



## Standard Avalanche SMD Rectifier



SMA (DO-214AC)



### DESIGN SUPPORT TOOLS AVAILABLE



### FEATURES

- Low profile package
- Ideal for automated placement
- Controlled avalanche characteristics
- Glass passivated pellet chip junction
- Low reverse current
- High surge current 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 or P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### TYPICAL APPLICATIONS

For use in general purpose rectification of power supplies, inverters, converters, and freewheeling diodes for consumer, 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, 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, HM3 suffix meet JESD 201 class 2 whisker test  
**Polarity:** color band denotes the cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
$V_{RRM}$	200 V, 400 V, 600 V, 800 V, 1000 V, 1600 V
$I_{FSM}$	30 A
$I_R$	1.0 $\mu$ A
$V_F$	1.15 V
$E_R$	20 mJ
$T_J$ max.	150 °C
Package	SMA (DO-214AC)
Circuit configuration	Single

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)								
PARAMETER	SYMBOL	BYG10D	BYG10G	BYG10J	BYG10K	BYG10M	BYG10Y	UNIT
Device marking code		BYG10D	BYG10G	BYG10J	BYG10K	BYG10M	BYG10Y	
Maximum repetitive peak reverse voltage	$V_{RRM}$	200	400	600	800	1000	1600	V
Average forward current	$I_{F(AV)}$	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) $I_{(BR)R} = 1\text{ A}$ , $T_J = 25\text{ °C}$ (for BYG10D thru BYG10M) $I_{(BR)R} = 0.4\text{ A}$ , $T_J = 25\text{ °C}$ (for BYG10Y)	$E_R$	20						mJ
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150						°C



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)										
PARAMETER	TEST CONDITIONS		SYMBOL	BYG10D	BYG10G	BYG10J	BYG10K	BYG10M	BYG10Y	UNIT
Maximum instantaneous forward voltage <sup>(1)</sup>	$I_F = 1\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	$V_F$	1.1						V
	$I_F = 1.5\text{ A}$			1.15						
Maximum DC reverse current	$V_R = V_{RRM}$	$T_J = 25\text{ }^\circ\text{C}$	$I_R$	1						$\mu\text{A}$
		$T_J = 100\text{ }^\circ\text{C}$		10						
Maximum reverse recovery time	$I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$		$t_{rr}$	4						$\mu\text{s}$

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

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)									
PARAMETER	SYMBOL	BYG10D	BYG10G	BYG10J	BYG10K	BYG10M	BYG10Y	UNIT	
Typical thermal resistance, junction to lead	$R_{\theta JL}$	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**<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 (Al<sub>2</sub>O<sub>3</sub>), 50 mm<sup>2</sup> 35  $\mu\text{m}$  Cu

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
BYG10M-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG10M-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG10MHE3_A/H <sup>(1)</sup>	0.064	H	1800	7" diameter plastic tape and reel
BYG10MHE3_A/I <sup>(1)</sup>	0.064	I	7500	13" diameter plastic tape and reel
BYG10M-M3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG10M-M3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG10MHM3_A/H <sup>(1)</sup>	0.064	H	1800	7" diameter plastic tape and reel
BYG10MHM3_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<sub>A</sub> = 25 °C unless otherwise noted)

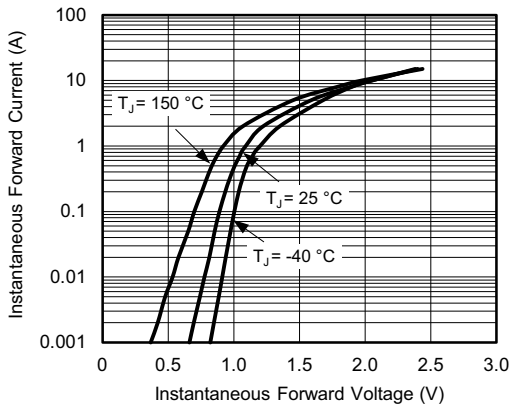


Fig. 1 - Forward Current vs. Forward Voltage

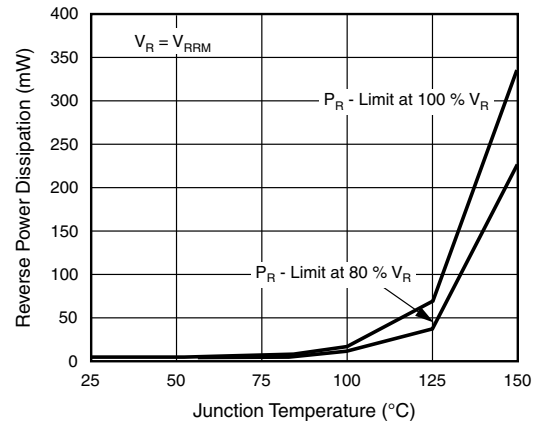


Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

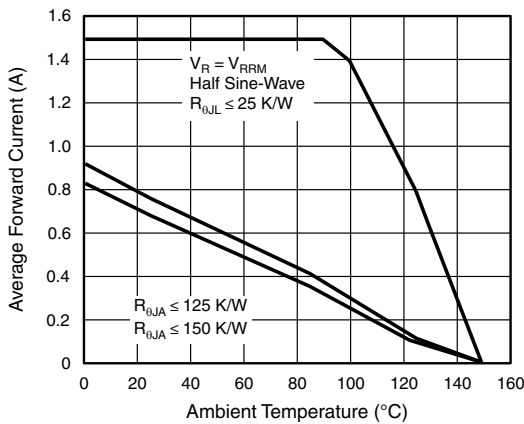


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

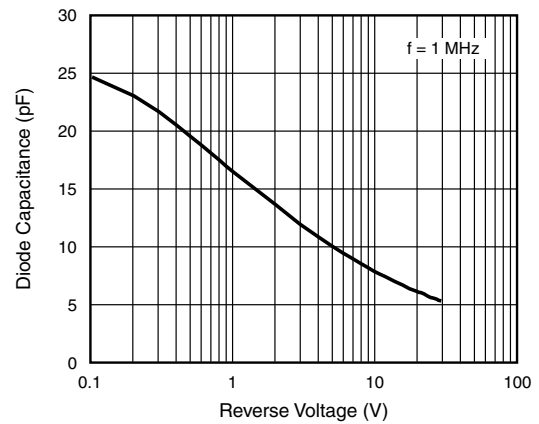


Fig. 5 - Diode Capacitance vs. Reverse Voltage

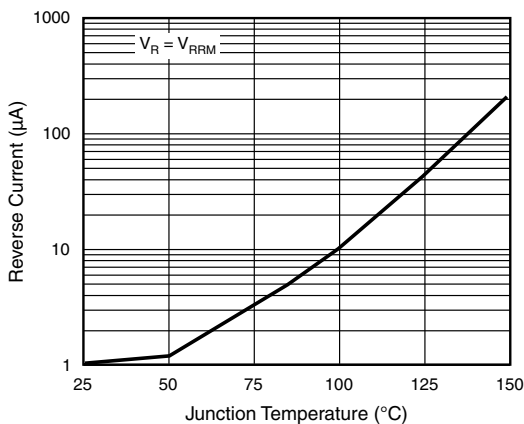


Fig. 3 - Reverse Current vs. Junction Temperature

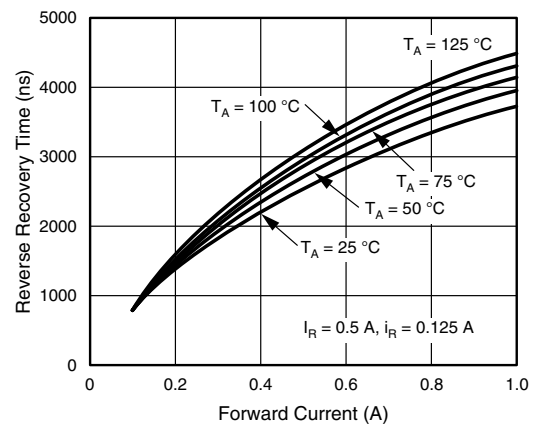


Fig. 6 - Reverse Recovery Time vs. Forward Current

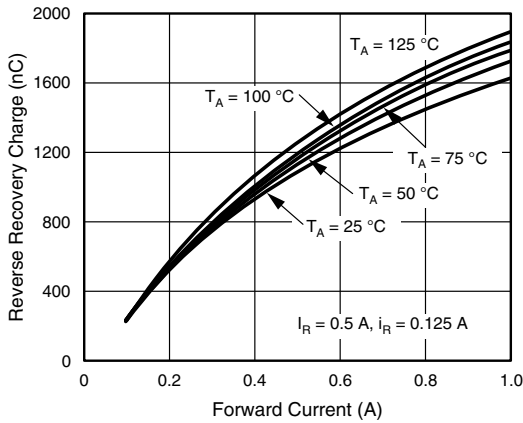
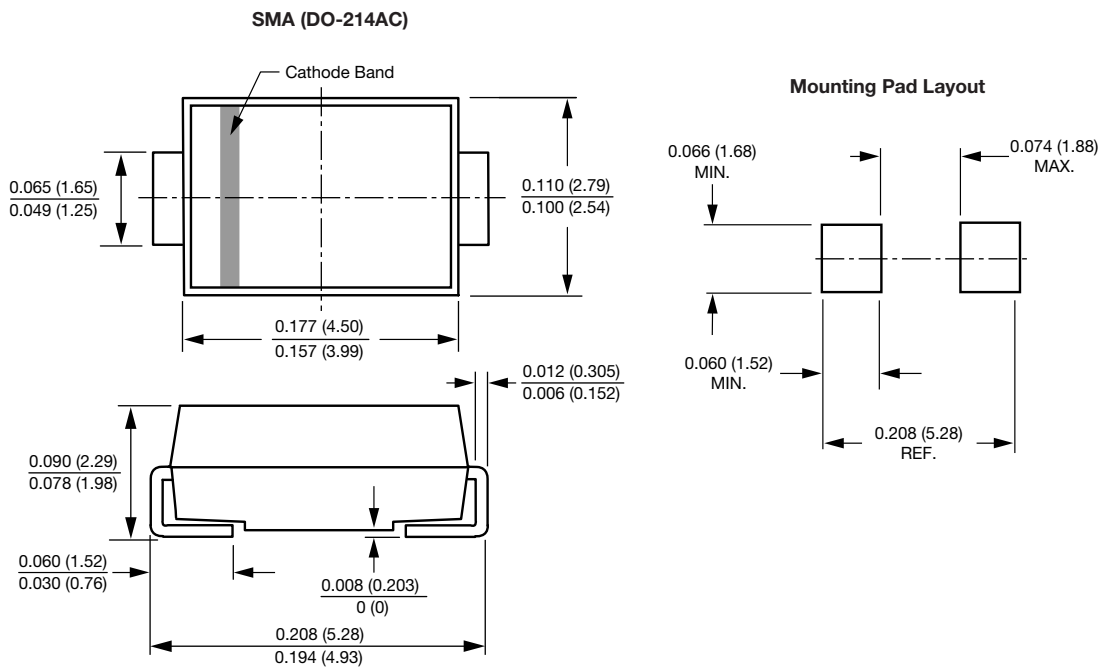


Fig. 7 - Reverse Recovery Charge vs. Forward Current

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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