

## Surface-Mount Ultrafast Avalanche Rectifiers

### eSMP® Series



Top view

Bottom view

### SMF (DO-219AB)

Cathode Anode

### LINKS TO ADDITIONAL RESOURCES


[3D Models](#)

**RoHS**  
 COMPLIANT  
 HALOGEN  
**FREE**

### 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)

### 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

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	1.0 A
$V_{RRM}$	800 V, 1000 V
$I_{FSM}$	25 A
$t_{tr}$	75 ns
$I_R$	1 $\mu$ A
$V_F$ at $I_F = 1$ A	1.6 V
$E_{AS}$	20 mJ
$T_J$ max.	175 °C
Package	SMF (DO-219AB)
Circuit configuration	Single

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

PARAMETER	SYMBOL	AU1FK	AU1FM	UNIT
Device marking code		AUK	AUM	
Max. repetitive peak reverse voltage	$V_{RRM}$	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	$I_{FSM}$	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** ( $T_J = 25\text{ }^\circ\text{C}$  unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	AU1FK	AU1FM	UNIT
Maximum instantaneous forward voltage	$I_F = 1.0\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	1.85		V
		$T_J = 125\text{ }^\circ\text{C}$	1.6		
Maximum reverse current	Rated $V_R$	$T_J = 25\text{ }^\circ\text{C}$	1.0		$\mu\text{A}$
		$T_J = 125\text{ }^\circ\text{C}$	100		
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	$C_J$	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	AU1FK	AU1FM	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	130		$^\circ\text{C/W}$
	$R_{\theta JM}$ (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 (1)	0.0145	H	3000	7" diameter plastic tape and reel
AU1FMHM3/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)

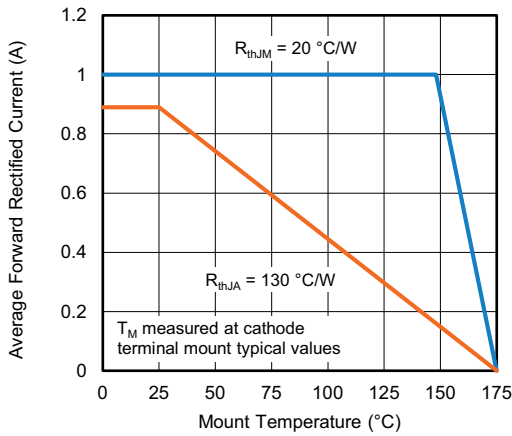


Fig. 1 - Max. Forward Current Derating Curve

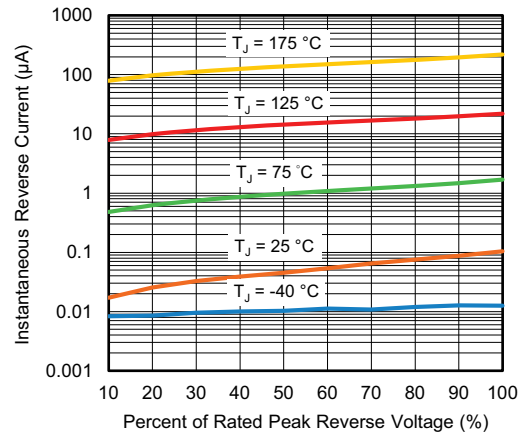


Fig. 4 - Typical Reverse Characteristics

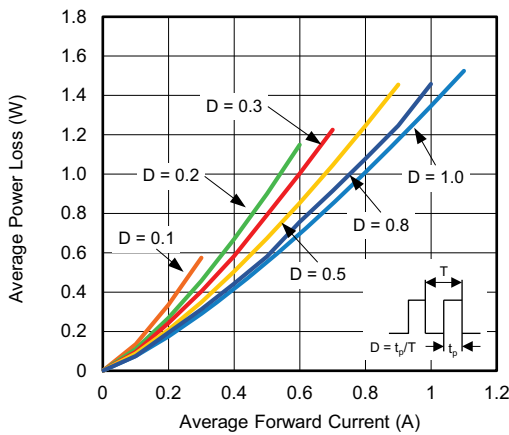


Fig. 2 - Forward Power Loss Characteristics

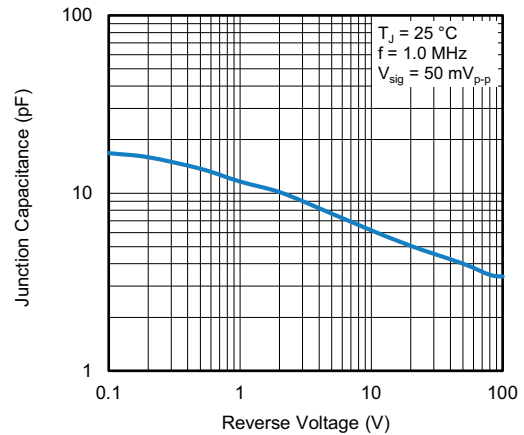


Fig. 5 - Typical Junction Capacitance

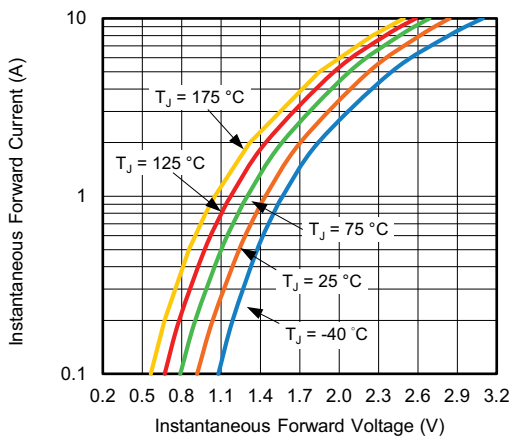


Fig. 3 - Typical Instantaneous Forward Characteristics

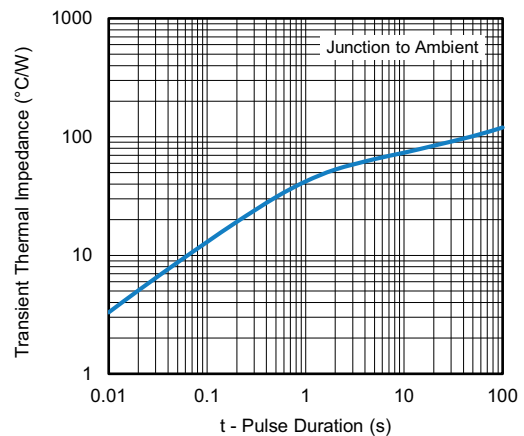
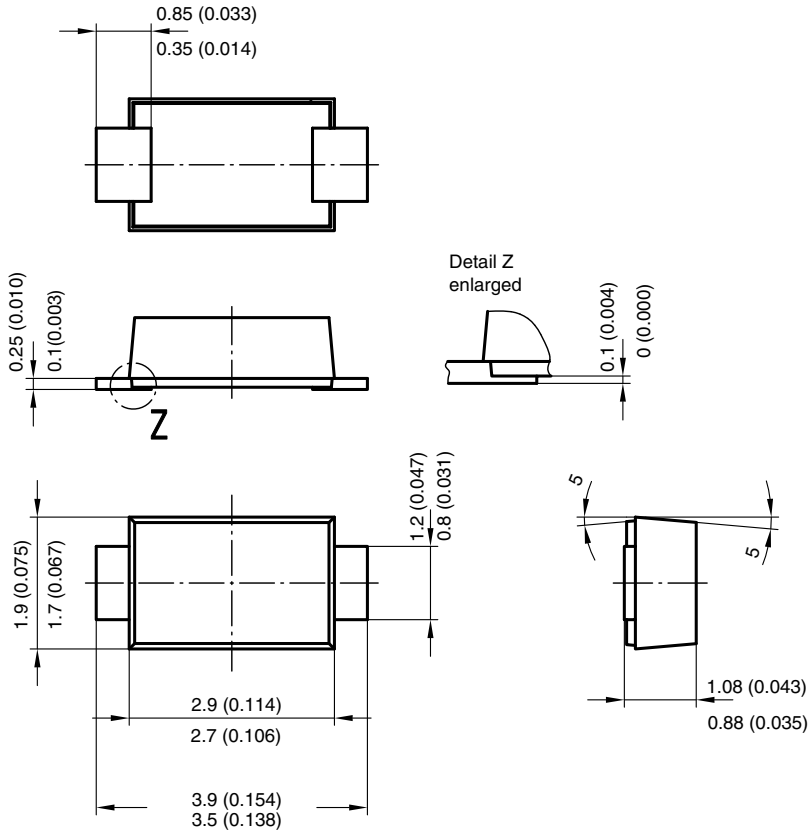


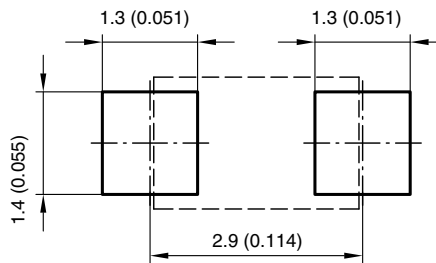
Fig. 6 - Typical Transient Thermal Impedance



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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