

## Ultrafast Avalanche SMD Rectifier



SMA (DO-214AC)

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low reverse current
- High reverse voltage
- Ultra fast reverse recovery time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	1.5 A
$V_{RRM}$	1000 V
$I_{FSM}$	30 A
$I_R$	5.0 $\mu$ A
$t_{rr}$	75 ns
$V_F$	1.7 V
$E_R$	20 mJ
$T_J$ max.	150 °C
Package	SMA (DO-214AC)
Circuit configuration	Single

### TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, 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, and commercial 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 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	BYG23M	UNIT
Device marking code		BYG23M	
Maximum repetitive peak reverse voltage	$V_{RRM}$	1000	V
Average forward current at $T_A = 65$ °C	$I_{F(AV)}$	1.5	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	$I_{FSM}$	30	A
Pulse energy in avalanche mode, non repetitive (inductive load switch off) $I_{(BR)R} = 1$ A, $T_J = 25$ °C	$E_R$	20	mJ
Operating 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	BYG23M	UNIT
Minimum breakdown voltage	$I_R = 100\text{ }\mu\text{A}$		$V_{BR}$	1000	V
Maximum instantaneous voltage	$I_F = 1.0\text{ A}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_F^{(1)}$	1.7	V
		$T_J = 150\text{ }^{\circ}\text{C}$		1.35	
Maximum reverse current	$V_R = V_{RRM}$	$T_J = 25\text{ }^{\circ}\text{C}$	$I_R$	5	$\mu\text{A}$
		$T_J = 125\text{ }^{\circ}\text{C}$		50	
Maximum reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$		$t_{rr}$	75	ns

**Note**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	BYG23M	UNIT
Typical thermal resistance, junction to case	$R_{\theta JC}$	25	$^{\circ}\text{C/W}$
Typical 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, 17 mm<sup>2</sup> 35  $\mu\text{m}$  Cu(2) Mounted on epoxy-glass hard tissue, 50 mm<sup>2</sup> 35  $\mu\text{m}$  Cu(3) 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
BYG23M-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG23M-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG23MHE3_A/H <sup>(1)</sup>	0.064	H	1800	7" diameter plastic tape and reel
BYG23MHE3_A/I <sup>(1)</sup>	0.064	I	7500	13" diameter plastic tape and reel
BYG23M-M3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG23M-M3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG23MHM3_A/H <sup>(1)</sup>	0.064	H	1800	7" diameter plastic tape and reel
BYG23MHM3_A/I <sup>(1)</sup>	0.064	I	7500	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

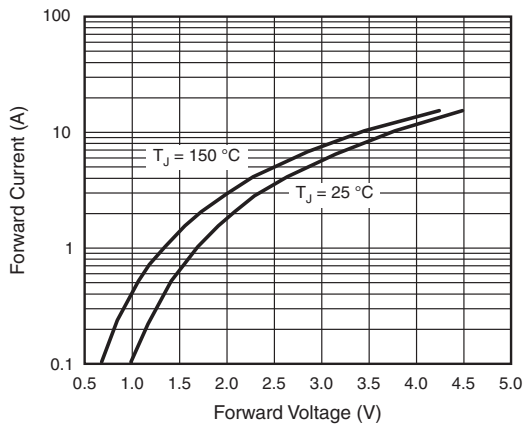
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Max. Forward Current vs. Forward Voltage

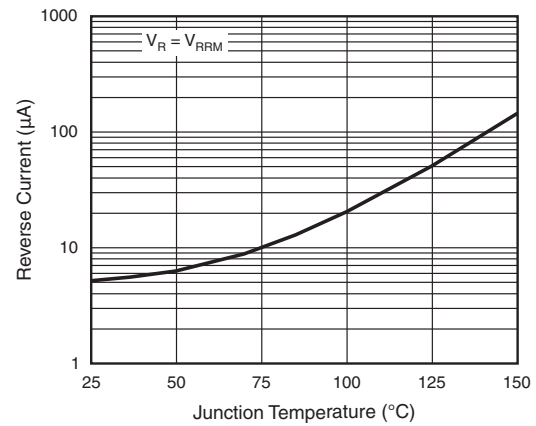


Fig. 4 - Reverse Current vs. Junction Temperature

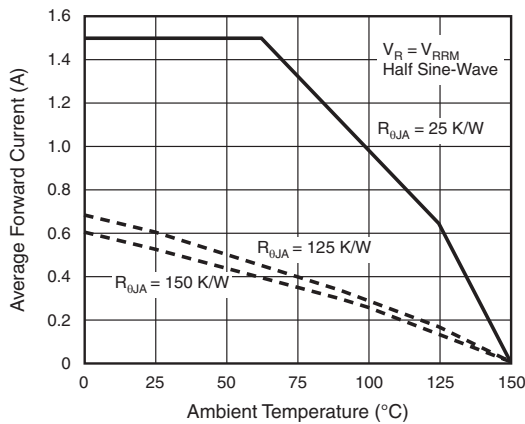


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

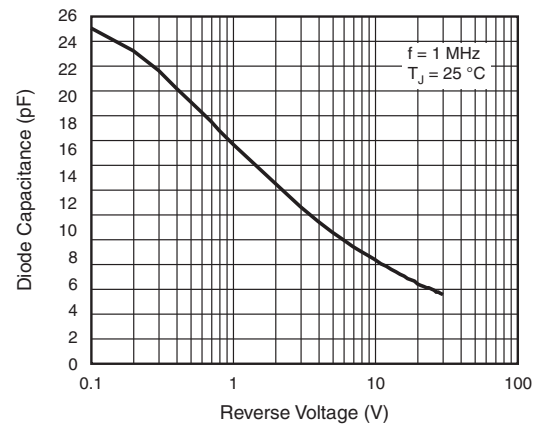


Fig. 5 - Diode Capacitance vs. Reverse Voltage

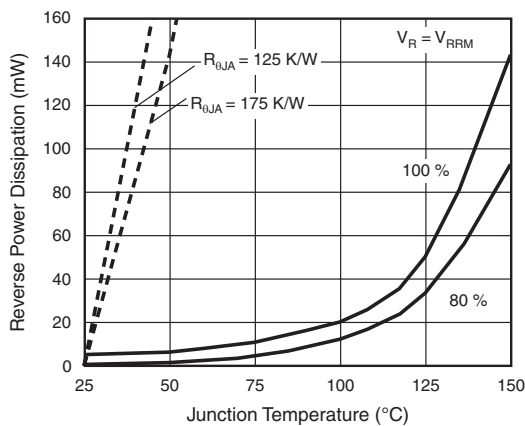
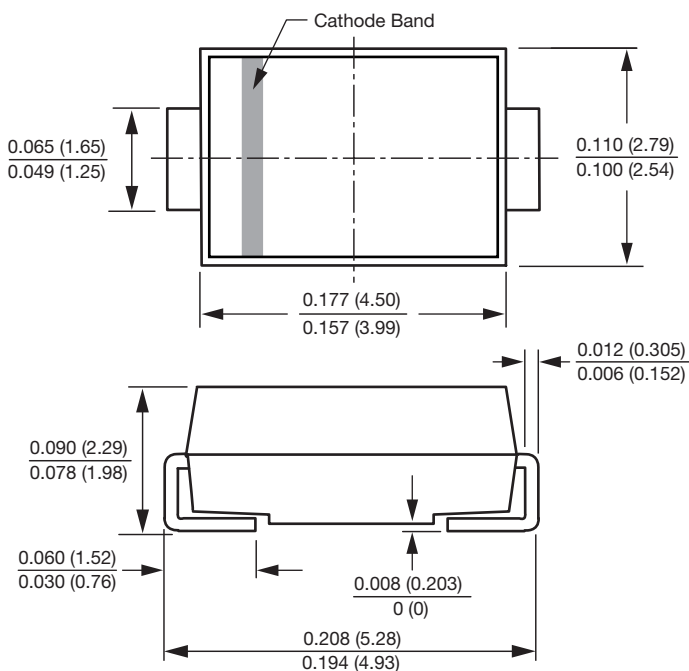


Fig. 3 - Max. Reverse Power Dissipation vs. Junction Temperature

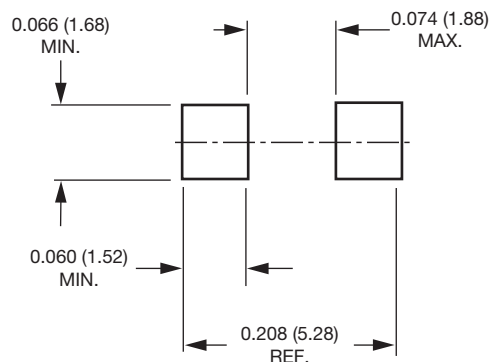


**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**SMA (DO-214AC)**



**Mounting Pad Layout**





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