



**THE DATASHEET OF  
S4PMHM3\_A/H**

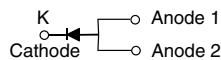


## High Current Density Surface-Mount Glass Passivated Rectifiers

### eSMP® Series



### SMPC (TO-277A)



### DESIGN SUPPORT TOOLS AVAILABLE



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

### 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](http://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

| 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   |



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ 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            | $\mu\text{A}$ |
|  |   | $T_A = 125\text{ }^\circ\text{C}$ |             | 55    | 100           |               |
| Max. reverse recovery time   | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ ,<br>$I_{rr} = 0.25\text{ A}$ | $t_{rr}$                          | 2.5         | -     | $\mu\text{s}$ |               |
| Typical junction capacitance   | 4.0 V, 1 MHz  | $C_J$                             | 30          | -     | pF            |               |

**Notes**

- (1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle  
(2) Pulse test: Pulse width  $\leq 40\text{ ms}$

| <b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ 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

| <b>ORDERING INFORMATION</b> (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_B/H <sup>(1)</sup>            | 0.10            | H            | 1500          | 7" diameter plastic tape and reel  |
| S4PJHM3_B/I <sup>(1)</sup>            | 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)

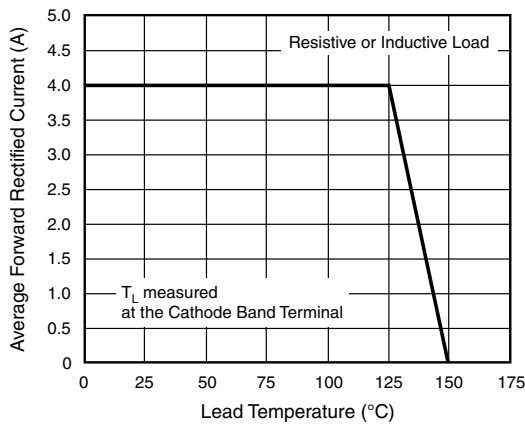


Fig. 1 - Maximum Forward Current Derating Curve

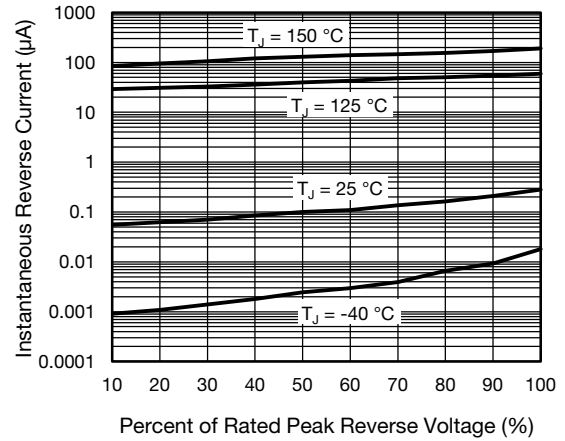


Fig. 4 - Typical Reverse Leakage Characteristics

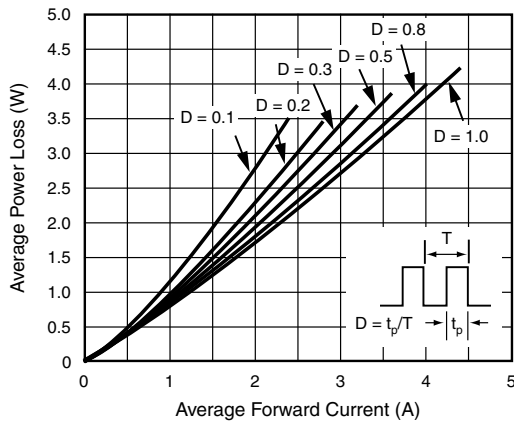


Fig. 2 - Forward Power Loss Characteristics

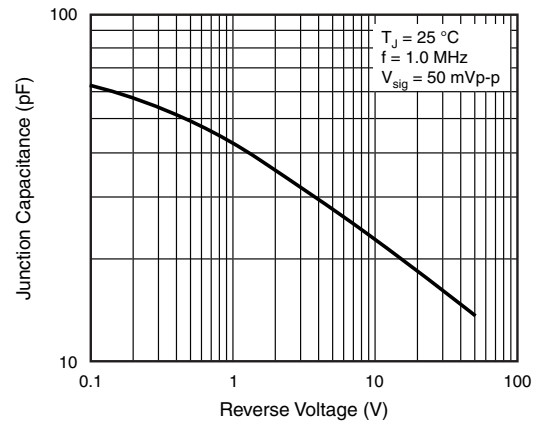


Fig. 5 - Typical Junction Capacitance

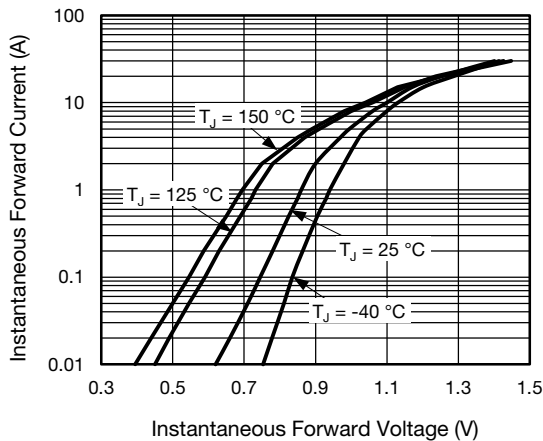


Fig. 3 - Typical Instantaneous Forward Characteristics

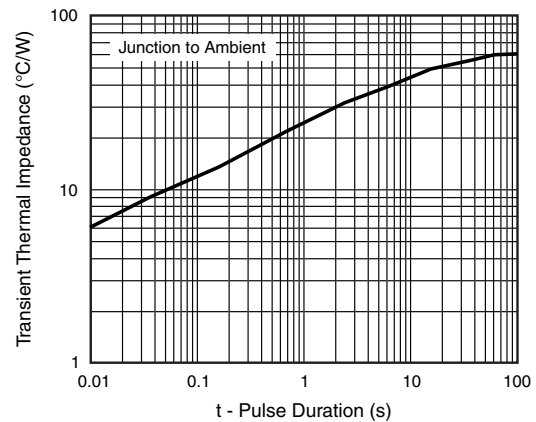
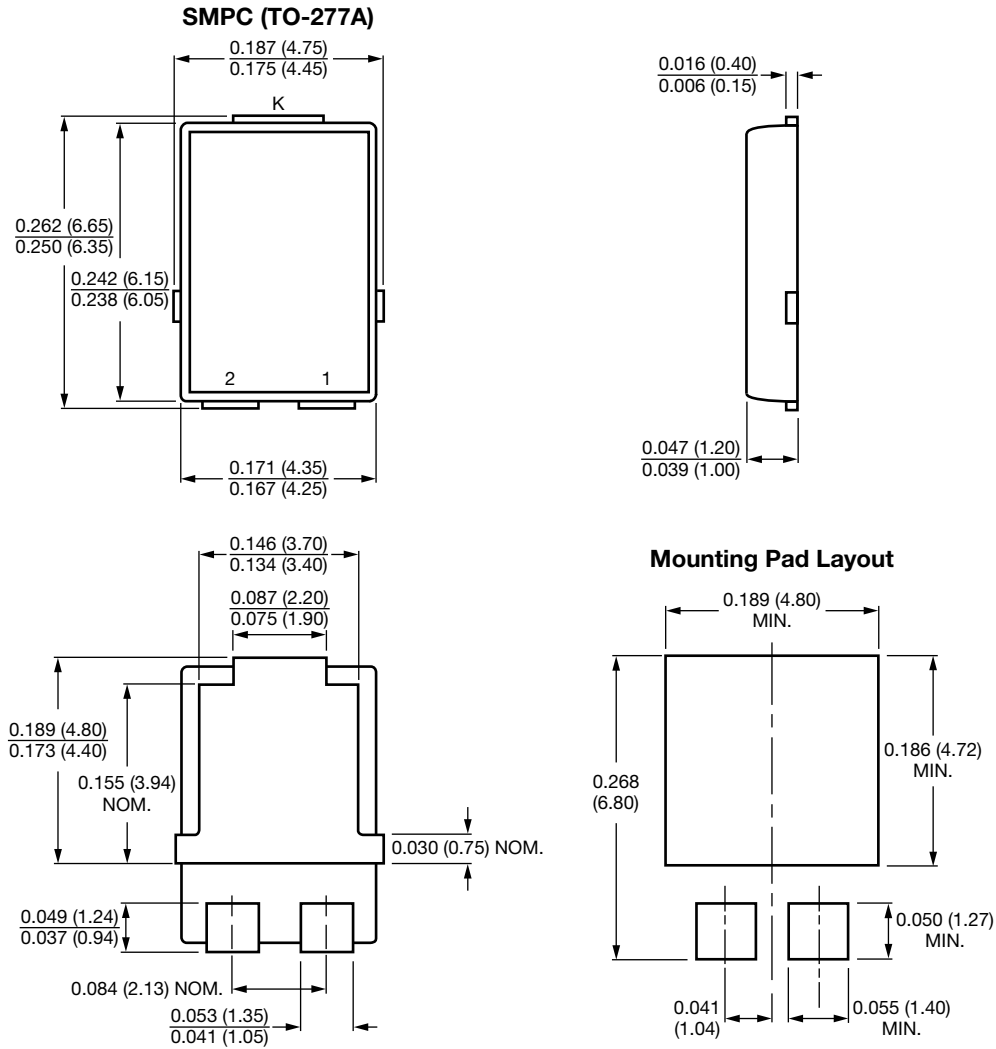


Fig. 6 - Typical Transient Thermal Impedance



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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