

High Current Density Surface Mount Glass Passivated Fast Switching Rectifier

eSMP® Series



DO-220AA (SMP)

PRIMARY CHARACTERISTICS

| | |
|-----------------|----------------------------|
| $I_{F(AV)}$ | 1.0 A |
| V_{RRM} | 100 V, 200 V, 400 V, 600 V |
| I_{FSM} | 30 A |
| t_{rr} | 150 ns, 250 ns |
| I_R | 1 μ A |
| V_F | 1.3 V |
| T_J max. | 150 °C |
| Package | DO-220AA (SMP) |
| Diode variation | Single die |

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive and telecommunication.

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated pellet chip junction
- Fast switching for high efficiency
- Low thermal resistance
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
- Automotive ordering code; base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

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 AEC-Q101 qualified

Base P/NHM3_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified

("_X" denotes revision code e.g. A, B,.....)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and 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 | RS1PB | RS1PD | RS1PG | RS1PJ | UNIT |
|---|----------------|-------------|-------|-------|-------|------|
| Device marking code | | RB | RD | RG | RJ | |
| Maximum repetitive peak reverse voltage | V_{RRM} | 100 | 200 | 400 | 600 | 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 |
| Operating junction and storage temperature range | T_J, T_{STG} | -55 to +150 | | | | °C |

ELECTRICAL CHARACTERISTICS ($T_A = 25$ °C unless otherwise noted)

| PARAMETER | TEST CONDITIONS | | SYMBOL | RS1PB | RS1PD | RS1PG | RS1PJ | UNIT |
|---|--|-------------------------|-------------------------------|-------|-------|-------|-------|------|
| Maximum instantaneous forward voltage | I _F = 1.0 A | | V _F ⁽¹⁾ | 1.3 | | | | V |
| Maximum reverse current at rated V _R voltage | | T _A = 25 °C | I _R ⁽²⁾ | 1.0 | | | | μA |
| | | T _A = 125 °C | | 60 | | | | |
| Maximum reverse recovery time | I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A | | t _{rr} | 150 | | | 250 | ns |
| Typical junction capacitance | 4.0 V, 1 MHz | | C _J | 9 | | | | pF |

Notes

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

(2) Pulse test: Pulse width \leq 40 ms

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

| PARAMETER | SYMBOL | RS1PB | RS1PD | RS1PG | RS1PJ | UNIT |
|----------------------------|---------------------------------|-------|-------|-------|-------|------|
| Typical thermal resistance | R _{θJA} ⁽¹⁾ | 115 | | | | °C/W |
| | R _{θJL} ⁽¹⁾ | 15 | | | | |
| | R _{θJC} ⁽¹⁾ | 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 |
|-----------------------------|-----------------|------------------------|---------------|------------------------------------|
| RS1PB-M3/84A | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel |
| RS1PB-M3/85A | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel |
| RS1PBHM3/84A ⁽¹⁾ | 0.024 | 84A | 3000 | 7" diameter plastic tape and reel |
| RS1PBHM3/85A ⁽¹⁾ | 0.024 | 85A | 10 000 | 13" diameter plastic tape and reel |
| RS1PBHM3/H ⁽¹⁾ | 0.024 | H | 3000 | 7" diameter plastic tape and reel |
| RS1PBHM3/I ⁽¹⁾ | 0.024 | I | 10 000 | 13" diameter plastic tape and reel |

Note

- (1) Automotive grade

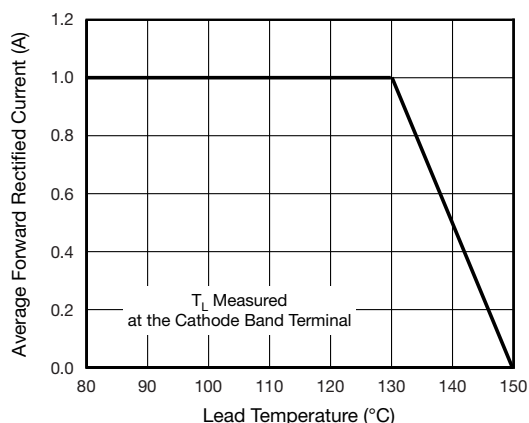
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Fig. 1 - Maximum Forward Current Derating Curve

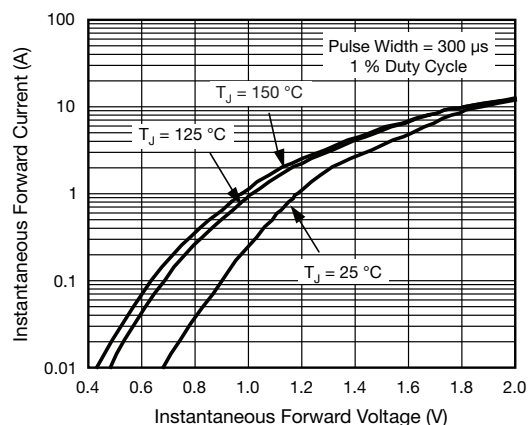


Fig. 3 - Typical Instantaneous Forward Characteristics

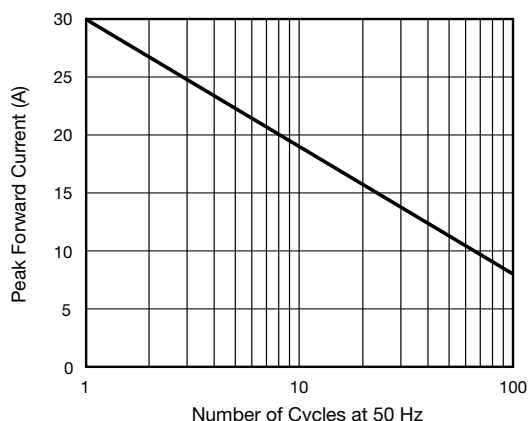


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

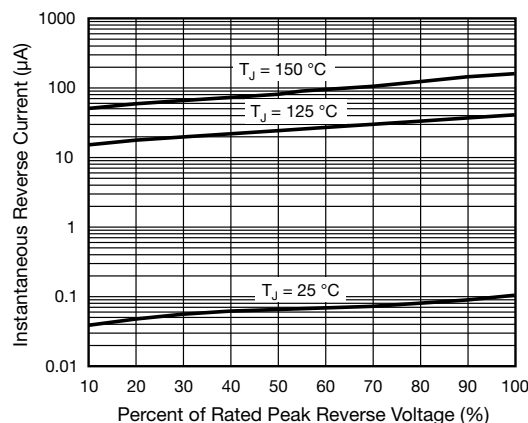


Fig. 4 - Typical Reverse Characteristics

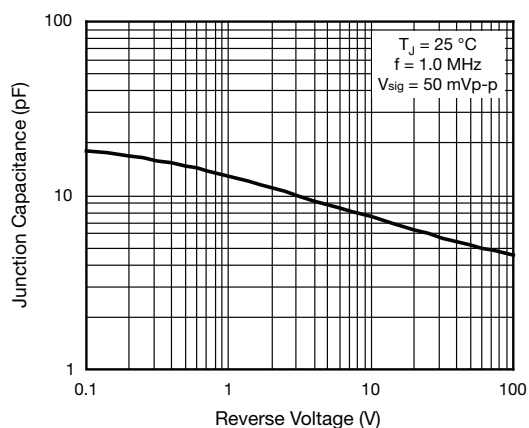


Fig. 5 - Typical Junction Capacitance

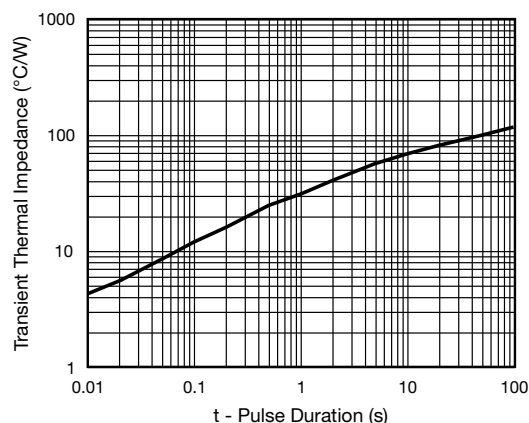
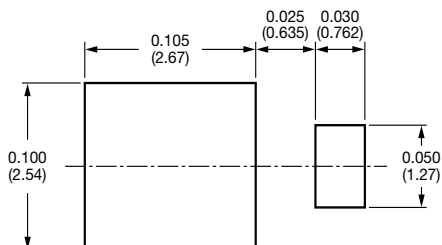
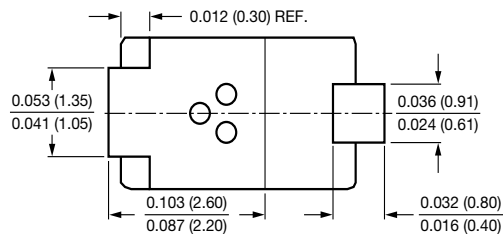
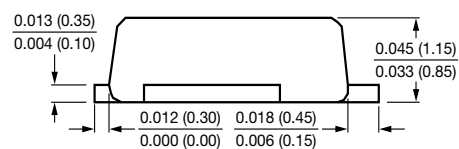
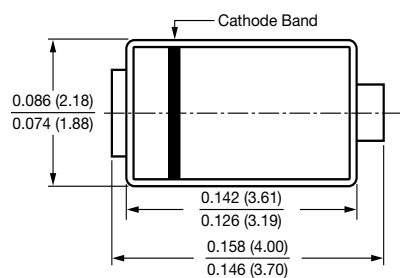


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)




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