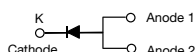


Ultrafast Avalanche Surface Mount Rectifiers

eSMP® Series



TO-277A (SMPC)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Glass passivated 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
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE
GRADE
Available



RoHS
COMPLIANT
HALOGEN
FREE

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	3.0 A
V_{RRM}	800 V, 1000 V
I_{FSM}	45 A
t_{rr}	75 ns
E_{AS}	20 mJ
V_F at $I_F = 3.0$ A	1.45 V
T_J max.	175 °C
Package	TO-277A (SMPC)
Diode variations	Single die

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: 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 automotive grade

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 $\frac{I_{AS} = 2.5 \text{ A max.}}{I_{AS} = 1.0 \text{ A typ.}}$	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	$I_F = 3.0\text{ A}$	$T_A = 25\text{ }^{\circ}\text{C}$	2.27	2.5	V
		$T_A = 125\text{ }^{\circ}\text{C}$	1.45	2.0	
Reverse current	Rated V_R	$T_A = 25\text{ }^{\circ}\text{C}$	0.40	10	μA
		$T_A = 125\text{ }^{\circ}\text{C}$	107	500	
Maximum reverse recovery time	$I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $t_{rr} = 0.25\text{ A}$	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 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	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
AU3PMHM3/86A ⁽¹⁾	0.10	86A	1500	7" diameter plastic tape and reel
AU3PMHM3/86A ⁽¹⁾	0.10	87A	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

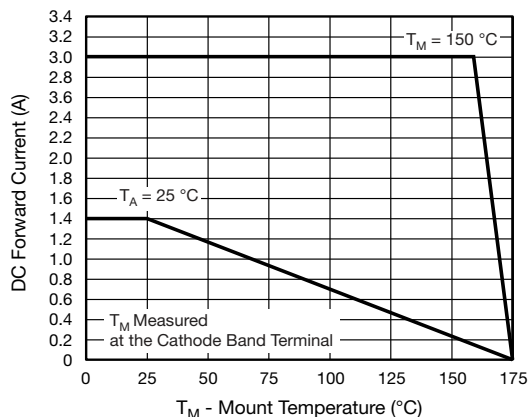
($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

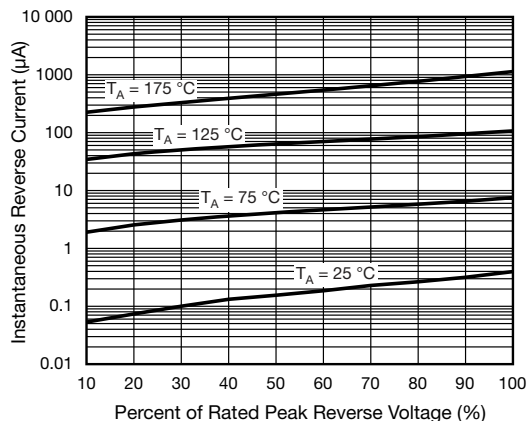


Fig. 4 - Typical Reverse Leakage Characteristics

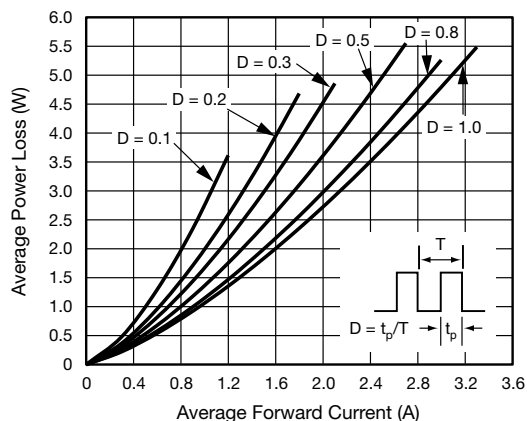


Fig. 2 - Average Power Loss Characteristics

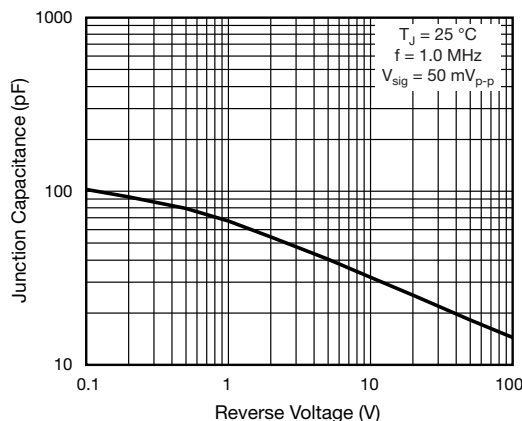


Fig. 5 - Typical Junction Capacitance

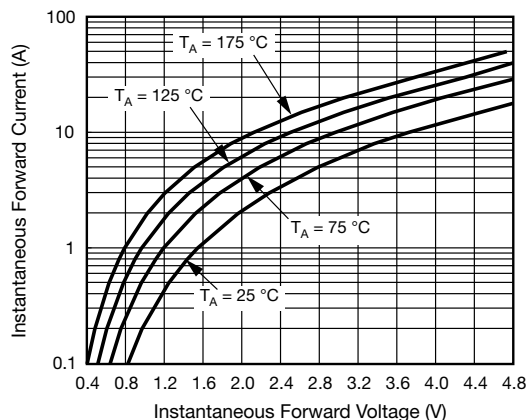


Fig. 3 - Typical Instantaneous Forward Characteristics

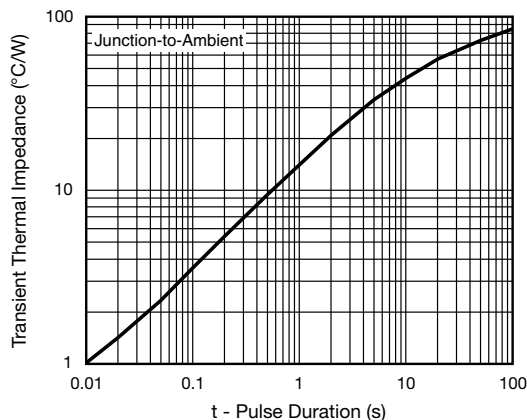
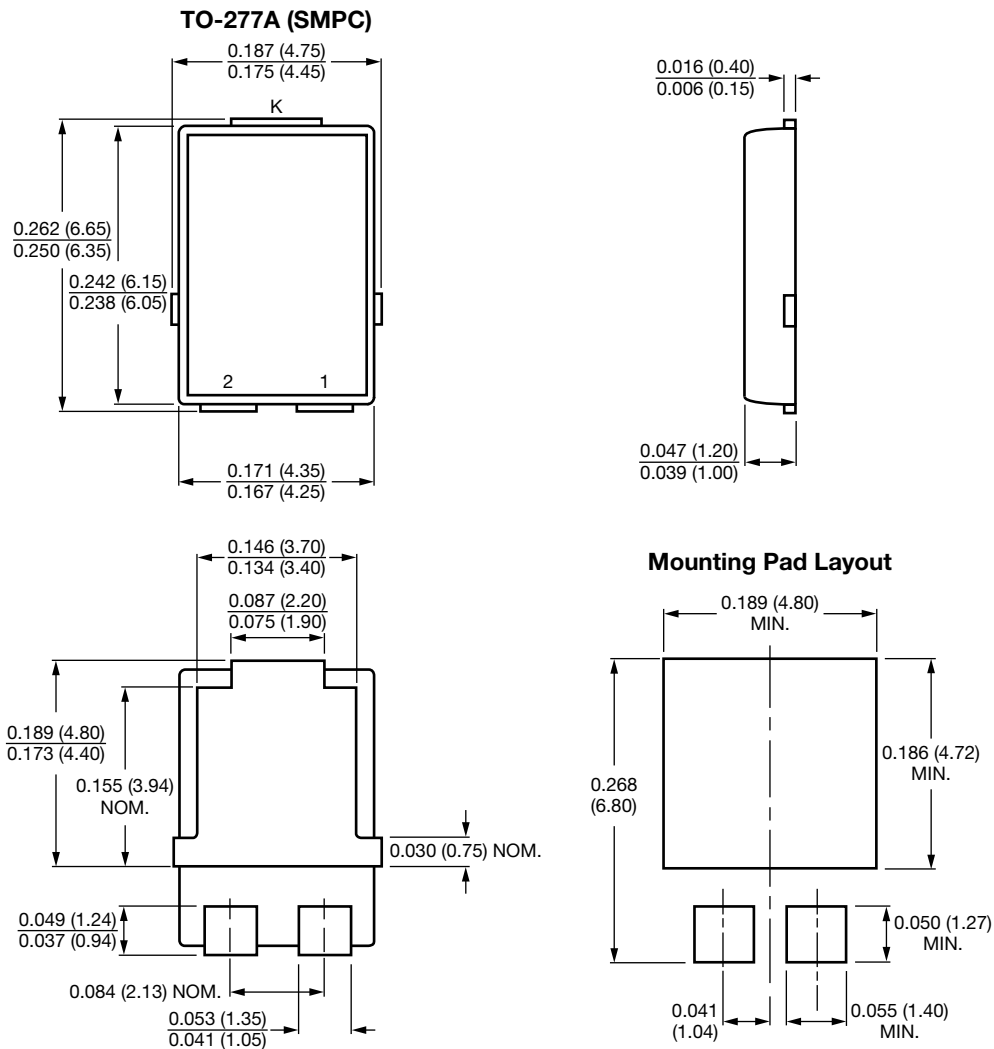


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)




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