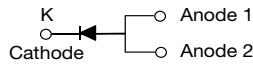


Fast Switching Avalanche Surface-Mount Rectifiers

eSMP® Series



SMPC (TO-277A)



ADDITIONAL RESOURCES



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



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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
V_{RRM}	800 V, 1000 V
I_{FSM}	50 A
t_{rr}	120 ns
E_{AS}	20 mJ
V_F at $I_F = 3.0$ A	1.26 V
T_J max.	175 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)				
PARAMETER	SYMBOL	AR3PK	AR3PM	UNIT
Device marking code		AR3K	AR3M	
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⁾	1.6		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	50		A
Non-repetitive avalanche energy at $T_J = 25$ °C	$I_{AS} = 2.5$ A max.		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 20 mm x 20 mm pad areas, 1 oz. FR4 PCB

(2) Free air, mounted on recommended pad area

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

PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 3.0 \text{ A}$	$T_A = 25^\circ\text{C}$	V_F ⁽¹⁾	1.55	1.9	V
		$T_A = 125^\circ\text{C}$		1.26	1.6	
Reverse current	Rated V_R	$T_A = 25^\circ\text{C}$	I_R ⁽²⁾	0.34	10	μA
		$T_A = 125^\circ\text{C}$		110	500	
Maximum reverse recovery time	$I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A}, I_{rr} = 0.25 \text{ A}$		t_{rr}	95	120	ns
Typical junction capacitance per diode	Rated $V_R = 4.0 \text{ V}, 1 \text{ MHz}$		C_J	34	-	pF

Notes

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width $\leq 40 \text{ ms}$

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

PARAMETER	SYMBOL	AR3PK	AR3PM	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

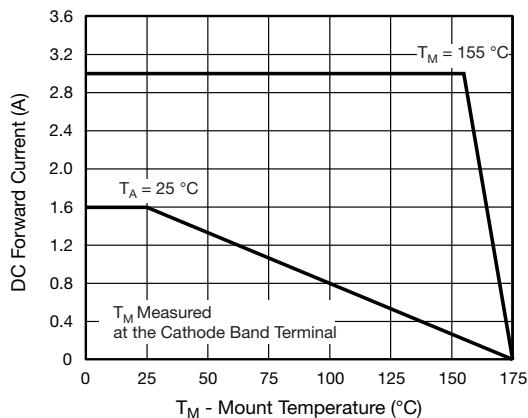
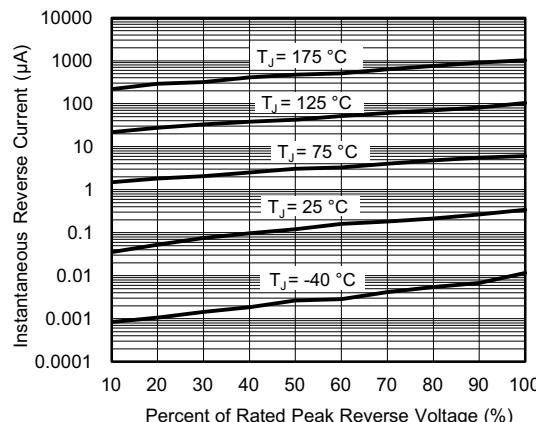
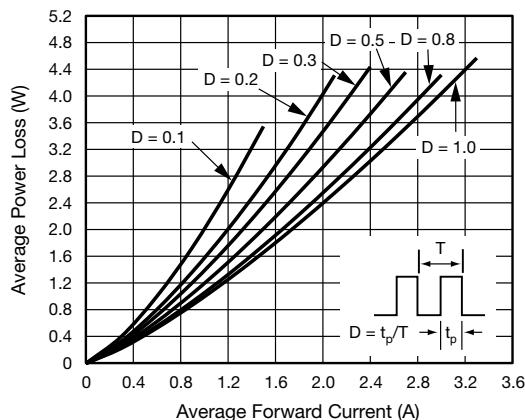
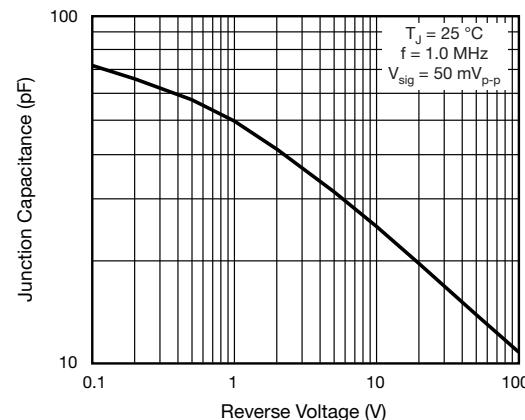
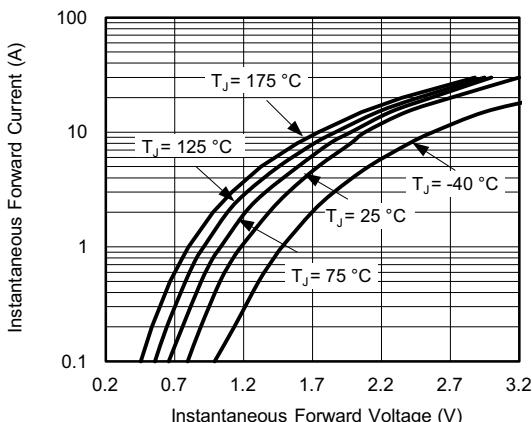
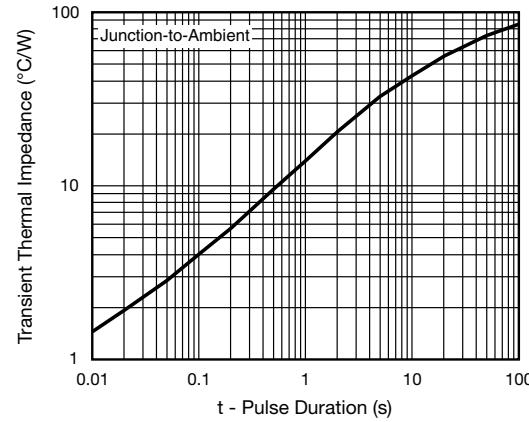
(2) Units mounted on PCB with 20 mm x 20 mm copper pad areas; $R_{\theta JM}$ - junction to mount

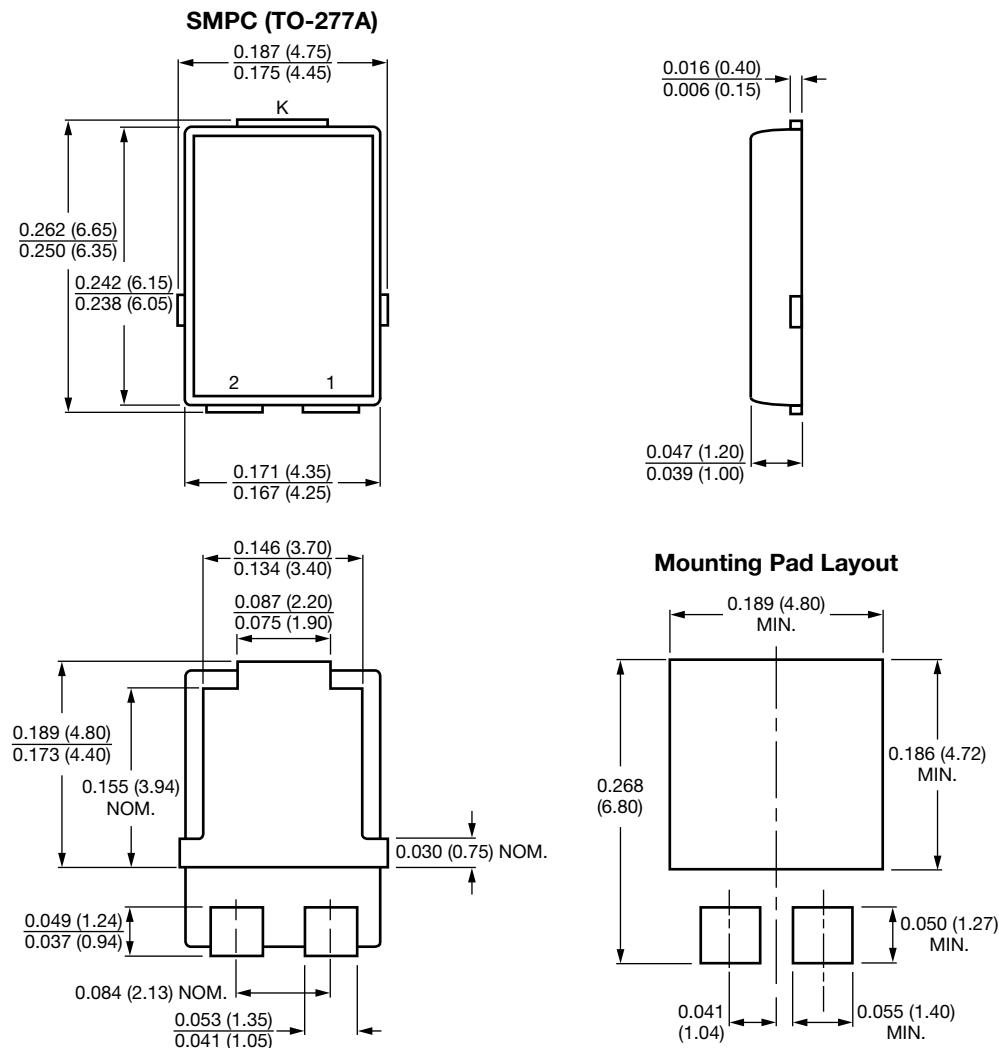
ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
AR3PM-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
AR3PM-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
AR3PMHM3_A/H ⁽¹⁾	0.10	H	1500	7" diameter plastic tape and reel
AR3PMHM3_A/I ⁽¹⁾	0.10	I	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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