

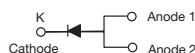
Fast Switching Avalanche Surface Mount Rectifiers

AR4PK, AR4PM

Vishaymas General Semiconductor



TO-277A (SMPC)



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.vishaymas.com

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 AEC-Q101 qualified

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	
$I_{F(AV)}$	4.0 A
V_{RRM}	800 V, 1000 V
I_{FSM}	65 A
t_{rr}	120 ns
E_{AS}	20 mJ
V_F at $I_F = 4.0$ A	1.27 V
T_J max.	175 °C
Package	TO-277A (SMPC)
Diode variation	Single die

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)					
PARAMETER		SYMBOL	AR4PK	AR4PM	UNIT
Device marking code			AR4K	AR4M	
Maximum repetitive peak reverse voltage		V _{RRM}	800	1000	V
Maximum DC forward current (fig. 1)		I _F ⁽¹⁾	4.0		A
		I _F ⁽²⁾	1.8		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load		I _{FSM}	65		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 30 mm x 30 mm pad areas, 1 oz. FR4 PCB

(2) Free air, mounted on recommended pad area

ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 4.0 A	T _A = 25 °C	V _F ⁽¹⁾	1.66	1.9	V
		T _A = 125 °C		1.27	1.6	
Reverse current	Rated V _R	T _A = 25 °C	I _R ⁽²⁾	0.42	10	μA
		T _A = 125 °C		96.3	500	
Maximum reverse recovery time	I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A		t _{rr}	79	120	ns
Typical junction capacitance per diode	Rated V _R = 4.0 V, 1 MHz		C _J	55	-	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 °C unless otherwise noted)				
PARAMETER	SYMBOL	AR4PK	AR4PM	UNIT
Typical thermal resistance	R _{θJA} ⁽¹⁾	85		°C/W
	R _{θJM} ⁽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 30 mm x 30 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
AR4PM-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
AR4PM-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
AR4PMHM3/86A ⁽¹⁾	0.10	86A	1500	7" diameter plastic tape and reel
AR4PMHM3/86A ⁽¹⁾	0.10	87A	6500	13" diameter plastic tape and reel
AR4PMHM3_A/H ⁽¹⁾	0.10	H	1500	7" diameter plastic tape and reel
AR4PMHM3_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)

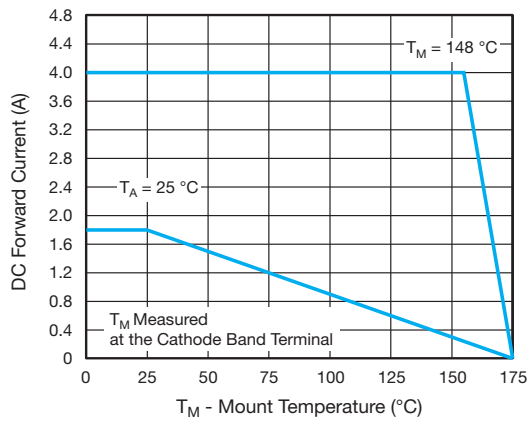


Fig. 1 - Maximum DC Forward Current Derating Curve

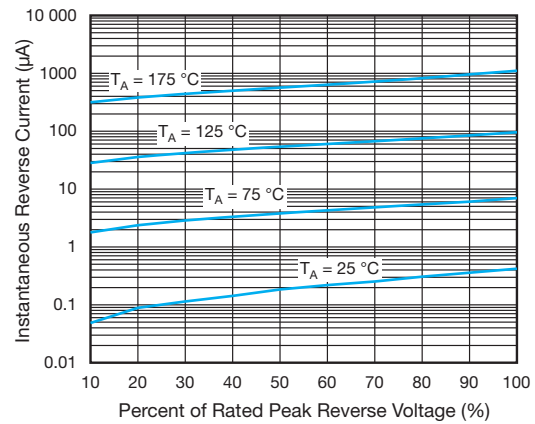


Fig. 4 - Typical Reverse Leakage Characteristics

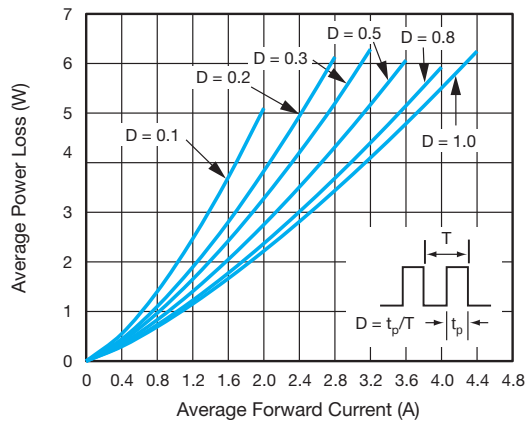


Fig. 2 - Average Power Loss Characteristics

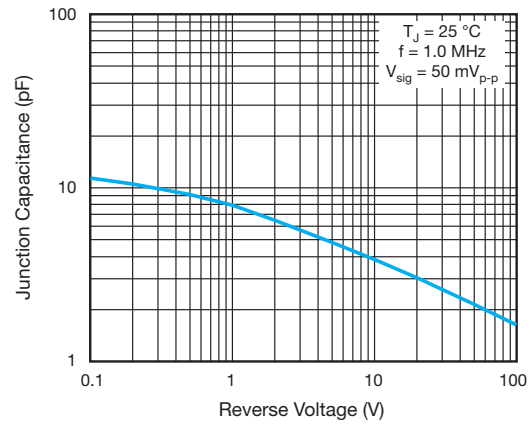


Fig. 5 - Typical Junction Capacitance

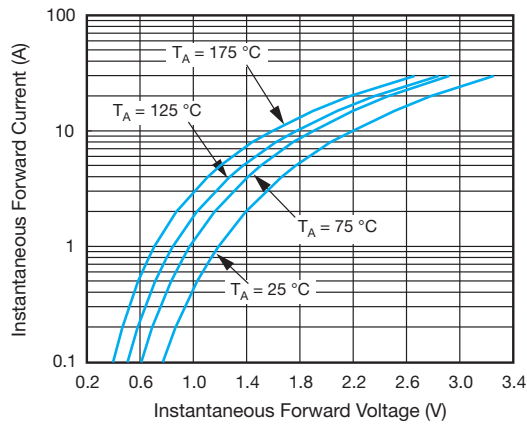


Fig. 3 - Typical Instantaneous Forward Characteristics

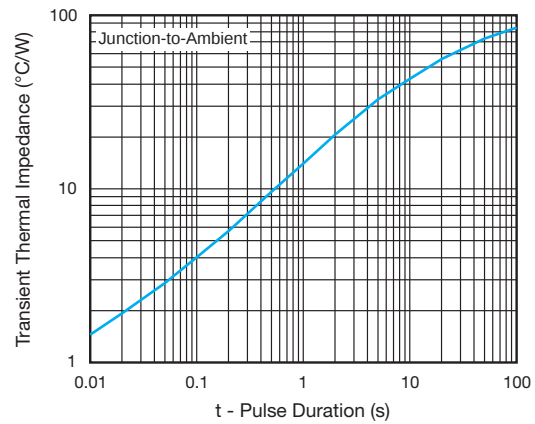
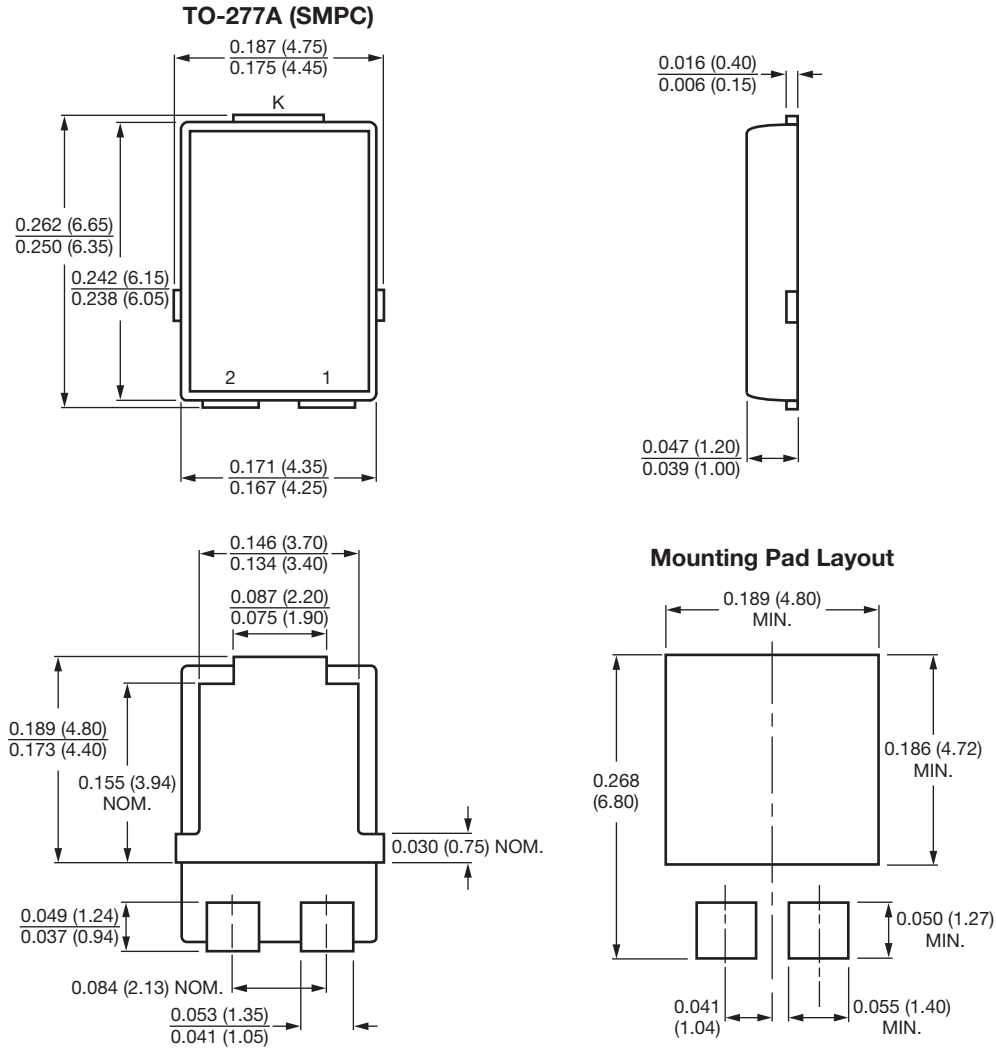


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A

