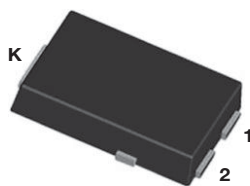
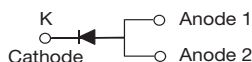


Ultrafast Avalanche Surface Mount Rectifiers

eSMP® Series



SMPC (TO-277A)



DESIGN SUPPORT TOOLS

[click logo to get started](#)


PRIMARY CHARACTERISTICS

| | |
|------------------------|---------------------|
| $I_{F(AV)}$ | 3.0 A |
| V_{RRM} | 200 V, 400 V, 600 V |
| I_{FSM} | 75 A |
| t_{rr} | 75 ns |
| E_{AS} | 20 mJ |
| V_F at $I_F = 3.0$ A | 1.13 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



RoHS
COMPLIANT
HALOGEN
FREE

TYPICAL APPLICATIONS

For use in lighting, high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, 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 | AU3PD | AU3PG | AU3PJ | UNIT |
|---|------------------------------|-----------------------------------|-------------|-------|-------|------|
| Device marking code | | | AU3D | AU3G | AU3J | |
| Maximum repetitive peak reverse voltage | | V _{RRM} | 200 | 400 | 600 | V |
| Maximum DC forward current (fig. 1) | | I _F ⁽¹⁾ | 3.0 | | | A |
| | | I _F ⁽²⁾ | 1.7 | | | |
| 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 | I _{AS} = 2.5 A max. | E _{AS} | 20 | | | mJ |
| | I _{AS} = 1.0 A typ. | | 30 | | | |
| Operating junction and storage temperature range | | T _J , T _{STG} | -55 to +175 | | | °C |

Notes

(1) Mounted on 14 mm x 14 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 | $I_F = 3.0\text{ A}$ | $T_A = 25\text{ }^{\circ}\text{C}$ | 1.53 | 1.9 | V |
| | | $T_A = 125\text{ }^{\circ}\text{C}$ | 1.13 | 1.4 | |
| Reverse current | Rated V_R | $T_A = 25\text{ }^{\circ}\text{C}$ | 0.41 | 10 | μA |
| | | $T_A = 125\text{ }^{\circ}\text{C}$ | 70 | 250 | |
| Maximum reverse recovery time | $I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $t_{rr} = 0.25\text{ A}$ | t_{rr} | 66 | 75 | ns |
| Typical junction capacitance per diode | Rated $V_R = 4.0\text{ V}$, 1 MHz | C_J | 72 | - | 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 noted)

| PARAMETER | SYMBOL | AU3PD | AU3PG | AU3PJ | UNIT |
|----------------------------|-----------------------|-------|-------|-------|------|
| Typical thermal resistance | $R_{\theta JA}^{(1)}$ | 85 | | | °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 14 mm x 14 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 |
|-----------------------------|-----------------|------------------------|---------------|------------------------------------|
| AU3PJ-M3/86A | 0.10 | 86A | 1500 | 7" diameter plastic tape and reel |
| AU3PJ-M3/87A | 0.10 | 87A | 6500 | 13" diameter plastic tape and reel |
| AU3PJHM3_A/H ⁽¹⁾ | 0.10 | H | 1500 | 7" diameter plastic tape and reel |
| AU3PJHM3_A/I ⁽¹⁾ | 0.10 | I | 6500 | 13" diameter plastic tape and reel |

Note

(1) AEC-Q101 qualified

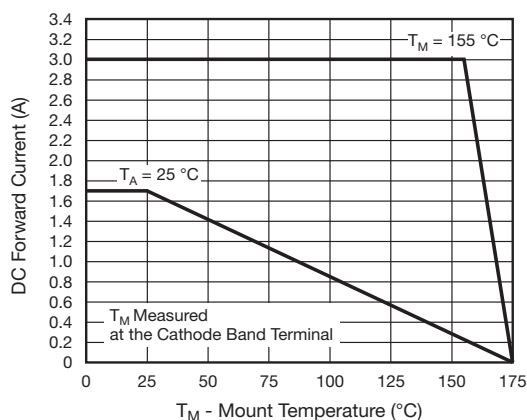
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

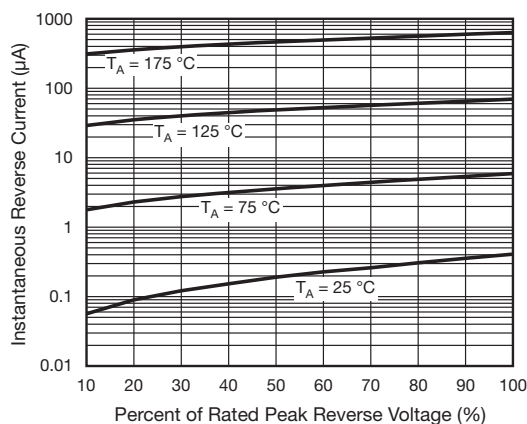


Fig. 4 - Typical Reverse Leakage Characteristics

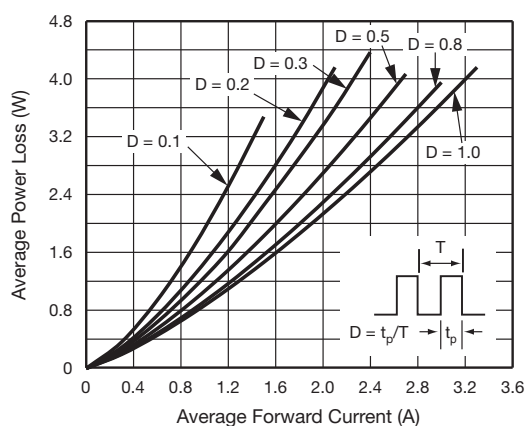


Fig. 2 - Average Power Loss Characteristics

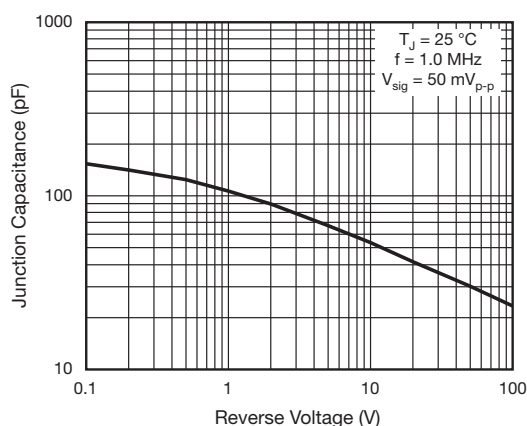


Fig. 5 - Typical Junction Capacitance

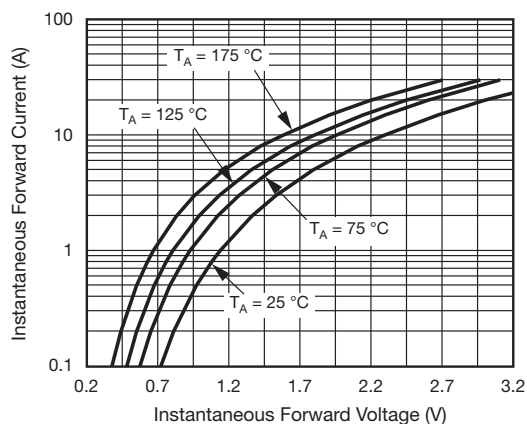


Fig. 3 - Typical Instantaneous Forward Characteristics

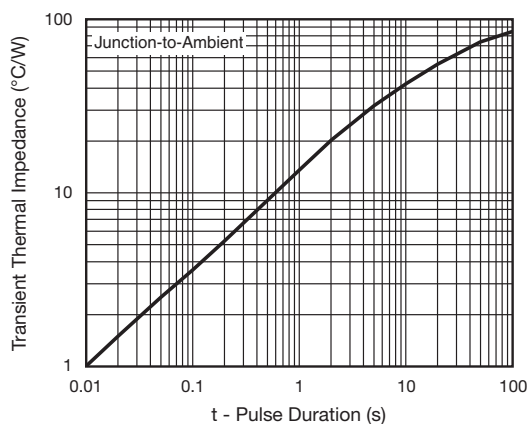
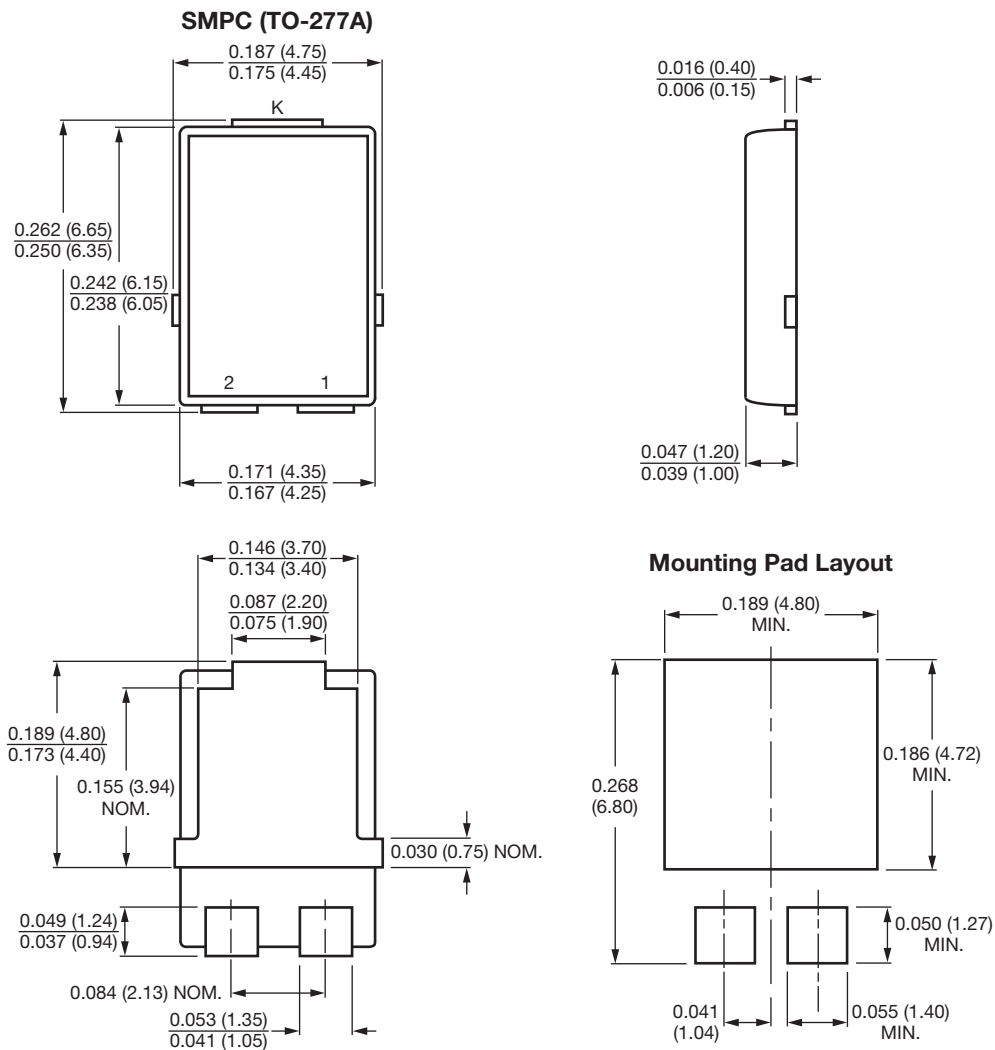


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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