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## Vishay General Semiconductor

## **Surface Mount Schottky Barrier Rectifier**



DO-214AC (SMA)

PRIMARY CHARACTERISTICS			
I <sub>F(AV)</sub>	1.5 A		
$V_{RRM}$	90 V		
I <sub>FSM</sub>	40 A		
V <sub>F</sub> at I <sub>F</sub> = 1.0 A	0.75 V		
T <sub>J</sub> max.	150 °C		
Package	DO-214AC (SMA)		
Diode variations	Single die		

#### **FEATURES**

- Low profile package
- Ideal for automated placement
- · Guardring for overvoltage protection
- Low power losses, high efficiency
- Very low switching losses
- High 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
- 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 high frequency inverters, switching power supplies, freewheeling diodes, OR-ing diode, DC/DC converters, and reverse battery protection.

#### **MECHANICAL DATA**

Case: DO-214AC (SMA)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified Base P/NHE3\_X - RoHS-compliant, 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 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes the cathode end

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER		SYMBOL	BYS12-90	UNIT
Device marking code			BYS 209	
Maximum repetitive peak reverse voltage		$V_{RRM}$	90	V
Maximum average forward rectified current		I <sub>F(AV)</sub>	1.5	A
Peak forward surge current single half sine-wave superimposed on rated load	8.3 ms	1	40	^
	10 ms	IFSM	30	A
Voltage rate of change (rated V <sub>R</sub> )		dV/dt	10 000	V/µs
Junction and storage temperature range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS		TEST CONDITIONS		SYMBOL	BYS12-90	UNIT
Maximum instantaneous forward voltage (1)	I <sub>F</sub> = 1.0 A	T <sub>J</sub> = 25 °C	V <sub>F</sub>	750	mV		
	$I_F = 15 \text{ mA}$			360	111 <b>V</b>		
Maximum DC reverse current (1)	V <sub>RRM</sub>	T <sub>J</sub> = 25 °C	I <sub>R</sub>	100	μΑ		
		T <sub>J</sub> = 100 °C		1	mA		

#### Note

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

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	BYS12-90	UNIT	
Maximum thermal resistance, junction to lead	$R_{ heta JL}$	25	°C/W	
	R <sub>0</sub> JA (1)	150		
Maximum thermal resistance, junction to ambient	R <sub>0JA</sub> (2)	125	°C/W	
	R <sub>0JA</sub> (3)	100		

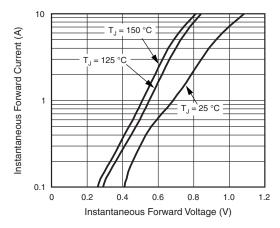
#### **Notes**

- (1) Mounted on epoxy-glass hard tissue
- (2) Mounted on epoxy-glass hard tissue, 50 mm<sup>2</sup> 35 μm Cu
- (3) Mounted on Al-oxide-ceramic (Al<sub>2</sub>O<sub>3</sub>), 50 mm<sup>2</sup> 35 μm Cu

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
BYS12-90-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel	
BYS12-90-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel	
BYS12-90HE3/TR (1)	0.064	TR	1800	7" diameter plastic tape and reel	
BYS12-90HE3/TR3 (1)	0.064	TR3	7500	13" diameter plastic tape and reel	
BYS12-90HE3_A/H (1)	0.064	Н	1800	7" diameter plastic tape and reel	
BYS12-90HE3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel	

#### Note

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





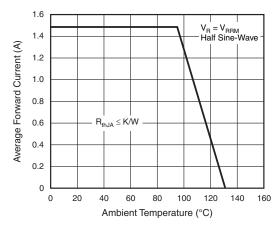


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

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



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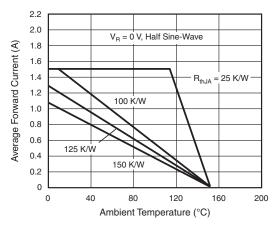


Fig. 3 - Max. Average Forward Current vs. Ambient Temperature

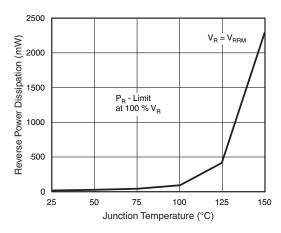


Fig. 5 - Max. Reverse Power Dissipation vs. Junction Temperature

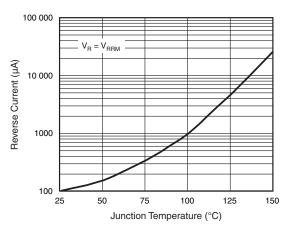


Fig. 4 - Reverse Current vs. Junction Temperature

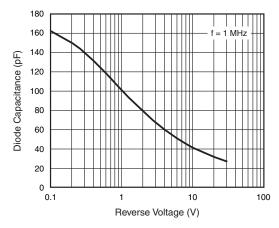
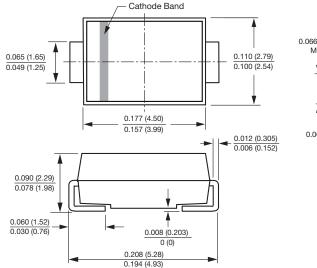
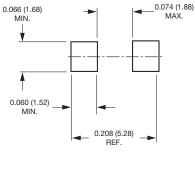


Fig. 6 - Diode Capacitance vs. Reverse Voltage

# PACKAGE OUTLINE DIMENSIONS in inches (millimeters) DO-214AC (SMA)



# Mounting Pad Layout





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<u>BYS12-90-E3/TR</u> <u>BYS12-90-E3/TR3</u> <u>BYS12-90HE3/TR3</u> <u>BYS12-90HE3/TR3</u> <u>BYS12-90HE3\_A/I</u> BYS12-90HE3\_A/H