Surface-Mount Fast Avalanche Rectifiers

eSMP® Series

Top view Bottom view

SMF (DO-219AB)

Cathode ○—▶|—○ Anode

LINKS TO 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
I_R	1 µA
V_F at I_F = 1 A	1.15 V, 1.4 V
E_{AS}	20 mJ
T_J max.	175 °C
Package	SMF (DO-219AB)
Circuit configuration	Single

FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT HALOGEN FREE

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Fast switching for high frequency
- Low reverse current
- Meets MSL level 1, per J-STD-020; LF maximum peak of 260 °C
- Wave and reflow solderable
- AEC-Q101 qualified
  - Automotive ordering code: base P/NHM3
- Compatible to SOD-123W package case outline
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: SMF (DO-219AB)
Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant
Base P/NHM3 - halogen-free, RoHS-compliant and AEC-Q101 qualified

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
M3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	AR1FD	AR1FG	AR1FJ	AR1FK	AR1FM	UNIT
Device marking code		ARD	ARG	ARJ	ARK	ARM	
Max. repetitive peak reverse voltage	V_{RRM}	200	400	600	800	1000	V
Max. DC forward current (see fig. 1)	I_F (1)	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

Note

(1) Free air, mounted on recommended PCB, 2 oz. pad area

ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS		SYMBOL	AR1FD	AR1FG	AR1FJ	AR1FK	AR1FM	UNIT
Maximum instantaneous forward voltage	I_F = 1.0 A	T_J = 25 °C	V_F (1)	1.25			1.6		V
		T_J = 125 °C		1.15			1.4		
Maximum reverse current	Rated V_R	T_J = 25 °C	I_R (2)	1.0					μA
		T_J = 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	12.6			9.3		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	AR1FD	AR1FG	AR1FJ	AR1FK	AR1FM	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	130					°C/W
	$R_{\theta JM}$ (1)	20					

Notes

(1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta JA}$ - junction to ambient; $R_{\theta JM}$ - junction to mount

(2) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
AR1FJ-M3/H	0.0145	H	3000	7" diameter plastic tape and reel
AR1FJ-M3/I	0.0145	I	10 000	13" diameter plastic tape and reel
AR1FJHM3/H (1)	0.0145	H	3000	7" diameter plastic tape and reel
AR1FJHM3/I (1)	0.0145	I	10 000	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

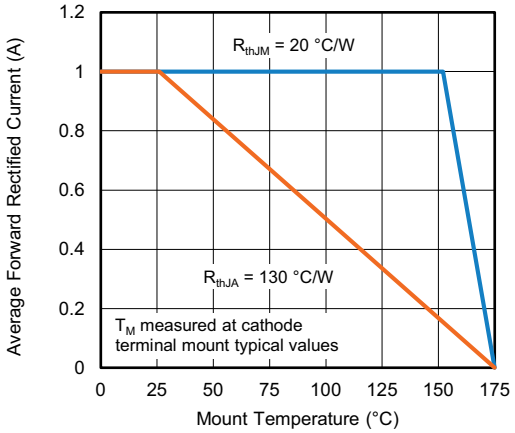


Fig. 1 - Max. Forward Current Derating Curve

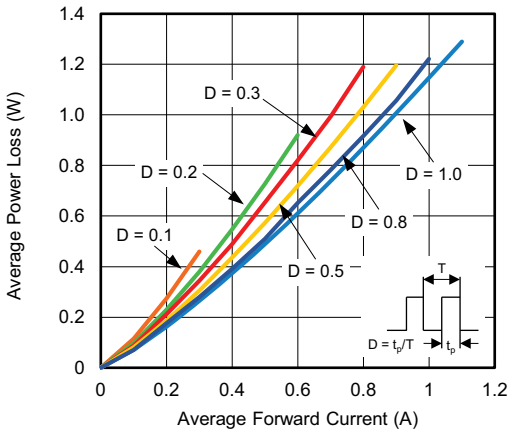


Fig. 2 - Forward Power Loss Characteristics

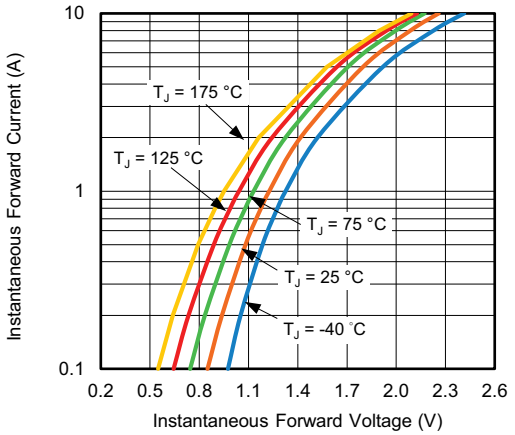


Fig. 3 - Typical Instantaneous Forward Characteristics

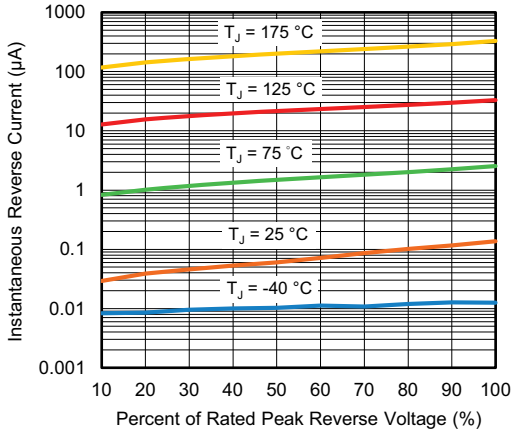


Fig. 4 - Typical Reverse Characteristics

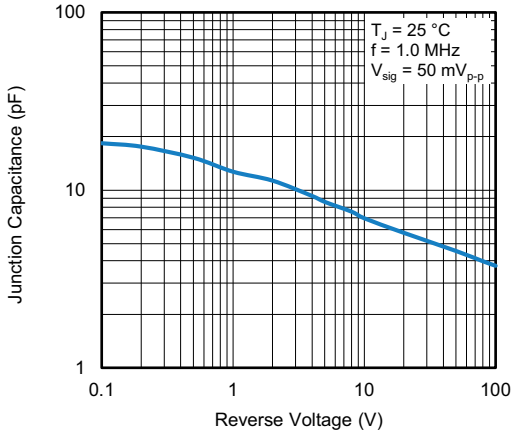


Fig. 5 - Typical Junction Capacitance

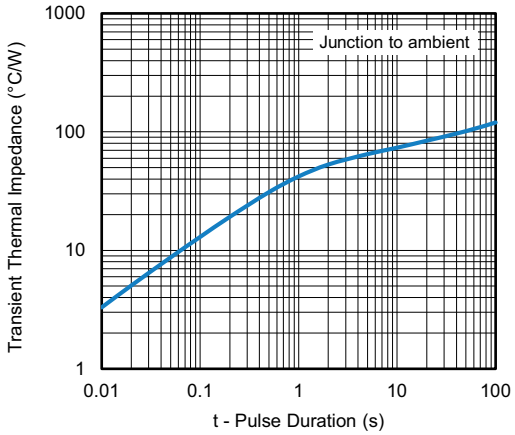
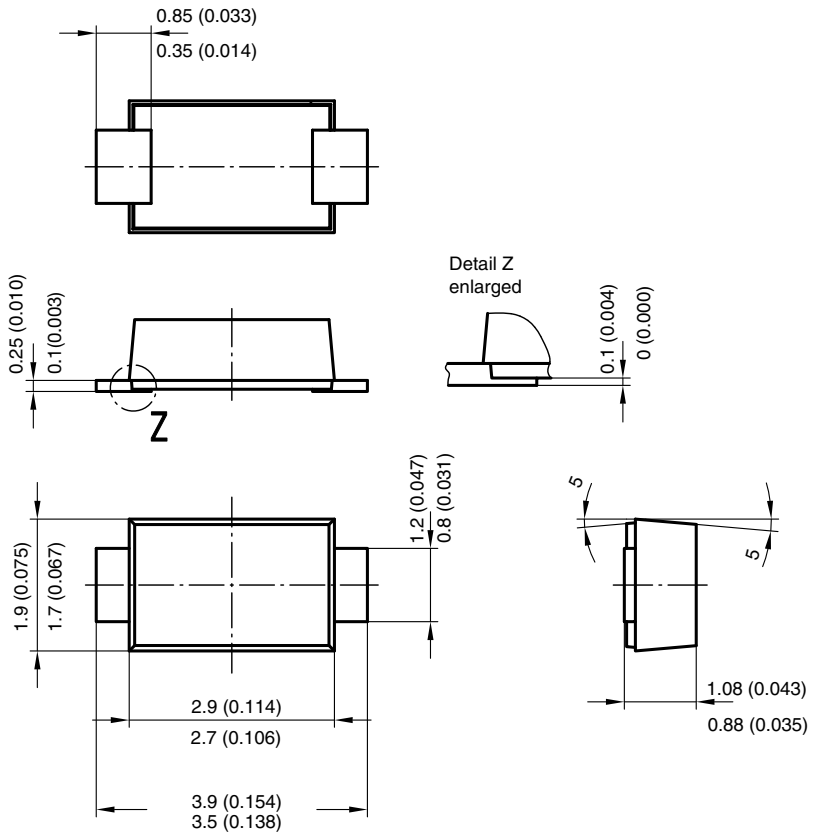
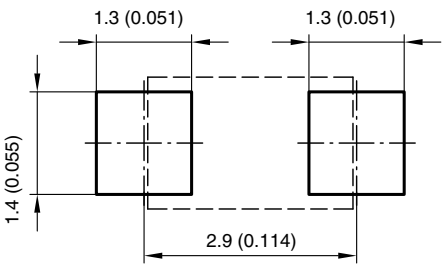


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



Foot print recommendation:



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