

## High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP® Series



DO-220AA (SMP)

### PRIMARY CHARACTERISTICS

|                  |            |
|------------------|------------|
| $I_{F(AV)}$      | 2.0 A      |
| $V_{RRM}$        | 50 V, 60 V |
| $I_{FSM}$        | 50 A       |
| $E_{AS}$         | 11.25 mJ   |
| $V_F$            | 0.54 V     |
| $T_J$ max.       | 150 °C     |
| Package          | DO-220AA   |
| Diode variations | Single     |

### FEATURES

- Very low profile - typical height of 1.1 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](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:** DO-220AA (SMP)

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         | SS2P5       | SS2P6 | UNIT       |
|-----------------------------------------------------------------------------------|----------------|-------------|-------|------------|
| Device marking code                                                               |                | 25          | 26    |            |
| Maximum repetitive peak reverse voltage                                           | $V_{RRM}$      | 50          | 60    | V          |
| Maximum average forward rectified current (fig. 1)                                | $I_{F(AV)}$    | 2.0         |       | A          |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$      | 50          |       | A          |
| Non-repetitive avalanche energy at $I_{AS} = 1.5$ A, $L = 10$ mH, $T_J = 25$ °C   | $E_{AS}$       | 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. |
| Maximum instantaneous forward voltage                                                   | $I_F = 2\text{ A}$ | $T_J = 25\text{ }^{\circ}\text{C}$  | $V_F^{(1)}$ | 0.62 | 0.70 |
|                                                                                         | $I_F = 2\text{ A}$ | $T_J = 125\text{ }^{\circ}\text{C}$ |             | 0.54 | 0.60 |
| Maximum reverse current at rated $V_R$                                                  |                    | $T_J = 25\text{ }^{\circ}\text{C}$  | $I_R^{(2)}$ | -    | 100  |
|                                                                                         |                    | $T_J = 125\text{ }^{\circ}\text{C}$ |             | 1.6  | 10   |
| 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 <sub>A</sub> = 25 °C unless otherwise specified) |                                 |       |       |      |
|-----------------------------------------------------------------------------|---------------------------------|-------|-------|------|
| PARAMETER                                                                   | SYMBOL                          | SS2P5 | SS2P6 | UNIT |
| Typical thermal resistance                                                  | R <sub>θJA</sub> <sup>(1)</sup> | 115   |       | °C/W |
|                                                                             | R <sub>θJL</sub> <sup>(1)</sup> | 15    |       |      |
|                                                                             | R <sub>θJC</sub> <sup>(1)</sup> | 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                      |
| SS2P5-M3/84A                   | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |
| SS2P5-M3/85A                   | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |
| SS2P5HM3/84A <sup>(1)</sup>    | 0.024           | 84A                    | 3000          | 7" diameter plastic tape and reel  |
| SS2P5HM3/85A <sup>(1)</sup>    | 0.024           | 85A                    | 10 000        | 13" diameter plastic tape and reel |

**Note**

(1) Automotive grade

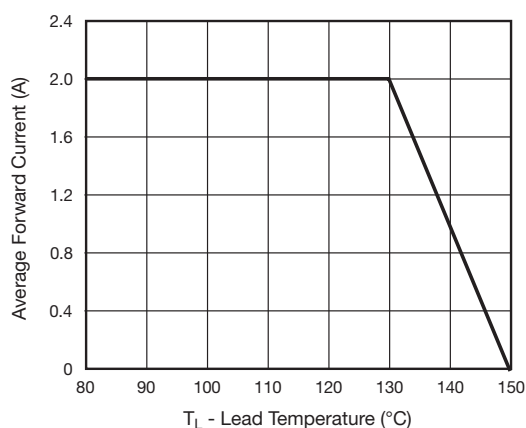
**RATINGS AND CHARACTERISTICS CURVES ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)**

Fig. 1 - Forward Current Derating Curve

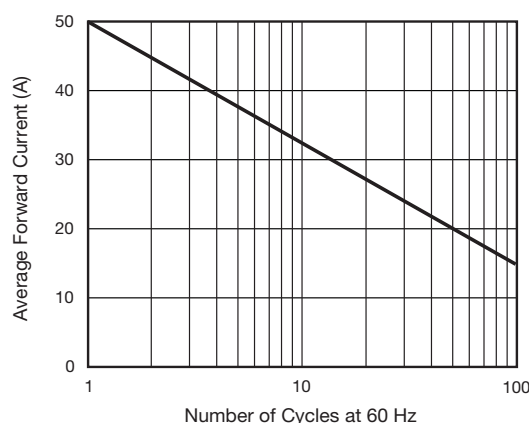


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

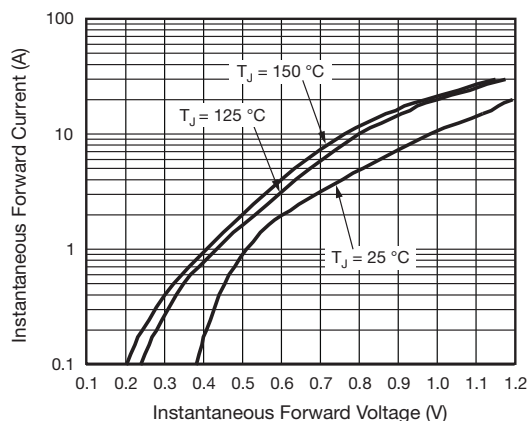


Fig. 3 - Typical Instantaneous Forward Characteristics

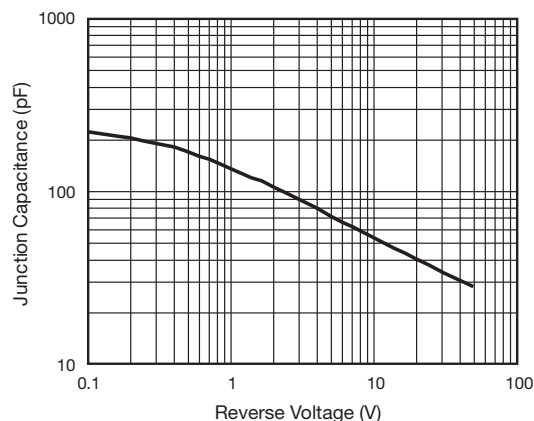


Fig. 5 - Typical Junction Capacitance

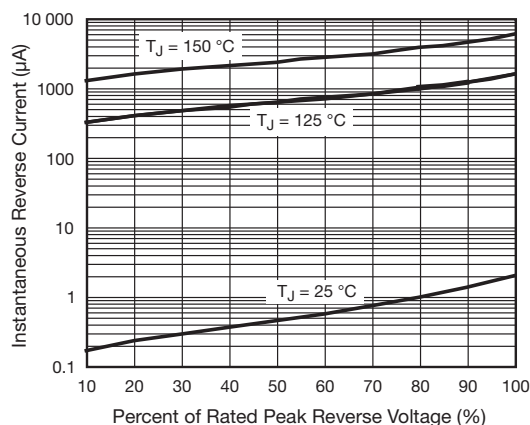


Fig. 4 - Typical Reverse Leakage Characteristics

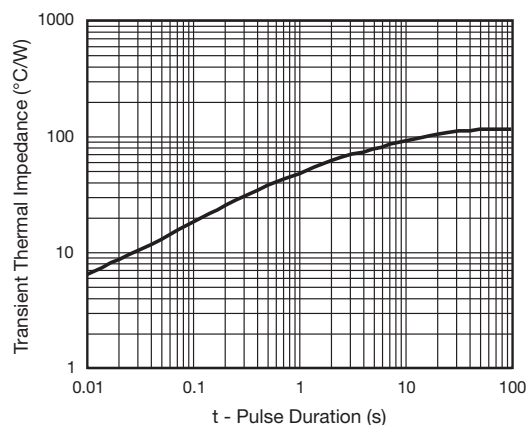
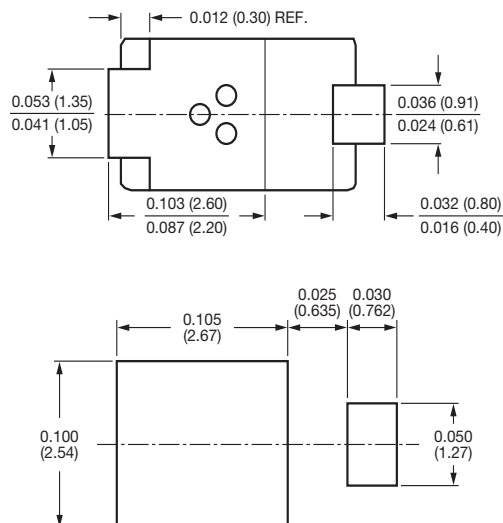
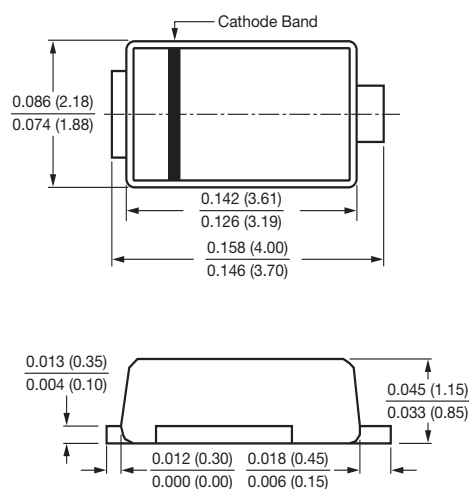


Fig. 6 - Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS IN INCHES (millimeters)

### DO-220AA (SMP)





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