

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

eSMP[®] Series

SMP (DO-220AA)

Cathode Anode

FEATURES

- Low profile package
- 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 |
| V_F at $I_F = 3.0$ A | 0.37 V |
| T_J max. | 150 °C |
| Package | SMP (DO-220AA) |
| Circuit configuration | Single |

TYPICAL APPLICATIONS

For use in low voltage, high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

MECHANICAL DATA
Case: SMP (DO-220AA)

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes the cathode end

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

| PARAMETER | SYMBOL | V3PL45 | UNIT |
|---|-------------|-------------|------|
| Device marking code | | 3LE | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 45 | V |
| Maximum DC forward current | $I_F^{(1)}$ | 3 | 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 | $T_J^{(2)}$ | -40 to +150 | °C |
| Operating junction and storage temperature range | T_{STG} | -55 to +150 | °C |

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** ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
|-------------------------------|----------------------|-----------------------------------|-------------|------|------|------|
| Instantaneous forward voltage | $I_F = 1.5\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.41 | - | V |
| | $I_F = 3\text{ A}$ | | | 0.46 | 0.54 | |
| | $I_F = 1.5\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.31 | - | |
| | $I_F = 3\text{ A}$ | | | 0.37 | 0.46 | |
| Reverse current | $V_R = 45\text{ V}$ | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | - | 0.45 | mA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 5.0 | 25.0 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 550 | - | 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 specified)

| PARAMETER | SYMBOL | V3PL45 | UNIT |
|----------------------------|-----------------------|--------|--------------------|
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 125 | $^\circ\text{C/W}$ |
| | $R_{\theta JM}^{(2)}$ | 15 | |

Notes(1) Free air, mounted on recommended PCB, 1 oz. pad area; thermal resistance $R_{\theta JA}$ - junction-to-ambient(2) Mounted on 10 mm x 10 mm copper pad area PCB; thermal resistance $R_{\theta JM}$ - junction-to-mount**ORDERING INFORMATION** (Example)

| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
|----------------------------|-----------------|------------------------|---------------|------------------------------------|
| V3PL45-M3/H | 0.024 | H | 3000 | 7" diameter plastic tape and reel |
| V3PL45-M3/I | 0.024 | I | 10 000 | 13" diameter plastic tape and reel |
| V3PL45HM3/H ⁽¹⁾ | 0.024 | H | 3000 | 7" diameter plastic tape and reel |
| V3PL45HM3/I ⁽¹⁾ | 0.024 | 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)

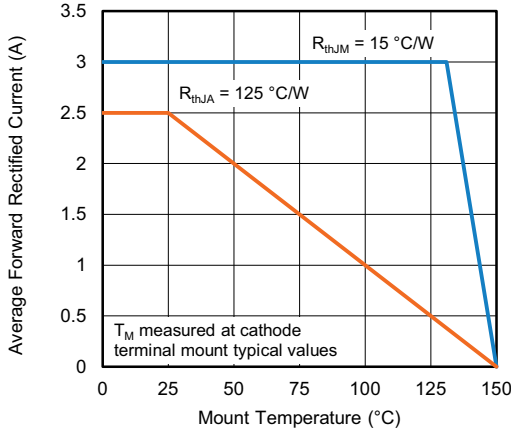


Fig. 1 - Maximum Forward Current Derating Curve

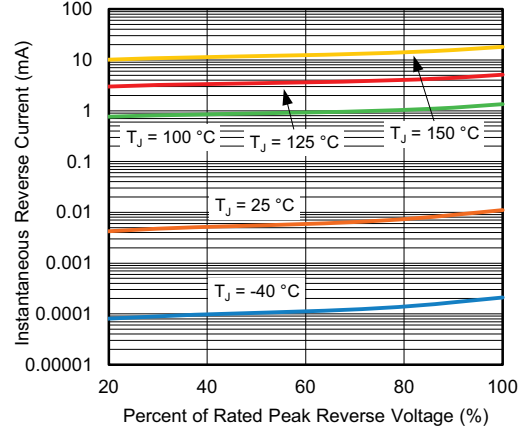


Fig. 4 - Typical Reverse Characteristics

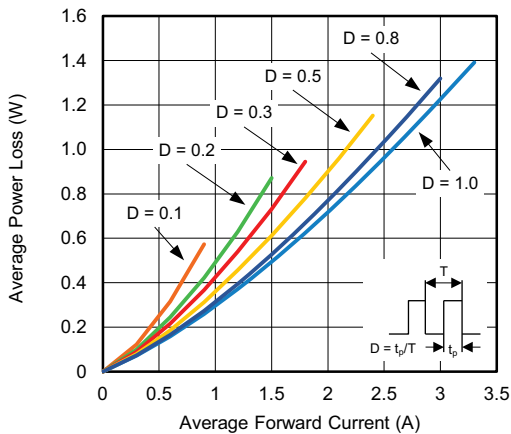


Fig. 2 - Forward Power Loss Characteristics

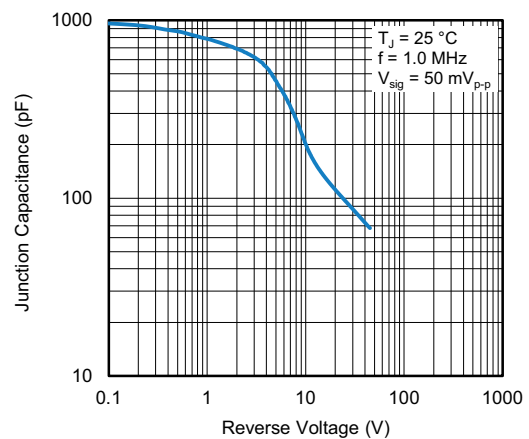


Fig. 5 - Typical Junction Capacitance

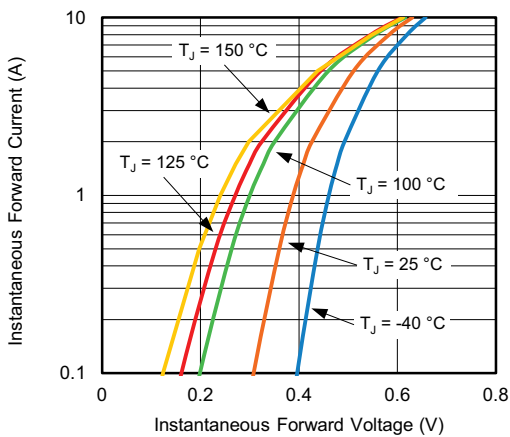


Fig. 3 - Typical Instantaneous Forward Characteristics

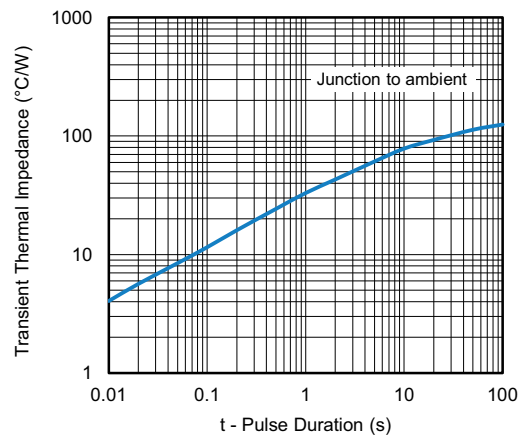
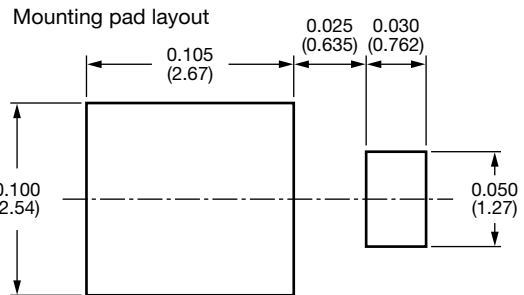
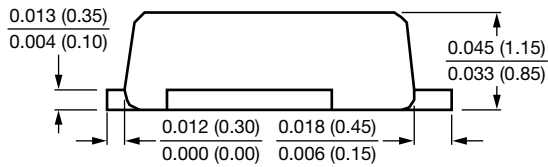
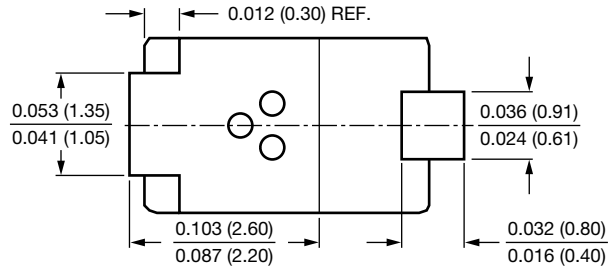
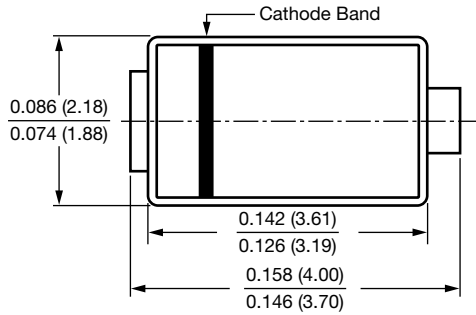


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)





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