

High Current Density Surface Mount Schottky Barrier Rectifier

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
- AEC-Q101 qualified
- 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.

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 cathode end

PRIMARY CHARACTERISTICS

| | |
|------------------|------------------|
| $I_{F(AV)}$ | 2.0 A |
| V_{RRM} | 20 V, 30 V, 40 V |
| I_{FSM} | 50 A |
| E_{AS} | 11.25 mJ |
| V_F | 0.50 V |
| T_J max. | 150 °C |
| Package | DO-220AA (SMP) |
| Diode variations | Single |

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)

| PARAMETER | SYMBOL | SS2P2 | SS2P3 | SS2P4 | UNIT |
|---|----------------|-------|---------------|-------|------|
| Device marking code | | 22 | 23 | 24 | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 20 | 30 | 40 | 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/μs |
| Operating junction and storage temperature range | T_J, T_{STG} | | - 55 to + 150 | | °C |

| ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | | |
|--|--------------------|---------------------------|-------------|------|------|---------------------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Maximum instantaneous forward voltage | $I_F = 2\text{ A}$ | $T_J = 25^\circ\text{C}$ | $V_F^{(1)}$ | 0.50 | 0.55 | V |
| | $I_F = 2\text{ A}$ | $T_J = 125^\circ\text{C}$ | | 0.43 | 0.50 | |
| Maximum reverse current at rated V_R voltage | | $T_J = 25^\circ\text{C}$ | $I_R^{(2)}$ | - | 150 | μA mA |
| | | $T_J = 125^\circ\text{C}$ | | 8 | 15 | |
| Typical junction capacitance | 4.0 V, 1 MHz | | C_J | 110 | | pF |

Notes

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

(2) Pulse test: Pulse width $\leq 40\text{ ms}$

| THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | | |
|---|-----------------------|-------|-------|-------|------|--|
| PARAMETER | SYMBOL | SS2P2 | SS2P3 | SS2P4 | UNIT | |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 115 | | | °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 6.0 mm x 6.0 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 |
| SS2P4-M3/84A | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel |
| SS2P4-M3/85A | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel |
| SS2P4HM3/84A ⁽¹⁾ | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel |
| SS2P4HM3/85A ⁽¹⁾ | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel |

Note

(1) Automotive grade

RATINGS AND CHARACTERISTICS CURVES

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

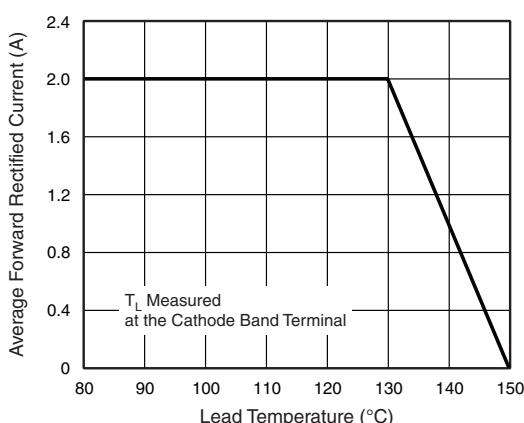


Fig. 1 - Forward Current Derating Curve

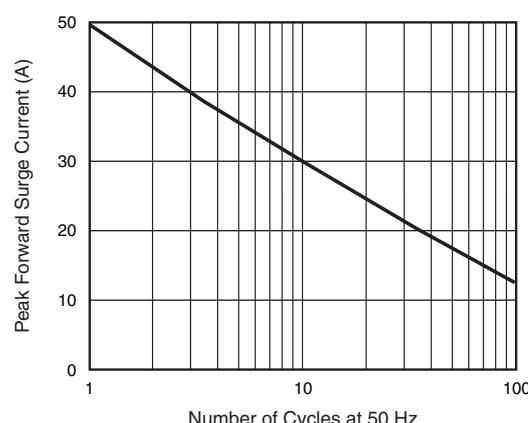


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

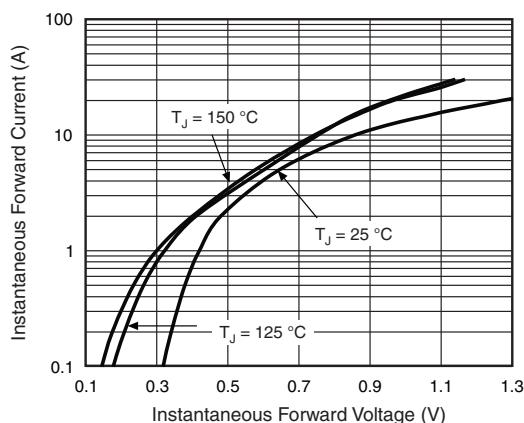


Fig. 3 - Typical Instantaneous Forward Characteristics

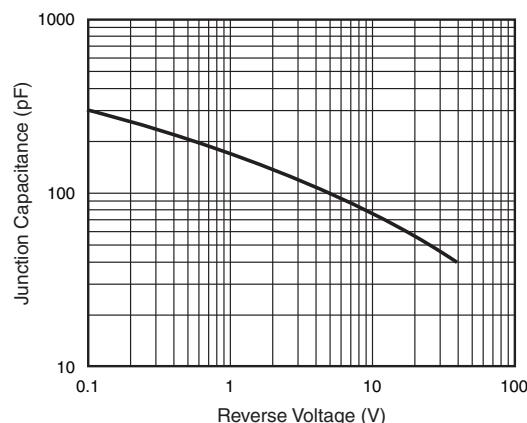


Fig. 5 - Typical Junction Capacitance

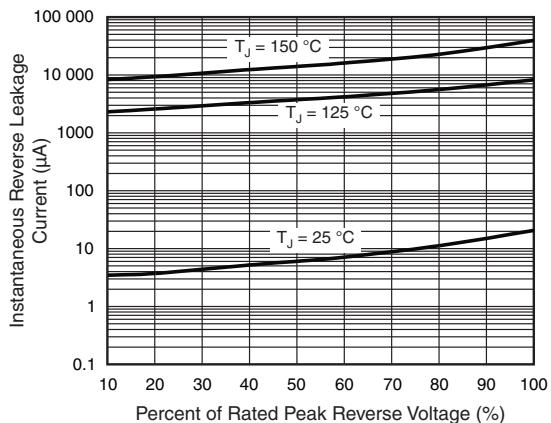


Fig. 4 - Typical Reverse Leakage Characteristics

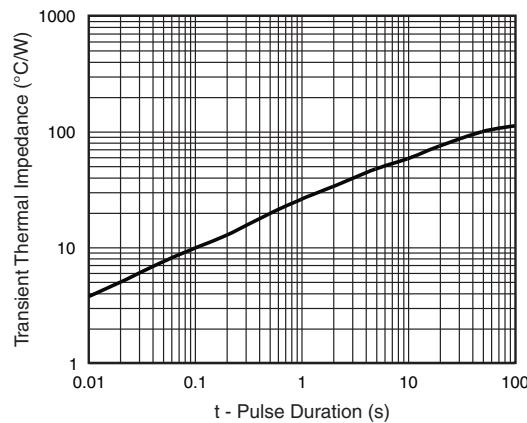
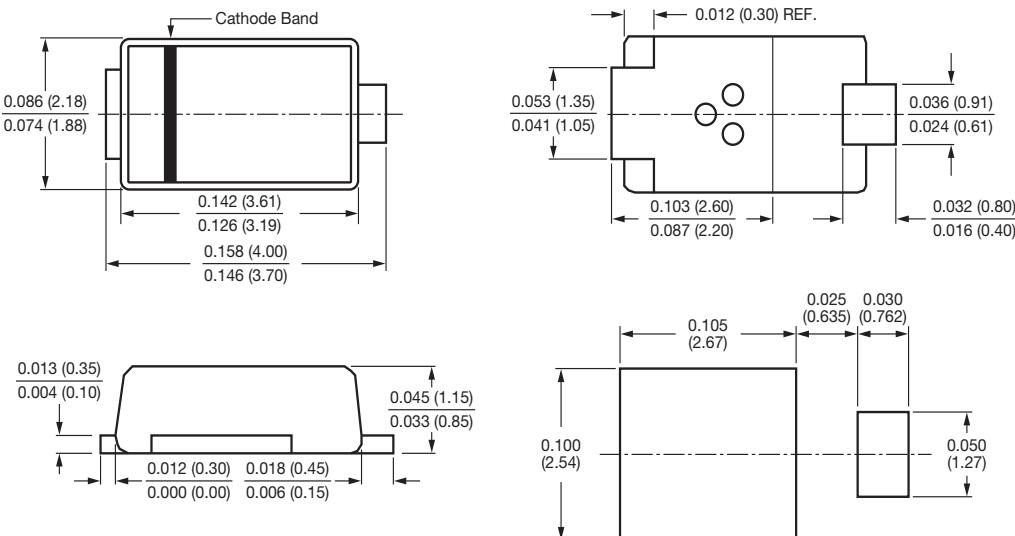


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



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