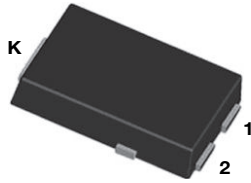
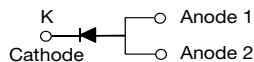


## Ultrafast Avalanche Surface Mount Rectifiers

### eSMP® Series



### SMPC (TO-277A)



### LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

| PRIMARY CHARACTERISTICS |                |
|-------------------------|----------------|
| $I_{F(AV)}$             | 3.0 A          |
| $V_{RRM}$               | 800 V, 1000 V  |
| $I_{FSM}$               | 45 A           |
| $t_{tr}$                | 75 ns          |
| $E_{AS}$                | 20 mJ          |
| $V_F$ at $I_F = 3.0$ A  | 1.45 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
- Fast reverse recovery time
- 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 lighting, fast switching 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 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)  |                |             |       |      |
|--|----------------|-------------|-------|------|
| PARAMETER  | SYMBOL         | AU3PK       | AU3PM | UNIT |
| Device marking code  |                | AU3K        | AU3M  |      |
| Maximum repetitive peak reverse voltage  | $V_{RRM}$      | 800         | 1000  | V    |
| Maximum DC forward current (fig. 1)  | $I_F^{(1)}$    | 3.0         |       | A    |
|  | $I_F^{(2)}$    | 1.4         |       |      |
| Peak forward surge current 10 ms single half sine-wave superimposed on rated load                  | $I_{FSM}$      | 45          |       | A    |
| Non-repetitive avalanche energy at $T_J = 25$ °C<br>$I_{AS} = 2.5$ A max.<br>$I_{AS} = 1.0$ A typ. | $E_{AS}$       | 20          |       | mJ   |
|  |                | 30          |       |      |
| Operating junction and storage temperature range   | $T_J, T_{STG}$ | -55 to +175 |       | °C   |

### Notes

(1) Mounted on 20 mm x 20 mm pad areas, 1 oz. FR4 PCB

(2) Free air, mounted on recommended pad area

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

| PARAMETER                              | TEST CONDITIONS   | SYMBOL      | TYP.                              | MAX. | UNIT |               |
|--|---|-------------|-----------------------------------|------|------|---------------|
| Instantaneous forward voltage          | $I_F = 3.0\text{ A}$  | $V_F^{(1)}$ | $T_A = 25\text{ }^\circ\text{C}$  | 2.27 | 2.5  | V             |
|  |   |             | $T_A = 125\text{ }^\circ\text{C}$ | 1.45 | 2.0  |               |
| Reverse current                        | Rated $V_R$   | $I_R^{(2)}$ | $T_A = 25\text{ }^\circ\text{C}$  | 0.40 | 10   | $\mu\text{A}$ |
|  |   |             | $T_A = 125\text{ }^\circ\text{C}$ | 107  | 500  |               |
| Maximum reverse recovery time          | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ ,<br>$t_{rr} = 0.25\text{ A}$ | $t_{rr}$    | 58                                | 75   | ns   |               |
| Typical junction capacitance per diode | Rated $V_R = 4.0\text{ V}$ , 1 MHz  | $C_J$       | 42                                | -    | 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** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

| PARAMETER                  | SYMBOL                | AU3PK | AU3PM | UNIT               |
|----------------------------|-----------------------|-------|-------|--------------------|
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 85    |       | $^\circ\text{C/W}$ |
|                            | $R_{\theta JM}^{(2)}$ | 5     |       |                    |

**Notes**(1) Free air, mounted on recommended PCB 1 oz. pad are; thermal resistance  $R_{\theta JA}$  - junction to ambient(2) Units mounted on PCB with 20 mm x 20 mm copper pad areas;  $R_{\theta JM}$  - junction to mount**ORDERING INFORMATION** (Example)

| PREFERRED P/N               | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|-----------------------------|-----------------|------------------------|---------------|------------------------------------|
| AU3PM-M3/86A                | 0.10            | 86A                    | 1500          | 7" diameter plastic tape and reel  |
| AU3PM-M3/87A                | 0.10            | 87A                    | 6500          | 13" diameter plastic tape and reel |
| AU3PMHM3_A/H <sup>(1)</sup> | 0.10            | H                      | 1500          | 7" diameter plastic tape and reel  |
| AU3PMHM3_A/I <sup>(1)</sup> | 0.10            | I                      | 6500          | 13" diameter plastic tape and reel |

**Note**

(1) AEC-Q101 qualified

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

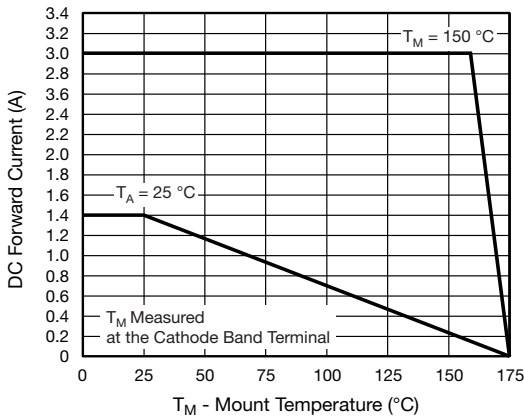


Fig. 1 - Maximum Forward Current Derating Curve

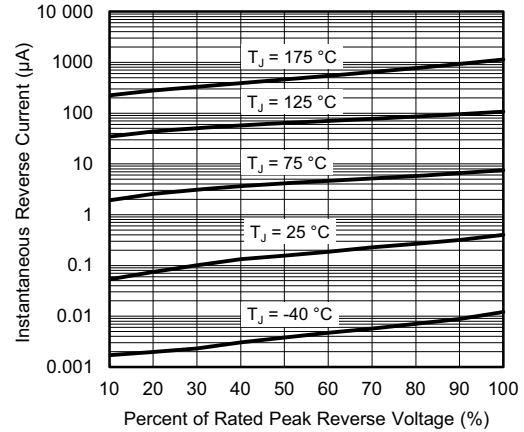


Fig. 4 - Typical Reverse Leakage Characteristics

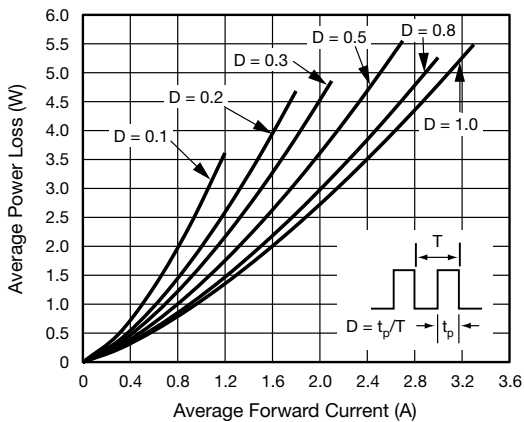


Fig. 2 - Average Power Loss Characteristics

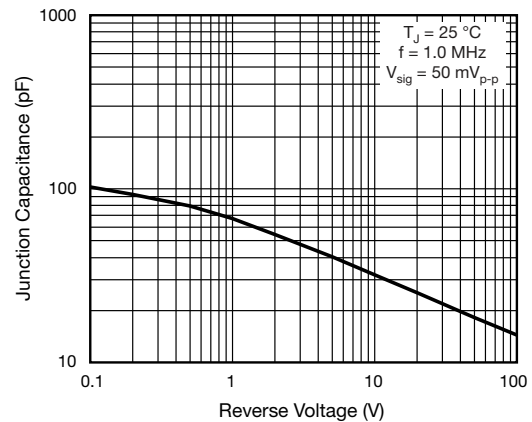


Fig. 5 - Typical Junction Capacitance

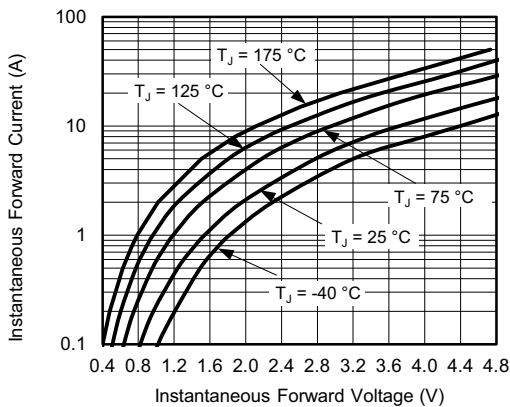


Fig. 3 - Typical Instantaneous Forward Characteristics

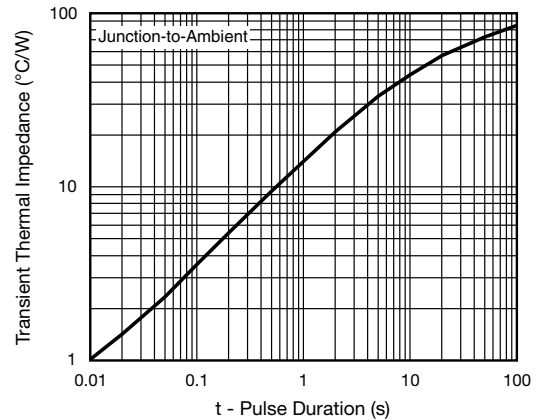
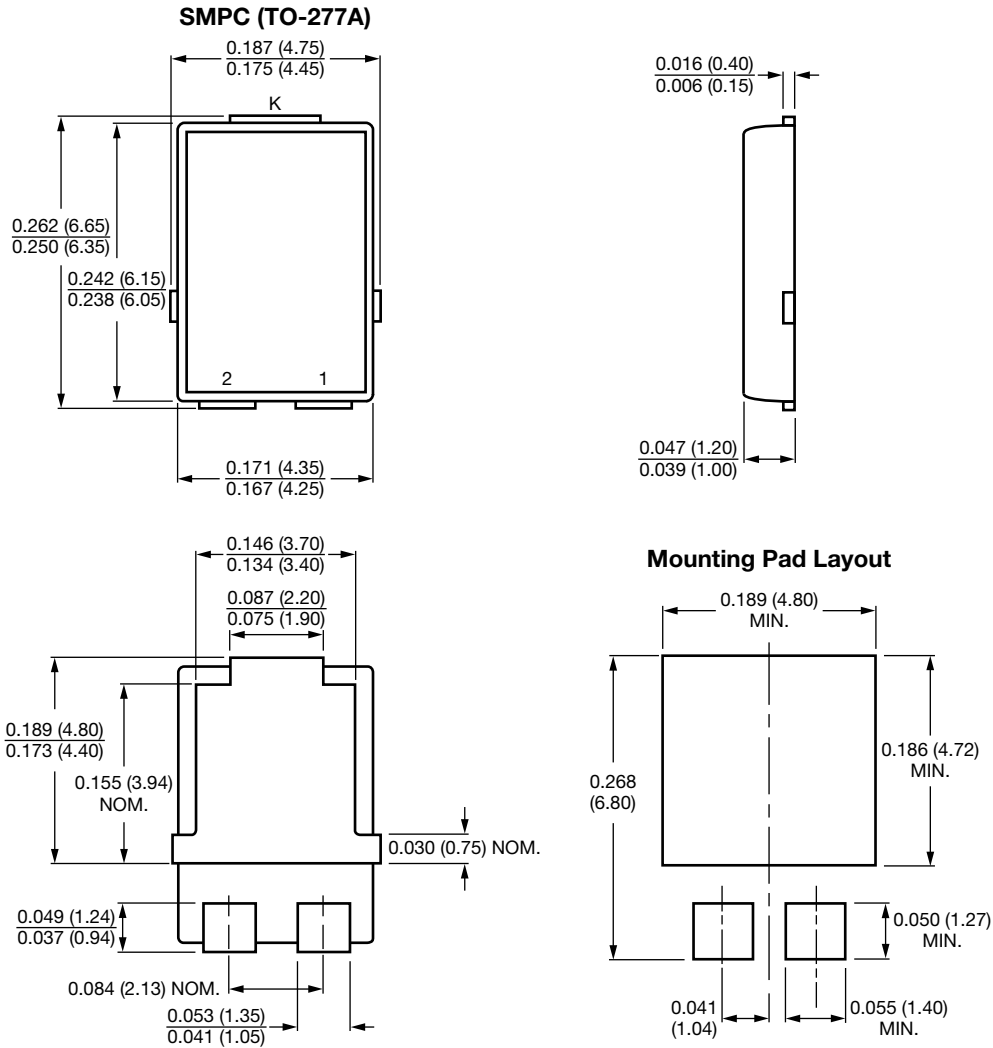


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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