



**THE DATASHEET OF
RS1PJ-M3/84A**



High Current Density Surface Mount Glass Passivated Fast Switching Rectifier

eSMP® Series


SMP (DO-220AA)

Cathode Anode

DESIGN SUPPORT TOOLS
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3D
Models
Available

| 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 | SMP (DO-220AA) |
| Circuit configuration | Single |

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

 AUTOMOTIVE
GRADE
Available

RoHS
COMPLIANT
HALOGEN
FREE
TYPICAL APPLICATIONS

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

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 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 T _A = 125 °C | I _R ⁽²⁾ | 1.0 | | | | μA |
| | | | 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 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

| THERMAL CHARACTERISTICS (T _A = 25 °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_{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 |
| 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_A/H ⁽¹⁾ | 0.024 | H | 3000 | 7" diameter plastic tape and reel |
| RS1PBHM3_A/I ⁽¹⁾ | 0.024 | I | 10 000 | 13" diameter plastic tape and reel |

Note

- (1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

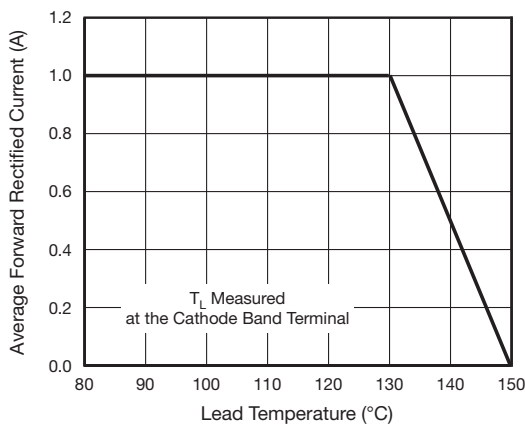


Fig. 1 - Maximum Forward Current Derating Curve

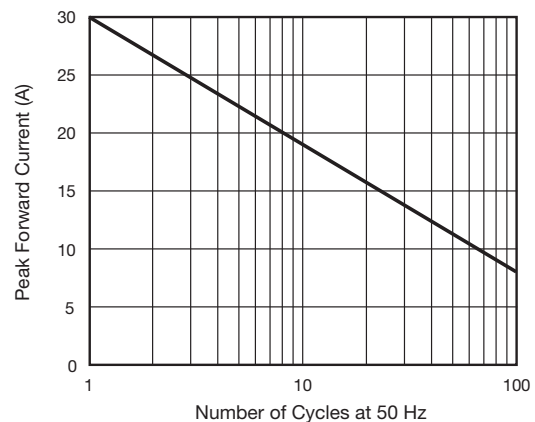


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

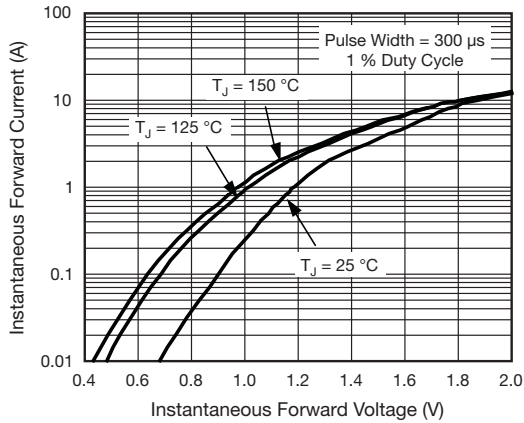


Fig. 3 - Typical Instantaneous Forward Characteristics

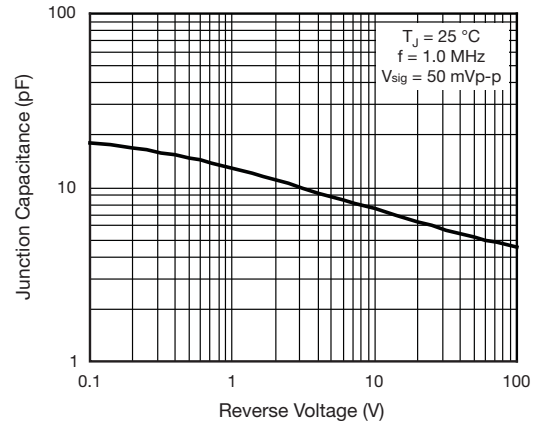


Fig. 5 - Typical Junction Capacitance

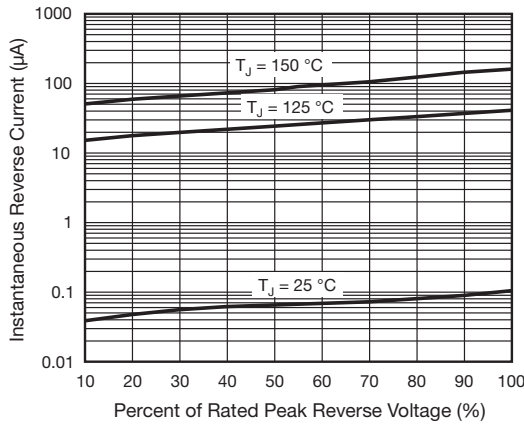


Fig. 4 - Typical Reverse Characteristics

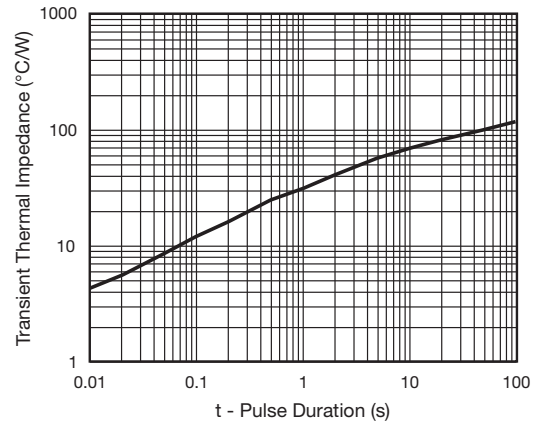
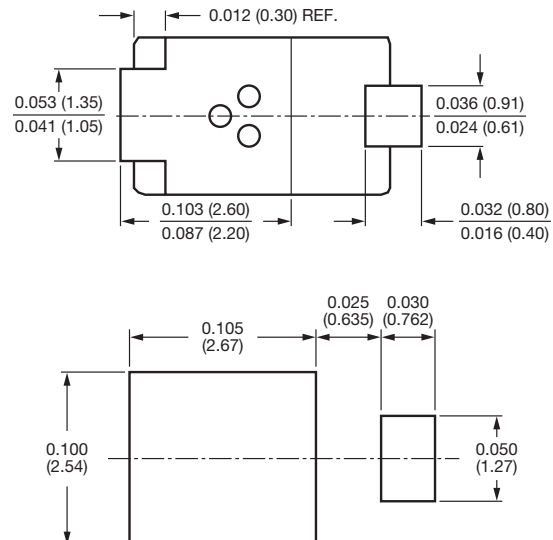
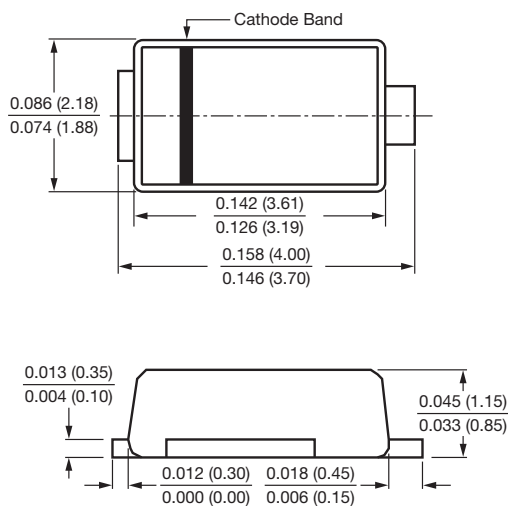


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)





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