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## Vishay General Semiconductor

AUTOMOTIVE GRADE

RoHS

COMPLIANT

HALOGEN FREE

## **Surface-Mount Glass Passivated Rectifier**



**SMA (DO-214AC)** 



### **LINKS TO ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS							
I <sub>F(AV)</sub>	1.0 A						
V <sub>RRM</sub>	50 V, 100 V, 200 V, 400 V, 600 V, 800 V, 1000 V						
I <sub>FSM</sub>	40 A, 30 A						
E <sub>AS</sub>	5 mJ						
I <sub>R</sub>	1.0 μΑ, 5.0 μΑ						
V <sub>F</sub>	1.1 V						
T <sub>J</sub> max.	175 °C						
Package	SMA (DO-214AC)						
Circuit configuration	Single						

### **FEATURES**

- Low profile package
- · Ideal for automated placement
- · Glass passivated pellet chip junction
- Low forward voltage drop
- · Low leakage current
- · High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></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: SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/N-M3 - halogen-free, RoHS-compliant, commercial grade

grade

Base P/NHE3\_X - RoHS-compliant and AEC-Q101 qualified 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

E3, M3, HE3, and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	S1A	S1B	S1D	S1G	S1J	S1K	S1M	UNIT
Device marking code		SA	SB	SD	SG	SJ	SK	SM	
Maximum recurrent peak reverse voltage	V <sub>RRM</sub>	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V <sub>RMS</sub>	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	$V_{DC}$	50 100 200 400 600		800	1000	V			
Maximum average forward rectified current (fig. 1)	I <sub>F(AV)</sub>	1.0						Α	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	40 30				0	Α		
Non-repetitive peak reverse avalanche energy at 25 °C, I <sub>AS</sub> = 1 A, L = 10 mH	E <sub>AS</sub>	5					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>A</sub> = 25 °C unless otherwise noted)											
PARAMETER	TEST CONDITIONS		SYMBOL	S1A	S1B	S1D	S1G	S1J	S1K	S1M	UNIT
Maximum instantaneous forward voltage	1.0 A		V <sub>F</sub>	1.1						٧	
Maximum DC reverse current at rated DC blocking voltage		T <sub>J</sub> = 25 °C	I <sub>R</sub>	1.0 5.0				.0	μA		
at rated Be blocking voltage	ing voltage $T_J = 125  ^{\circ}\text{C}$										
Typical reverse recovery time	$I_F = 0.5$ $I_{rr} = 0.2$	A, I <sub>R</sub> = 1.0 A, 5 A	t <sub>rr</sub>	1.8					μs		
Typical junction capacitance	4.0 V, 1	MHz	CJ	12						pF	

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL S1A S1B S1D S1G S1J S1K S1M UNIT						UNIT		
Typical thermal resistance (1)	$R_{\theta JA}$	75					85		°C/W
Typical thermal resistance (*)	$R_{\theta JL}$	27					30		C/VV

#### Note

<sup>(1)</sup> Thermal resistance from junction to ambient and from junction to lead mounted on PCB with 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad areas

ORDERING INFORMATION (Example)									
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE					
S1J-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel					
S1J-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel					
S1JHE3_A/H (1)	0.064	Н	1800	7" diameter plastic tape and reel					
S1JHE3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel					
S1J-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel					
S1J-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel					
S1JHM3_A/H <sup>(1)</sup>	0.064	Н	1800	7" diameter plastic tape and reel					
S1JHM3_A/I <sup>(1)</sup>	0.064	I	7500	13" diameter plastic tape and reel					

## Note

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

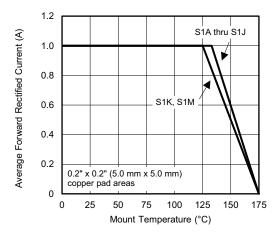


Fig. 1 - Forward Current Derating Curve

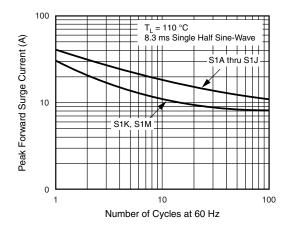


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

<sup>(1)</sup> AEC-Q101 qualified

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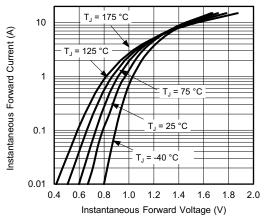


Fig. 3 - Typical Instantaneous Forward Characteristics

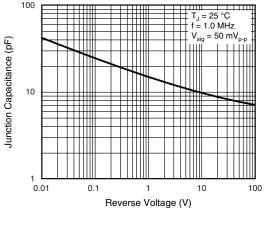


Fig. 5 - Typical Junction Capacitance

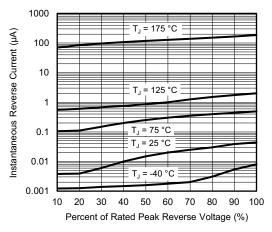


Fig. 4 - Typical Reverse Leakage Characteristics

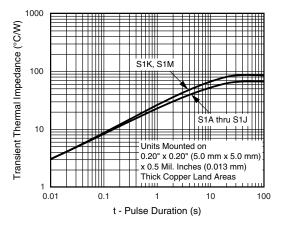


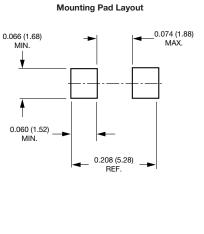
Fig. 6 - Typical Transient Thermal Impedance

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

# 0.065 (1.65) 0.049 (1.25) 0.177 (4.50) 0.199 (2.29) 0.090 (2.29) 0.090 (1.52) 0.008 (0.203) 0.008 (0.203) 0.008 (0.203)

0.208 (5.28)

SMA (DO-214AC)



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