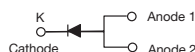


Fast Switching Avalanche Surface Mount Rectifiers

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

$I_{F(AV)}$	4.0 A
V_{RRM}	200 V, 400 V, 600 V
I_{FSM}	65 A
t_{rr}	140 ns
E_{AS}	20 mJ
V_F at $I_F = 4.0$ A	1.02 V
T_J max.	175 °C
Package	TO-277A (SMPC)
Diode variation	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)

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)						
PARAMETER		SYMBOL	AR4PD	AR4PG	AR4PJ	UNIT
Device marking code			AR4D	AR4G	AR4J	
Maximum repetitive peak reverse voltage		V _{RRM}	200	400	600	V
Maximum DC forward current (fig. 1)		I _F ⁽¹⁾	4.0			A
		I _F ⁽²⁾	2.0			
Peak forward surge current 10 ms single half sine-wave superimposed on rated load		I _{FSM}	65			A
Non-repetitive avalance 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** ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 4.0\text{ A}$	$V_F^{(1)}$	1.24	1.6	V
			1.02	1.20	
Reverse current	Rated V_R	$I_R^{(2)}$	0.6	10	μA
			60	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}	110	140	ns
Typical junction capacitance per diode	Rated $V_R = 4.0\text{ V}$, 1 MHz	C_J	77	-	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	AR4PD	AR4PG	AR4PJ	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
AR4PJ-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
AR4PJ-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
AR4PJHM3/86A ⁽¹⁾	0.10	86A	1500	7" diameter plastic tape and reel
AR4PJHM3/86A ⁽¹⁾	0.10	87A	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

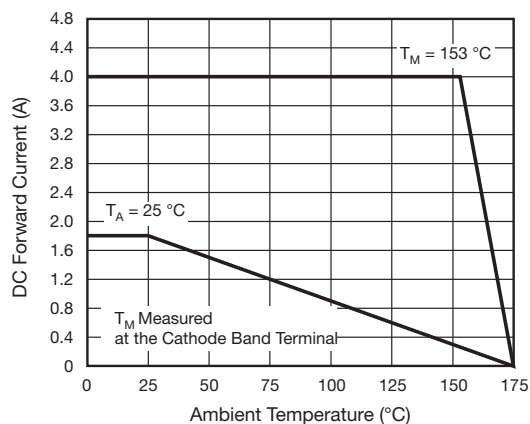
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

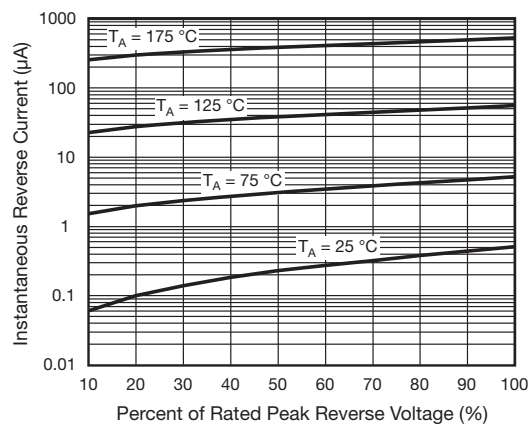


Fig. 4 - Typical Reverse Leakage Characteristics

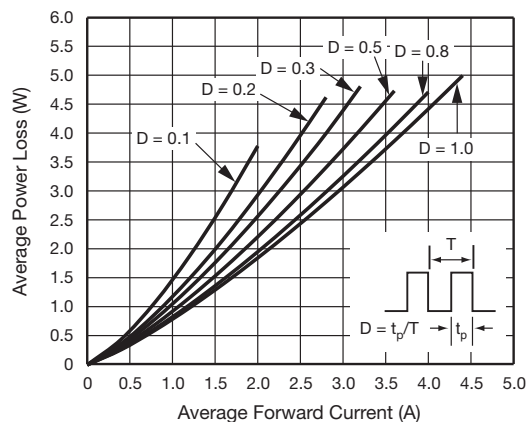


Fig. 2 - Average Power Loss Characteristics

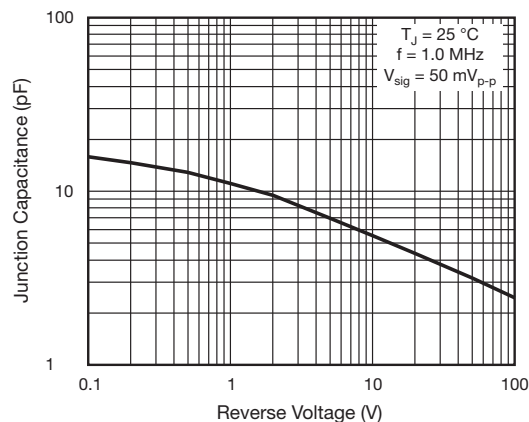


Fig. 5 - Typical Junction Capacitance

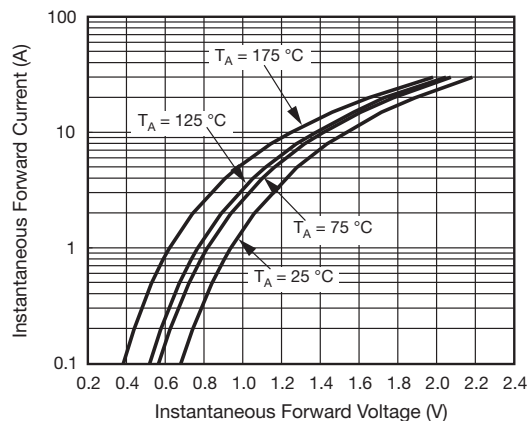


Fig. 3 - Typical Instantaneous Forward Characteristics

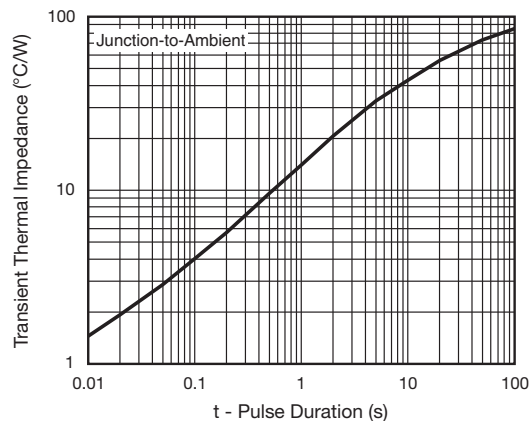
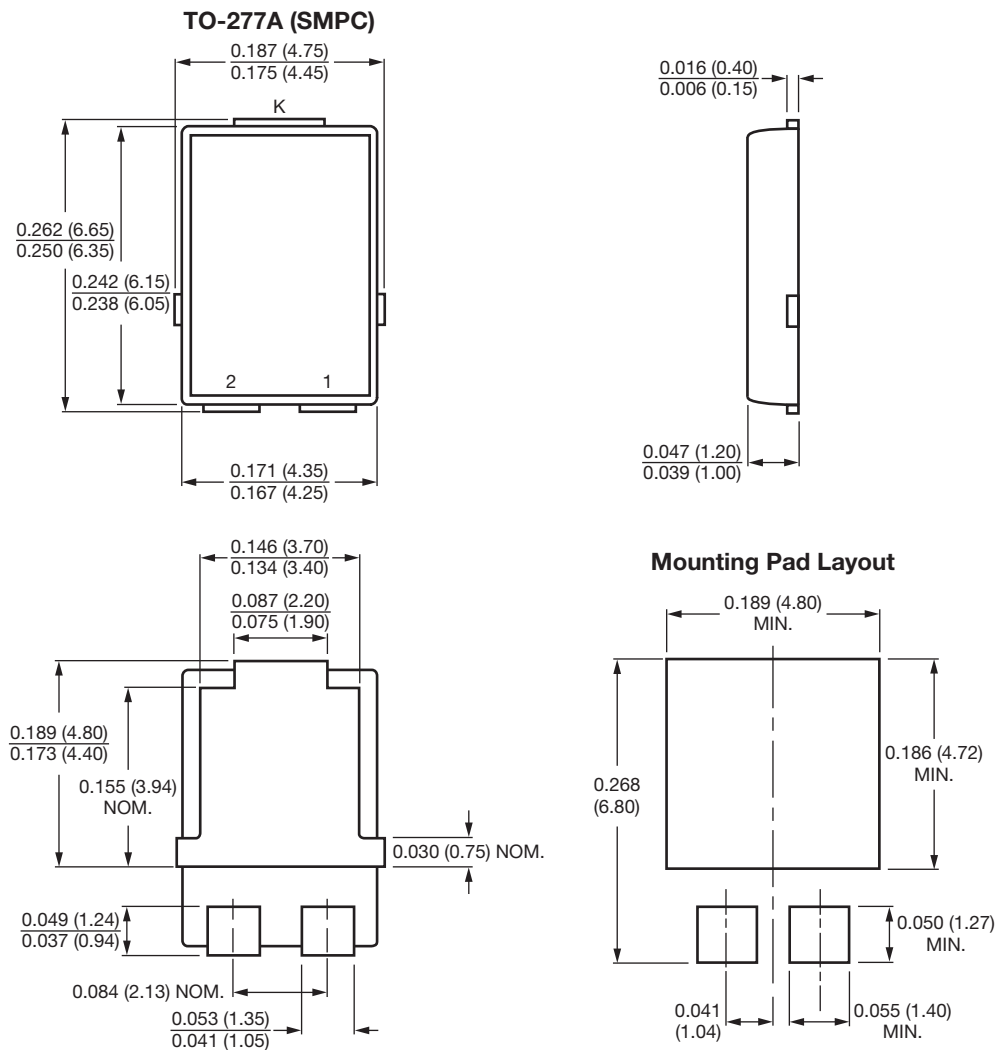


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC TO-277A



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