AUTOMOTIVE

RoHS

COMPLIANT

HALOGEN FREE



Vishay General Semiconductor

Fast Switching Avalanche Surface-Mount Rectifiers



ADDITIONAL RESOURCES



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	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
- \bullet Meets MSL level 1, per J-STD-020, LF maximum peak of 260 $^{\circ}\text{C}$
- 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

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		Α	
Non-repetitive avalanche energy at T _J = 25 °C	$I_{AS} = 2.5 A \text{ max}.$	_	20		I	
	$I_{AS} = 1.0 A \text{ typ.}$	E _{AS}	30		mJ	
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



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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	μΑ
		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		CJ	55	-	pF

Notes

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

(2) Pulse test: Pulse width ≤ 40 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 _{0JM} (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_A/H (1)	0.10	Н	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

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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

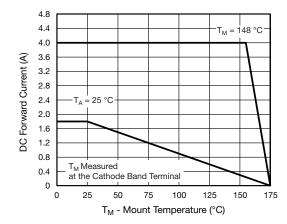


Fig. 1 - Maximum DC Forward Current Derating Curve

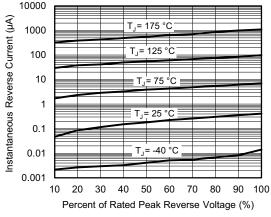


Fig. 4 - Typical Reverse Leakage Characteristics

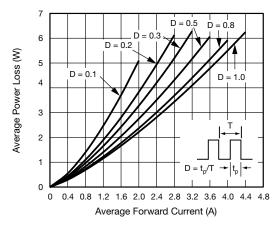


Fig. 2 - Average Power Loss Characteristics

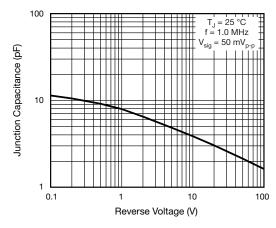


Fig. 5 - Typical Junction Capacitance

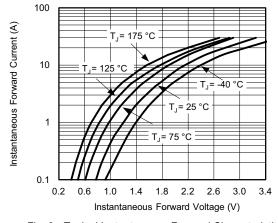


Fig. 3 - Typical Instantaneous Forward Characteristics

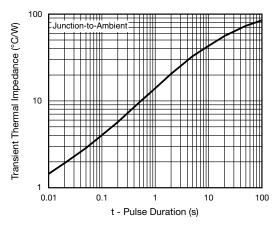
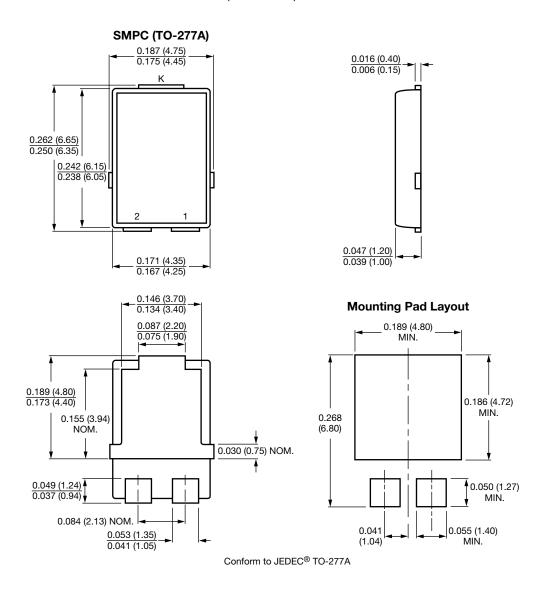


Fig. 6 - Typical Transient Thermal Impedance



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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