

High Current Density Surface Mount Glass Passivated Rectifiers

eSMP® Series



SMPC (TO-277A)



DESIGN SUPPORT TOOLS

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FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low forward voltage drop
- High 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

TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for consumer, automotive, and telecommunication.

MECHANICAL DATA

Case: SMPC (TO-277A)

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

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 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test

| PRIMARY CHARACTERISTICS | |
|-------------------------|---|
| $I_{F(AV)}$ | 4.0 A |
| V_{RRM} | 100 V, 200 V, 400 V, 600 V, 800 V, 1000 V |
| I_{FSM} | 100 A |
| I_R | 10 μ A |
| V_F at $I_F = 4$ A | 0.860 V |
| T_J max. | 150 °C |
| Package | SMPC (TO-277A) |
| Circuit configuration | Single |

| MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted) | | | | | | | | |
|---|----------------|-------------|------|------|------|------|------|------|
| PARAMETER | SYMBOL | S4PB | S4PD | S4PG | S4PJ | S4PK | S4PM | UNIT |
| Device marking code | | S4PB | S4PD | S4PG | S4PJ | S4PK | S4PM | |
| Max. repetitive peak reverse voltage | V_{RRM} | 100 | 200 | 400 | 600 | 800 | 1000 | V |
| Average forward current | $I_{F(AV)}$ | 4.0 | | | | | | A |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | I_{FSM} | 100 | | | | | | A |
| 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 | |
| Instantaneous forward voltage | $I_F = 2.0\text{ A}$ | $T_A = 25\text{ }^\circ\text{C}$ | $V_F^{(1)}$ | 0.897 | - | V |
| | $I_F = 4.0\text{ A}$ | | | 0.958 | 1.10 | |
| | $I_F = 2.0\text{ A}$ | $T_A = 125\text{ }^\circ\text{C}$ | | 0.783 | - | |
| | $I_F = 4.0\text{ A}$ | | | 0.860 | 0.95 | |
| Reverse current | Rated V_R | $T_A = 25\text{ }^\circ\text{C}$ | $I_R^{(2)}$ | - | 10 | μA |
| | | $T_A = 125\text{ }^\circ\text{C}$ | | 55 | 100 | |
| Max. reverse recovery time | $I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{rr} = 0.25\text{ A}$ | t_{rr} | 2.5 | - | μs | |
| Typical junction capacitance | 4.0 V, 1 MHz | C_J | 30 | - | 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 specified) | | | | | | | | | |
|---|-----------------------|------|------|------|------|------|------|------|--------------------|
| PARAMETER | SYMBOL | S4PB | S4PD | S4PG | S4PJ | S4PK | S4PM | UNIT | |
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 60 | | | | | | | $^\circ\text{C/W}$ |
| | $R_{\theta JL}$ | 4 | | | | | | | |

Note

- (1) Units mounted on recommended PCB 1 oz. pad layout

| ORDERING INFORMATION (Example) | | | | |
|---------------------------------------|-----------------|--------------|---------------|------------------------------------|
| PREFERRED P/N | UNIT WEIGHT (g) | PACKAGE CODE | BASE QUANTITY | DELIVERY MODE |
| S4PJ-M3/86A | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| S4PJ-M3/87A | 0.10 | 87A | 6500 | 13" diameter plastic tape and reel |
| S4PJHM3_A/H ⁽¹⁾ | 0.10 | H | 1500 | 7" diameter plastic tape and reel |
| S4PJHM3_A/I ⁽¹⁾ | 0.10 | I | 6500 | 13" diameter plastic tape and reel |

Note

- (1) AEC-Q101 qualified



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

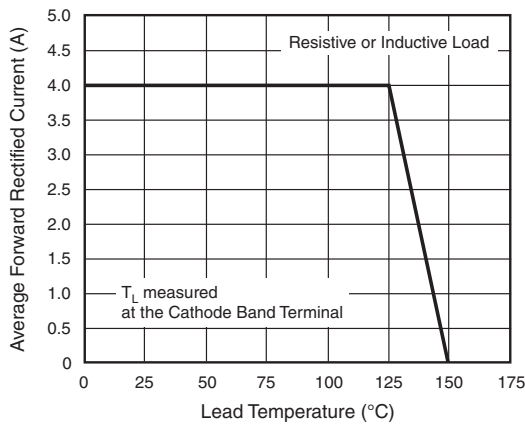


Fig. 1 - Maximum Forward Current Derating Curve

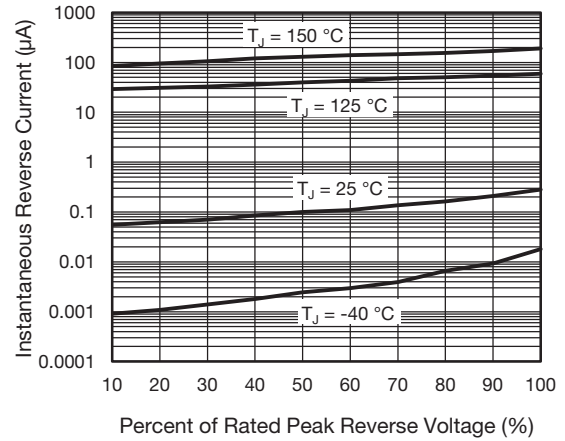


Fig. 4 - Typical Reverse Leakage Characteristics

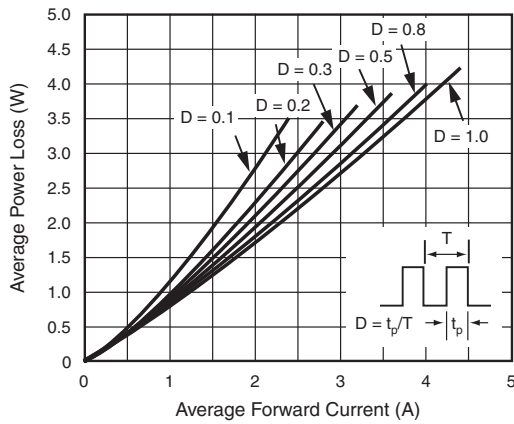


Fig. 2 - Forward Power Loss Characteristics

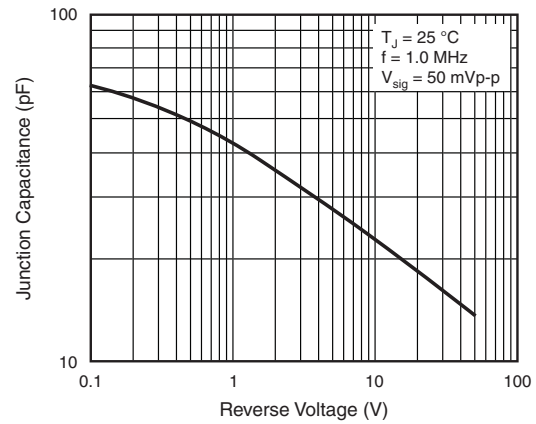


Fig. 5 - Typical Junction Capacitance

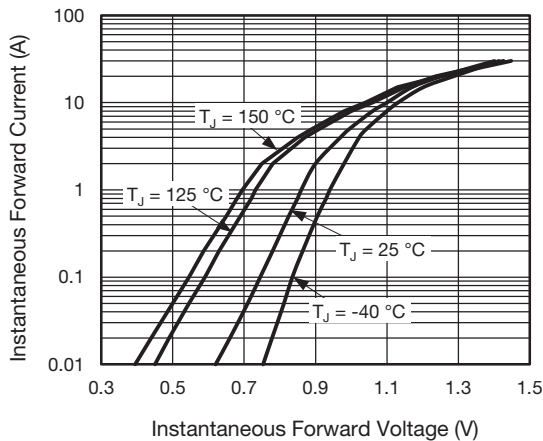


Fig. 3 - Typical Instantaneous Forward Characteristics

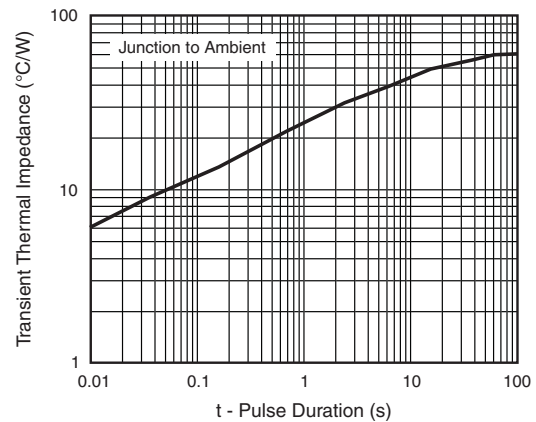
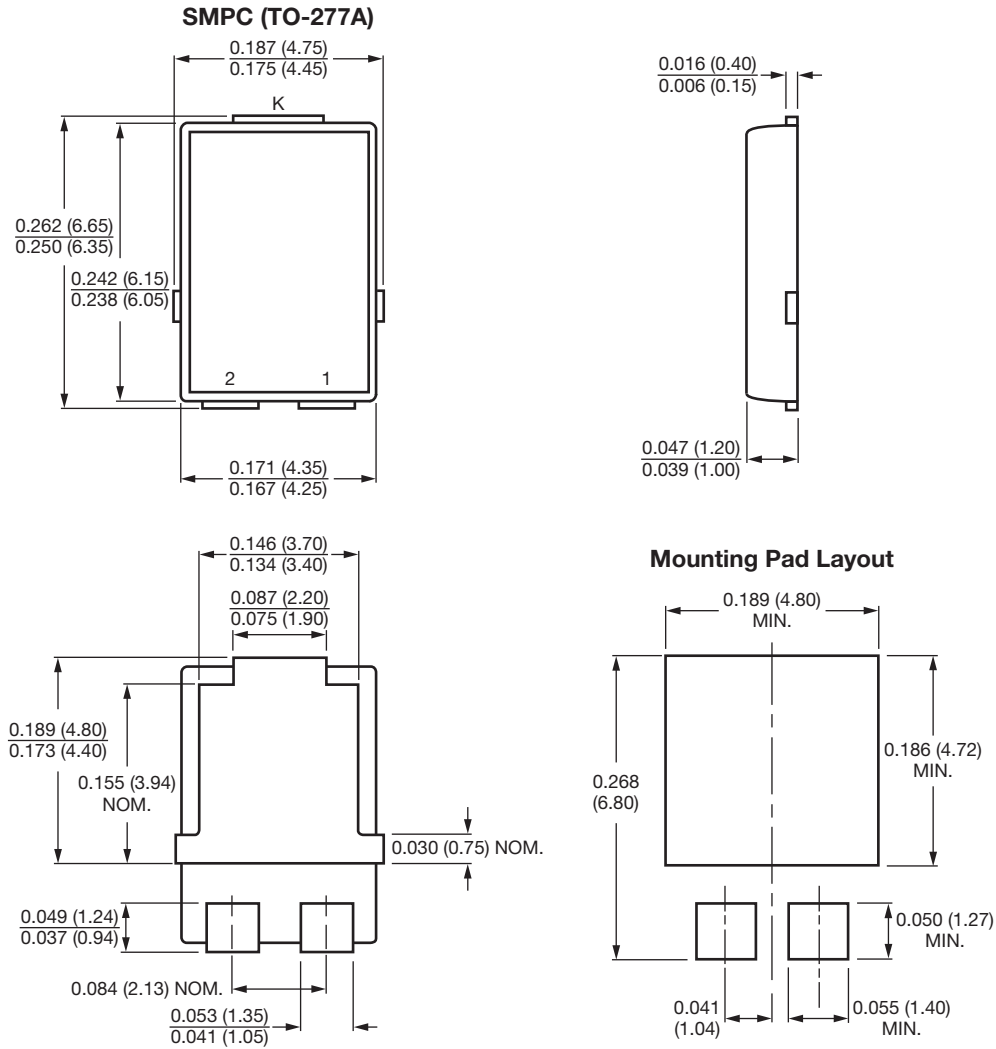


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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