

# High Voltage Surface-Mount Schottky Barrier Rectifier

High Barrier Technology for Improved High Temperature Performance

## eSMP® Series



SMP (DO-220AA)

Cathode Anode

### LINKS TO ADDITIONAL RESOURCES



3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
$V_{RRM}$	90 V, 100 V
$I_{FSM}$	50 A
$E_{AS}$	11.25 mJ
$V_F$ at $I_F = 2.0$ A, $T_J = 125$ °C	0.62 V
$I_R$ max. at rated $V_R$ , $T_J = 25$ °C	1.0 $\mu$ A
$T_J$ max.	175 °C
Package	SMP (DO-220AA)
Circuit configuration	Single

### FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available  
- Automotive ordering code: base P/NHM3
- 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 high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

### MECHANICAL DATA

**Case:** SMP (DO-220AA)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3\_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified  
("X" denotes revision code e.g. A, B,.....)

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** color band denotes the cathode end

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)				
PARAMETER	SYMBOL	SS2PH9	SS2PH10	UNIT
Device marking code		29	210	
Maximum repetitive peak reverse voltage	$V_{RRM}$	90	100	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	50		A
Non-repetitive avalanche energy at $T_J = 25$ °C, $I_{AS} = 1.5$ A, $L = 10$ mH	$E_{AS}$	11.25		mJ
Voltage rate of change (rated $V_R$ )	$dV/dt$	10 000		V/ $\mu$ s
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +175		°C



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Maximum instantaneous forward voltage	I <sub>F</sub> = 2.0 A	T <sub>J</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.77	0.80	V
		T <sub>J</sub> = 125 °C		0.62	0.66	
Maximum reverse current at rated V <sub>R</sub>		T <sub>J</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	0.1	1.0	μA
		T <sub>J</sub> = 125 °C		60	500	
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	65	-	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	SS2PH9	SS2PH10	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	110		°C/W
	R <sub>θJL</sub> <sup>(1)</sup>	15		
	R <sub>θJC</sub> <sup>(1)</sup>	25		

Note

- (1) Thermal resistance from junction to ambient and junction to lead mounted on PCB with 15 mm x 15 mm copper pad areas. R<sub>θJC</sub> is measured at the top center of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SS2PH9-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
SS2PH9-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
SS2PH9HM3_A/H <sup>(1)</sup>	0.024	H	3000	7" diameter plastic tape and reel
SS2PH9HM3_A/I <sup>(1)</sup>	0.024	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)

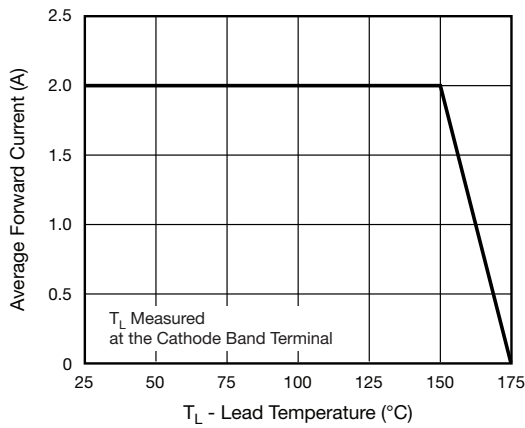


Fig. 1 - Forward Current Derating Curve

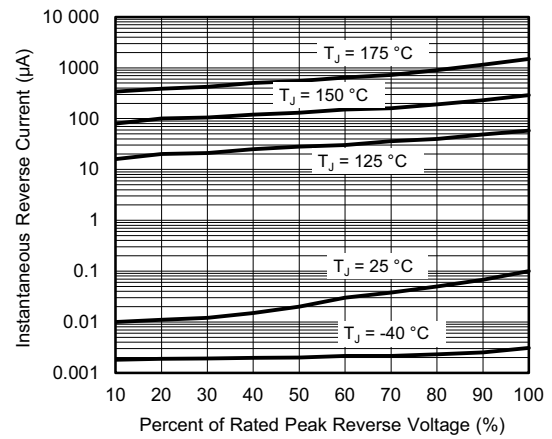


Fig. 4 - Typical Reverse Leakage Characteristics

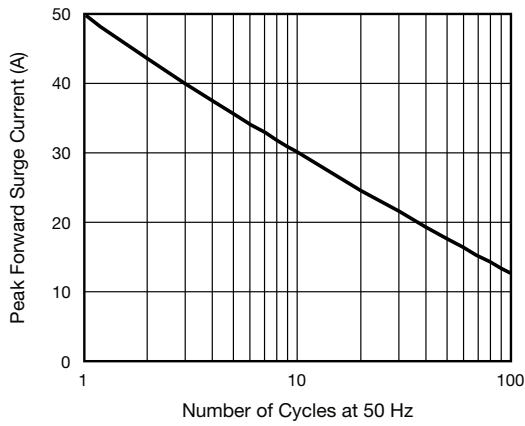


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

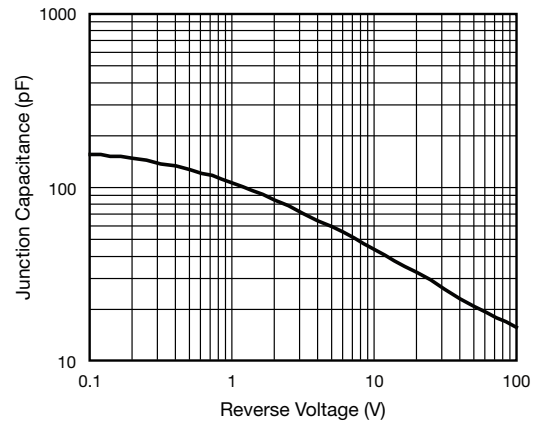


Fig. 5 - Typical Junction Capacitance

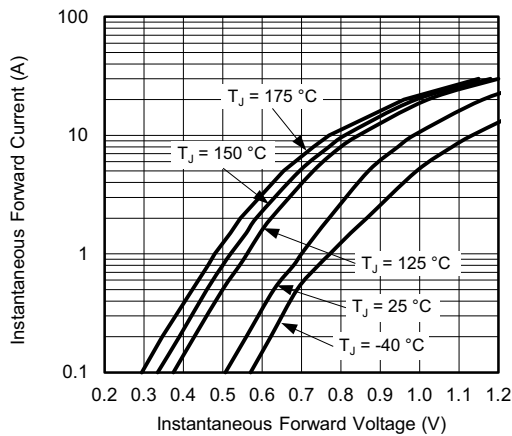


Fig. 3 - Typical Instantaneous Forward Characteristics

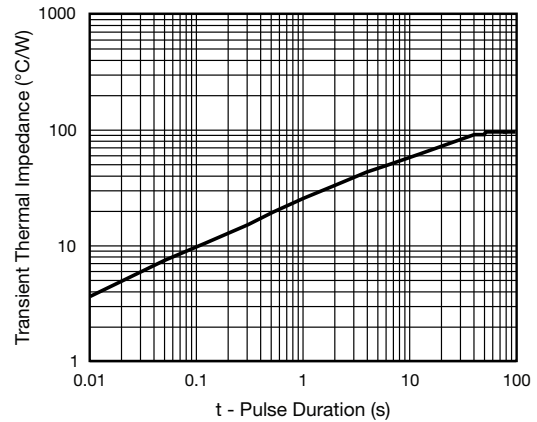
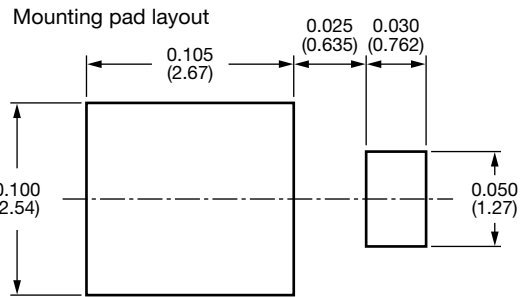
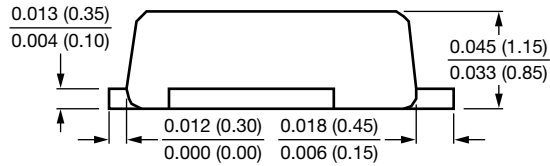
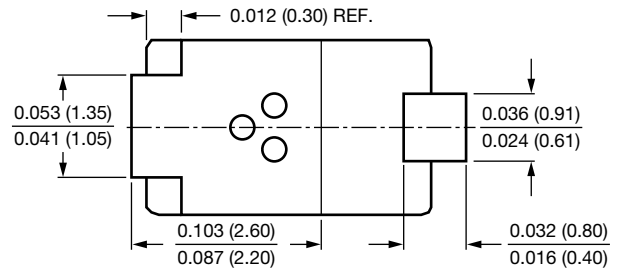
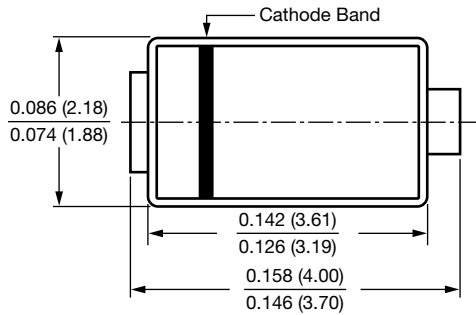


Fig. 6 - Typical Transient Thermal Impedance



### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### SMP (DO-220AA)





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