

Surface Mount Schottky Barrier Rectifier



DO-214AC (SMA)

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



RoHS
COMPLIANT

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	DO-214AC (SMA)
Diode variations	Single die

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 ($T_A = 25$ °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/ 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⁾	$I_F = 1.0\text{ A}$	$T_J = 25\text{ }^{\circ}\text{C}$	750	mV
	$I_F = 15\text{ mA}$		360	
Maximum DC reverse current ⁽¹⁾	V_{RRM}	$T_J = 25\text{ }^{\circ}\text{C}$	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 (Al_2O_3), 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/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	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

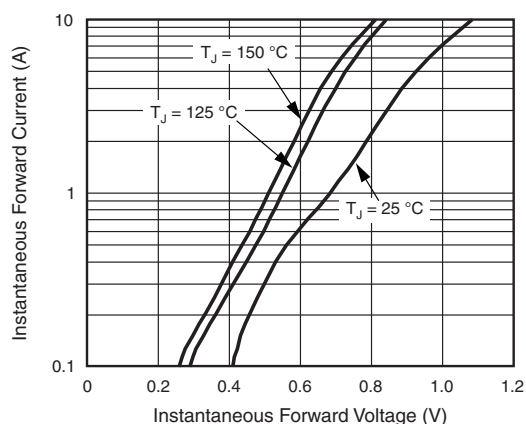
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Fig. 1 - Forward Current vs. Forward Voltage

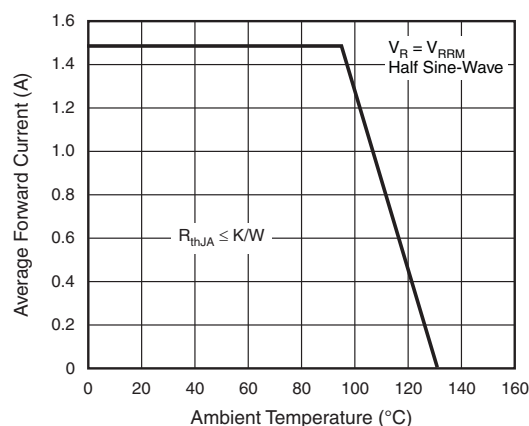


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

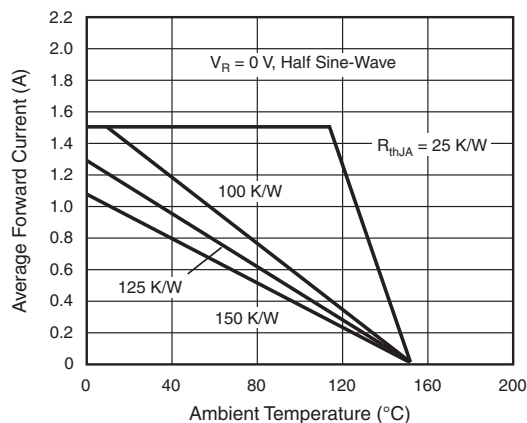


Fig. 3 - Max. Average Forward Current vs. Ambient Temperature

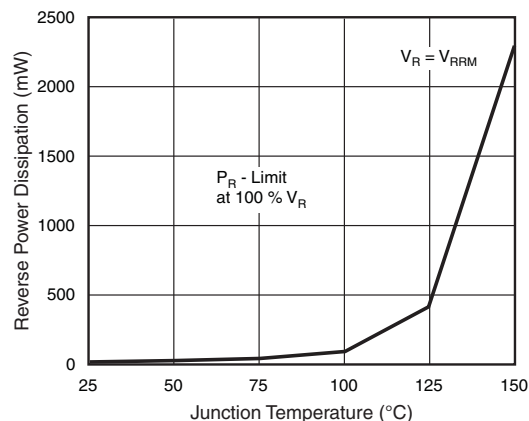


Fig. 5 - Max. Reverse Power Dissipation vs. Junction Temperature

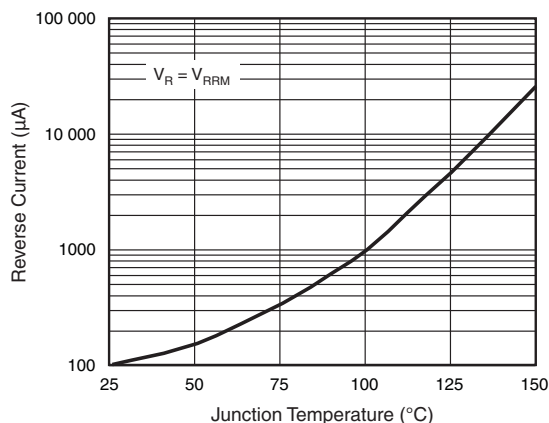


Fig. 4 - Reverse Current vs. Junction Temperature

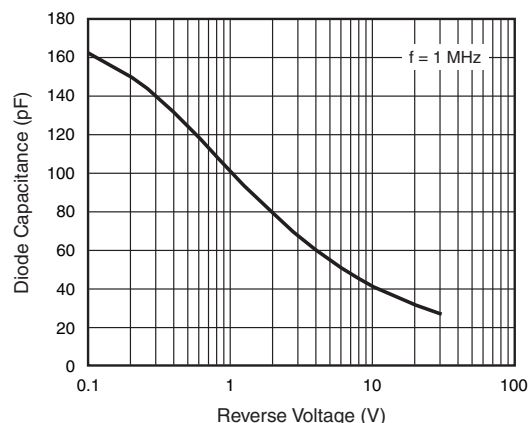
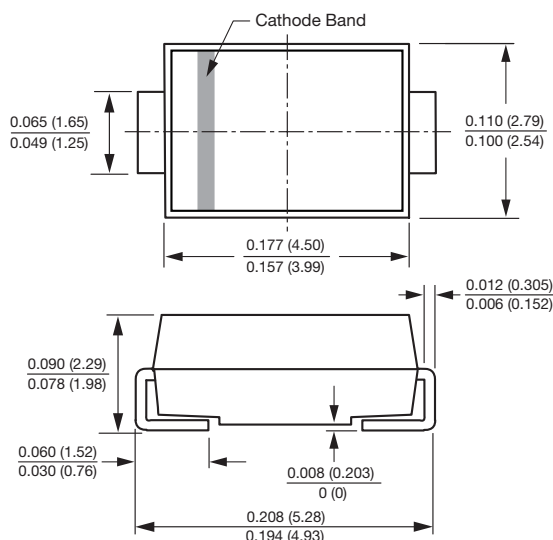


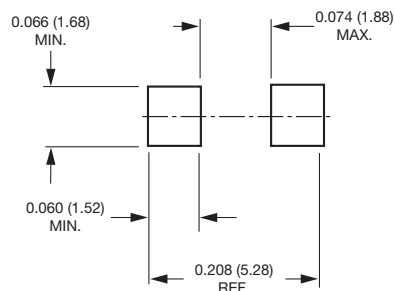
Fig. 6 - Diode Capacitance vs. Reverse Voltage

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout





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