

## High Current Density Surface Mount Glass Passivated Rectifiers

### eSMP® Series



TO-277A (SMPC)



### FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Glass passivated 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/doc299912](http://www.vishay.com/doc299912)



**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: TO-277A (SMPC)

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 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 $\mu$ A                                |
| $V_F$ at $I_F = 4$ A | 0.860 V                                   |
| $T_J$ max.           | 150 °C                                    |
| Package              | TO-277A (SMPC)                            |
| Diode variations     | Single die                                |

### 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 <sub>A</sub> = 25 °C unless otherwise noted) |                                                                          |                         |                               |       |      |      |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------|-------------------------------|-------|------|------|
| PARAMETER                                                                  | TEST CONDITIONS                                                          |                         | SYMBOL                        | TYP.  | MAX. | UNIT |
| Instantaneous forward voltage                                              | I <sub>F</sub> = 2.0 A                                                   | T <sub>A</sub> = 25 °C  | V <sub>F</sub> <sup>(1)</sup> | 0.897 | -    | V    |
|                                                                            | I <sub>F</sub> = 4.0 A                                                   |                         |                               | 0.958 | 1.10 |      |
|                                                                            | I <sub>F</sub> = 2.0 A                                                   | T <sub>A</sub> = 125 °C |                               | 0.783 | -    |      |
|                                                                            | I <sub>F</sub> = 4.0 A                                                   |                         |                               | 0.860 | 0.95 |      |
| Reverse current                                                            | Rated V <sub>R</sub>                                                     | T <sub>A</sub> = 25 °C  | I <sub>R</sub> <sup>(2)</sup> | -     | 10   | μA   |
|                                                                            |                                                                          | T <sub>A</sub> = 125 °C |                               | 55    | 100  |      |
| Max. reverse recovery time                                                 | I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A |                         | t <sub>rr</sub>               | 2.5   | -    | μs   |
| Typical junction capacitance                                               | 4.0 V, 1 MHz                                                             |                         | C <sub>J</sub>                | 30    | -    | pF   |

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

| THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified) |                                 |      |      |      |      |      |      |      |
|-----------------------------------------------------------------------------|---------------------------------|------|------|------|------|------|------|------|
| PARAMETER                                                                   | SYMBOL                          | S4PB | S4PD | S4PG | S4PJ | S4PK | S4PM | UNIT |
| Typical thermal resistance                                                  | R <sub>θJA</sub> <sup>(1)</sup> | 60   |      |      |      |      |      | °C/W |
|                                                                             | R <sub>θJL</sub>                | 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 |
| S4PJHM3/86A <sup>(1)</sup>            | 0.10            | 86A          | 1500          | 7" diameter plastic tape and reel  |
| S4PJHM3/87A <sup>(1)</sup>            | 0.10            | 87A          | 6500          | 13" diameter plastic tape and reel |
| S4PJHM3_A/H <sup>(1)</sup>            | 0.10            | H            | 1500          | 7" diameter plastic tape and reel  |
| S4PJHM3_A/I <sup>(1)</sup>            | 0.10            | I            | 6500          | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified



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

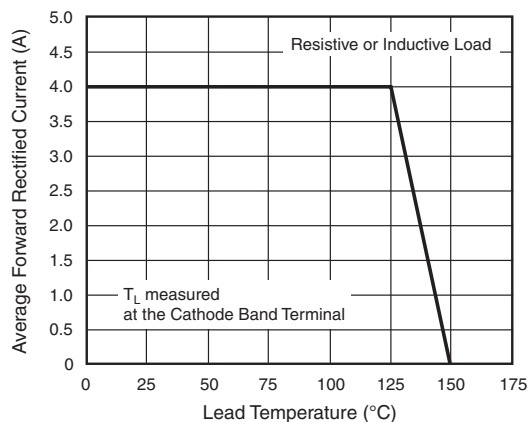


Fig. 1 - Maximum Forward Current Derating Curve

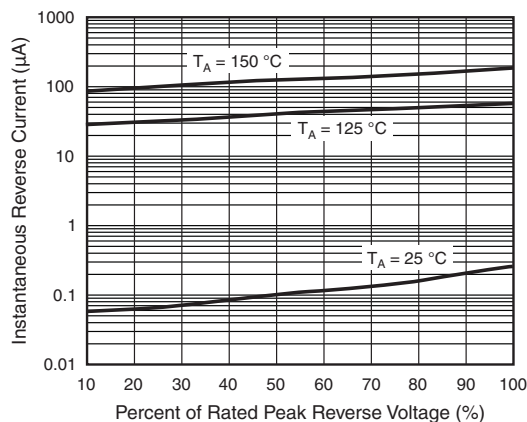


Fig. 4 - Typical Reverse Leakage Characteristics

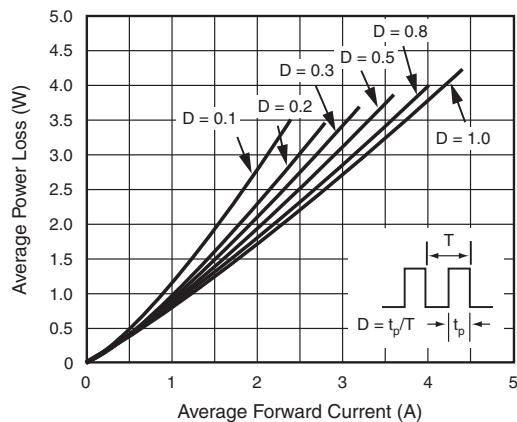


Fig. 2 - Forward Power Loss Characteristics

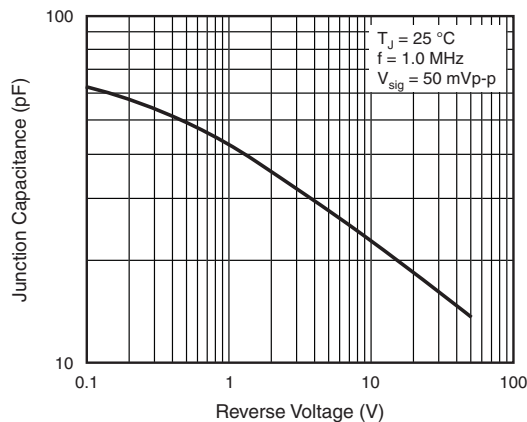


Fig. 5 - Typical Junction Capacitance

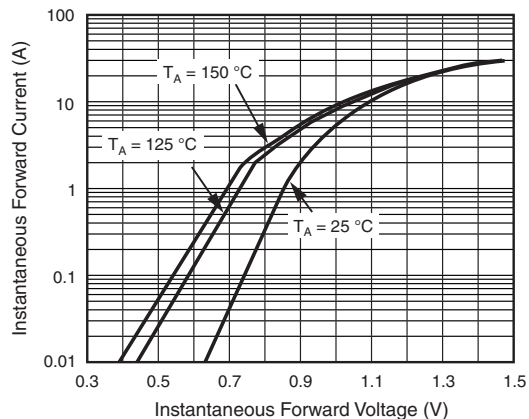


Fig. 3 - Typical Instantaneous Forward Characteristics

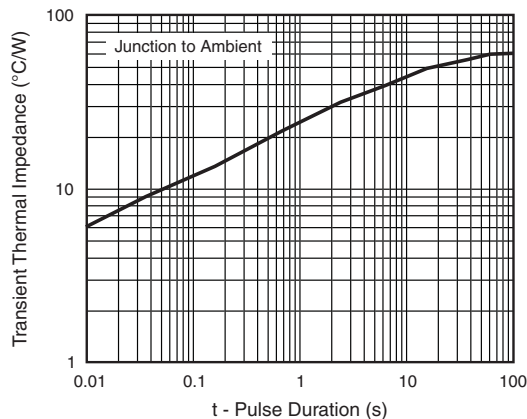
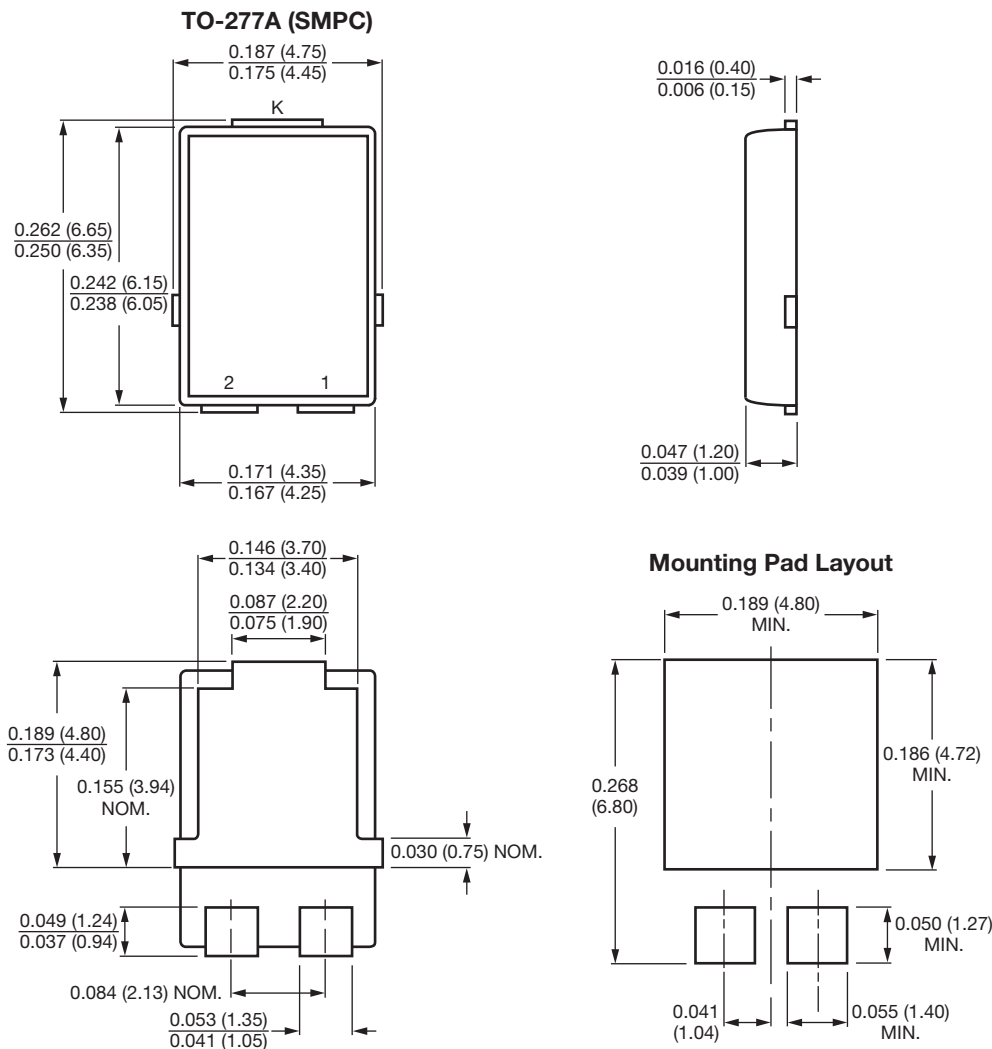


Fig. 6 - Typical Transient Thermal Impedance



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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Электрон  
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