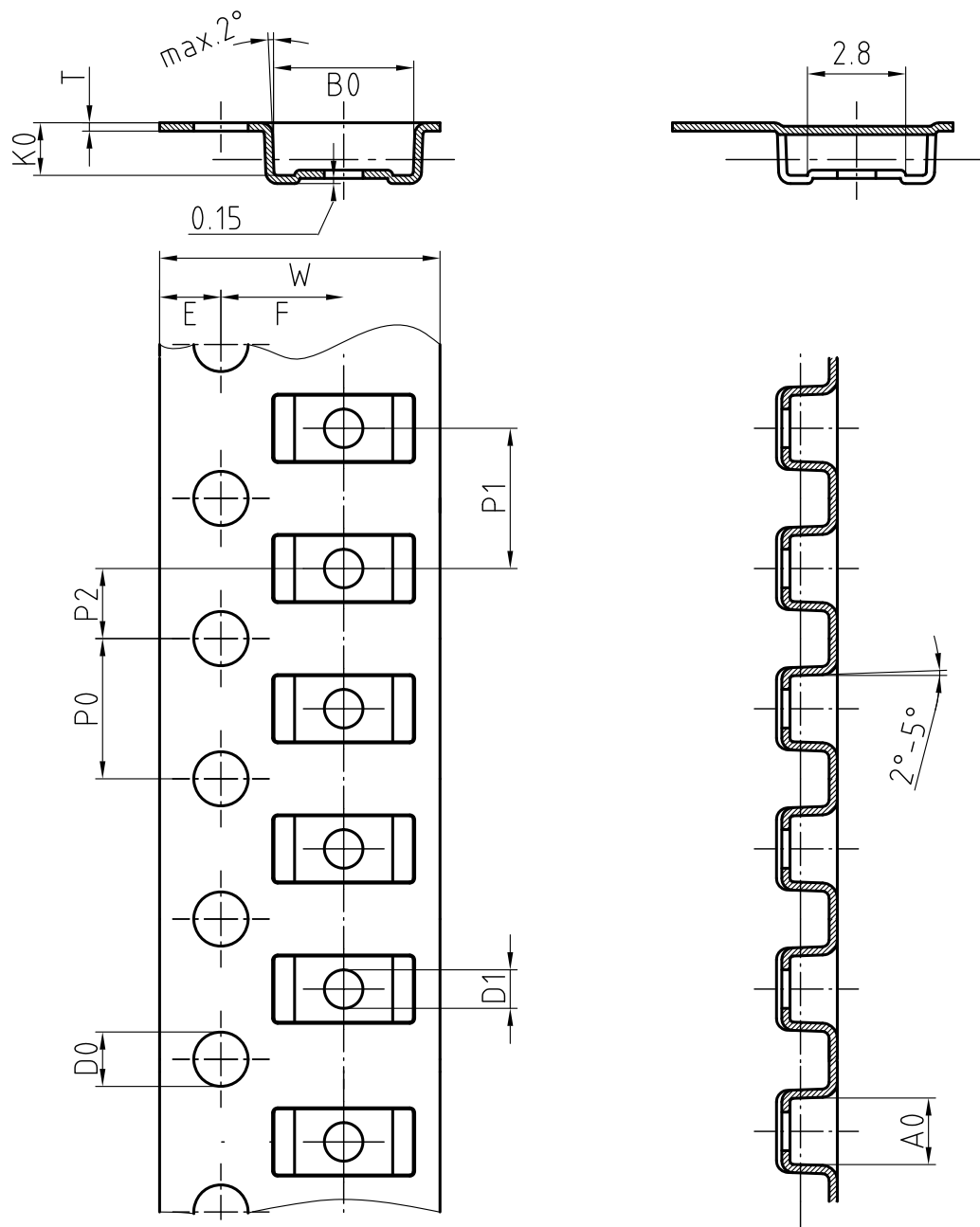


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters (inches)


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 17247

BLISTERTAPE DIMENSIONS in millimeters: **SMF (DO-219AB)**


| Mat: | A0 | B0 | K0 | W | T | P0 | P2 | P1 | D0 | D1 | E | F |
|------|-----|-----|-----|-----|-------|-----|-----|-----|-----|----|------|-----|
| PS | 1.9 | 4.0 | 1.5 | 8.0 | 0.235 | 4.0 | 2.0 | 4.0 | 1.5 | 1 | 1.75 | 3.5 |

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