

# High Current Density Surface-Mount Schottky Rectifier

## 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 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**

## LINKS TO ADDITIONAL RESOURCES



| PRIMARY CHARACTERISTICS |                |
|-------------------------|----------------|
| $I_{F(AV)}$             | 3.0 A          |
| $V_{RRM}$               | 50 V, 60 V     |
| $I_{FSM}$               | 45 A           |
| $E_{AS}$                | 11.25 mJ       |
| $V_F$ at $I_F = 3.0$ A  | 0.61 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 cathode end

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)                            |                |             |       |            |
|------------------------------------------------------------------------------------|----------------|-------------|-------|------------|
| PARAMETER                                                                          | SYMBOL         | SS3P5       | SS3P6 | UNIT       |
| Device marking code                                                                |                | 35          | 36    |            |
| Maximum repetitive peak reverse voltage                                            | $V_{RRM}$      | 50          | 60    | 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 | $I_{FSM}$      | 45          |       | 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/ $\mu$ 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  | $I_F = 3\text{ A}$ | $V_F^{(1)}$ | 0.71 | 0.78 | V             |
|                                        |                    |             | 0.61 | 0.65 |               |
| Maximum reverse current at rated $V_R$ |                    | $I_R^{(2)}$ | -    | 100  | $\mu\text{A}$ |
|                                        |                    |             | 2.0  | 10   | mA            |
| Typical junction capacitance           | 4.0 V, 1 MHz       | $C_J$       | 80   |      | 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                | SS3P6 | UNIT                 |
|-------------------------------------------|-----------------------|-------|----------------------|
| Typical thermal resistance <sup>(1)</sup> | $R_{\theta JA}^{(1)}$ | 115   | $^{\circ}\text{C/W}$ |
|                                           | $R_{\theta JL}^{(1)}$ | 15    |                      |
|                                           | $R_{\theta JC}^{(1)}$ | 20    |                      |

**Note**(1) Thermal resistance from junction to ambient and junction to lead mounted on PCB with 15 mm x 15 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                      |
|-----------------------------|-----------------|------------------------|---------------|------------------------------------|
| SS3P6-M3/84A                | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |
| SS3P6-M3/85A                | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |
| SS3P6HM3/84A <sup>(1)</sup> | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |
| SS3P6HM3/85A <sup>(1)</sup> | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |

**Note**

(1) Automotive grade

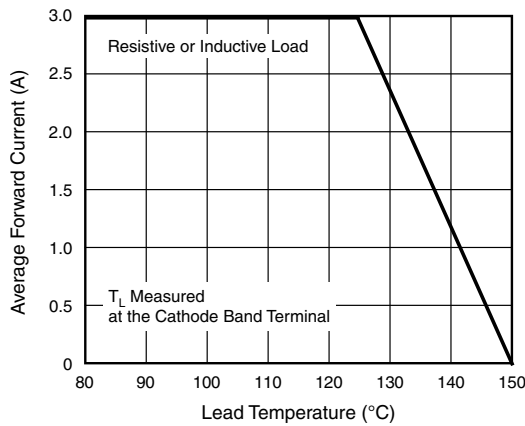
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)


Fig. 1 - Forward Current Derating Curve

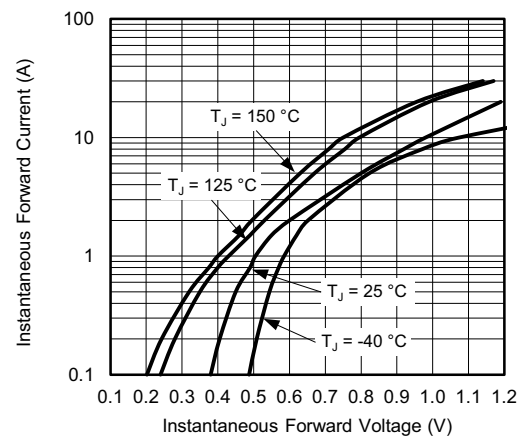


Fig. 4 - Typical Instantaneous Forward Characteristics

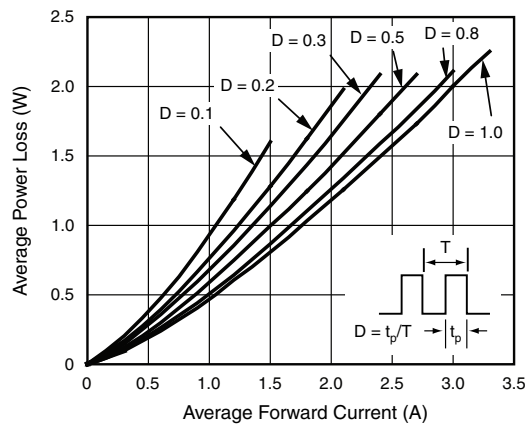


Fig. 2 - Forward Power Loss Characteristics

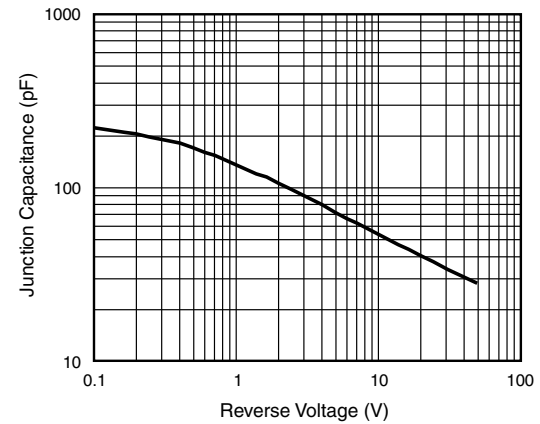


Fig. 5 - Typical Junction Capacitance

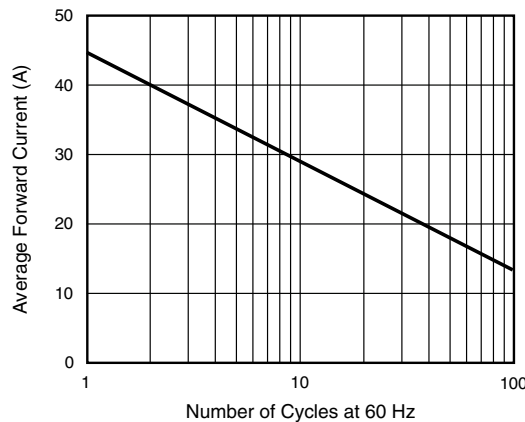


Fig. 3 - Maximum Non-Repetitive Peak Forward Surge Current

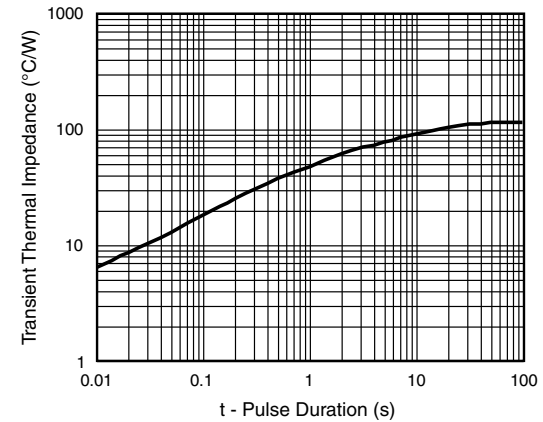


Fig. 6 - Typical Transient Thermal Impedance

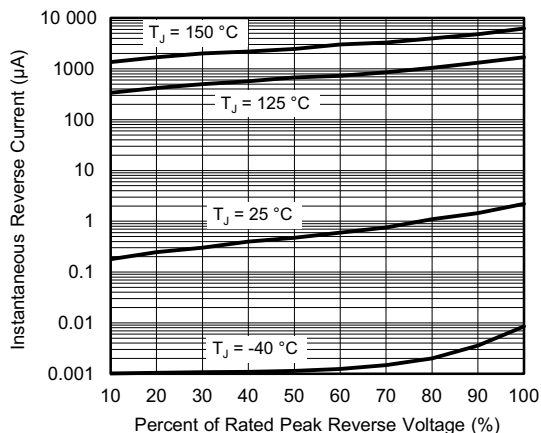
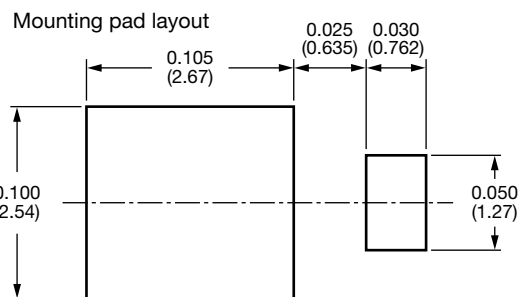
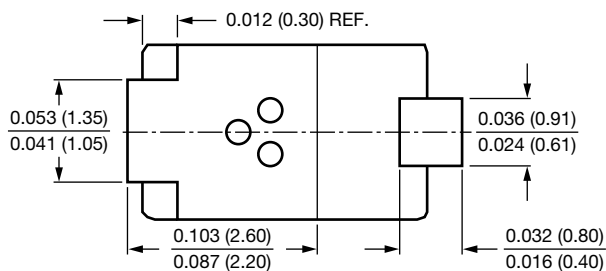
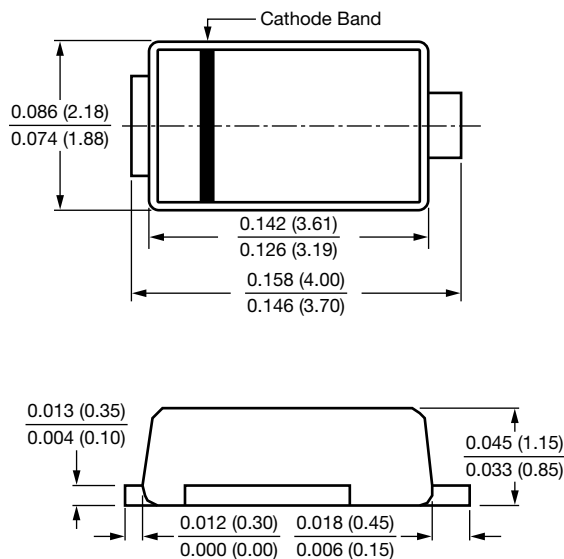


Fig. 7 - Typical Reverse Leakage Characteristics

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

**SMP (DO-220AA)**




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