

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_{tr}	140 ns, 120 ns
I_R	1 μ A
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

- 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

 AUTOMOTIVE
GRADE
Available

RoHS
COMPLIANT
HALOGEN
FREE

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 _{θJA} ⁽¹⁾⁽²⁾	130					°C/W	
	R _{θJM} ⁽¹⁾	20						

Notes

- (1) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance R_{θJA} - junction to ambient; R_{θJM} - junction to mount
- (2) The heat generated must be less than the thermal conductivity from junction-to-ambient: dP_D/dT_J < 1/R_{θJA}

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

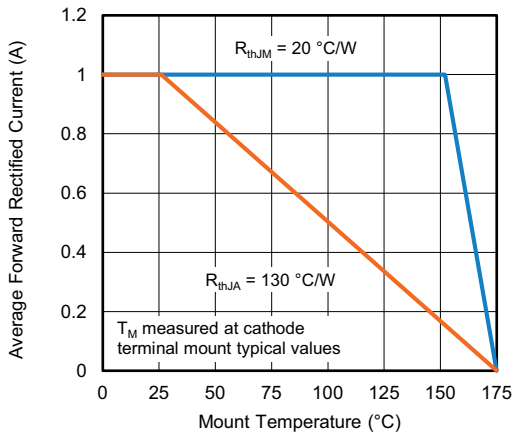


Fig. 1 - Max. Forward Current Derating Curve

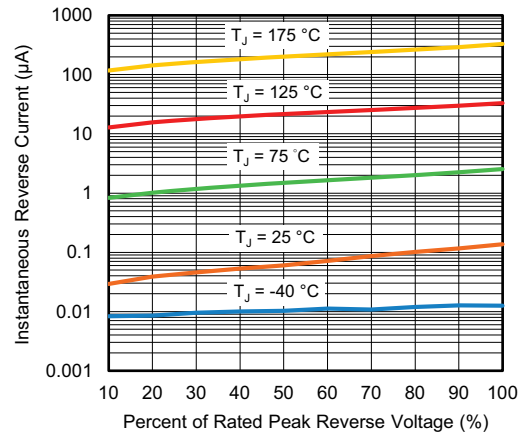


Fig. 4 - Typical Reverse Characteristics

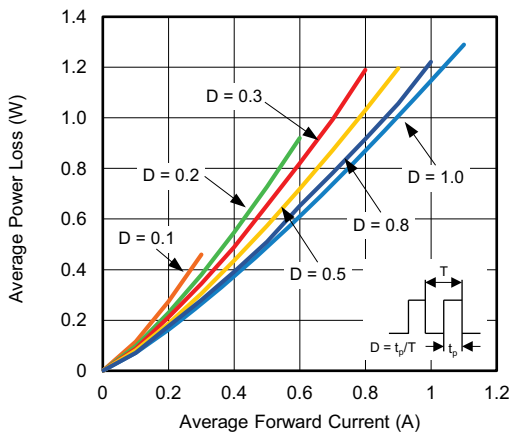


Fig. 2 - Forward Power Loss Characteristics

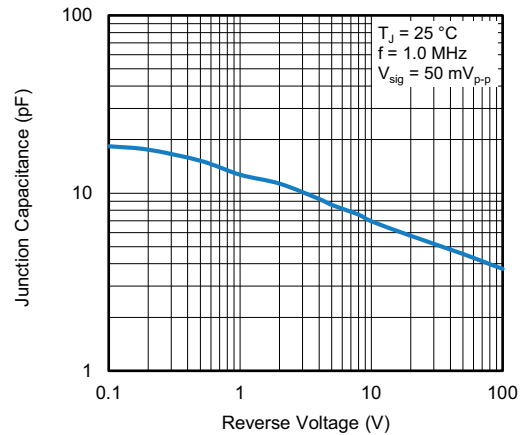


Fig. 5 - Typical Junction Capacitance

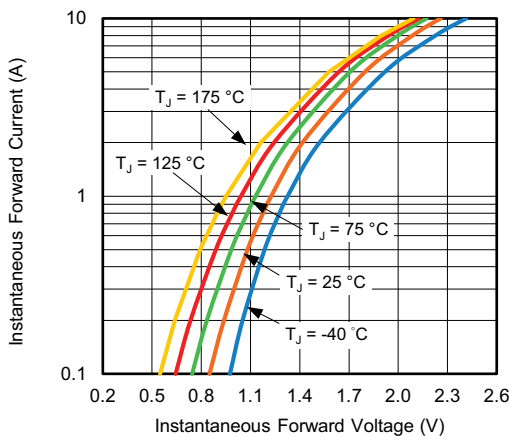


Fig. 3 - Typical Instantaneous Forward Characteristics

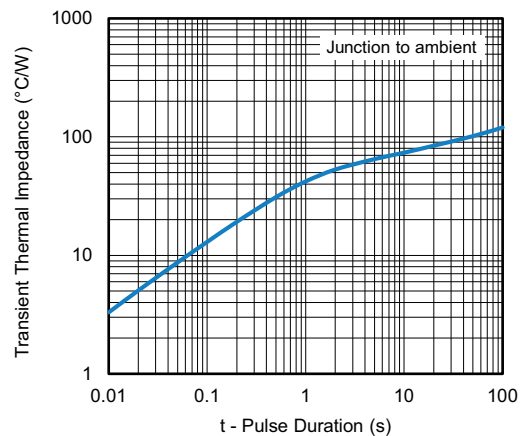
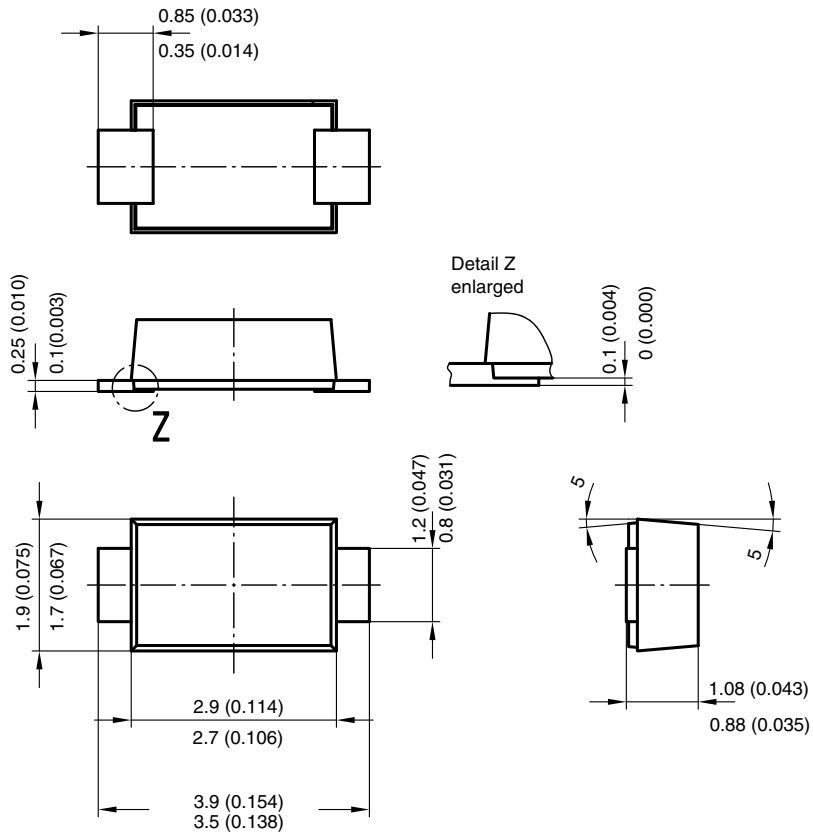


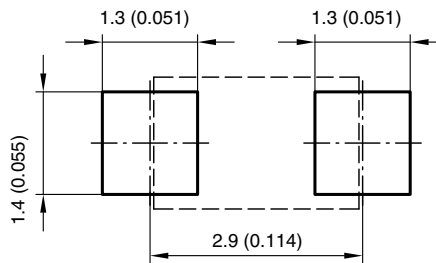
Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



Foot print recommendation:



Created - Date: 15. February 2005
 Rev. 3 - Date: 13. March 2007
 Document no.: S8-V-3915.01-001 (4)
 17247



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