# High Current Density Surface Mount Schottky Barrier Rectifiers

**eSMP® Series**

**SMP (DO-220AA)**

Cathode ○—|◀—○ Anode

## FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

## DESIGN SUPPORT TOOLS

click logo to get started

3D Models Available

| PRIMARY CHARACTERISTICS | |
|---|---|
| $I_{F(AV)}$ | 3.0 A |
| $V_{RRM}$ | 30 V |
| $I_{FSM}$ | 50 A |
| $E_{AS}$ | 11.25 mJ |
| $V_F$ | 0.43 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 automotive grade

**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 | SS3P3 | UNIT |
|---|---|---|---|
| Device marking code | | 33 | |
| Maximum repetitive peak reverse voltage | $V_{RRM}$ | 30 | V |
| Maximum average forward rectified current (fig. 1) | $I_{F(AV)}$ | 3.0 | A |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | $I_{FSM}$ | 50 | A |
| Non-repetitive avalanche energy at $T_J$ = 25 °C, $I_{AS}$ = 1.5 A, L = 10 mH | $E_{AS}$ | 11.25 | mJ |
| Voltage rate of change (rated $V_R$) | dV/dt | 10 000 | V/µs |
| Operating junction and storage temperature range | $T_J$, $T_{STG}$ | -55 to +150 | °C |

| **ELECTRICAL CHARACTERISTICS** ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | | **SYMBOL** | **TYP.** | **MAX.** | **UNIT** |
| Maximum instantaneous forward voltage | $I_F$ = 3 A | $T_J$ = 25 °C | $V_F$ (1) | 0.52 | 0.58 | V |
| | $I_F$ = 3 A | $T_J$ = 125 °C | | 0.43 | 0.48 | |
| Maximum reverse current at rated $V_R$ | | $T_J$ = 25 °C | $I_R$ (2) | - | 200 | µA |
| | | $T_J$ = 125 °C | | 9.0 | 20 | mA |
| Typical junction capacitance | 4.0 V, 1 MHz | | $C_J$ | 130 | | pF |

**Notes**

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

(2) Pulse test: Pulse width ≤ 40 ms

| **THERMAL CHARACTERISTICS** ($T_A$ = 25 °C unless otherwise specified) | | | |
|---|---|---|---|
| **PARAMETER** | **SYMBOL** | **SS3P3** | **UNIT** |
| Typical thermal resistance (1) | $R_{\theta JA}$ (1) | 95 | °C/W |
| | $R_{\theta JL}$ (1) | 15 | |
| | $R_{\theta JC}$ (1) | 20 | |

**Note**

(1) Thermal resistance from junction to ambient and junction to lead mounted on PCB with 5.0 mm x 5.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top center of the body

| **ORDERING INFORMATION** (Example) | | | | |
|---|---|---|---|---|
| **PREFERRED P/N** | **UNIT WEIGHT (g)** | **PREFERRED PACKAGE CODE** | **BASE QUANTITY** | **DELIVERY MODE** |
| SS3P3-M3/84A | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel |
| SS3P3-M3/85A | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel |
| SS3P3HM3/84A (1) | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel |
| SS3P3HM3/85A (1) | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel |

**Note**

(1) Automotive grade

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

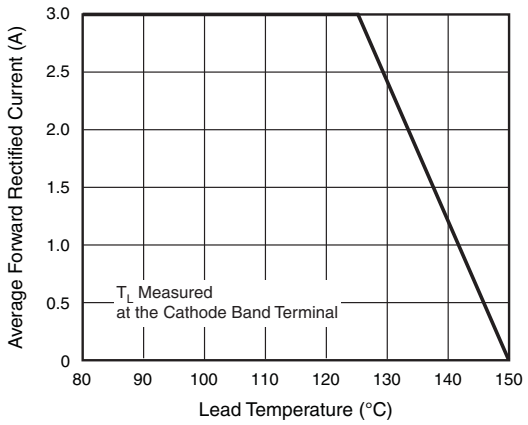



Fig. 1 - Forward Current Derating Curve

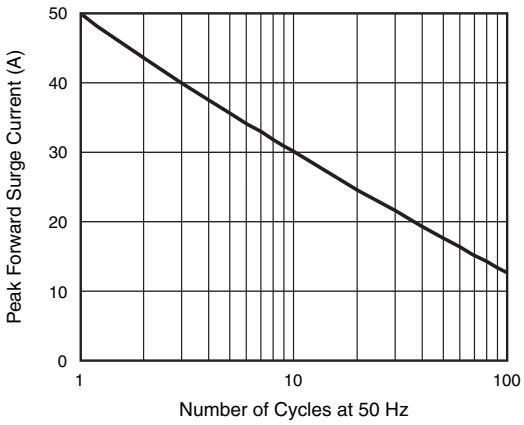



Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

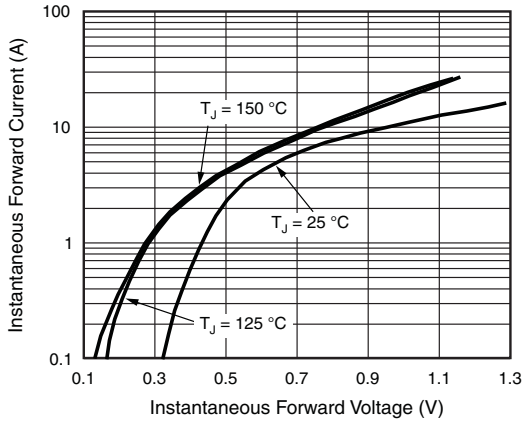



Fig. 3 - Typical Instantaneous Forward Characteristics

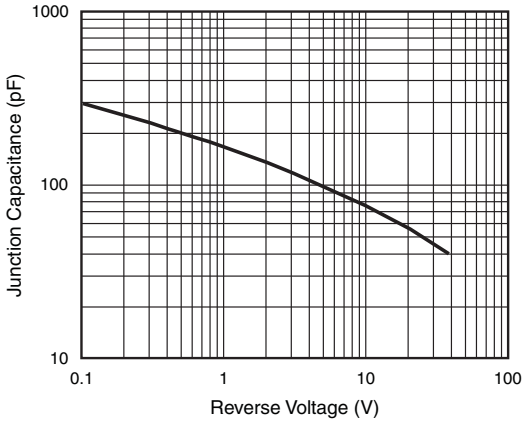



Fig. 5 - Typical Junction Capacitance

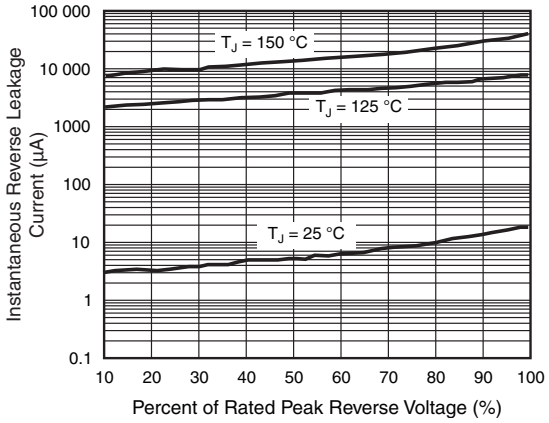



Fig. 4 - Typical Reverse Leakage Characteristics

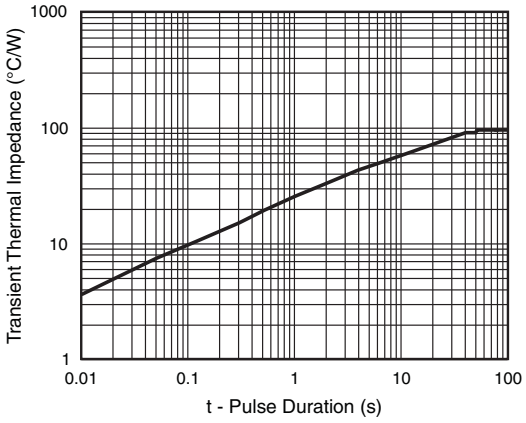
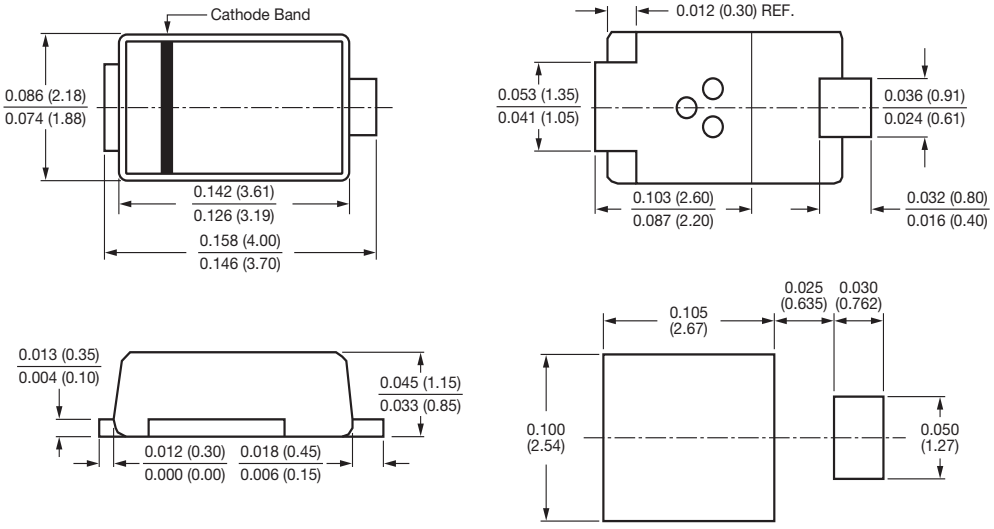



Fig. 6 - Typical Transient Thermal Impedance

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

**SMP (DO-220AA)**



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