

High Current Density Surface Mount Schottky Barrier Rectifiers

eSMP™ Series



DO-220AA (SMP)

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
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, dc-to-dc converters, and polarity protection applications.

(Note: These devices are not Q101 qualified.)

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test

Polarity: Color band denotes the cathode end

| PRIMARY CHARACTERISTICS | |
|-------------------------|----------------|
| $I_{F(AV)}$ | 1 A |
| V_{RRM} | 30 V, 40 V |
| I_{FSM} | 30 A |
| E_{AS} | 10 mJ |
| V_F | 0.40 V, 0.45 V |
| $T_J \text{ max.}$ | 150 °C |

| 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 $I_{AS} = 1.5\text{ A}$, $L = 10\text{ mH}$, $T_J = 25\text{ °C}$ | 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 ⁽¹⁾ | $I_F = 1.0\text{ A}$ $I_F = 1.0\text{ A}$ | $T_J = 25\text{ °C}$ $T_J = 125\text{ °C}$ | V_F | 0.50 0.40 | 0.53 0.45 | V |
| Maximum reverse current at rated V_R ⁽²⁾ | | $T_J = 25\text{ °C}$ $T_J = 125\text{ °C}$ | I_R | 150 15 | | μ A mA |
| 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 °C unless otherwise noted) | | | | |
|---|------------------|-------|-------|------|
| PARAMETER | SYMBOL | SS1P3 | SS1P4 | UNIT |
| Typical thermal resistance ⁽¹⁾ | R _{θJA} | 105 | | °C/W |
| | R _{θJL} | 15 | | |
| | R _{θJC} | 25 | | |

Note:

(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 x 5.0 mm copper pad areas R_{θJL} is measured at the terminal of cathode band. R_{θJC} is measured at the top centre of the body

| ORDERING INFORMATION (Example) | | | | |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| SS1P3-E3/84A | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel |
| SS1P3-E3/85A | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel |

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

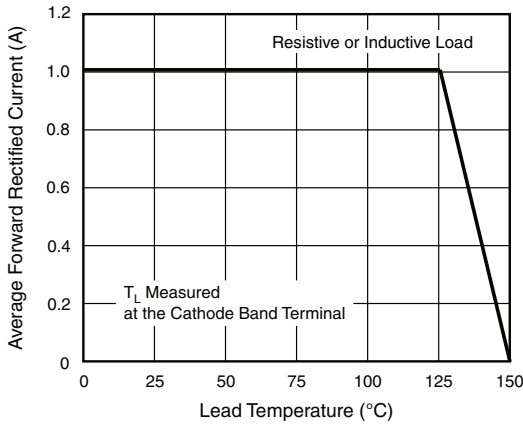


Figure 1. Maximum Forward Current Derating Curve

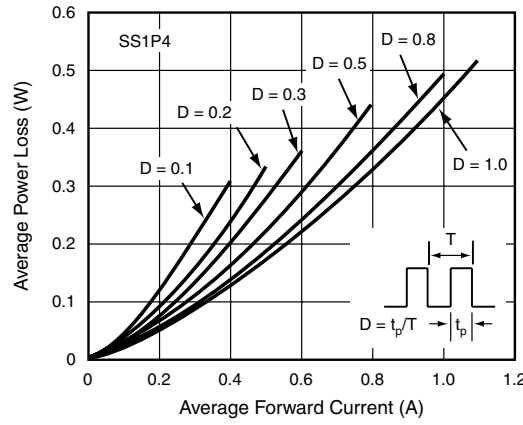


Figure 3. Forward Power Loss Characteristics

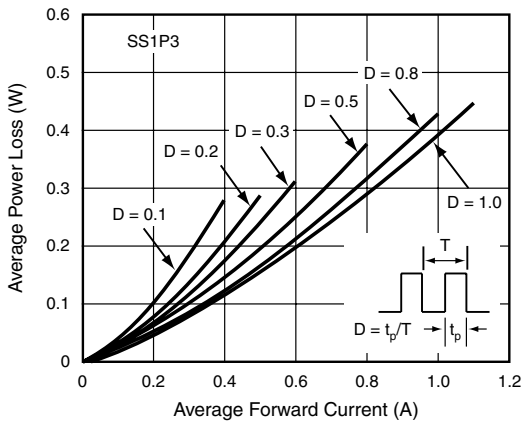


Figure 2. Forward Power Loss Characteristics

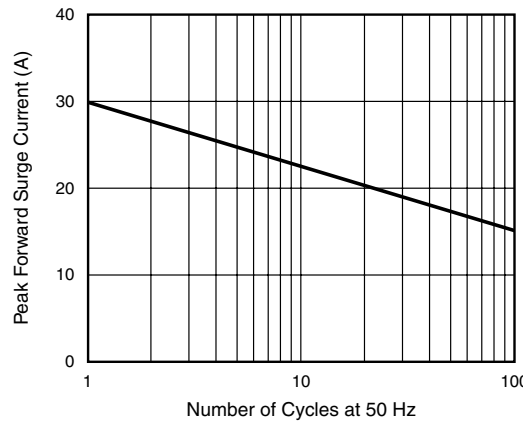


Figure 4. Typical Instantaneous Forward Characteristics

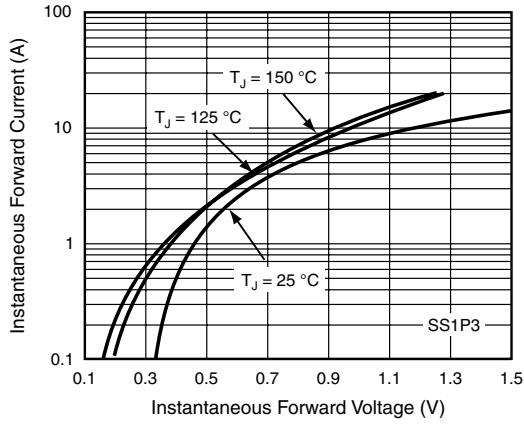


Figure 5. Typical Instantaneous Forward Characteristics

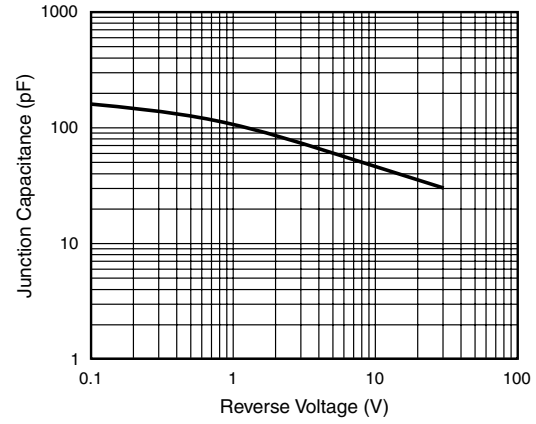


Figure 8. Typical Junction Capacitance

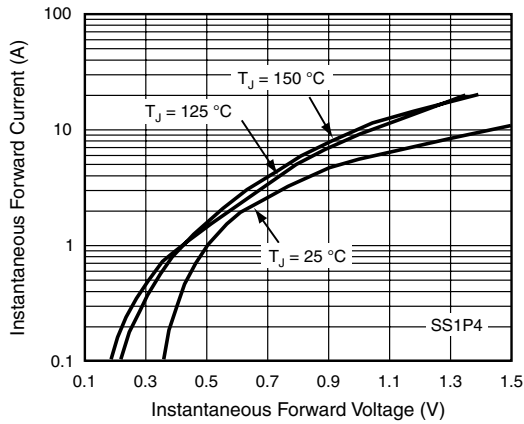


Figure 6. Typical Instantaneous Forward Characteristics

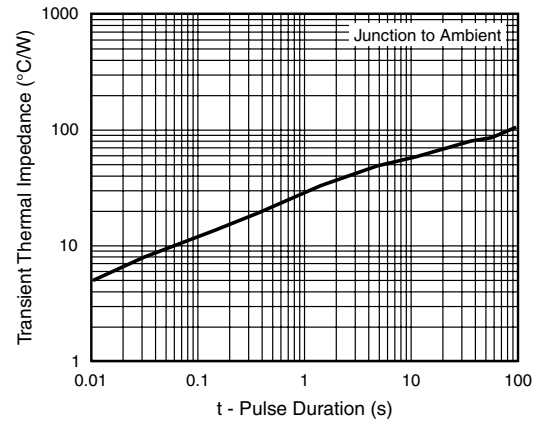


Figure 9. Typical Transient Thermal Impedance

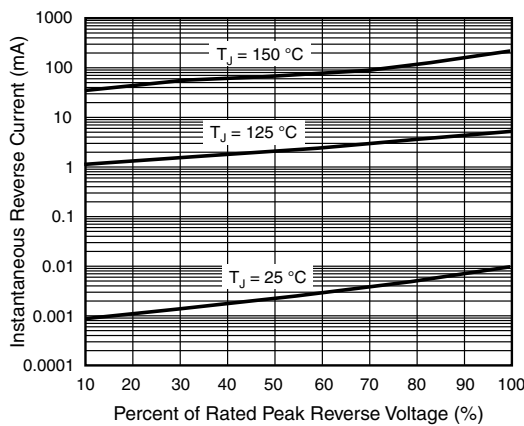
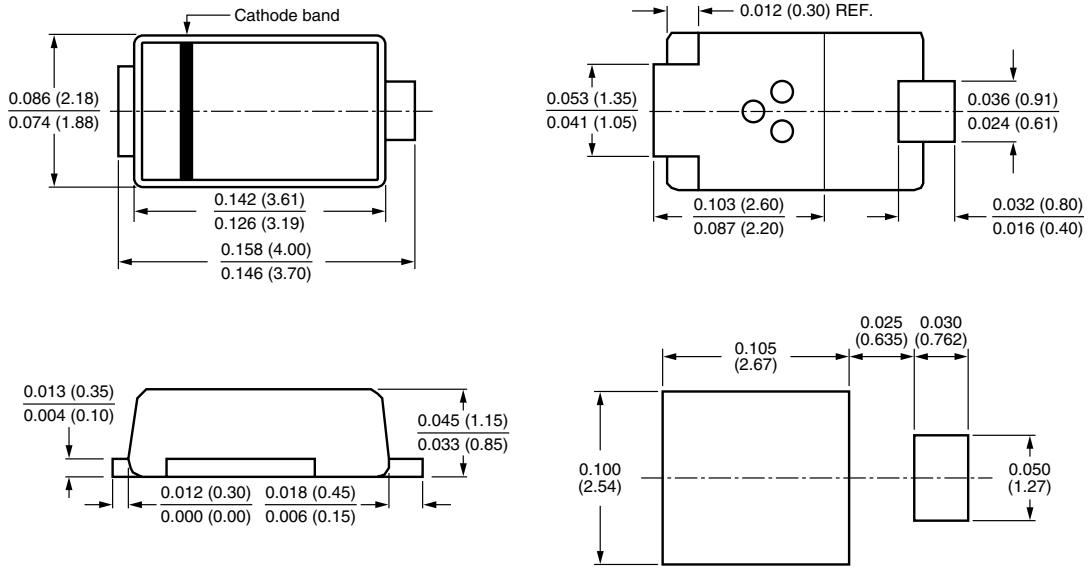


Figure 7. Typical Reverse Leakage Characteristics



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)





Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.