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

**eSMP® Series**



**SMP (DO-220AA)**

Cathode ○—◀—○ Anode

## LINKS TO ADDITIONAL RESOURCES

3D Models

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 2.0 A |
| $V_{RRM}$ | 100 V |
| $I_{FSM}$ | 50 A |
| $V_F$ at $I_F$ = 2.0 A | 0.58 V |
| $T_J$ max. | 175 °C |
| Package | SMP (DO-220AA) |
| Circuit configuration | Single |

## FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT HALOGEN FREE

- 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

## 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** | **V2PM10L** | **UNIT** |
| Device marking code | | 2MB | |
| Maximum repetitive peak reverse voltage | $V_{RRM}$ | 100 | V |
| Maximum DC forward current | $I_F$ (1) | 2 | A |
| | $I_F$ (2) | 1.9 | A |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$ | 50 | A |
| Operating junction and storage temperature range | $T_J$ (3) | -40 to +175 | °C |
| Operating junction and storage temperature range | $T_{STG}$ | -55 to +175 | °C |

**Notes**

(1) Mounted on 10 mm x 10 mm copper pad area PCB
(2) Free air, mounted on recommended copper pad area
(3) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$


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| **ELECTRICAL CHARACTERISTICS** ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | | **SYMBOL** | **TYP.** | **MAX.** | **UNIT** |
| Instantaneous forward voltage | $I_F$ = 1.0 A | $T_A$ = 25 °C | $V_F$ (1) | 0.55 | - | V |
| | $I_F$ = 2.0 A | | | 0.66 | 0.74 | |
| | $I_F$ = 1.0 A | $T_A$ = 125 °C | | 0.48 | - | |
| | $I_F$ = 2.0 A | | | 0.58 | 0.65 | |
| Reverse current | $V_R$ = 70 V | $T_A$ = 25 °C | $I_R$ (2) | 0.001 | - | mA |
| | | $T_A$ = 125 °C | | 0.6 | - | |
| | $V_R$ = 100 V | $T_A$ = 25 °C | | - | 0.1 | mA |
| | | $T_A$ = 125 °C | | 1.0 | 3.0 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | $C_J$ | 195 | - | pF |

**Notes**

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: pulse width ≤ 5 ms

| **THERMAL CHARACTERISTICS** ($T_A$ = 25 °C unless otherwise specified) | | | |
|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **V2PM10L** | **UNIT** |
| Typical thermal resistance | $R_{\theta JA}$ (1) | 125 | °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) Units mounted on PCB with specific copper pad areas; $R_{\theta JM}$ - junction-to-mount

| **ORDERING INFORMATION** (Example) | | | | |
|---|---|---|---|---|
| **PREFERRED P/N** | **UNIT WEIGHT (g)** | **PREFERRED PACKAGE CODE** | **BASE QUANTITY** | **DELIVERY MODE** |
| V2PM10L-M3/H | 0.024 | H | 3000 | 7" diameter plastic tape and reel |
| V2PM10L-M3/I | 0.024 | I | 10 000 | 13" diameter plastic tape and reel |
| V2PM10LHM3/H (1) | 0.024 | H | 3000 | 7" diameter plastic tape and reel |
| V2PM10LHM3/I (1) | 0.024 | I | 10 000 | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified


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## RATINGS AND CHARACTERISTICS CURVES ($T_A$ = 25 °C unless otherwise noted)

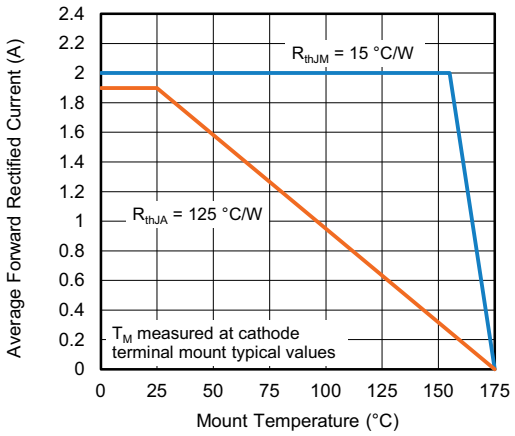



Fig. 1 - Maximum Forward Current Derating Curve

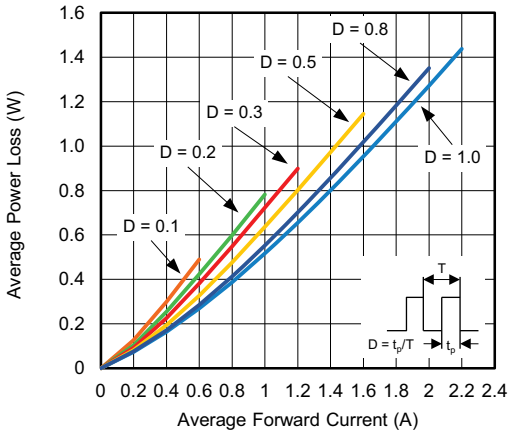



Fig. 2 - Forward Power Loss Characteristics

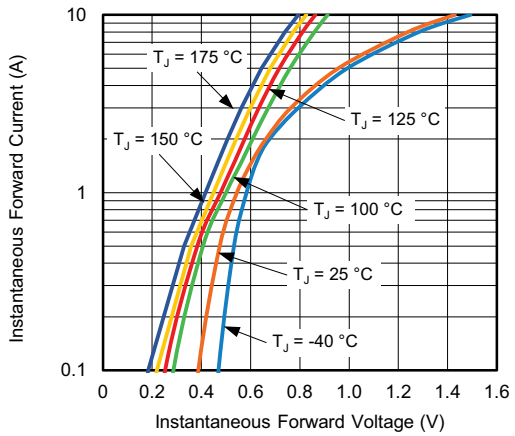



Fig. 3 - Typical Instantaneous Forward Characteristics

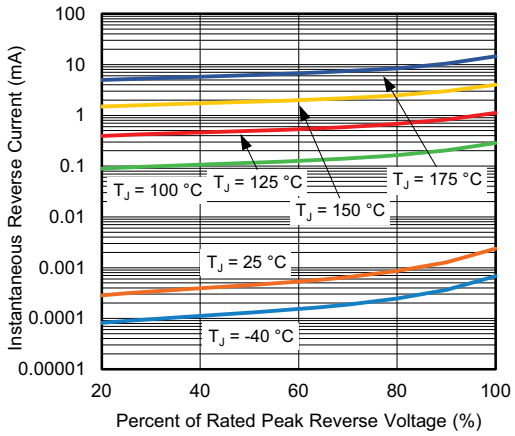



Fig. 4 - Typical Reverse Characteristics

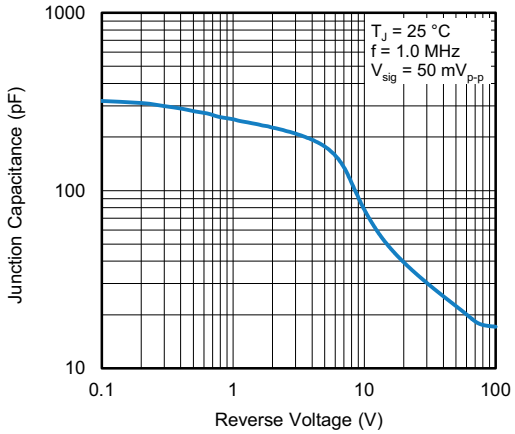



Fig. 5 - Typical Junction Capacitance

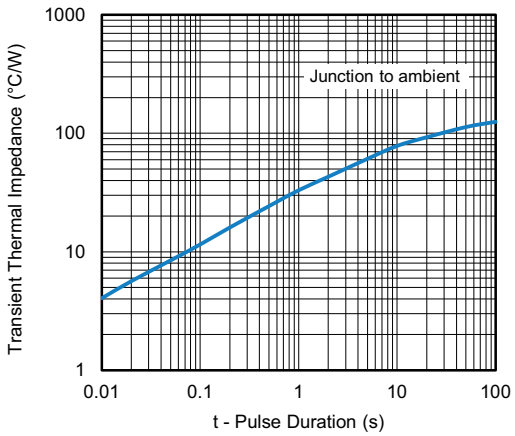
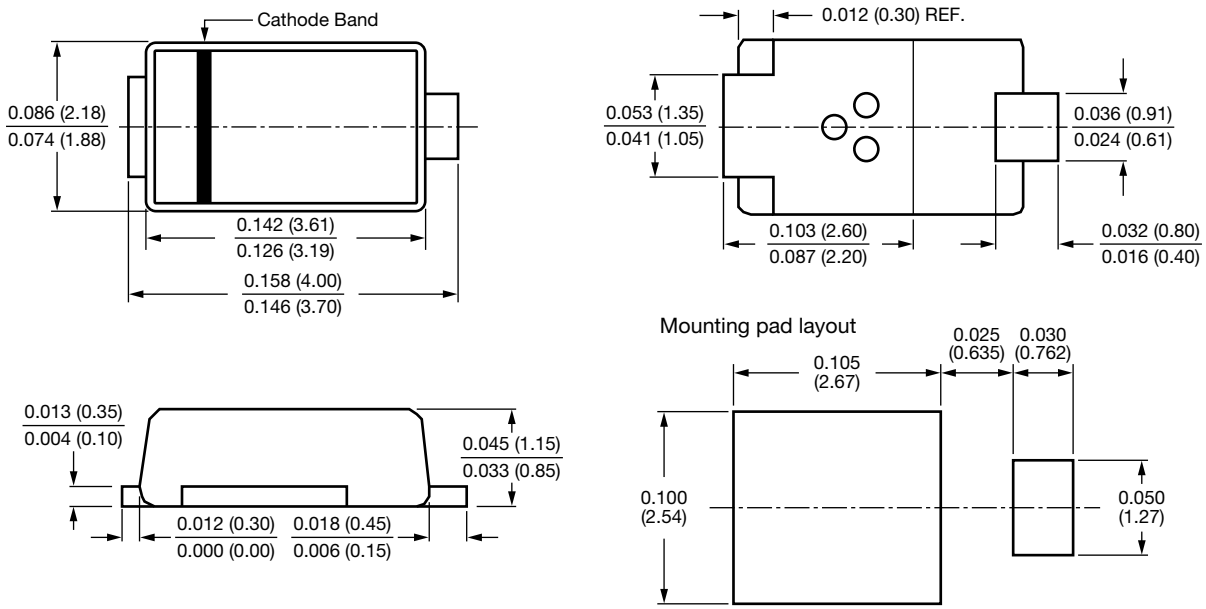



Fig. 6 - Typical Transient Thermal Impedance


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**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

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