

Ultrafast Avalanche SMD Rectifier


SMA (DO-214AC)

 Cathode  Anode

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


RoHS
 COMPLIANT
 HALOGEN
FREE

ADDITIONAL RESOURCES


[3D Models](#)

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	1000 V
I_{FSM}	30 A
I_R	5.0 μ 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

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 ($T_A = 25\text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	BYG23M	UNIT
Device marking code		BYG23M	
Maximum repetitive peak reverse voltage	V_{RRM}	1000	V
Average forward current at $T_A = 65\text{ °C}$	$I_{F(AV)}$	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) $I_{(BR)R} = 1\text{ A}$, $T_J = 25\text{ °C}$	E_R	20	mJ
Operating junction and storage temperature range	T_J , T_{STG}	-55 to +150	°C



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	BYG23M	UNIT
Minimum breakdown voltage	I _R = 100 μA		V _{BR}	1000	V
Maximum instantaneous voltage	I _F = 1.0 A	T _J = 25 °C	V _F ⁽¹⁾	1.7	V
		T _J = 150 °C		1.35	
Maximum reverse current	V _R = V _{RRM}	T _J = 25 °C	I _R	5	μA
		T _J = 125 °C		50	
Maximum reverse recovery time	I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A		t _{rr}	75	ns

Note

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

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)			
PARAMETER	SYMBOL	BYG23M	UNIT
Typical thermal resistance, junction to case	R _{θJC}	25	°C/W
Typical thermal resistance, junction to ambient	R _{θJA} ⁽¹⁾	150	°C/W
	R _{θJA} ⁽²⁾	125	
	R _{θJA} ⁽³⁾	100	

Notes(1) Mounted on epoxy-glass hard tissue, 17 mm² 35 μm Cu(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
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 ⁽¹⁾	0.064	H	1800	7" diameter plastic tape and reel
BYG23MHE3_A/I ⁽¹⁾	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 ⁽¹⁾	0.064	H	1800	7" diameter plastic tape and reel
BYG23MHM3_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)

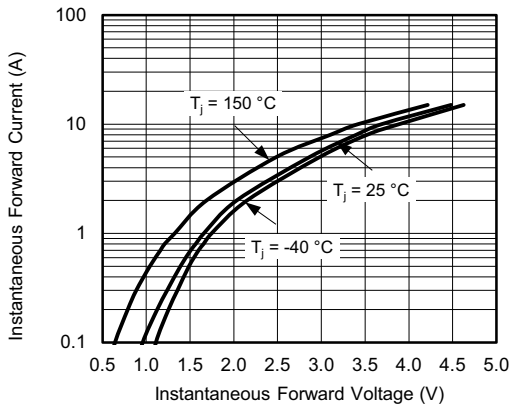


Fig. 1 - Max. Forward Current vs. Forward Voltage

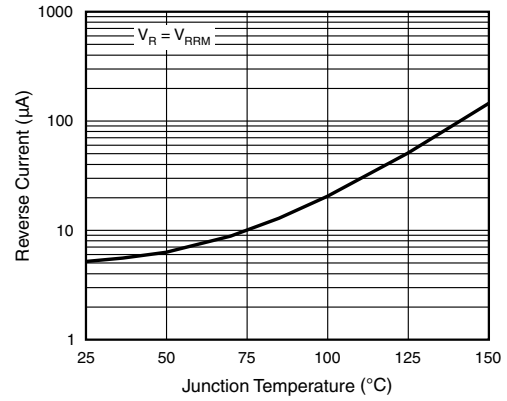


Fig. 4 - Reverse Current vs. Junction Temperature

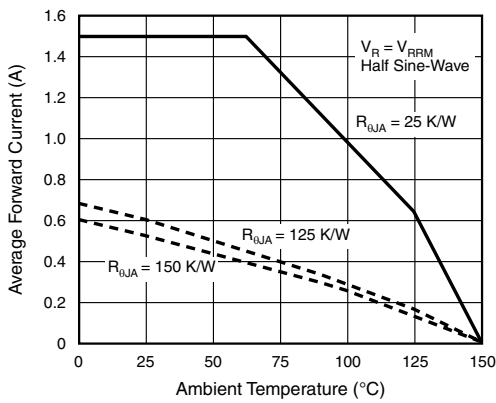


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

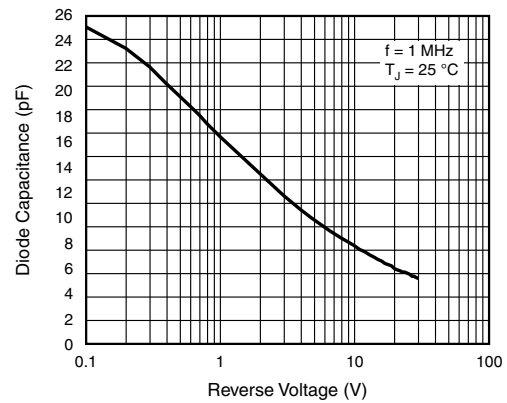


Fig. 5 - Diode Capacitance vs. Reverse Voltage

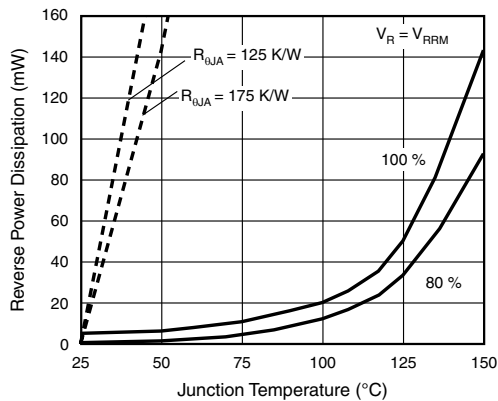
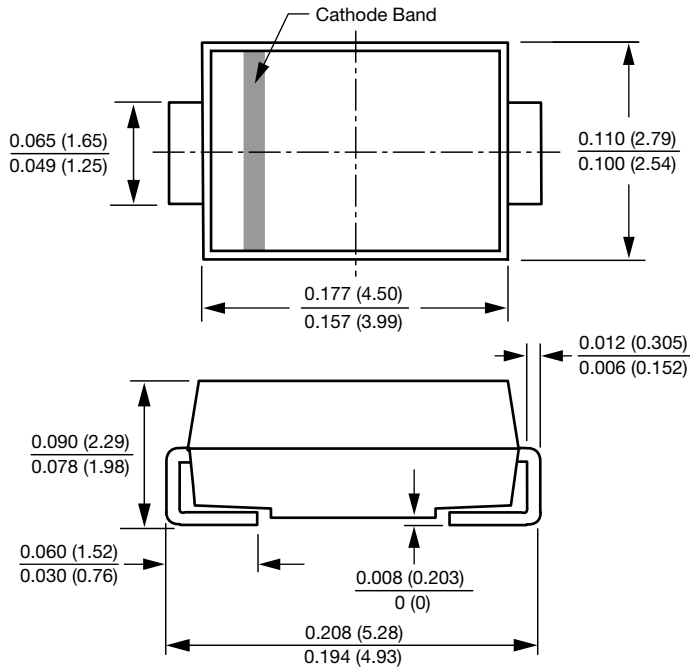


Fig. 3 - Max. Reverse Power Dissipation vs. Junction Temperature

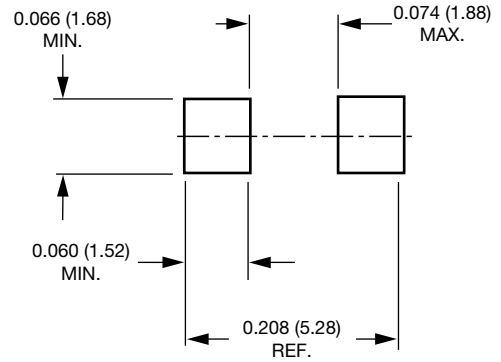


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)



Mounting Pad Layout





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