AR1PD thru AR1PM

Vishay General Semiconductor

Surface Mount Fast Avalanche Rectifiers

eSMP® Series

DO-220AA (SMP)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	200 V to 1000 V
I_{FSM}	30 A, 25 A
t_{rr}	140 ns, 120 ns
I_R	1 µA
E_{AS}	20 mJ
T_J max.	175 °C

TYPICAL APPLICATIONS

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

FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated 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
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**

MECHANICAL DATA

Case: DO-220AA (SMP)
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 1A 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)

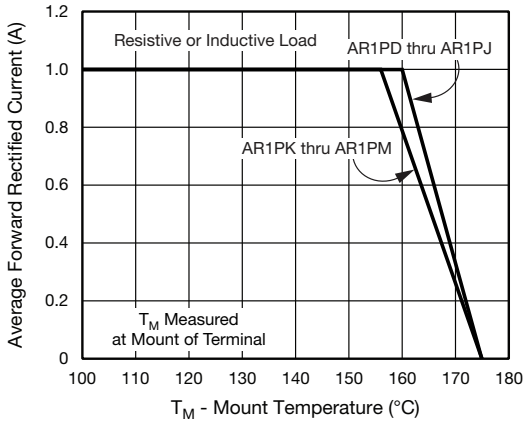

Fig. 1 - Maximum Forward Current Derating Curve

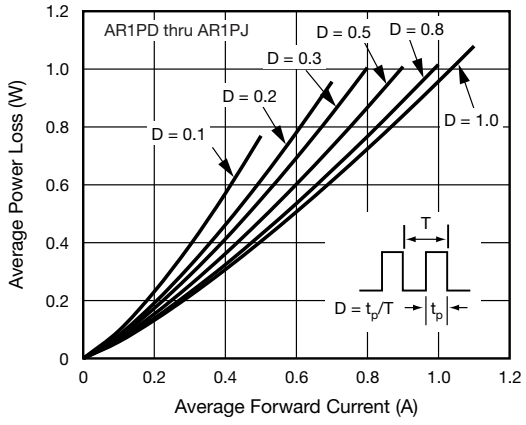

Fig. 2 - Forward Power Loss Characteristics

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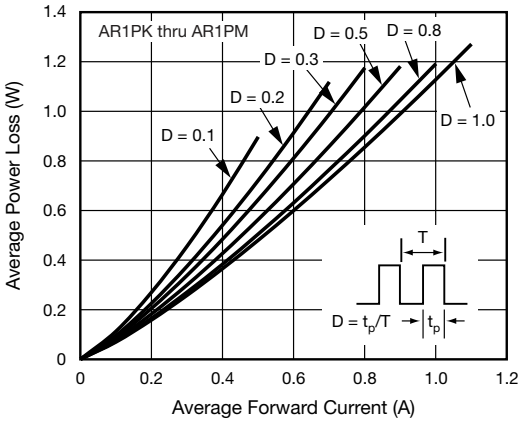

Fig. 3 - Forward Power Loss Characteristics

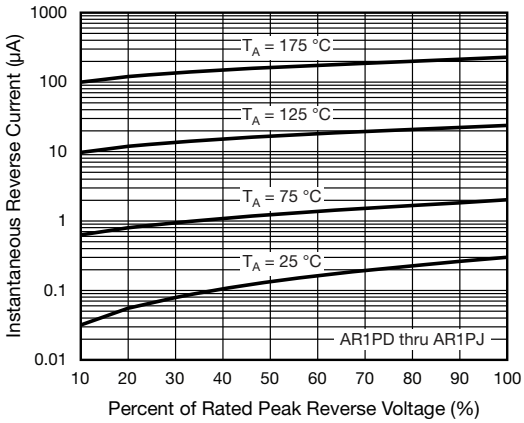

Fig. 6 - Typical Reverse Characteristics

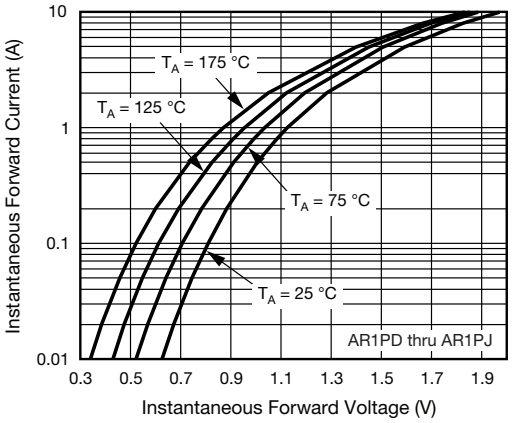

Fig. 4 - Typical Instantaneous Forward Characteristics

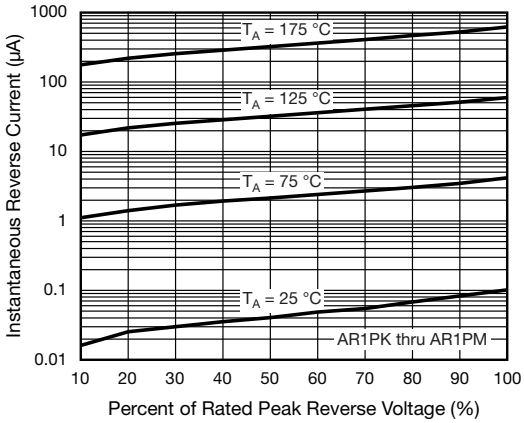

Fig. 7 - Typical Reverse Characteristics

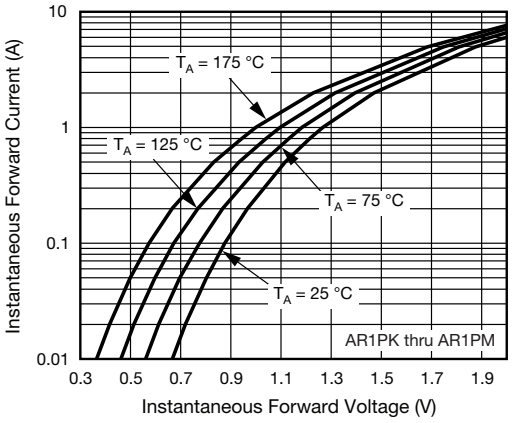

Fig. 5 - Typical Instantaneous Forward Characteristics

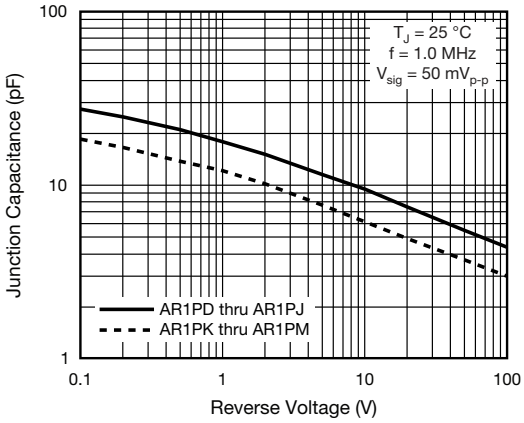

Fig. 8 - Typical Junction Capacitance

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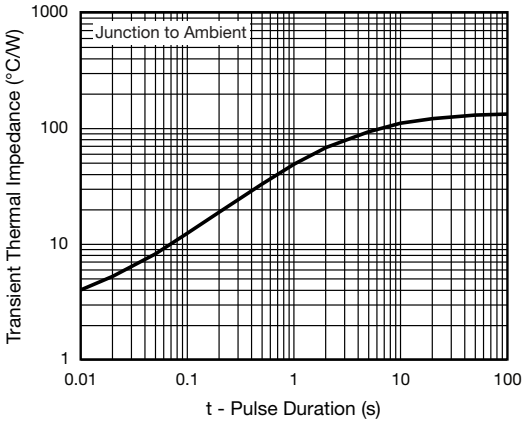
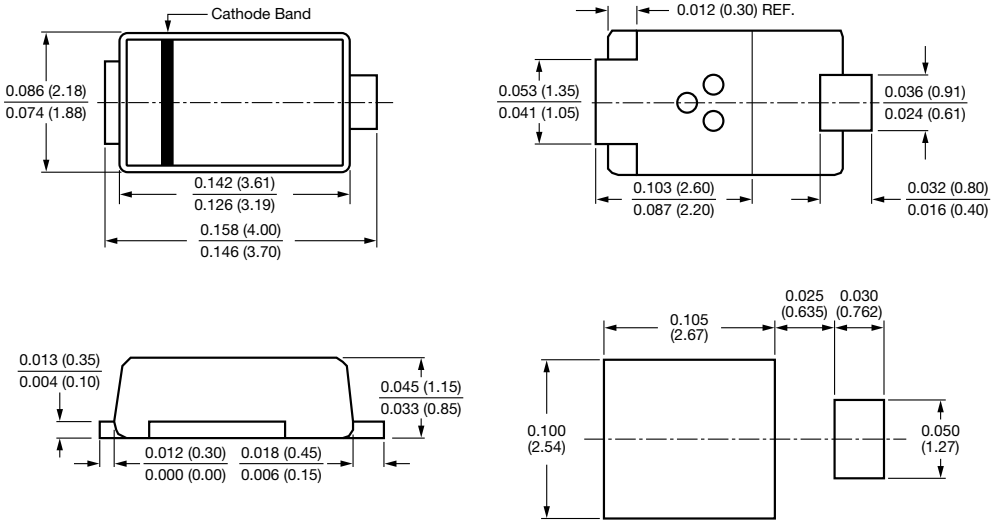


Fig. 9 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



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