

## High Current Density Surface-Mount Schottky Barrier Rectifiers

### eSMP® Series


**SMP (DO-220AA)**

Cathode  Anode

### LINKS TO ADDITIONAL RESOURCES



3D Models

#### PRIMARY CHARACTERISTICS

|                       |                |
|-----------------------|----------------|
| $I_{F(AV)}$           | 1.0 A          |
| $V_{RRM}$             | 30 V, 40 V     |
| $I_{FSM}$             | 30 A           |
| $E_{AS}$              | 10 mJ          |
| $V_F$                 | 0.40 V, 0.45 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
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT  
HALOGEN  
FREE

### TYPICAL APPLICATIONS

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

#### Note

- These devices are not AEC-Q101 qualified

### 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

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 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         | SS1P3       | SS1P4 | UNIT       |
|--------------------------------------------------------------------------------------------------------|----------------|-------------|-------|------------|
| Device marking code                                                                                    |                | 13          | 14    |            |
| Maximum repetitive peak reverse voltage                                                                | $V_{RRM}$      | 30          | 40    | V          |
| Maximum average forward rectified current (fig. 1)                                                     | $I_{F(AV)}$    | 1.0         |       | A          |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load                      | $I_{FSM}$      | 30          |       | A          |
| Non-repetitive avalanche energy at $T_J = 25\text{ °C}$ , $I_{AS} = 1.5\text{ A}$ , $L = 10\text{ mH}$ | $E_{AS}$       | 10          |       | 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 ( $T_A = 25\text{ °C}$ unless otherwise noted)

| PARAMETER                              | TEST CONDITIONS       | SYMBOL      | SS1P3 | SS1P4 | UNIT    |
|----------------------------------------|-----------------------|-------------|-------|-------|---------|
| Maximum instantaneous forward voltage  | $I_F = 1.0\text{ A}$  | $V_F^{(1)}$ | 0.50  | 0.53  | V       |
|                                        | $T_J = 125\text{ °C}$ |             | 0.40  | 0.45  |         |
| Maximum reverse current at rated $V_R$ | $T_J = 25\text{ °C}$  | $I_R^{(2)}$ | 150   |       | $\mu$ A |
|                                        | $T_J = 125\text{ °C}$ |             | 15    |       | mA      |
| Typical junction capacitance           | 4.0 V, 1 MHz          | $C_J$       | 70    |       | pF      |

#### Notes

<sup>(1)</sup> Pulse test: 300  $\mu$ s pulse width, 1 % duty cycle

<sup>(2)</sup> Pulse test: Pulse width  $\leq 40\text{ ms}$

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise specified) |                       |       |       |                      |
|-------------------------------------------------------------------------------------------------|-----------------------|-------|-------|----------------------|
| PARAMETER                                                                                       | SYMBOL                | SS1P3 | SS1P4 | UNIT                 |
| Typical thermal resistance                                                                      | $R_{\theta JA}^{(1)}$ | 105   |       | $^{\circ}\text{C/W}$ |
|                                                                                                 | $R_{\theta JL}^{(1)}$ | 15    |       |                      |
|                                                                                                 | $R_{\theta JC}^{(1)}$ | 25    |       |                      |

**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

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| SS1P3-M3/84A                          | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |
| SS1P3-M3/85A                          | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |

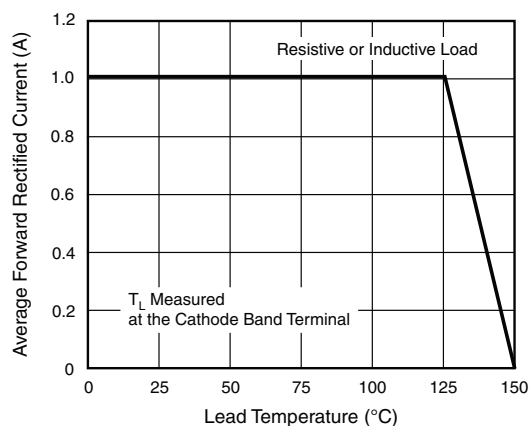
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

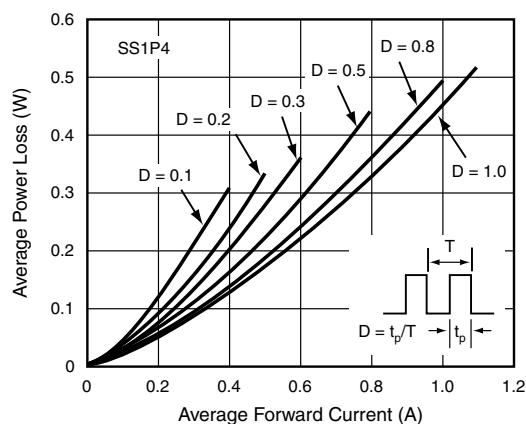


Fig. 3 - Forward Power Loss Characteristics

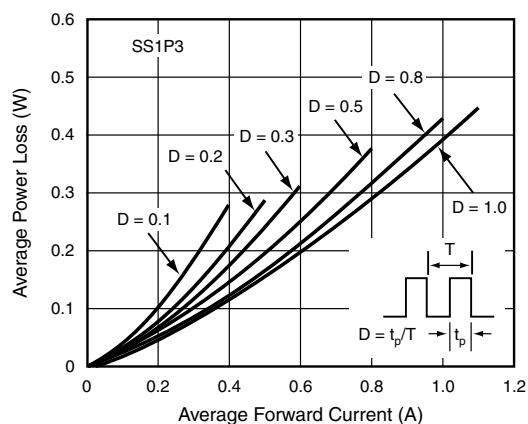


Fig. 2 - Forward Power Loss Characteristics

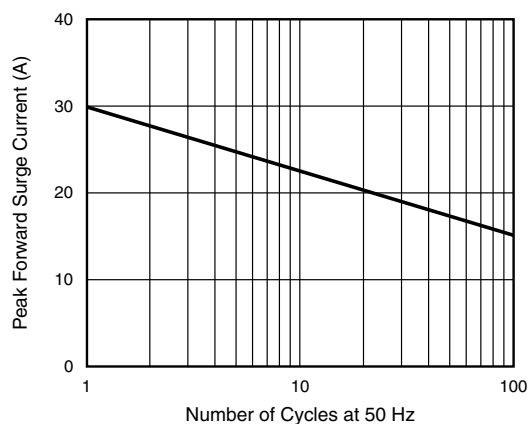


Fig. 4 - Typical Instantaneous Forward Characteristics

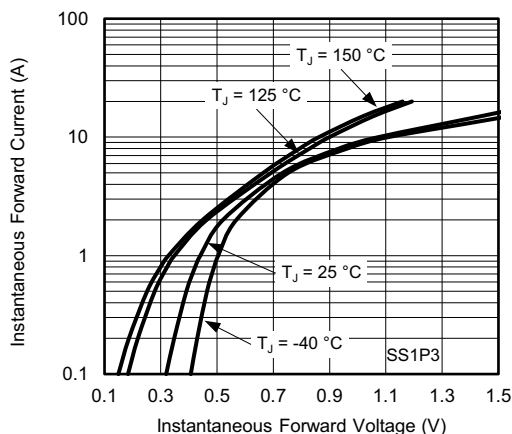


Fig. 5 - Typical Instantaneous Forward Characteristics

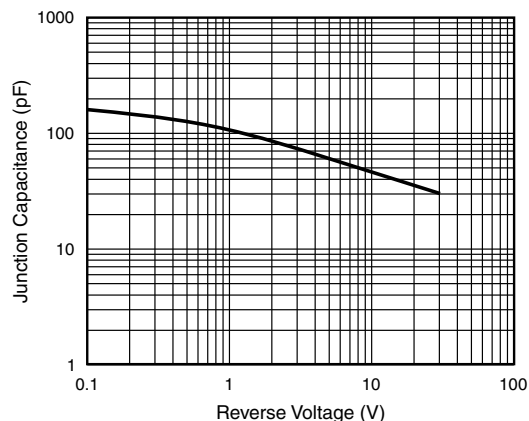


Fig. 8 - Typical Junction Capacitance

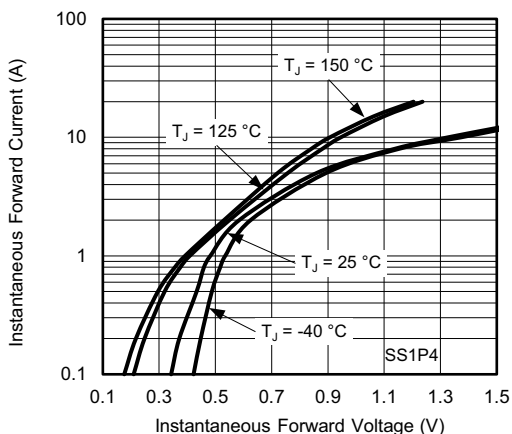


Fig. 6 - Typical Instantaneous Forward Characteristics

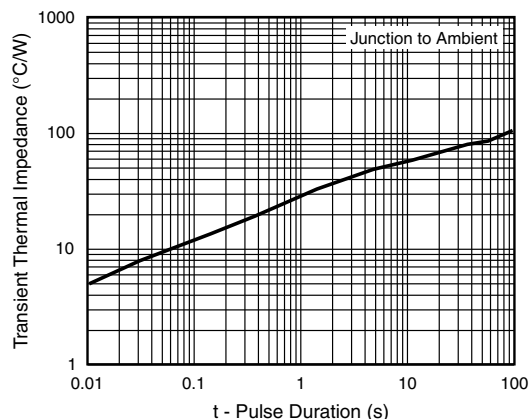


Fig. 9 - Typical Transient Thermal Impedance

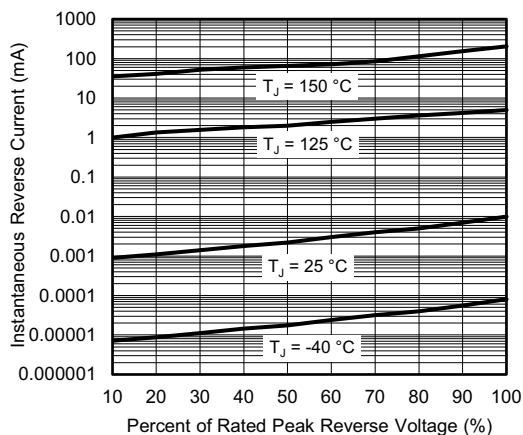
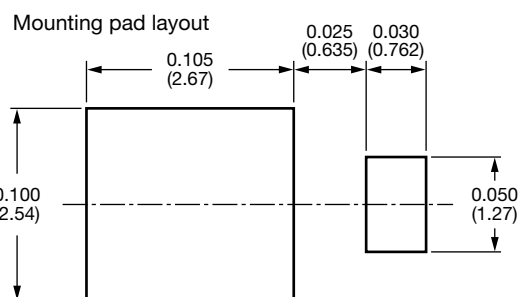
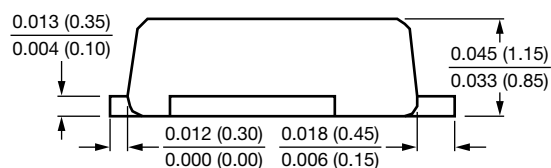
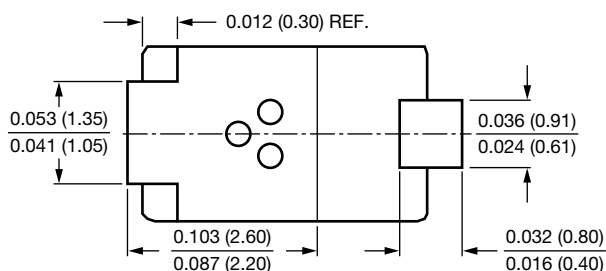
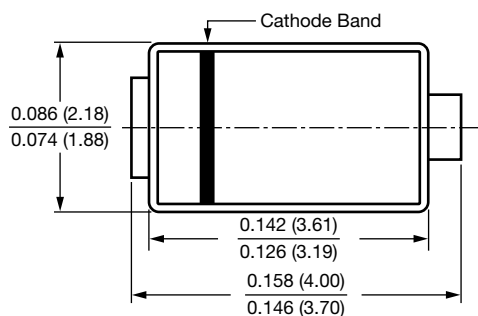


Fig. 7 - Typical Reverse Leakage Characteristics



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)





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