

# Surface-Mount Schottky Barrier Rectifier



**SMA (DO-214AC)**

Cathode  Anode

## LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
$V_{RRM}$	90 V
$I_{FSM}$	40 A
$V_F$ at $I_F = 1.0$ A	0.75 V
$T_J$ max.	150 °C
Package	SMA (DO-214AC)
Circuit configuration	Single

## 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 [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

## 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:** SMA (DO-214AC)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade  
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 and HE3 suffix meet JESD 201 class 2 whisker test

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

MAXIMUM RATINGS ( $T_A = 25$ °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	$I_{F(AV)}$	1.5	A
Peak forward surge current single half sine-wave superimposed on rated load	$I_{FSM}$	40	A
		30	
Voltage rate of change (rated $V_R$ )	$dV/dt$	10 000	V/ $\mu$ s
Junction and storage temperature range	$T_J, T_{STG}$	-55 to +150	°C

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25\text{ °C}$  unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	BYS12-90	UNIT
Maximum instantaneous forward voltage <sup>(1)</sup>	$I_F = 1.0\text{ A}$	$T_J = 25\text{ °C}$	$V_F$	750	mV
	$I_F = 15\text{ mA}$			360	
Maximum DC reverse current <sup>(1)</sup>	$V_{RRM}$	$T_J = 25\text{ °C}$	$I_R$	100	$\mu\text{A}$
		$T_J = 100\text{ °C}$		1	mA

**Note**

<sup>(1)</sup> Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

**THERMAL CHARACTERISTICS** ( $T_A = 25\text{ °C}$  unless otherwise noted)

PARAMETER	SYMBOL	BYS12-90	UNIT
Maximum thermal resistance, junction to lead	$R_{\theta JL}$	25	$^{\circ}\text{C/W}$
Maximum thermal resistance, junction to ambient	$R_{\theta JA}^{(1)}$	150	$^{\circ}\text{C/W}$
	$R_{\theta JA}^{(2)}$	125	
	$R_{\theta JA}^{(3)}$	100	

**Notes**

<sup>(1)</sup> Mounted on epoxy-glass hard tissue

<sup>(2)</sup> Mounted on epoxy-glass hard tissue, 50 mm<sup>2</sup> 35  $\mu\text{m}$  Cu

<sup>(3)</sup> Mounted on Al-oxide-ceramic ( $\text{Al}_2\text{O}_3$ ), 50 mm<sup>2</sup> 35  $\mu\text{m}$  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_A/H <sup>(1)</sup>	0.064	H	1800	7" diameter plastic tape and reel
BYS12-90HE3_A/I <sup>(1)</sup>	0.064	I	7500	13" diameter plastic tape and reel

**Note**

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

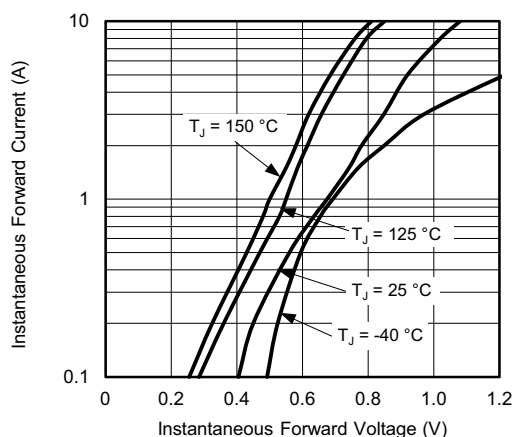
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Typical Instantaneous Forward Characteristics

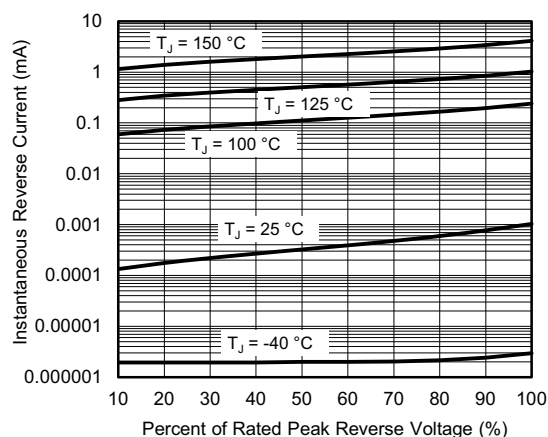


Fig. 4 - Typical Reverse Characteristics

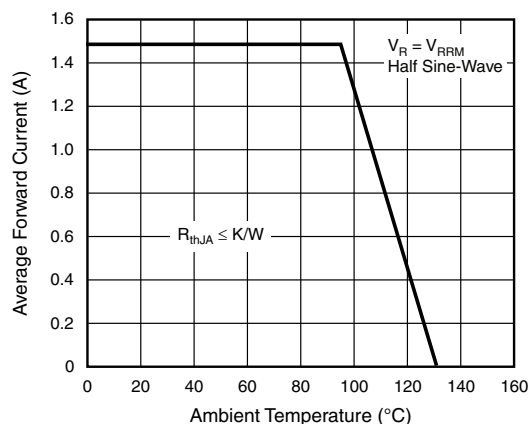


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

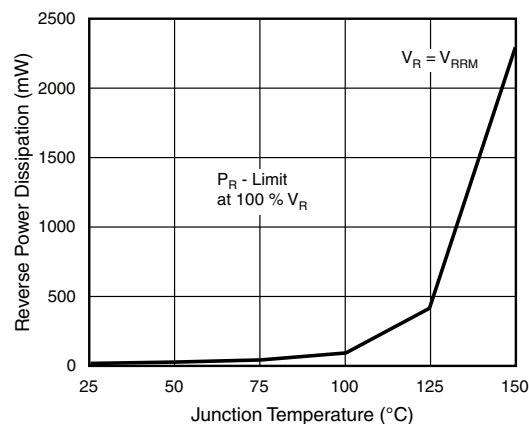


Fig. 5 - Max. Reverse Power Dissipation vs. Junction Temperature

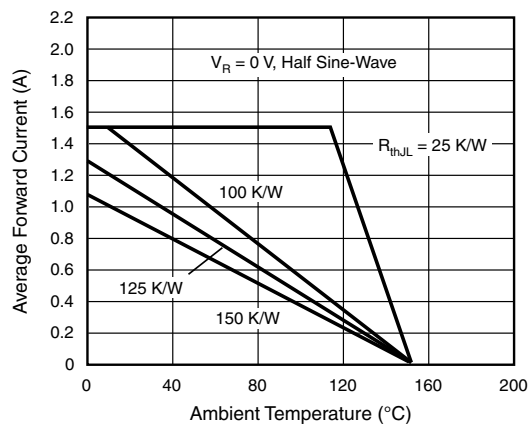


Fig. 3 - Max. Average Forward Current vs. Ambient Temperature

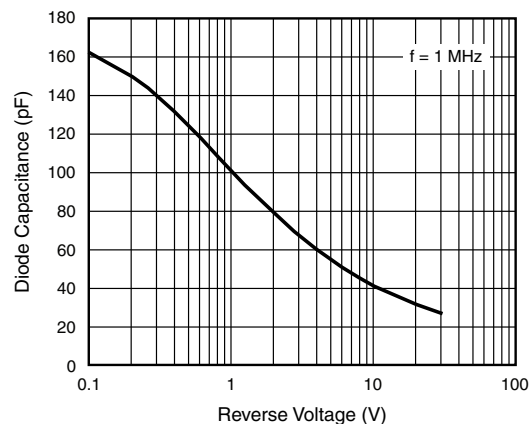
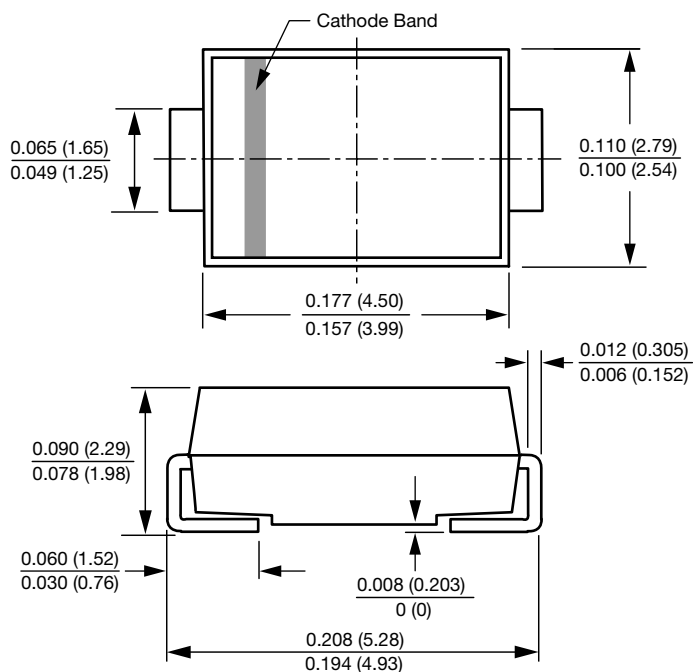


Fig. 6 - Diode Capacitance vs. Reverse Voltage

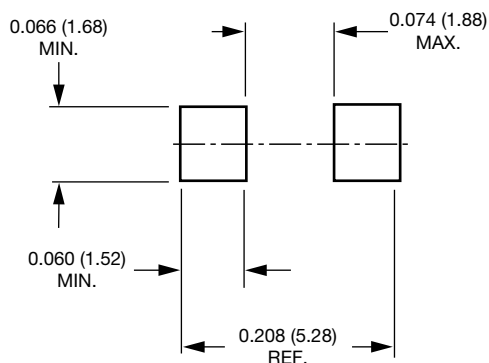


**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**SMA (DO-214AC)**



**Mounting Pad Layout**





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