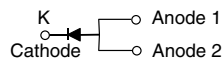


## High Current Density Standard Avalanche Surface-Mount Rectifiers

### eSMP® Series



### SMPC (TO-277A)



### LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

| PRIMARY CHARACTERISTICS |                                    |
|-------------------------|------------------------------------|
| $I_{F(AV)}$             | 3.0 A                              |
| $V_{RRM}$               | 200 V, 400 V, 600 V, 800 V, 1000 V |
| $I_{FSM}$               | 70 A                               |
| $E_{AS}$                | 20 mJ                              |
| $V_F$ at $I_F = 3$ A    | 0.90 V                             |
| $T_J$ max.              | 175 °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
- Controlled avalanche characteristics
- Low leakage current
- 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](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                   | AS3PD       | AS3PG | AS3PJ | AS3PK | AS3PM | UNIT |
| Device marking code   |                          | AS3D        | AS3G  | AS3J  | AS3K  | AS3M  |      |
| Max. repetitive peak reverse voltage  | $V_{RRM}$                | 200         | 400   | 600   | 800   | 1000  | V    |
| Max. DC forward current (fig. 1)  | $I_F^{(1)}$              | 3.0         |       |       |       |       | A    |
|   | $I_F^{(2)}$              | 2.1         |       |       |       |       |      |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load | $I_{FSM}$                | 70          |       |       |       |       | A    |
| Non-repetitive avalanche energy at $T_J = 25$ °C                                  | $I_{AS} = 2.5$ A max.    | 20          |       |       |       |       | mJ   |
|   | $I_{AS} = 1.0$ A typical | 30          |       |       |       |       |      |
| Operating junction and storage temperature range                                  | $T_J, T_{STG}$           | -55 to +175 |       |       |       |       | °C   |

### Notes

(1) Mounted on 10 mm x 10 mm pad areas, 1 oz. FR4 PCB

(2) Free air, mounted on recommended copper pad area



| <b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted) |   |                                   |             |      |               |               |
|--|---|-----------------------------------|-------------|------|---------------|---------------|
| PARAMETER  | TEST CONDITIONS   | SYMBOL                            | TYP.        | MAX. | UNIT          |               |
| Instantaneous forward voltage  | $I_F = 1.5\text{ A}$  | $T_A = 25\text{ }^\circ\text{C}$  | $V_F^{(1)}$ | 0.92 | -             | V             |
|  | $I_F = 3.0\text{ A}$  |                                   |             | 1.00 | 1.10          |               |
|  | $I_F = 1.5\text{ A}$  | $T_A = 125\text{ }^\circ\text{C}$ |             | 0.81 | -             |               |
|  | $I_F = 3.0\text{ A}$  |                                   |             | 0.90 | 0.95          |               |
| Reverse current  | rated $V_R$   | $T_A = 25\text{ }^\circ\text{C}$  | $I_R^{(2)}$ | 0.28 | 10            | $\mu\text{A}$ |
|  |   | $T_A = 125\text{ }^\circ\text{C}$ |             | 62   | 150           |               |
| Typical reverse recovery time  | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ ,<br>$t_{rr} = 0.25\text{ A}$ | $t_{rr}$                          | 1.2         | -    | $\mu\text{s}$ |               |
| Typical junction capacitance per diode   | 4.0 V, 1 MHz  | $C_J$                             | 37          | -    | 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 noted) |                       |       |       |       |       |       |                    |
|---|-----------------------|-------|-------|-------|-------|-------|--------------------|
| PARAMETER   | SYMBOL                | AS3PD | AS3PG | AS3PJ | AS3PK | AS3PM | UNIT               |
| Typical thermal resistance  | $R_{\theta JA}^{(1)}$ | 80    |       |       |       |       | $^\circ\text{C/W}$ |
|   | $R_{\theta JM}^{(2)}$ | 5     |       |       |       |       |                    |

**Notes**

(1) Free air, mounted on recommended PCB 1 oz. pad area; thermal resistance  $R_{\theta JA}$  - junction to ambient

(2) Units mounted on PCB with 10 mm x 10 mm copper pad areas, 1 oz. FR4 PCB;  $R_{\theta JM}$  - junction to mount

| <b>ORDERING INFORMATION</b> (Example) |                 |                        |               |                                    |
|---------------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                         | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| AS3PJ-M3/86A                          | 0.10            | 86A                    | 1500          | 7" diameter plastic tape and reel  |
| AS3PJ-M3/87A                          | 0.10            | 87A                    | 6500          | 13" diameter plastic tape and reel |
| AS3PJHM3_A/H <sup>(1)</sup>           | 0.10            | H                      | 1500          | 7" diameter plastic tape and reel  |
| AS3PJHM3_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<sub>A</sub> = 25 °C unless otherwise noted)

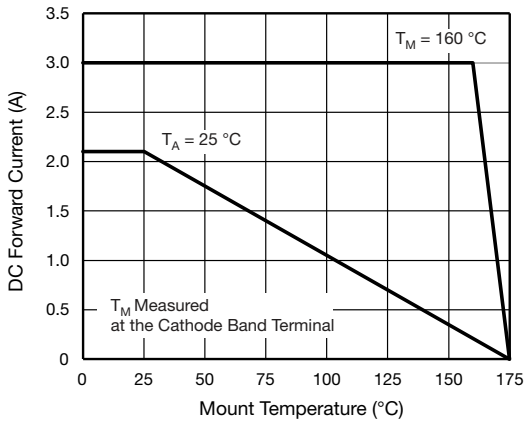


Fig. 1 - Maximum Forward Current Derating Curve

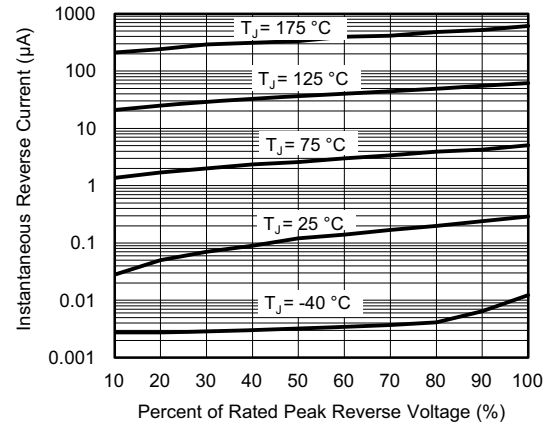


Fig. 4 - Typical Reverse Leakage Characteristics

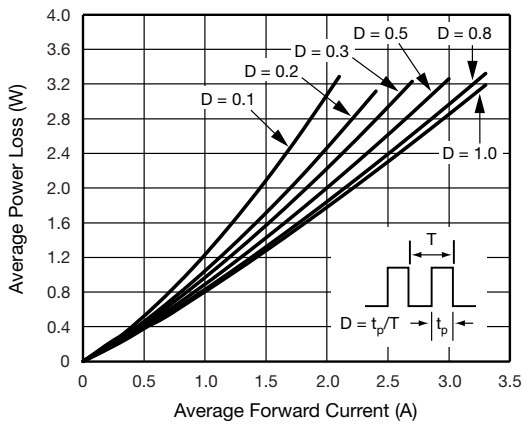


Fig. 2 - Forward Power Loss Characteristics

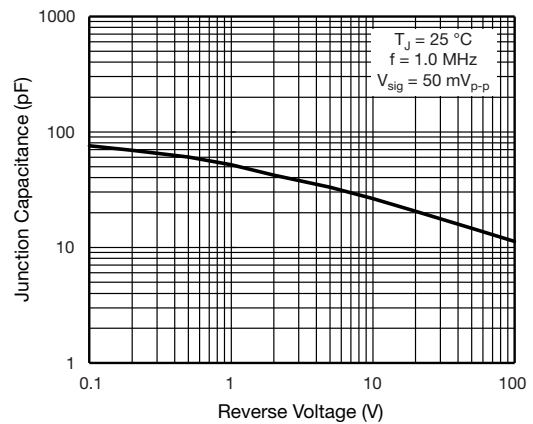


Fig. 5 - Typical Junction Capacitance

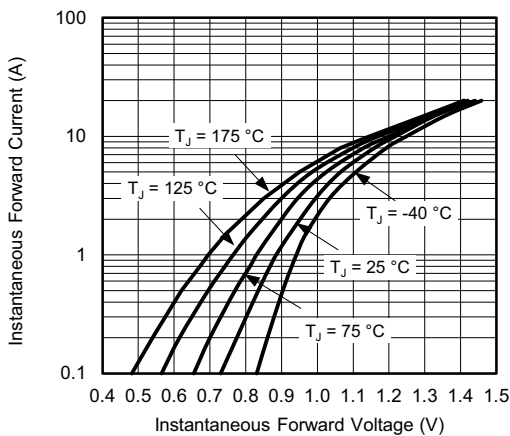


Fig. 3 - Typical Instantaneous Forward Characteristics

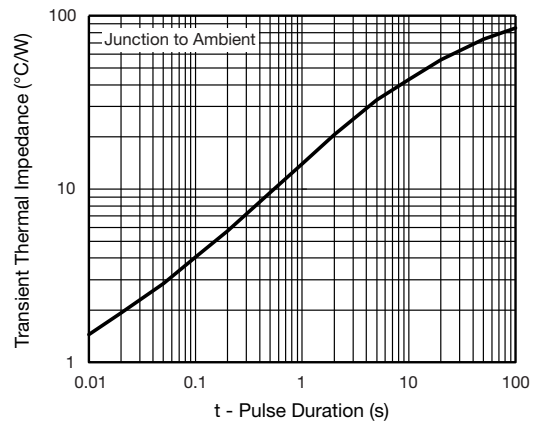
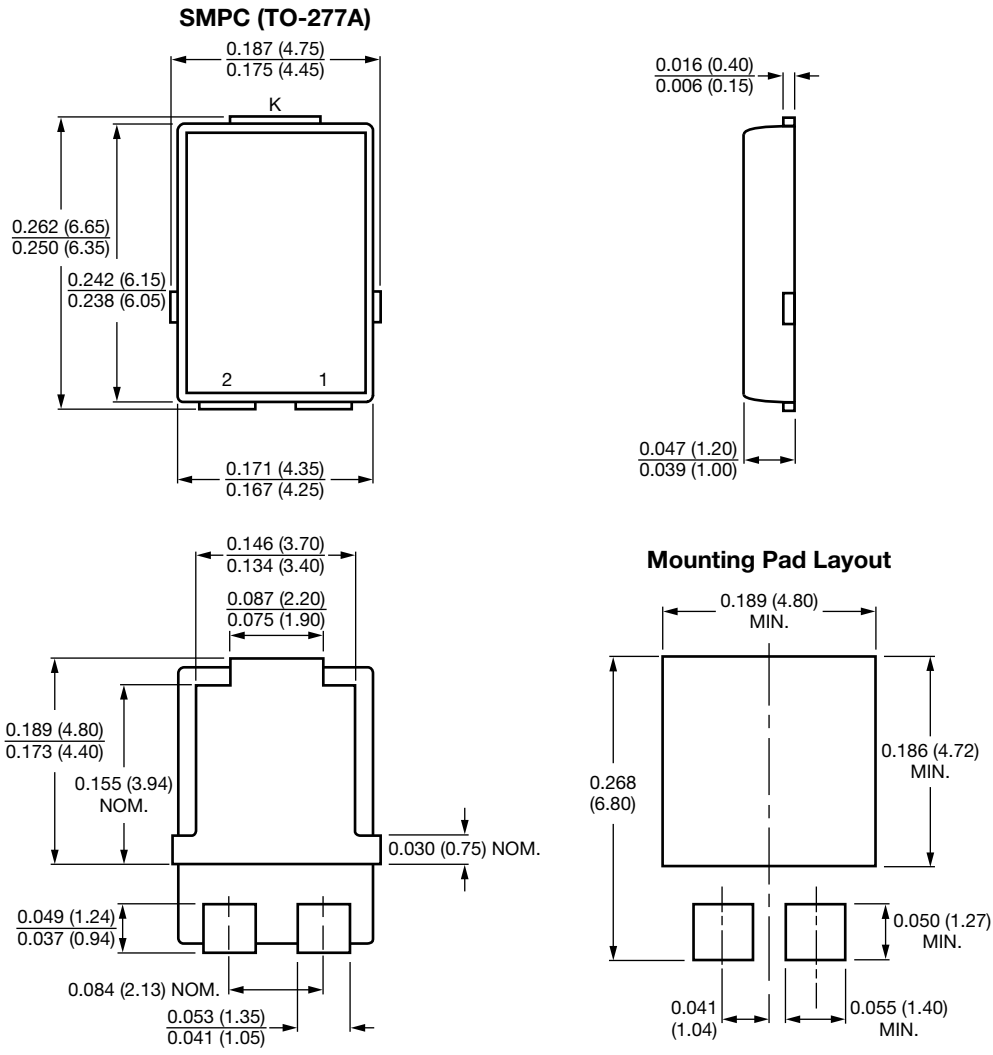


Fig. 6 - Typical Transient Thermal Impedance



### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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