

## High Current Density Surface-Mount Schottky Barrier Rectifiers

### eSMP® Series


**SMP (DO-220AA)**

Cathode Anode

### LINKS TO ADDITIONAL RESOURCES



| 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         |

### 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 available
- 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**

### 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 ( $T_A = 25\text{ °C}$ 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 $T_J = 25\text{ °C}$ , $I_{AS} = 1.5\text{ A}$ , $L = 10\text{ mH}$ | $E_{AS}$       | 11.25       | mJ         |
| Voltage rate of change (rated $V_R$ )  | $dV/dt$        | 10 000      | V/ $\mu$ s |
| Operating junction and storage temperature range   | $T_J, T_{STG}$ | -55 to +150 | °C         |



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

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle  
(2) Pulse test: Pulse width  $\leq 40\text{ ms}$

| THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise specified) |                       |       |                    |
|--|-----------------------|-------|--------------------|
| PARAMETER  | SYMBOL                | SS3P3 | UNIT               |
| Typical thermal resistance <sup>(1)</sup>  | $R_{\theta JA}^{(1)}$ | 95    | $^\circ\text{C/W}$ |
|  | $R_{\theta JL}^{(1)}$ | 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 <sup>(1)</sup>    | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |
| SS3P3HM3/85A <sup>(1)</sup>    | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |

**Note**

- (1) Automotive grade

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

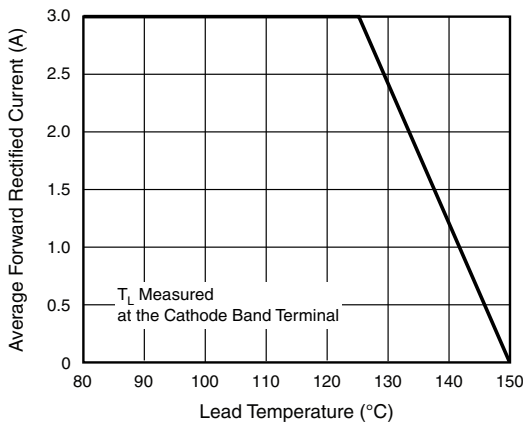


Fig. 1 - Forward Current Derating Curve

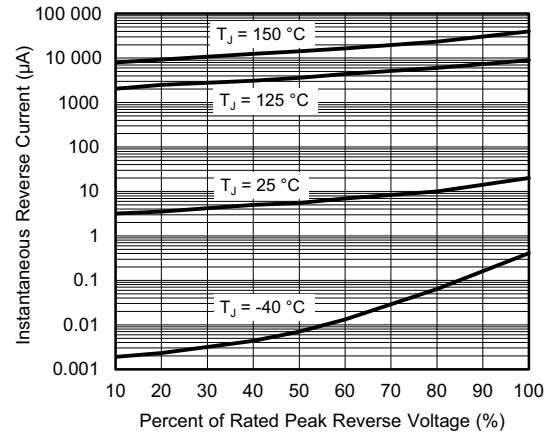


Fig. 4 - Typical Reverse Leakage Characteristics

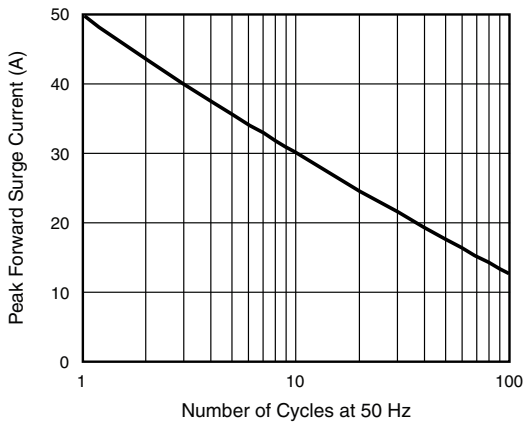


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

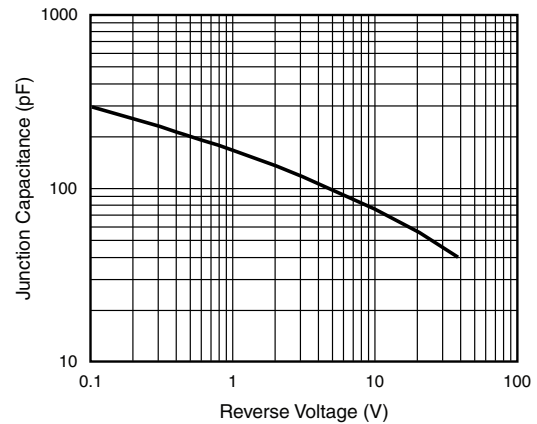


Fig. 5 - Typical Junction Capacitance

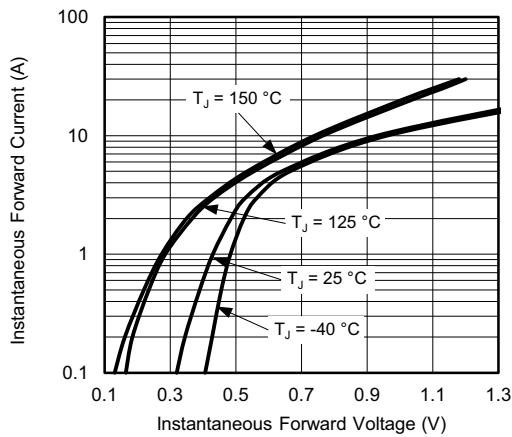


Fig. 3 - Typical Instantaneous Forward Characteristics

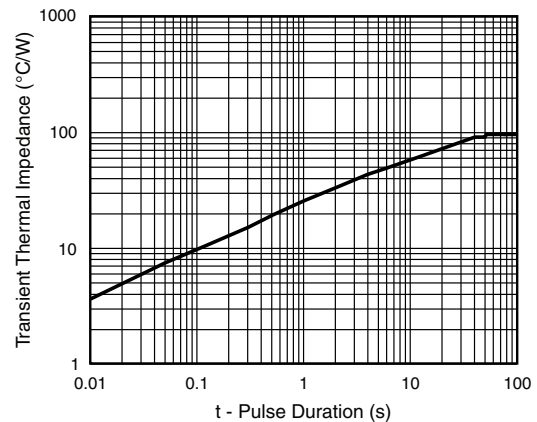
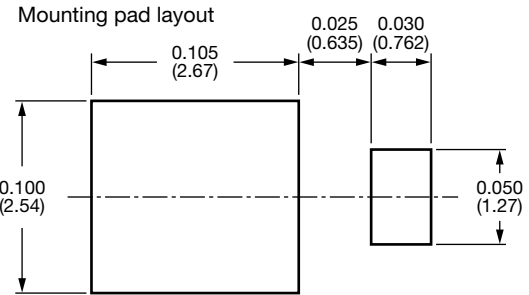
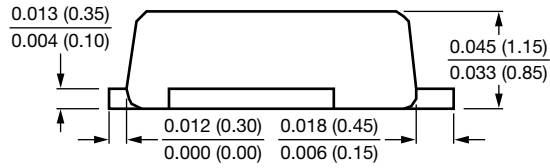
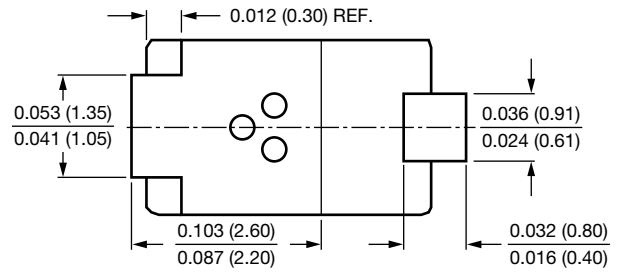
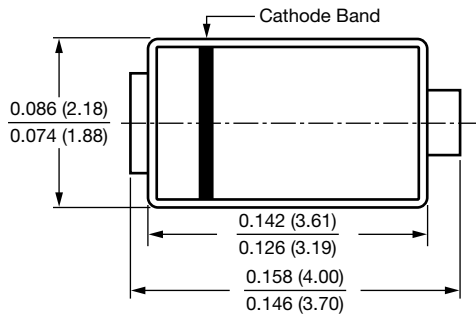


Fig. 6 - Typical Transient Thermal Impedance

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

**SMP (DO-220AA)**





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