

High Current Density Surface-Mount Schottky Barrier Rectifiers

eSMP® Series

SMP (DO-220AA)

Cathode Anode

LINKS TO ADDITIONAL RESOURCES

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


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

| 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 |

| 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/ μ 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 | $I_F = 1.0\text{ A}$ | $V_F^{(1)}$ | $T_J = 25\text{ °C}$ | 0.50 | V |
| | | | $T_J = 125\text{ °C}$ | 0.40 | |
| Maximum reverse current at rated V_R | | $I_R^{(2)}$ | $T_J = 25\text{ °C}$ | 150 | |
| | | | $T_J = 125\text{ °C}$ | 15 | |
| Typical junction capacitance | 4.0 V, 1 MHz | C_J | 70 | | pF |

Notes

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

 (2) Pulse test: Pulse width \leq 40 ms

| THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ 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

| ORDERING INFORMATION (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 |

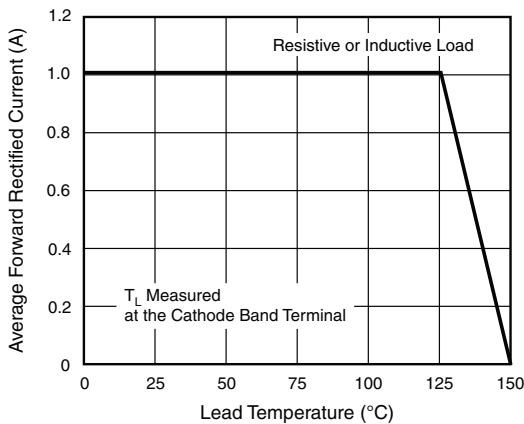
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

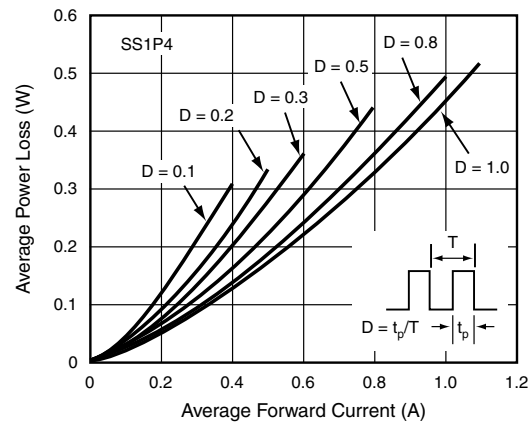


Fig. 3 - Forward Power Loss Characteristics

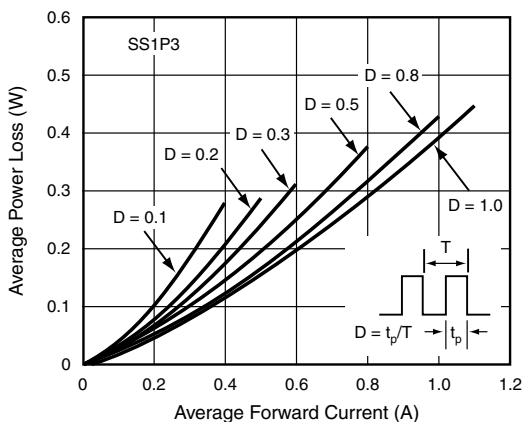


Fig. 2 - Forward Power Loss Characteristics

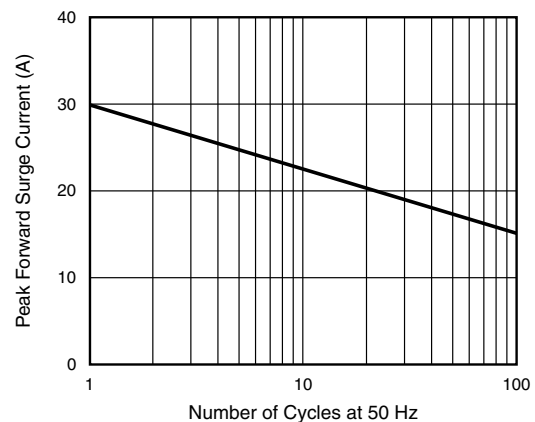


Fig. 4 - Typical Instantaneous Forward Characteristics

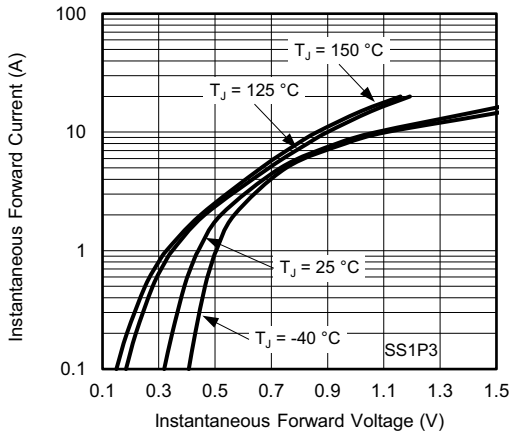


Fig. 5 - Typical Instantaneous Forward Characteristics

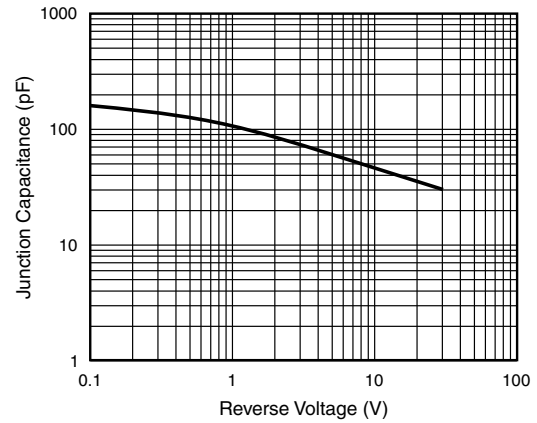


Fig. 8 - Typical Junction Capacitance

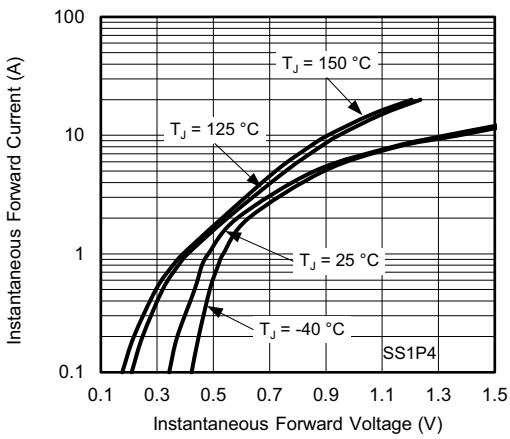


Fig. 6 - Typical Instantaneous Forward Characteristics

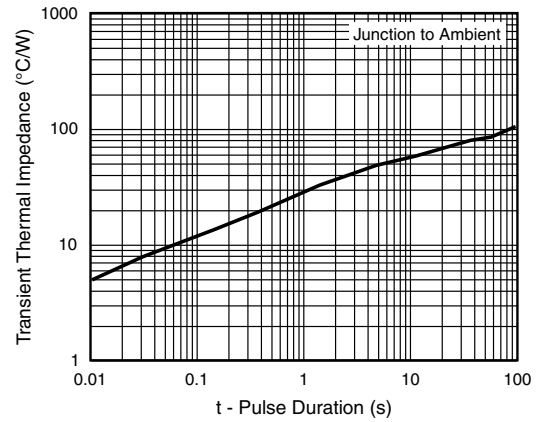


Fig. 9 - Typical Transient Thermal Impedance

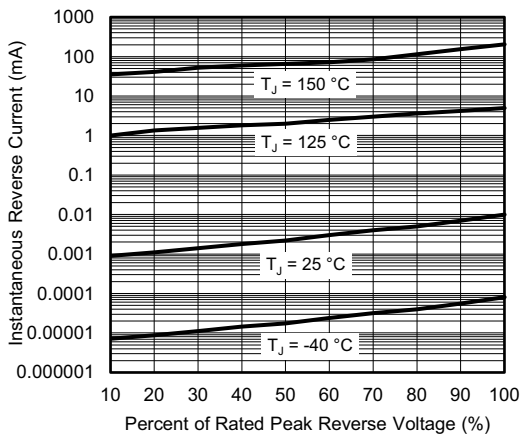
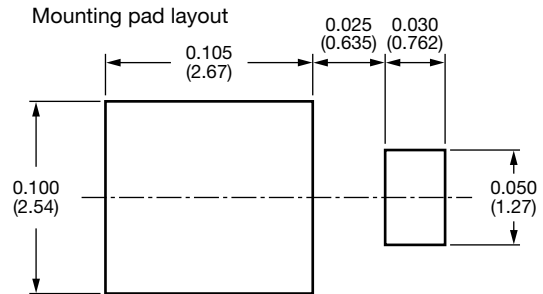
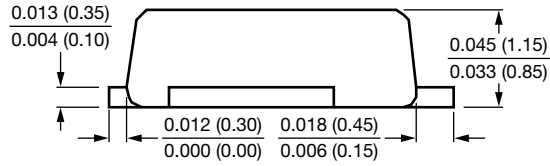
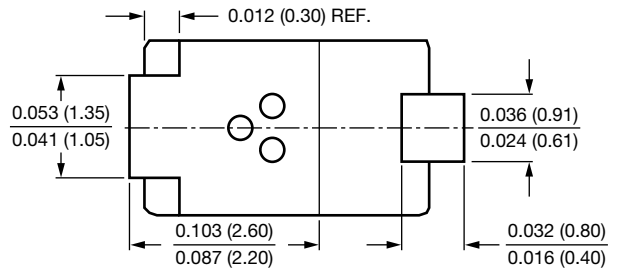
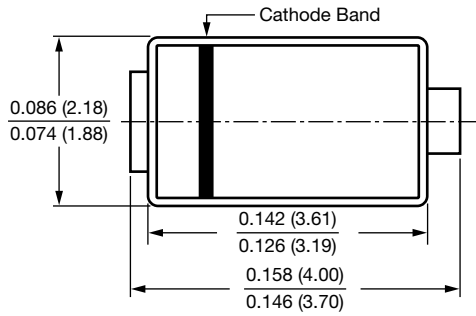


Fig. 7 - Typical Reverse Leakage Characteristics



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)





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