

# Surface-Mount TMBS<sup>®</sup> (Trench MOS Barrier Schottky) Rectifier

**eSMP<sup>®</sup> 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](http://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          |
| $V_{RRM}$              | 60 V           |
| $I_{FSM}$              | 60 A           |
| $V_F$ at $I_F = 3.0$ A | 0.48 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                     | V3PL63      | UNIT |
|--|----------------------------|-------------|------|
| Device marking code  |                            | 3LF         |      |
| Maximum repetitive peak reverse voltage  | $V_{RRM}$                  | 60          | V    |
| Maximum DC forward current   | $I_{F(AV)}$ <sup>(1)</sup> | 3           | A    |
|  | $I_{F(AV)}$ <sup>(2)</sup> | 2.1         | A    |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$                  | 60          | A    |
| Operating junction temperature range   | $T_J$ <sup>(3)</sup>       | -40 to +150 | °C   |
| Storage temperature range  | $T_{STG}$                  | -55 to +150 | °C   |

**Notes**

(1) Mounted on 10 mm x 10 mm PCB pad area

(2) Free air, mounted on recommended copper pad area

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



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_J = 25\text{ }^\circ\text{C}$ unless otherwise noted) |                      |                                   |             |      |      |      |
|--|----------------------|-----------------------------------|-------------|------|------|------|
| PARAMETER  | TEST CONDITIONS      |                                   | SYMBOL      | TYP. | MAX. | UNIT |
| Instantaneous forward voltage  | $I_F = 1.5\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$  | $V_F^{(1)}$ | 0.46 | -    | V    |
|  | $I_F = 3\text{ A}$   |                                   |             | 0.53 | 0.59 |      |
|  | $I_F = 1.5\text{ A}$ | $T_J = 125\text{ }^\circ\text{C}$ |             | 0.38 | -    |      |
|  | $I_F = 3\text{ A}$   |                                   |             | 0.48 | 0.55 |      |
| Reverse current  | $V_R = 60\text{ V}$  | $T_J = 25\text{ }^\circ\text{C}$  | $I_R^{(2)}$ | -    | 0.07 | mA   |
|  |                      | $T_J = 125\text{ }^\circ\text{C}$ |             | 2.5  | 5    |      |
| Typical junction capacitance   | 4.0 V, 1 MHz         |                                   | $C_J$       | 460  | -    | pF   |

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle  
(2) Pulse test: pulse width  $\leq 5\text{ ms}$

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified) |                          |        |                    |
|---|--------------------------|--------|--------------------|
| PARAMETER   | SYMBOL                   | V3PL63 | UNIT               |
| Typical thermal resistance  | $R_{\theta JA}^{(1)(2)}$ | 125    | $^\circ\text{C/W}$ |
|   | $R_{\theta JM}^{(3)}$    | 15     |                    |

**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 the thermal conductivity from junction-to-ambient:  $dP_D/dT_J < 1/R_{\theta JA}$   
(3) Mounted on 10 mm x 10 mm copper pad area PCB; thermal resistance  $R_{\theta JM}$  - junction-to-mount

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| V3PL63-M3/H                           | 0.024           | H                      | 3000          | 7" diameter plastic tape and reel  |
| V3PL63-M3/I                           | 0.024           | I                      | 10 000        | 13" diameter plastic tape and reel |
| V3PL63HM3/H <sup>(1)</sup>            | 0.024           | H                      | 3000          | 7" diameter plastic tape and reel  |
| V3PL63HM3/I <sup>(1)</sup>            | 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)

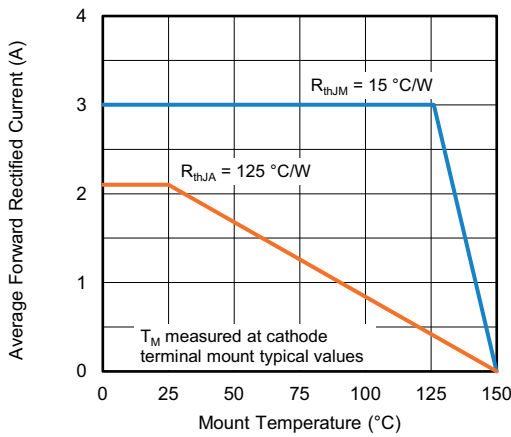


Fig. 1 - Maximum Forward Current Derating Curve

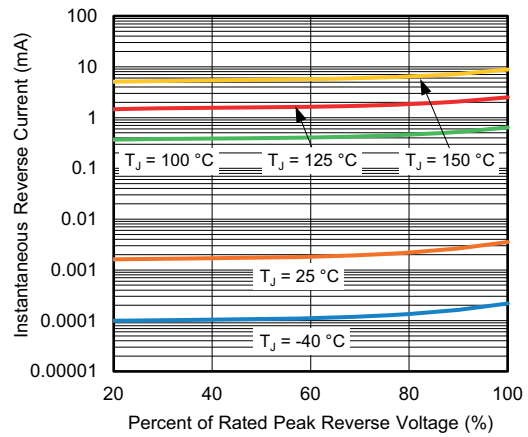


Fig. 4 - Typical Reverse Characteristics

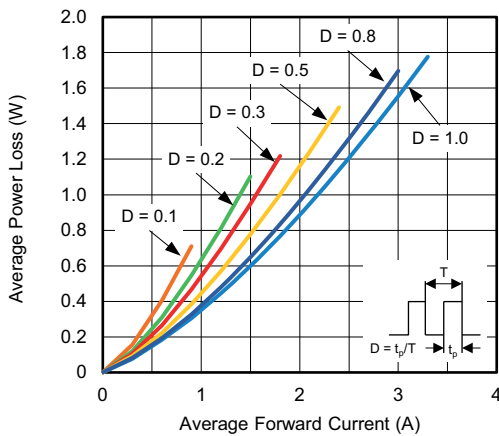


Fig. 2 - Forward Power Loss Characteristics

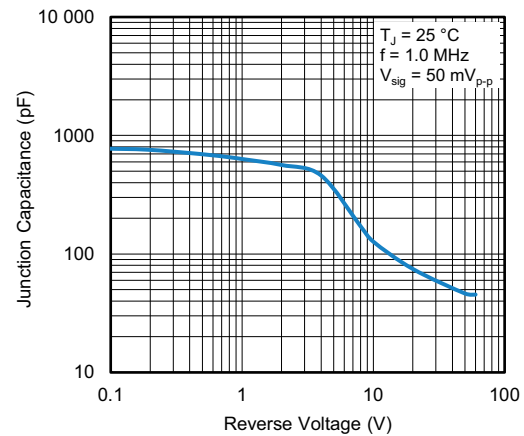


Fig. 5 - Typical Junction Capacitance

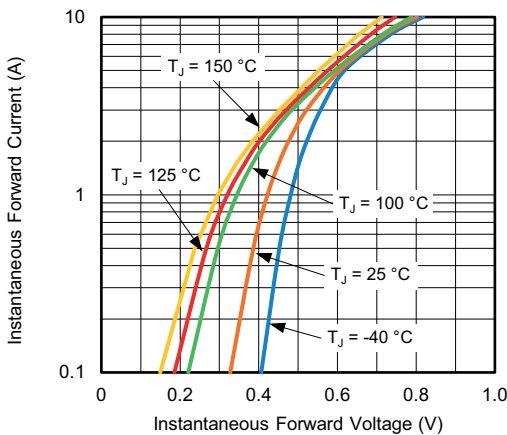


Fig. 3 - Typical Instantaneous Forward Characteristics

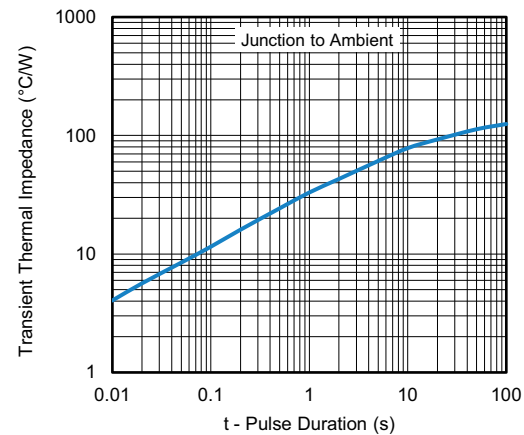
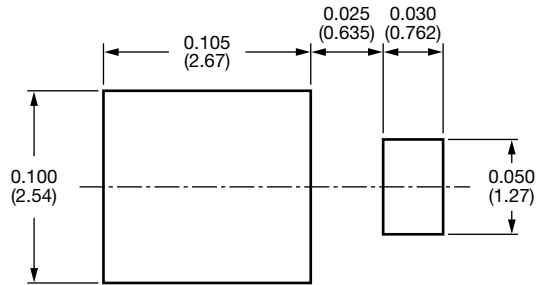
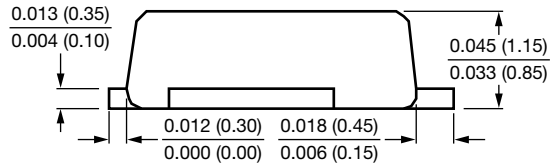
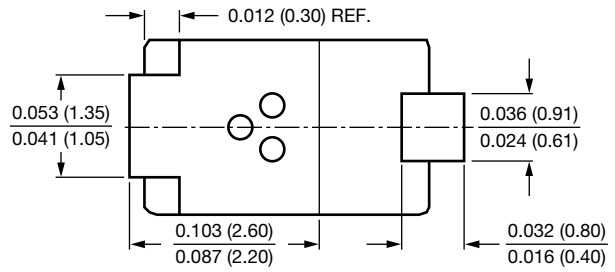
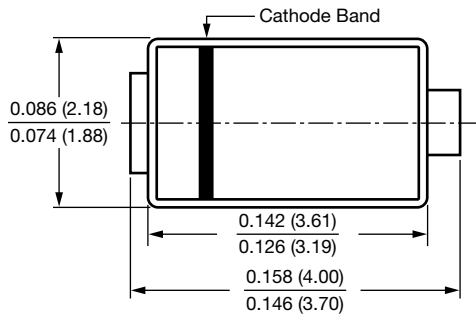


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)





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