



**THE DATASHEET OF
BYS12-90-E3/TR**



Surface Mount Schottky Barrier Rectifier


SMA (DO-214AC)

RoHS
COMPLIANT

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

DESIGN SUPPORT TOOLS AVAILABLE

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

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

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}	8.3 ms	40
		10 ms	30
Voltage rate of change (rated V_R)	dV/dt	10 000	V/ μ s
Junction and storage temperature range	T_J, T_{STG}	-55 to +150	°C



ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	BYS12-90	UNIT
Maximum instantaneous forward voltage ⁽¹⁾	$I_F = 1.0\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	V_F	750	mV
	$I_F = 15\text{ mA}$			360	
Maximum DC reverse current ⁽¹⁾	V_{RRM}	$T_J = 25\text{ }^\circ\text{C}$	I_R	100	μA
		$T_J = 100\text{ }^\circ\text{C}$		1	mA

Note

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

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ 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

- ⁽¹⁾ Mounted on epoxy-glass hard tissue
- ⁽²⁾ Mounted on epoxy-glass hard tissue, 50 mm² 35 μm Cu
- ⁽³⁾ Mounted on Al-oxide-ceramic (Al₂O₃), 50 mm² 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_A/H ⁽¹⁾	0.064	H	1800	7" diameter plastic tape and reel
BYS12-90HE3_A/I ⁽¹⁾	0.064	I	7500	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)

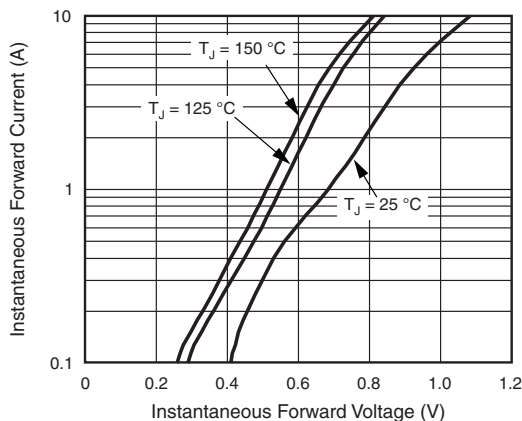


Fig. 1 - Forward Current vs. Forward Voltage

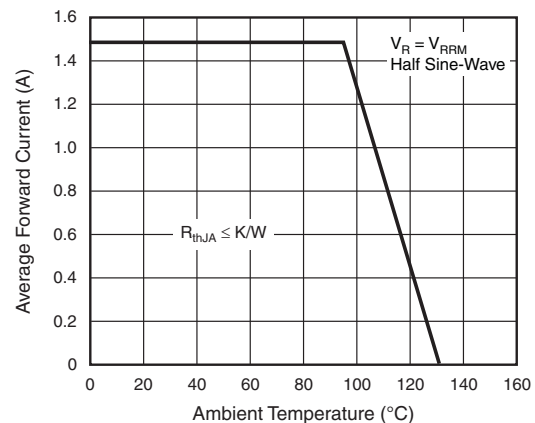


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

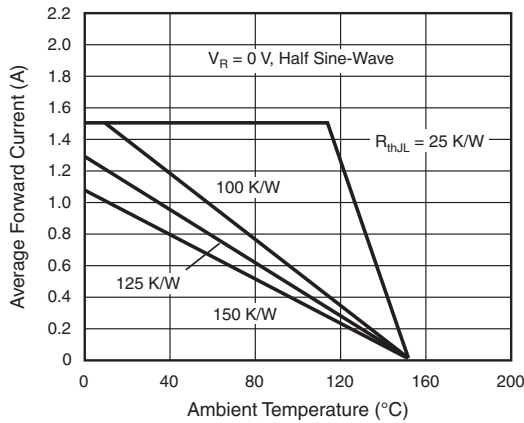


Fig. 3 - Max. Average Forward Current vs. Ambient Temperature

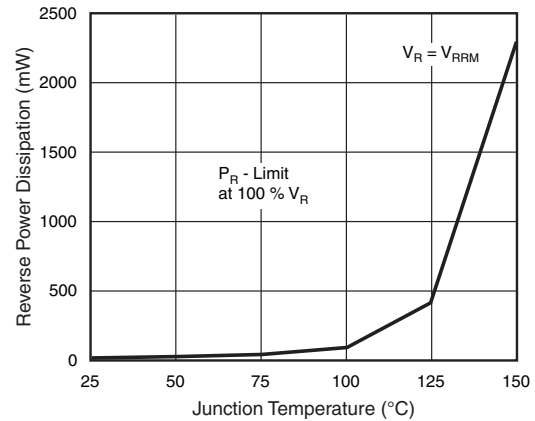


Fig. 5 - Max. Reverse Power Dissipation vs. Junction Temperature

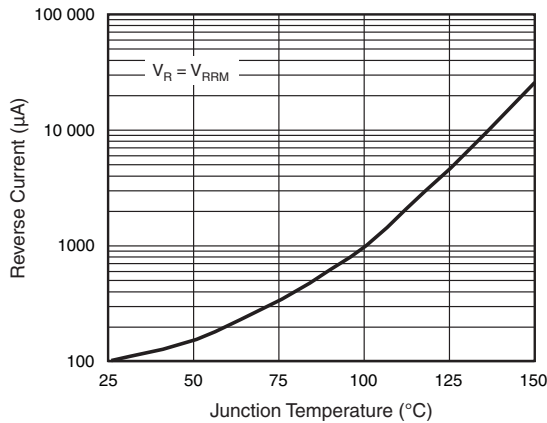


Fig. 4 - Reverse Current vs. Junction Temperature

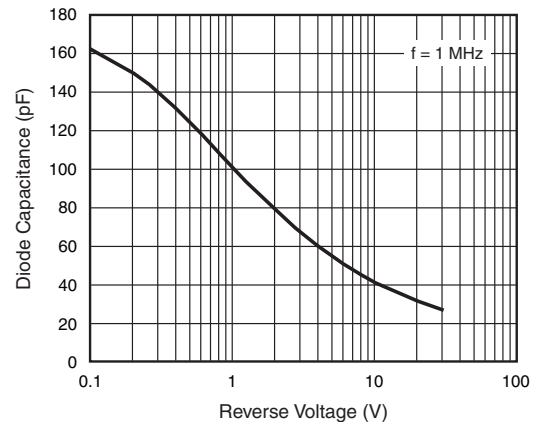
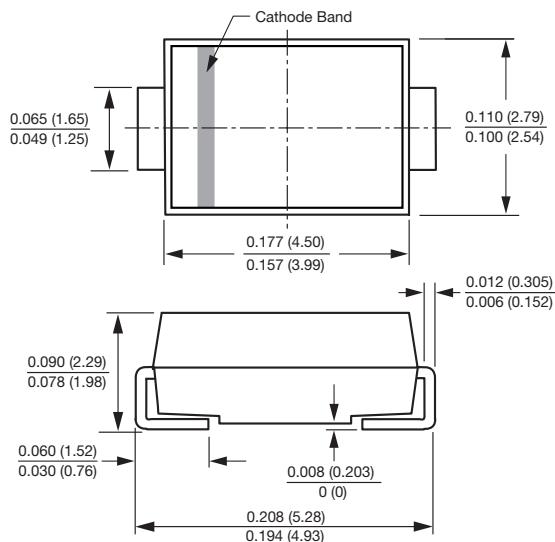


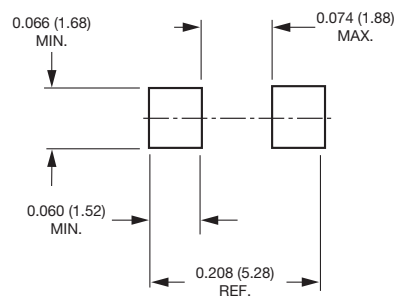
Fig. 6 - Diode Capacitance vs. Reverse Voltage

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)



Mounting Pad Layout





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