Surface Mount Fast Avalanche Rectifiers

eSMP® Series



SMP (DO-220AA)

Cathode ○—|◀—○ Anode

ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V, 400 V, 600 V, 800 V, 1000 V
I_{FSM}	30 A, 25 A
t_{rr}	140 ns, 120 ns
V_F	1.15 V, 1.4 V
I_R	1 µA
E_{AS}	20 mJ
T_J max.	175 °C
Package	SMP (DO-220AA)
Circuit configuration	Single

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated pellet chip junction
- Fast switching for high efficiency
- Low reverse current
- 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

TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, inverters, converters, and freewheeling diodes for consumer, automotive, and telecommunication.

MECHANICAL DATA

Case: SMP (DO-220AA)
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	AR1PD	AR1PG	AR1PJ	AR1PK	AR1PM	UNIT
Device marking code		ARD	ARG	ARJ	ARK	ARM	
Maximum repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	V
Average forward current	$I_{F(AV)}$	1.0					A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	30			25		A
Non-repetitive avalanche energy at I_{AS} = 1.0 A, T_A = 25 °C	E_{AS}	20					mJ
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175					°C

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS		SYMBOL	AR1PD	AR1PG	AR1PJ	AR1PK	AR1PM	UNIT
Maximum instantaneous forward voltage	I_F = 1.0 A	T_A = 25 °C	V_F (1)	1.25			1.6		V
		T_A = 125 °C		1.15			1.4		
Maximum reverse current	Rated V_R	T_A = 25 °C	I_R (2)	1.0					μA
		T_A = 125 °C		100					
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	140			120		ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	12.5			8.5		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	AR1PD	AR1PG	AR1PJ	AR1PK	AR1PM	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)	132					°C/W
	$R_{\theta JM}$ (1)	15					

Note

(1) Free air, mounted on recommended copper pad area. Thermal resistance $R_{\theta JA}$ - junction to ambient, $R_{\theta JM}$ - junction to mount at the terminal cathode band

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
AR1PJ-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
AR1PJ-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
AR1PJHM3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
AR1PJHM3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note

(1) Automotive grade

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

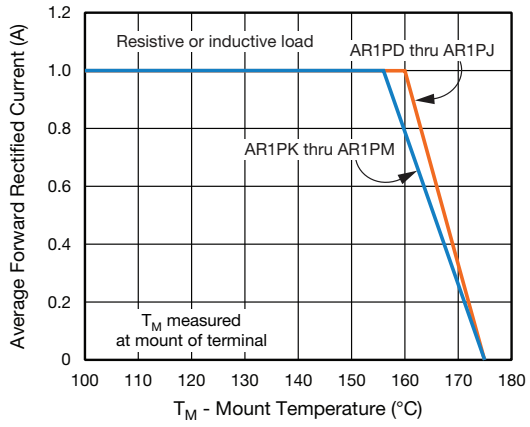

Fig. 1 - Maximum Forward Current Derating Curve

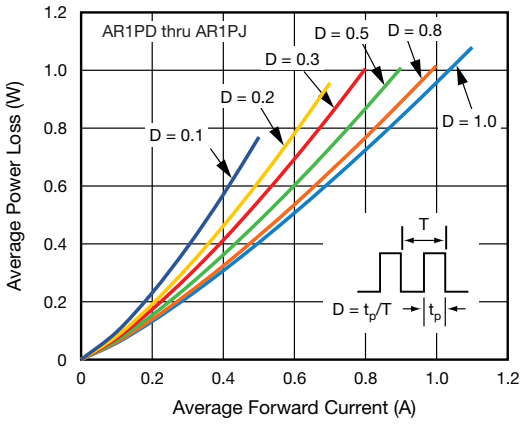

Fig. 2 - Forward Power Loss Characteristics

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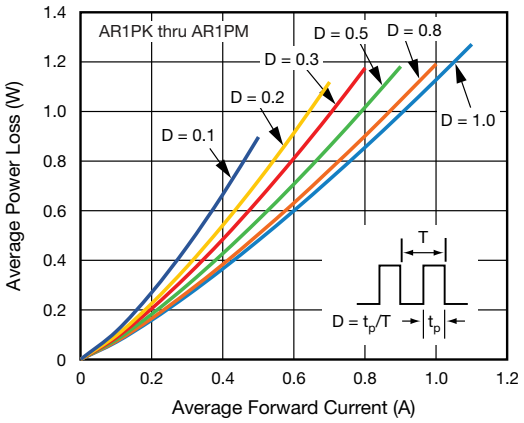

Fig. 3 - Forward Power Loss Characteristics

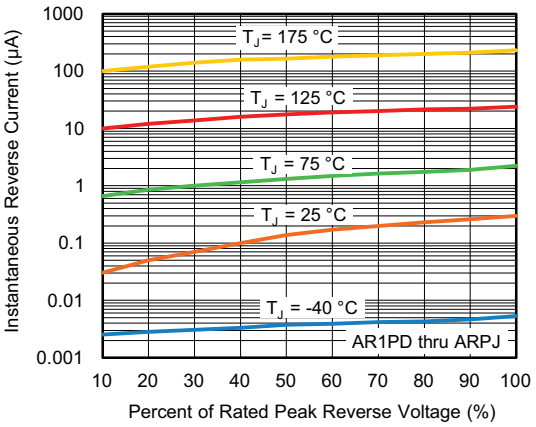

Fig. 6 - Typical Reverse Characteristics

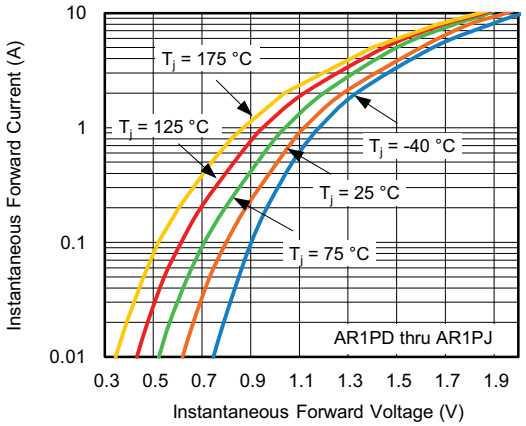

Fig. 4 - Typical Instantaneous Forward Characteristics

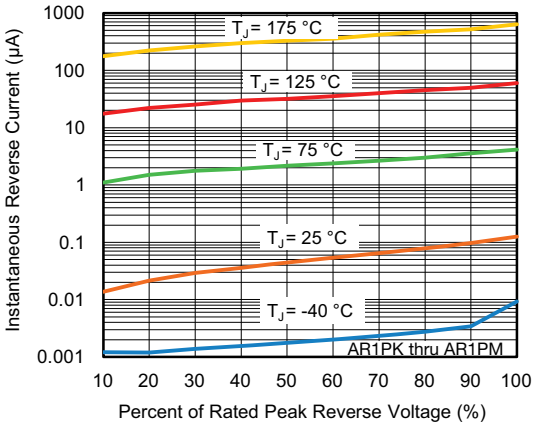

Fig. 7 - Typical Reverse Characteristics

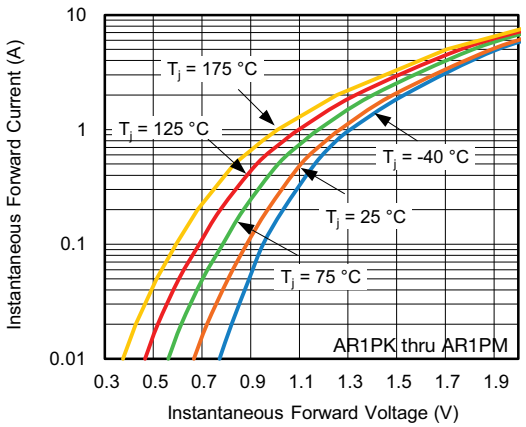

Fig. 5 - Typical Instantaneous Forward Characteristics

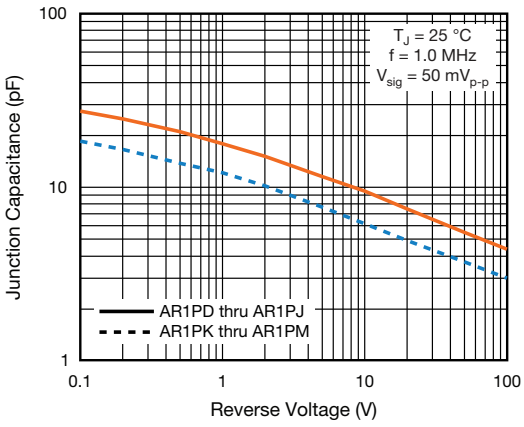

Fig. 8 - Typical Junction Capacitance

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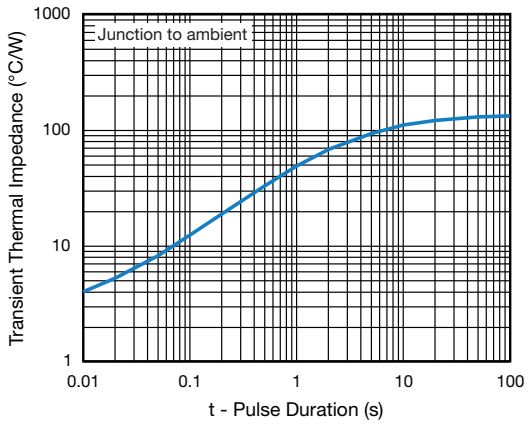
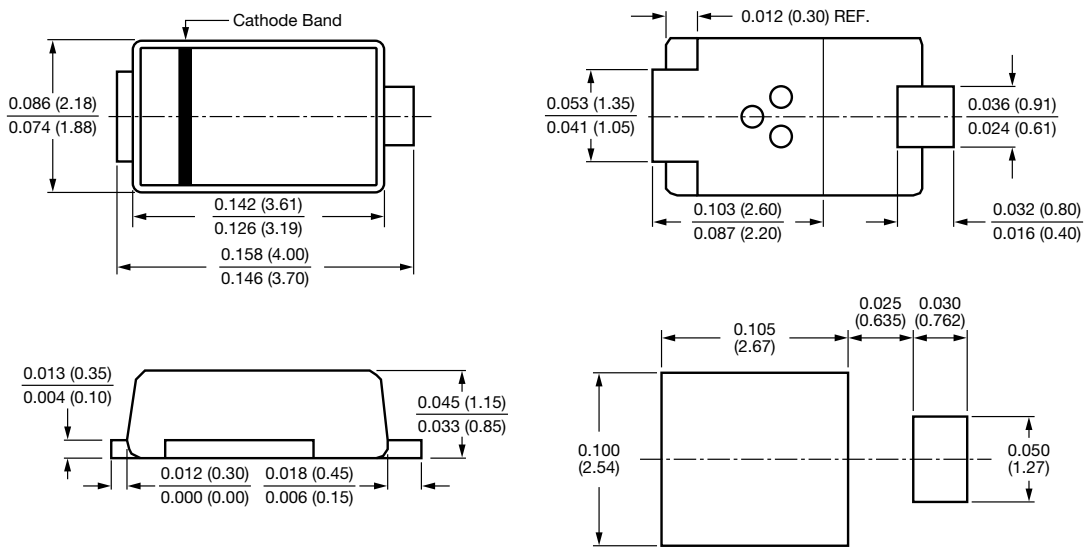


Fig. 9 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)



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