AR1FD, AR1FG, AR1FJ, AR1FK, AR1FM

Vishay General Semiconductor

AUTOMOTIVE GRADE

RoHS

COMPLIANT

HALOGEN FREE

Surface-Mount Fast Avalanche Rectifiers

eSMP® Series



SMF (DO-219AB)

Cathode O Anode

LINKS TO ADDITIONAL RESOURCES



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 μΑ					
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	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

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			Α		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I _{FSM}	30 25		5	Α		
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}	erg -55 to +175				°C	

Note

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



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ELECTRICAL CHARACTERISTICS (T _J = 25 °C unless otherwise noted)									
PARAMETER	TEST CON	DITIONS	SYMBOL	L AR1FD AR1FG AR1FJ		AR1FK	AR1FM	UNIT	
Maximum instantaneous	I _F = 1.0 A	T _J = 25 °C	V _E (1)	1.25		1.6		V	
forward voltage	I _F = 1.0 A	T _J = 125 °C	= 125 °C		1.15			1.4	
Maximum various surrent	T _J = 25 °C		I _R ⁽²⁾	1.0					
Maximum reverse current	Rated V _R	T _J = 125 °C	IR ^{(−} /	100					μA
Maximum reverse recovery time	$I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A}, I_{rr} = 0.25 \text{ A}$		t _{rr}		140		12	20	ns
Typical junction capacitance	4.0 V, 1 MHz	0 V, 1 MHz			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	L AR1FD AR1FG AR1FJ AR1FK AR1FM UN					UNIT
Typical thermal resistance	R _{θJA} (1)(2)	130					°C/W
Typical trieffilal resistance	R _{0JM} (1)	20					C/ VV

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	Н	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	Н	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

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

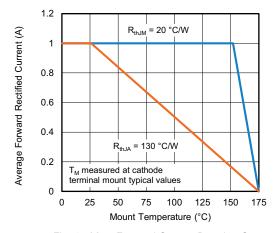


Fig. 1 - Max. Forward Current Derating Curve

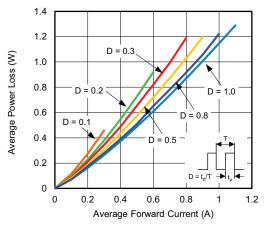


Fig. 2 - Forward Power Loss Characteristics

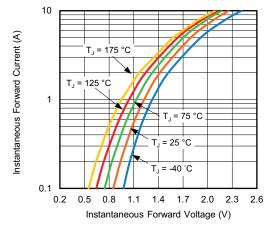


Fig. 3 - Typical Instantaneous Forward Characteristics

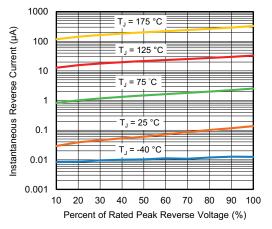


Fig. 4 - Typical Reverse Characteristics

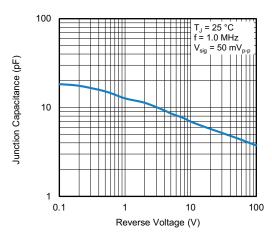


Fig. 5 - Typical Junction Capacitance

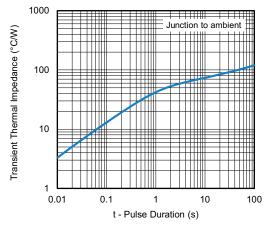
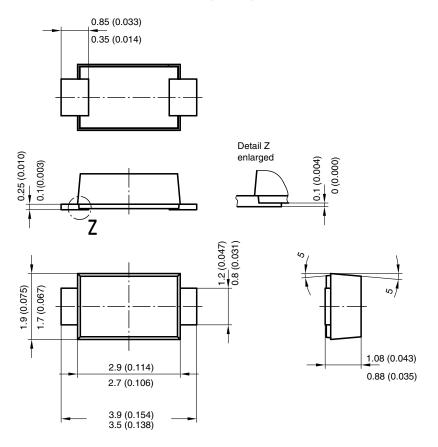


Fig. 6 - Typical Transient Thermal Impedance

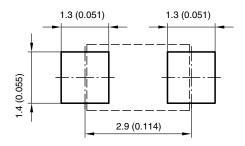
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PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



Foot print recommendation:



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