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AUTOMOTIVE

RoHS

COMPLIANT

HALOGEN FREE

## Standard Avalanche SMD Rectifier



**SMA (DO-214AC)** 



#### **DESIGN SUPPORT TOOLS AVAILABLE**



PRIMARY CHARACTERISTICS						
I <sub>F(AV)</sub>	1.5 A					
V <sub>RRM</sub>	200 V, 400 V, 600 V, 800 V, 1000 V, 1600 V					
I <sub>FSM</sub>	30 A					
I <sub>R</sub>	1.0 μA					
V <sub>F</sub>	1.15 V					
E <sub>R</sub>	20 mJ					
T <sub>J</sub> max.	150 °C					
Package	SMA (DO-214AC)					
Circuit configuration	Single					

#### **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 <a href="https://www.vishay.com/doc?99912">www.vishay.com/doc?99912</a>

#### **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

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °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 <sub>RRM</sub>	200	400	600	800	1000	1600	V
Average forward current	I <sub>F(AV)</sub>	1.5					Α	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	30					Α	
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 <sub>R</sub>	20					mJ	
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	G -55 to +150					°C	



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS		SYMBOL	BYG10D	BYG10G	BYG10J	BYG10K	BYG10M	BYG10Y	UNIT
Maximum	I <sub>F</sub> = 1 A	T 05 00	V	1.1						V
instantaneous forward voltage <sup>(1)</sup>	$I_F = 1.5 A$	T <sub>J</sub> = 25 °C	V <sub>F</sub>	1.15						
Maximum DC	W -W	T <sub>J</sub> = 25 °C						μA		
reverse current	$V_R = V_{RRM}$	T <sub>J</sub> = 100 °C	l <sub>R</sub>	10					μΛ	
Maximum reverse recovery time	$I_F = 0.5 A, I_R$ $I_{rr} = 0.25 A$	= 1.0 A,	t <sub>rr</sub>	4				μs		

#### Note

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

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	SYMBOL BYG10D BYG10G BYG10J BYG10K BYG10M BYG10Y					BYG10Y	UNIT
Typical thermal resistance, junction to lead	$R_{\theta JL}$	25					°C/W	
	R <sub>0</sub> JA (1)	150						
Typical thermal resistance, junction to ambient	R <sub>0</sub> JA (2)	125						°C/W
	R <sub>0JA</sub> (3)	100						

#### Notes

- (1) Mounted on epoxy-glass hard tissue
- (2) Mounted on epoxy-glass hard tissue, 50 mm<sup>2</sup> 35 μm Cu
- (3) Mounted on Al-oxide-ceramic (Al<sub>2</sub>O<sub>3</sub>), 50 mm<sup>2</sup> 35 μm Cu

ORDERING INFORMATION (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 (1)	0.064	Н	1800	7" diameter plastic tape and reel					
BYG10MHE3_A/I (1)	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 (1)	0.064	Н	1800	7" diameter plastic tape and reel					
BYG10MHM3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel					

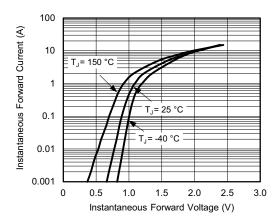
### Note

(1) AEC-Q101 qualified



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## RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)



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Fig. 1 - Forward Current vs. Forward Voltage

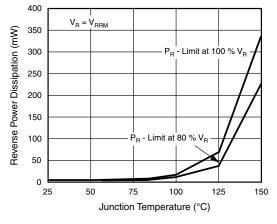


Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

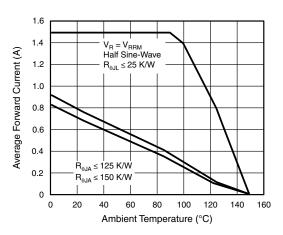


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

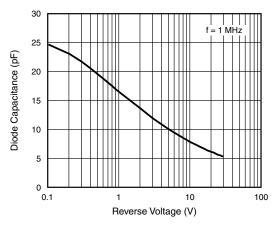


Fig. 5 - Diode Capacitance vs. Reverse Voltage

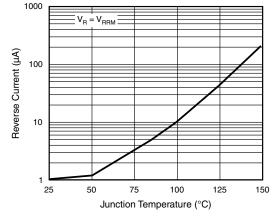


Fig. 3 - Reverse Current vs. Junction Temperature

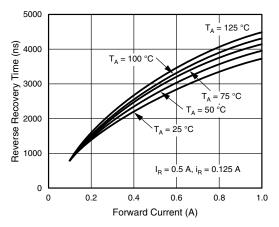


Fig. 6 - Reverse Recovery Time vs. Forward Current

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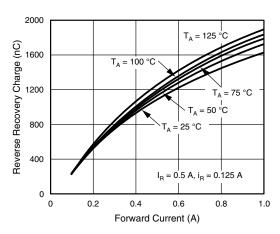
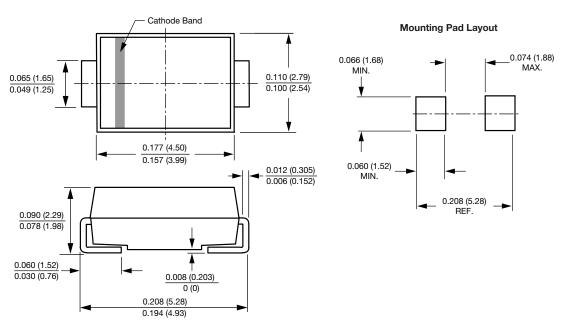


Fig. 7 - Reverse Recovery Charge vs. Forward Current

### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### SMA (DO-214AC)





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