

High Current Density Surface Mount Schottky Barrier Rectifier

eSMP[®] Series


SMP (DO-220AA)

Cathode Anode

DESIGN SUPPORT TOOLS

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| 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 |
| $T_J \text{ max.}$ | 150 °C |
| Package | SMP (DO-220AA) |
| Circuit configuration | Single |

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

 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: 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 ($T_A = 25\text{ °C}$ 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 $I_{AS} = 1.5\text{ A}$, $L = 10\text{ mH}$, $T_J = 25\text{ °C}$ | E_{AS} | 11.25 | | | 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 ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | | |
|---|--------------------|-----------------------------------|-------------|-----------------------------------|------|---------------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | TYP. | MAX. | UNIT |
| Maximum instantaneous forward voltage | $I_F = 2\text{ A}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.50 | 0.55 | V |
| | $I_F = 2\text{ A}$ | $T_J = 125\text{ }^\circ\text{C}$ | | 0.43 | 0.50 | |
| Maximum reverse current at rated V_R voltage | | | $I_R^{(2)}$ | - | 150 | μA |
| | | | | $T_J = 125\text{ }^\circ\text{C}$ | 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 ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) | | | | | |
|--|-----------------------|-------|-------|-------|--------------------|
| PARAMETER | SYMBOL | SS2P2 | SS2P3 | SS2P4 | UNIT |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 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 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 ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

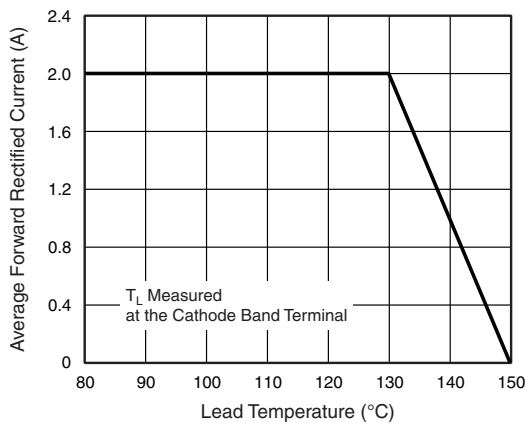


Fig. 1 - Forward Current Derating Curve

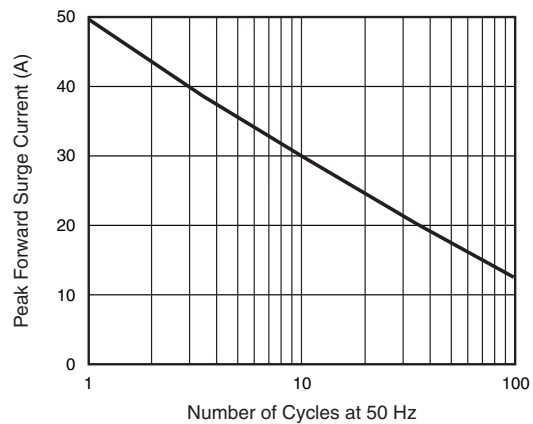


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

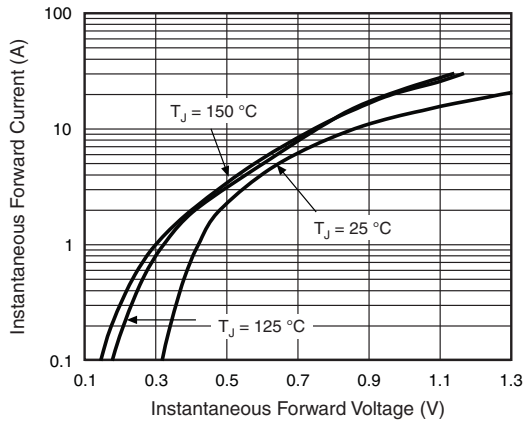


Fig. 3 - Typical Instantaneous Forward Characteristics

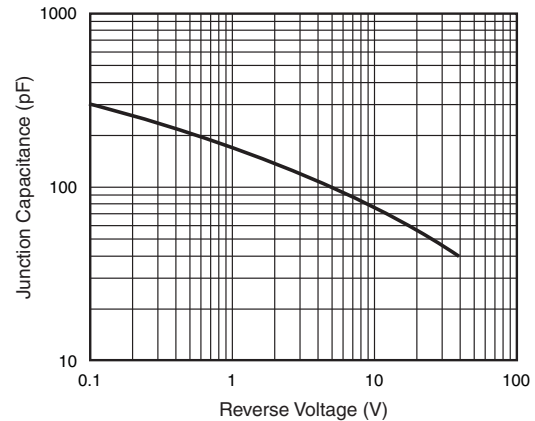


Fig. 5 - Typical Junction Capacitance

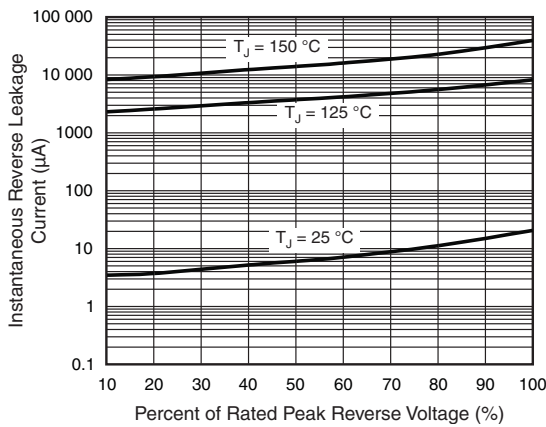


Fig. 4 - Typical Reverse Leakage Characteristics

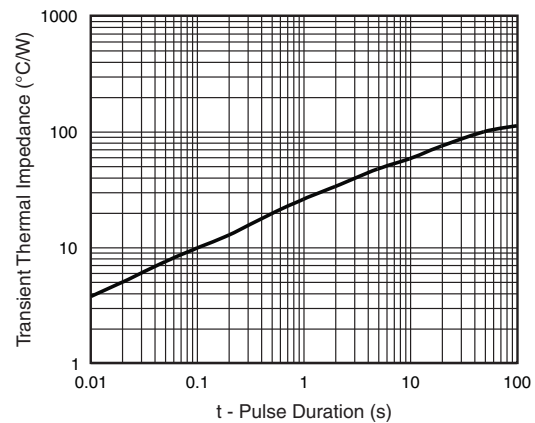
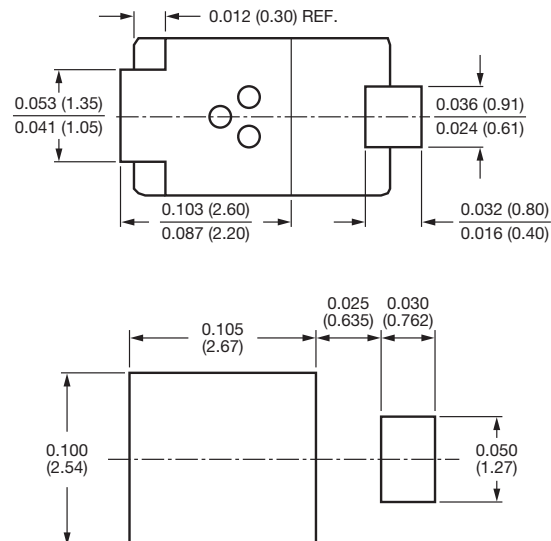
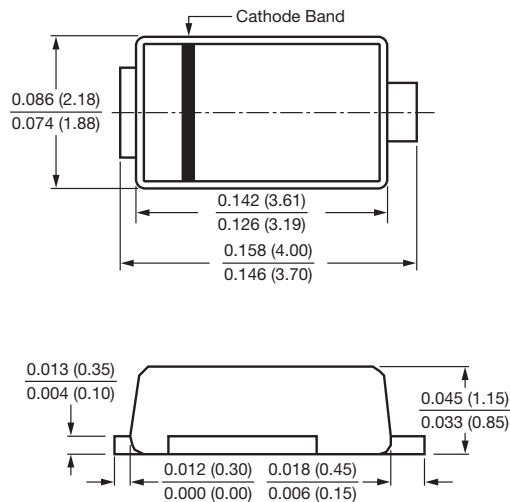


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)





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