

Vishay General Semiconductor

AUTOMOTIVE

RoHS

COMPLIANT

HALOGEN FREE

## **Surface-Mount Ultrafast Avalanche Rectifiers**

# eSMP® Series



SMF (DO-219AB)

Cathode O Anode

### **LINKS TO ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS						
I <sub>F(AV)</sub>	1.0 A					
$V_{RRM}$	200 V, 400 V, 600 V, 800 V, 1000 V					
I <sub>FSM</sub>	30 A, 25 A					
t <sub>rr</sub>	75 ns					
I <sub>R</sub>	1 μΑ					
$V_F$ at $I_F = 1$ A	1.4, 1.6 V					
E <sub>AS</sub>	20 mJ					
T <sub>J</sub> 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 <a href="https://www.vishav.com/doc?99912">www.vishav.com/doc?99912</a>

### **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

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 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	$V_{RRM}$	200	400	600	800	1000	V
Average forward current	I <sub>F(AV)</sub>	1				Α	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	30 25			:5	Α	
Non-repetitive avalanche energy at $I_{AS} = 1.0 \text{ A}$ , $T_A = 25 ^{\circ}\text{C}$	E <sub>AS</sub>	E <sub>AS</sub> 20			mJ		
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175				°C	



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>J</sub> = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS S		SYMBOL	AU1FD	AU1FG	AU1FJ	AU1FK	AU1FM	UNIT
Maximum instantaneous forward voltage	Ι – 1 Ο Δ	T <sub>J</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	1.5		1.85		V	
Maximum instantaneous forward voltage	$I_F = 1.0 A$	T <sub>J</sub> = 125 °C	<b>v</b> F (.)	1.4		1.6			
Maximum reverse current	Poted V	$T_J = 25 ^{\circ}\text{C}$ $T_J = 125 ^{\circ}\text{C}$	I <sub>R</sub> <sup>(2)</sup>	1					
Maximum reverse current	Rated V <sub>R</sub>	T <sub>J</sub> = 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 <sub>rr</sub>	75				ns	
Typical junction capacitance	4.0 V, 1 MHz		CJ		12.2		8	.2	pF

#### Notes

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °c unless otherwise noted)							
PARAMETER SYMBOL AU1FD AU1FG AU1FJ AU1FK AU1FM						UNIT	
Typical thermal resistance	R <sub>θJA</sub> (1)(2)	130					°C/W
Typical trieffial resistance		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				
AU1FM-M3/H	0.0145	Н	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	Н	3000	7" diameter plastic tape and reel				
AU1FMHM3/I (1)	0.0145	L	10 000	13" diameter plastic tape and reel				

### Note

(1) AEC-Q101 qualified



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### **RATINGS AND CHARACTERISTICS CURVES** (T<sub>A</sub> = 25 °C unless otherwise noted)

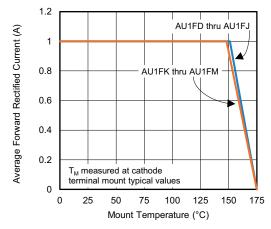


Fig. 1 - Maximum Forward Current Derating Curve

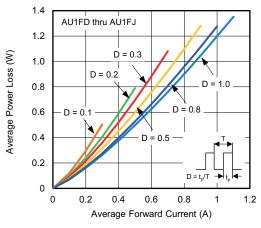


Fig. 2 - Forward Power Loss Characteristics

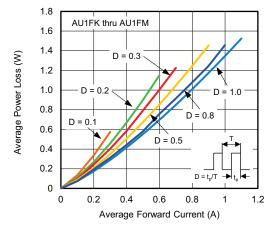


Fig. 3 - Forward Power Loss Characteristics

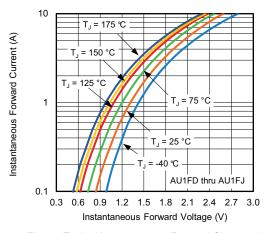


Fig. 4 - Typical Instantaneous Forward Characteristics

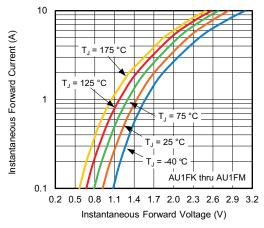


Fig. 5 - Typical Instantaneous Forward Characteristics

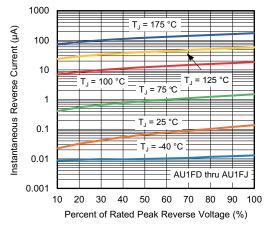


Fig. 6 - Typical Reverse Characteristics

1000

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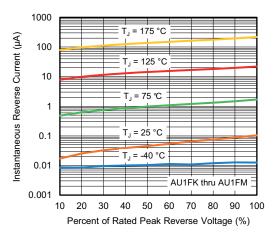
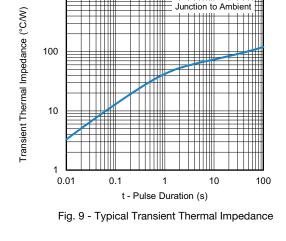


Fig. 7 - Typical Reverse Characteristics



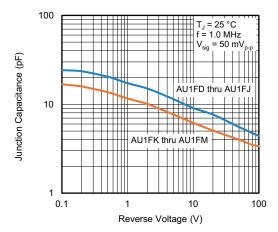
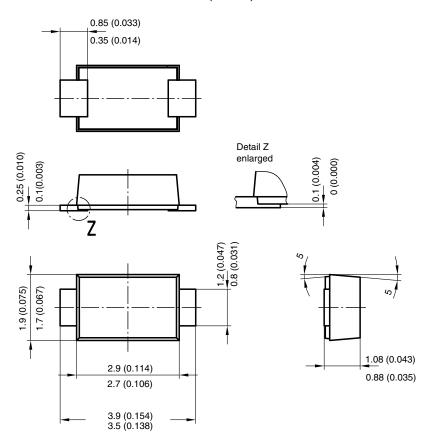


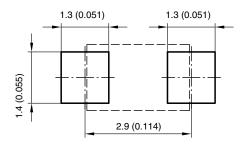
Fig. 8 - Typical Junction Capacitance

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### **PACKAGE OUTLINE DIMENSIONS** in millimeters (inches)



### Foot print recommendation:



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