



High Current Density Surface Mount Glass Passivated Rectifiers

eSMP® Series



DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated chip junction
- Low forward voltage drop
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**

AUTOMOTIVE
GRADE
Available



RoHS
COMPLIANT
HALOGEN
FREE

PRIMARY CHARACTERISTICS

| | |
|-------------|-----------------|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 100 V to 1000 V |
| I_R | 1 μ A |
| V_F | 0.95 V |
| T_J max. | 150 °C |

TYPICAL APPLICATIONS

General purpose, polarity protection, and rail-to-rail protection in both consumer and automotive 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 1A 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 | S1PB | S1PD | S1PG | S1PJ | S1PK | S1PM | UNIT |
|---|----------------|---------------|------|------|------|------|------|------|
| Device marking code | | SB | SD | SG | SJ | SK | SM | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Maximum RMS voltage | V_{RMS} | 70 | 140 | 280 | 420 | 560 | 700 | V |
| Maximum DC blocking voltage | V_{DC} | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Average forward current | $I_{F(AV)}$ | 1.0 | | | | | | A |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 30 | | | | | | A |
| Operating junction and storage temperature range | T_J, T_{STG} | - 55 to + 150 | | | | | | °C |

S1PB thru S1PM

Vishay General Semiconductor



| ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | | | | | |
|--|---|-------------------------|-------------------------------|------|------|------|------|------|----------|------|
| PARAMETER | TEST CONDITIONS | | SYMBOL | S1PB | S1PD | S1PG | S1PJ | S1PK | S1PM | UNIT |
| Maximum instantaneous forward voltage | I _F = 1.0 A | T _J = 25 °C | V _F ⁽¹⁾ | 1.1 | | | | | V | |
| | I _F = 1.0 A | T _J = 125 °C | | 0.95 | | | | | | |
| Maximum reverse current | Rated V _R | T _J = 25 °C | I _R ⁽²⁾ | 1.0 | | | 1.0 | | μA μA | |
| | | T _J = 125 °C | | 50 | | | 100 | | | |
| Typical reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | | t _{rr} | 1.8 | | | | | μs | |
| Typical junction capacitance time | 4.0 V, 1 MHz | | C _J | 6.0 | | | | | pF | |

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted) | | | | | | | | | |
|---|---------------------------------|------|------|------|------|------|------|------|--|
| PARAMETER | SYMBOL | S1PB | S1PD | S1PG | S1PJ | S1PK | S1PM | UNIT | |
| Typical thermal resistance | R _{θJA} ⁽¹⁾ | 105 | | | | | °C/W | | |
| | R _{θJL} ⁽¹⁾ | 15 | | | | | | | |
| | R _{θJC} ⁽¹⁾ | 20 | | | | | | | |

Note

- (1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 5.0 mm x 5.0 mm copper pad areas. R_{θJL} is measured at the terminal of cathode band. R_{θJC} 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 |
| S1PJ-M3/84A | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel |
| S1PJ-M3/85A | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel |
| S1PJHM3/84A (1) | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel |
| S1PJHM3/85A (1) | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel |

Note

- (1) Automotive grade

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

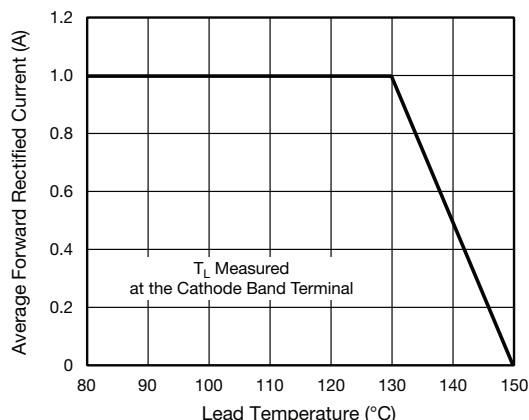


Fig. 1 - Maximum Forward Current Derating Curve

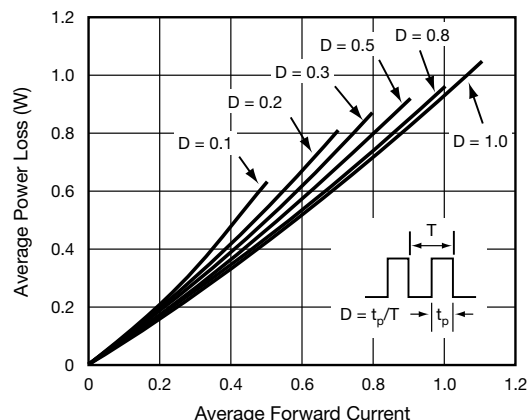


Fig. 2 - Forward Power Loss Characteristics

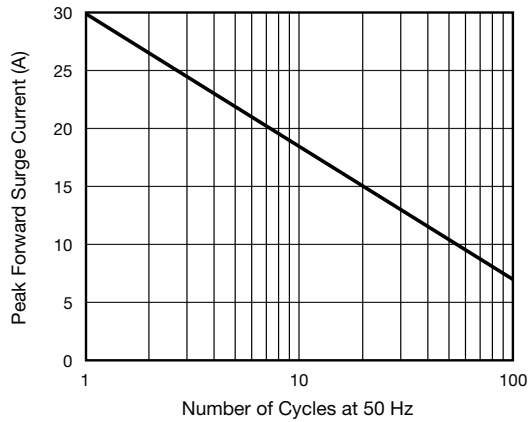


Fig. 3 - Maximum Non-Repetitive Peak Forward Surge Current

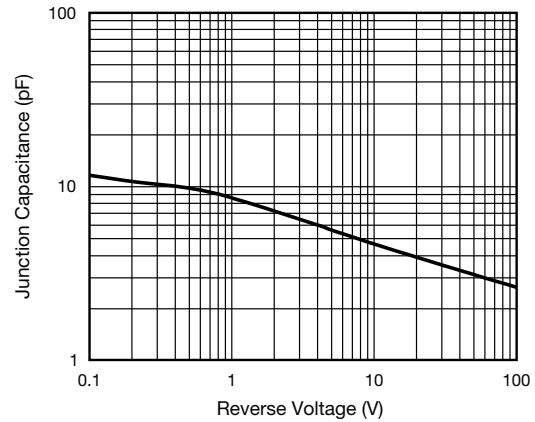


Fig. 6 - Typical Junction Capacitance

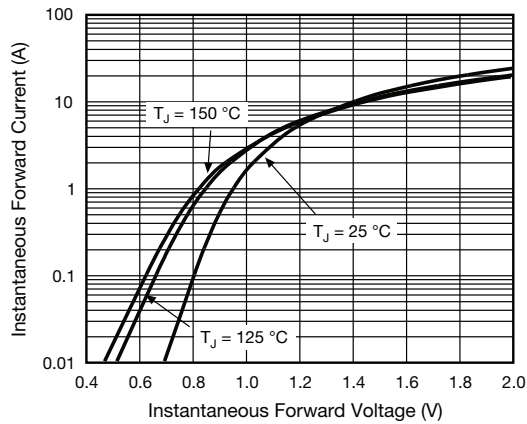


Fig. 4 - Typical Instantaneous Forward Characteristics

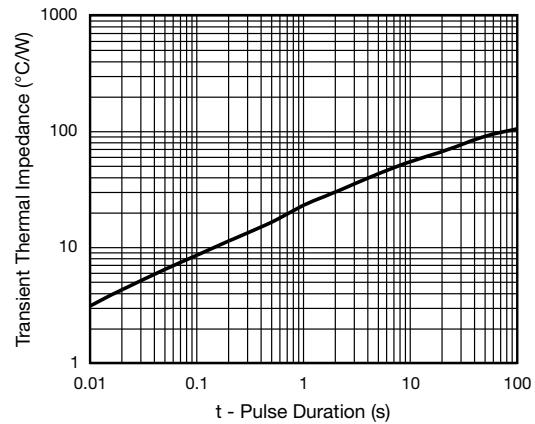


Fig. 7 - Typical Transient Thermal Impedance

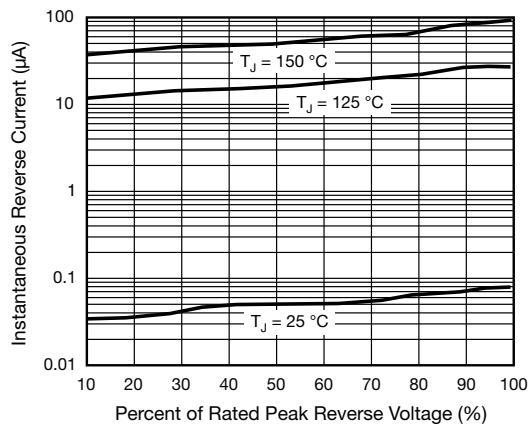


Fig. 5 - Typical Reverse Leakage Characteristics

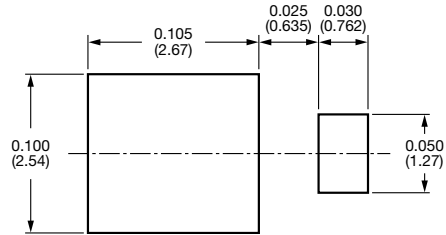
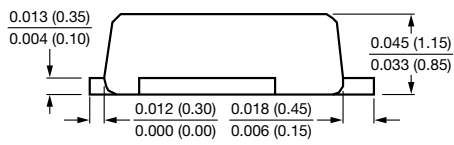
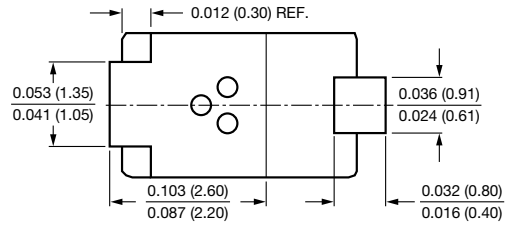
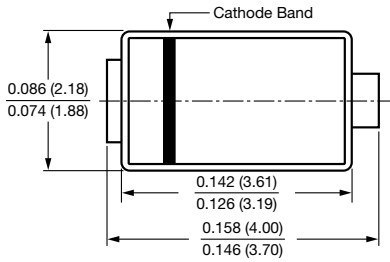
S1PB thru S1PM

Vishay General Semiconductor



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)





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