

## Surface-Mount Ultrafast 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
$t_{rr}$	75 ns
$I_R$	1 $\mu$ A
$V_F$ at $I_F = 1$ A	1.4, 1.6 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
- Ultrafast recovery times 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](http://www.vishay.com/doc?99912)


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	AU1FD	AU1FG	AU1FJ	AU1FK	AU1FM	UNIT
Device marking code		AUD	AUG	AUJ	AUK	AUM	
Max. repetitive peak reverse voltage	V <sub>RRM</sub>	200	400	600	800	1000	V
Average forward current	I <sub>F(AV)</sub>	1					A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	30			25		A
Non-repetitive avalanche energy at I <sub>AS</sub> = 1.0 A, T <sub>A</sub> = 25 °C	E <sub>AS</sub>	20					mJ
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175					°C

**ELECTRICAL CHARACTERISTICS** ( $T_J = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	AU1FD	AU1FG	AU1FJ	AU1FK	AU1FM	UNIT
Maximum instantaneous forward voltage	$I_F = 1.0\text{ A}$ $T_J = 25\text{ }^{\circ}\text{C}$ $T_J = 125\text{ }^{\circ}\text{C}$	$V_F^{(1)}$	1.5 1.4			1.85 1.6		V
Maximum reverse current	Rated $V_R$ $T_J = 25\text{ }^{\circ}\text{C}$ $T_J = 125\text{ }^{\circ}\text{C}$	$I_R^{(2)}$	1 100					$\mu\text{A}$
Maximum reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$	$t_{rr}$	75					ns
Typical junction capacitance	4.0 V, 1 MHz	$C_J$	12.2			8.2		pF

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ **THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	SYMBOL	AU1FD	AU1FG	AU1FJ	AU1FK	AU1FM	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
AU1FM-M3/H	0.0145	H	3000	7" diameter plastic tape and reel
AU1FM-M3/I	0.0145	I	10 000	13" diameter plastic tape and reel
AU1FMHM3/H <sup>(1)</sup>	0.0145	H	3000	7" diameter plastic tape and reel
AU1FMHM3/I <sup>(1)</sup>	0.0145	I	10 000	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified



## RATINGS AND CHARACTERISTICS CURVES ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

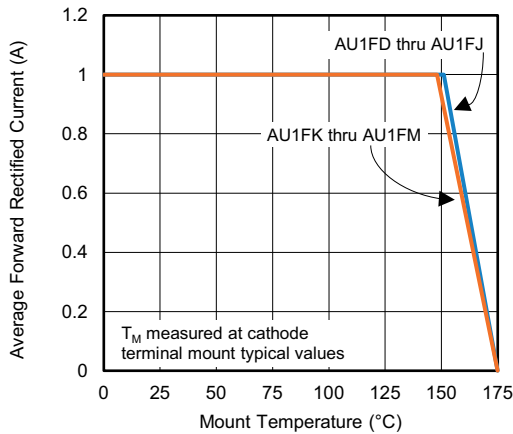


Fig. 1 - Maximum Forward Current Derating Curve

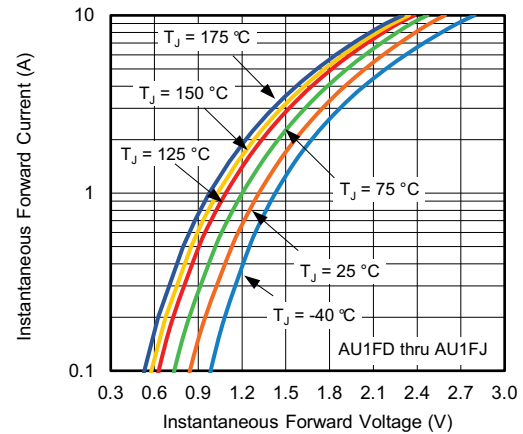


Fig. 4 - Typical Instantaneous Forward Characteristics

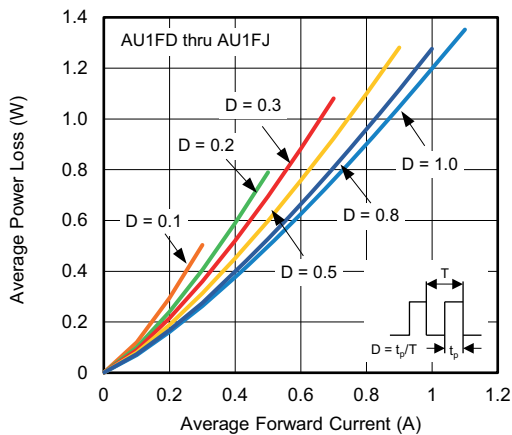


Fig. 2 - Forward Power Loss Characteristics

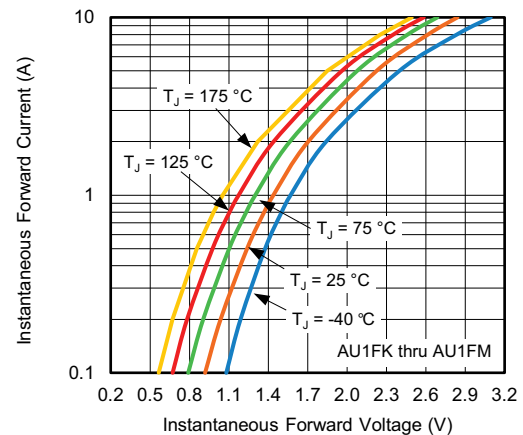


Fig. 5 - Typical Instantaneous Forward Characteristics

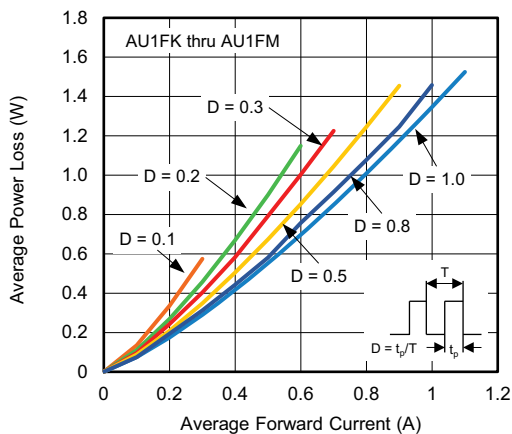


Fig. 3 - Forward Power Loss Characteristics

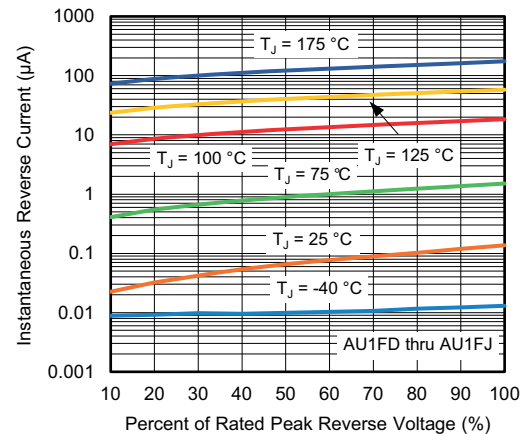


Fig. 6 - Typical Reverse Characteristics

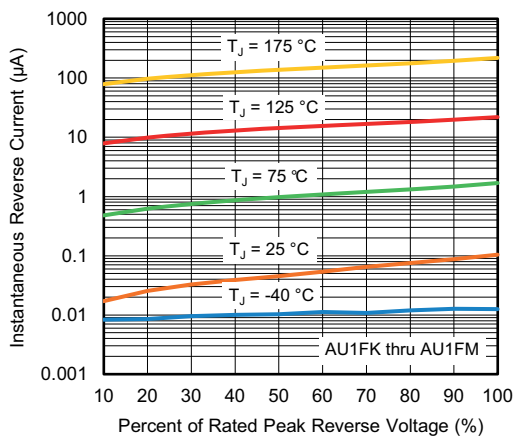


Fig. 7 - Typical Reverse Characteristics

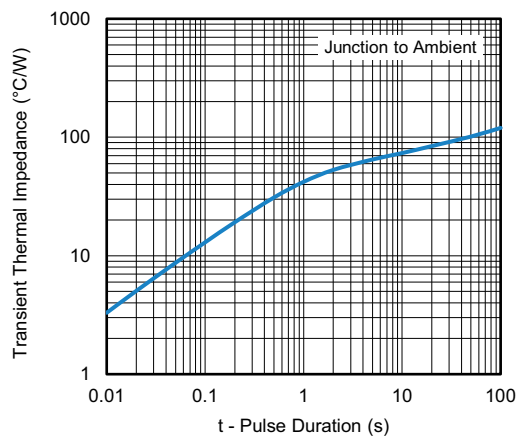


Fig. 9 - Typical Transient Thermal Impedance

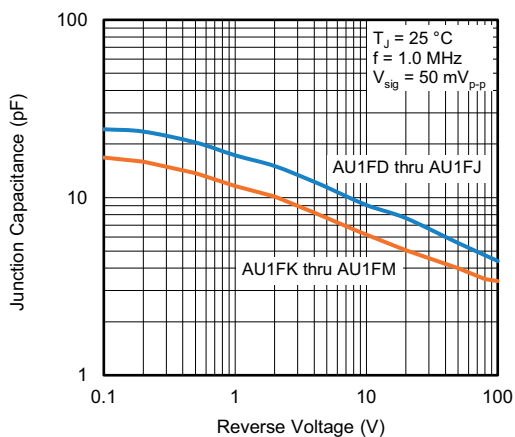
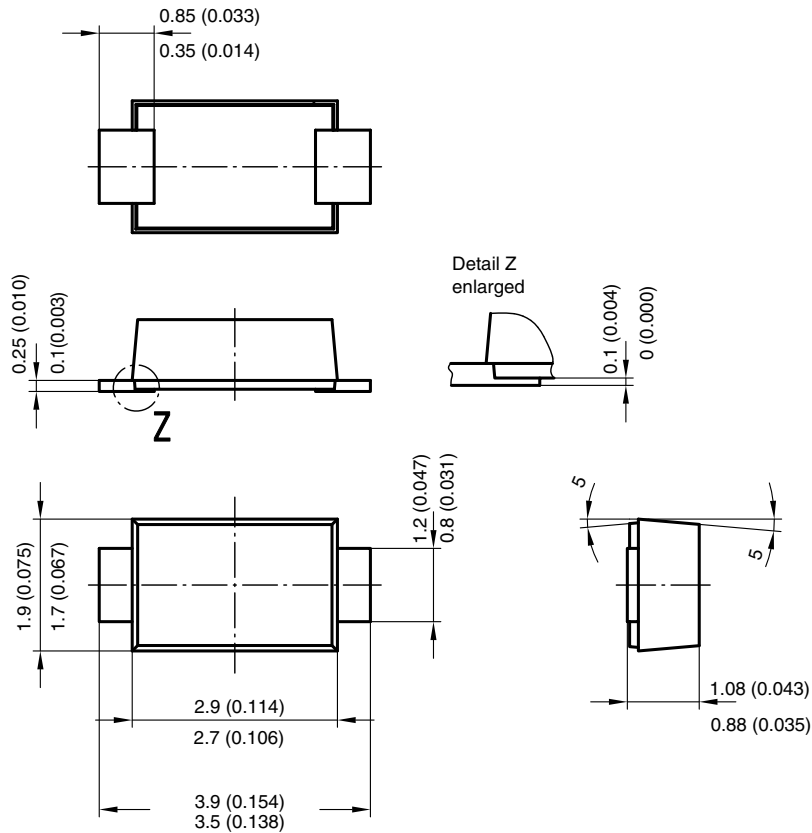


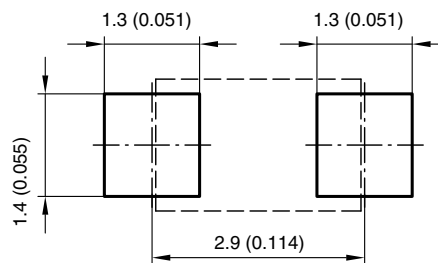
Fig. 8 - Typical Junction Capacitance



## PACKAGE OUTLINE DIMENSIONS in millimeters (inches)



Foot print recommendation:



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17247



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