

## Standard Avalanche Surface Mount Rectifiers

### eSMP® Series


**DO-220AA (SMP)**


### FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Controlled avalanche characteristics
- Low forward voltage drop
- Low leakage 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](http://www.vishay.com/doc?99912)

### 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

**Polarity:** Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
$V_{RRM}$	200 V, 400 V, 600 V, 800 V, 1000 V
$I_{FSM}$	30 A
$I_R$	0.3 $\mu$ A
$V_F$ at $I_F = 1.5$ A	0.89 V
$E_{AS}$	20 mJ
$T_J$ max.	175 °C
Package	DO-220AA (SMP)
Diode variations	Single die

### TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters, and freewheeling diodes for consumer, automotive, and telecommunication.

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)							
PARAMETER	SYMBOL	AS1PD	AS1PG	AS1PJ	AS1PK	AS1PM	UNIT
Device marking code		ASD	ASG	ASJ	ASK	ASM	
Max. repetitive peak reverse voltage	$V_{RRM}$	200	400	600	800	1000	V
Max. DC forward current (see fig. 1)	$I_F^{(1)}$	1.5					A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	30					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

#### Note

(1) Mounted on 5 mm x 5 mm pad areas PCB



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	I <sub>F</sub> = 1.0 A	V <sub>F</sub> <sup>(1)</sup>	T <sub>A</sub> = 25 °C	0.95	-	V
			T <sub>A</sub> = 125 °C	0.84	-	
	I <sub>F</sub> = 1.5 A		T <sub>A</sub> = 25 °C	0.99	1.15	
			T <sub>A</sub> = 125 °C	0.89	1.0	
Reverse current	Rated V <sub>R</sub>	I <sub>R</sub> <sup>(2)</sup>	T <sub>A</sub> = 25 °C	0.3	5	μA
			T <sub>A</sub> = 125 °C	35	100	
Typical reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A	t <sub>rr</sub>	1.5	-	μs	
Typical junction capacitance	4.0 V, 1 MHz	C <sub>J</sub>	10.4	-	pF	

**Notes**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)							
PARAMETER	SYMBOL	AS1PD	AS1PG	AS1PJ	AS1PK	AS1PM	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	115					°C/W
	R <sub>θJM</sub> <sup>(1)</sup>	15					

**Note**

- (1) Unit mounted on PCB with 5 mm x 5 mm copper pad areas. Thermal resistance R<sub>θJA</sub> - junction to ambient, R<sub>θJM</sub> - junction to mount at the terminal of cathode band

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
AS1PJ-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
AS1PJ-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
AS1PJHM3/84A <sup>(1)</sup>	0.024	84A	3000	7" diameter plastic tape and reel
AS1PJHM3/85A <sup>(1)</sup>	0.024	85A	10 000	13" diameter plastic tape and reel

**Note**

- (1) Automotive grade

**RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)**

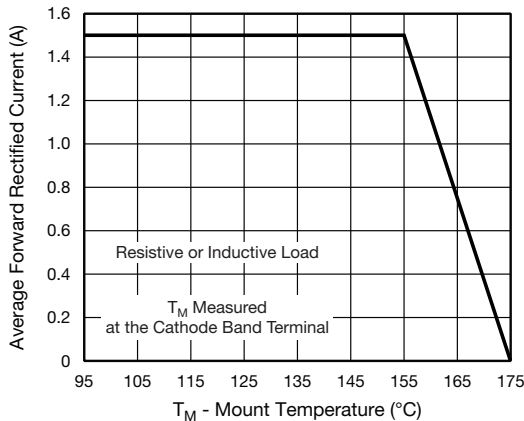


Fig. 1 - Max. Forward Current Derating Curve

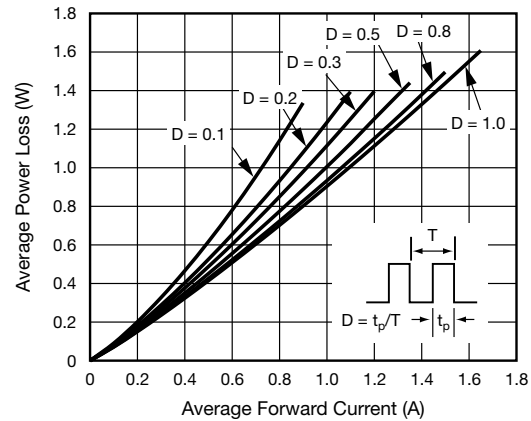


Fig. 2 - Forward Power Loss Characteristics

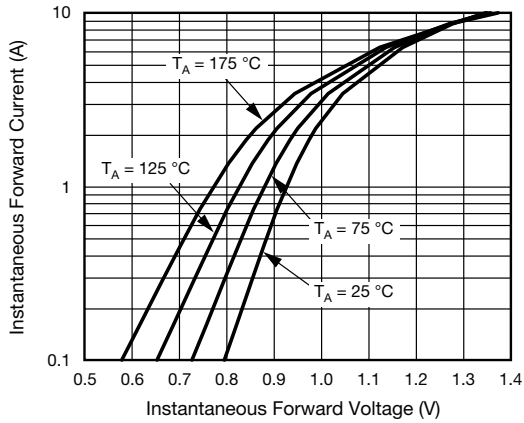


Fig. 3 - Typical Instantaneous Forward Characteristics

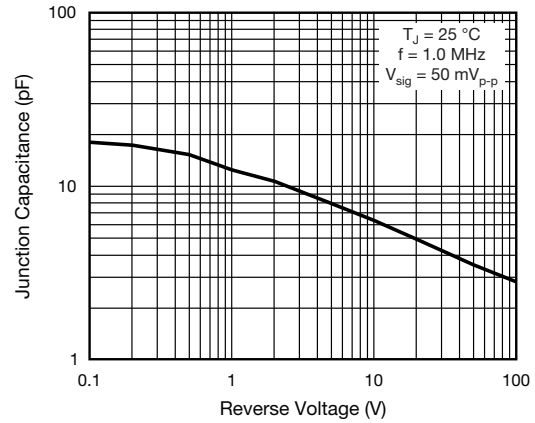


Fig. 5 - Typical Junction Capacitance

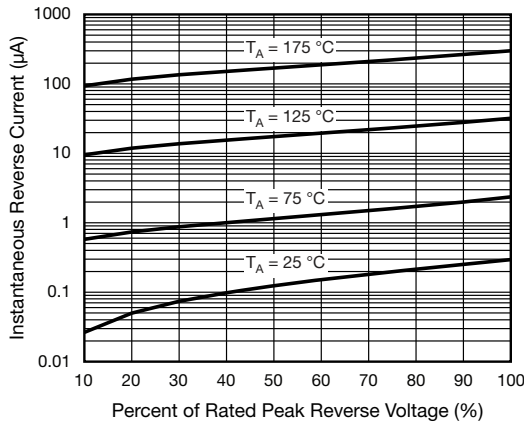


Fig. 4 - Typical Reverse Characteristics

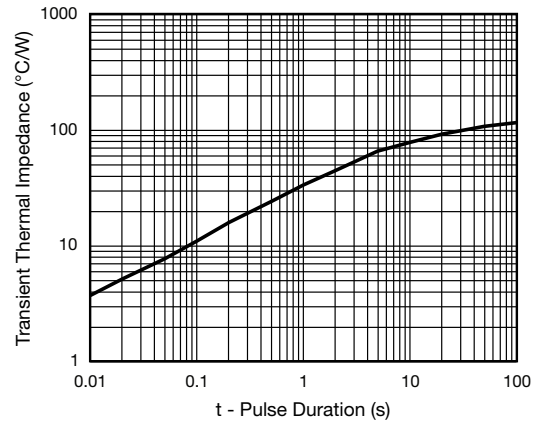
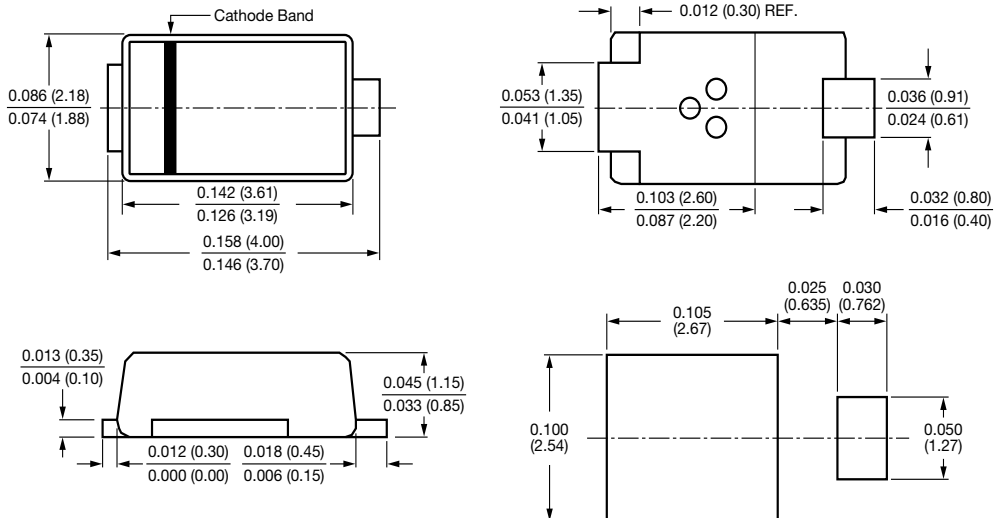


Fig. 6 - Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-220AA (SMP)





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