

## Fast Avalanche SMD Rectifier


**SMA (DO-214AC)**

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low reverse current
- Soft recovery characteristic
- Fast reverse recovery time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
FREE

<b>PRIMARY CHARACTERISTICS</b>	
I <sub>F(AV)</sub>	1.5 A
V <sub>RRM</sub>	800 V, 1000 V
I <sub>FSM</sub>	30 A
I <sub>R</sub>	1.0 µA
V <sub>F</sub>	1.6 V
t <sub>rr</sub>	120 ns
E <sub>R</sub>	20 mJ
T <sub>J</sub> max.	150 °C
Package	SMA (DO-214AC)
Diode variation	Single

### TYPICAL APPLICATIONS

For use in fast switching rectification of power supply, 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-M3 - halogen-free, RoHS-compliant, and commercial grade  
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

M3 and HM3 suffix meets 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	BYG21K	BYG21M	UNIT
Device marking code		BYG21K	BYG21M	
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	800	1000	V
Average forward current	I <sub>F(AV)</sub>	1.5		A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	30		A
Pulse energy in avalanche mode, non repetitive (inductive load switch off) I <sub>(BR)R</sub> = 1 A, T <sub>J</sub> = 25 °C	E <sub>R</sub>	20		mJ
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150		°C

ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	BYG21K	BYG21M	UNIT
Maximum instantaneous forward voltage	$I_F = 1 \text{ A}$	$T_J = 25^\circ\text{C}$	$V_F^{(1)}$	1.5	1.6	V
	$I_F = 1.5 \text{ A}$			1.6		
Maximum reverse current	$V_R = V_{RRM}$	$T_J = 25^\circ\text{C}$	$I_R$	1	10	$\mu\text{A}$
		$T_J = 100^\circ\text{C}$		10		
Maximum reverse recovery time	$I_F = 0.5 \text{ A}$ , $I_R = 1.0 \text{ A}$ , $I_{rr} = 0.25 \text{ A}$	$t_{rr}$		120		ns

**Note**

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

THERMAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	BYG21K	BYG21M	UNIT	
Typical thermal resistance, junction to lead, $T_L = \text{const.}$	$R_{\theta JL}$		25	$^\circ\text{C/W}$	$^\circ\text{C/W}$
Typical thermal resistance, junction to ambient	$R_{\theta JA}^{(1)}$		150		
	$R_{\theta JA}^{(2)}$		125		
	$R_{\theta JA}^{(3)}$		100		

**Notes**

(1) Mounted on epoxy-glass hard tissue

(2) Mounted on epoxy-glass hard tissue, 50 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	
BYG21K-M3/TR	0.064	TR	1800	7" diameter plastic tape and reel	
BYG21K-M3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel	
BYG21KHM3_A/H <sup>(1)</sup>	0.064	H	1800	7" diameter plastic tape and reel	
BYG21KHM3_A/I <sup>(1)</sup>	0.064	I	7500	13" diameter plastic tape and reel	

**Note**

(1) AEC-Q101 qualified

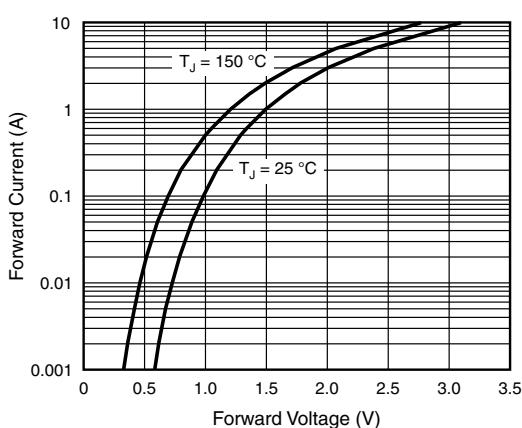
**RATINGS AND CHARACTERISTICS CURVES ( $T_A = 25^\circ\text{C}$  unless otherwise noted)**


Fig. 1 - Forward Current vs. Forward Voltage

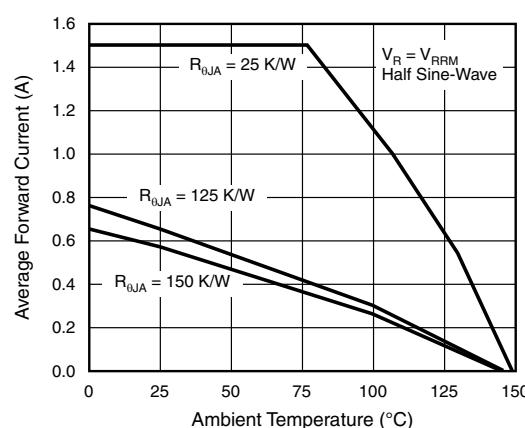


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

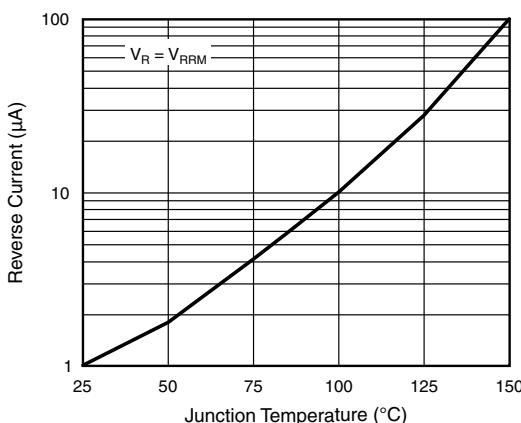


Fig. 3 - Reverse Current vs. Junction Temperature

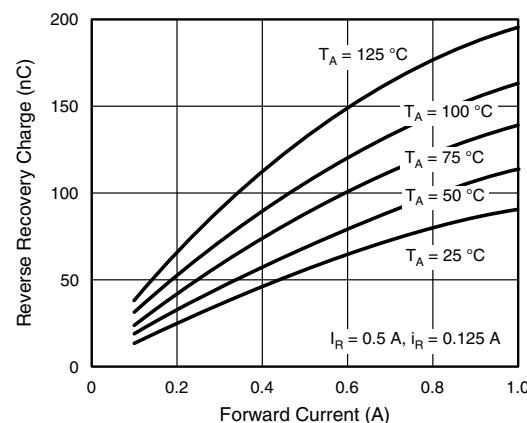


Fig. 6 - Max. Reverse Recovery Charge vs. Forward Current

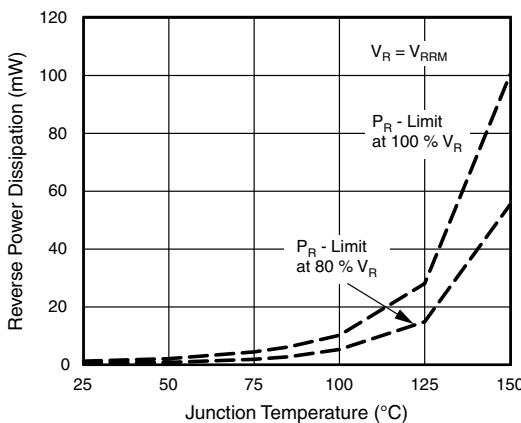


Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

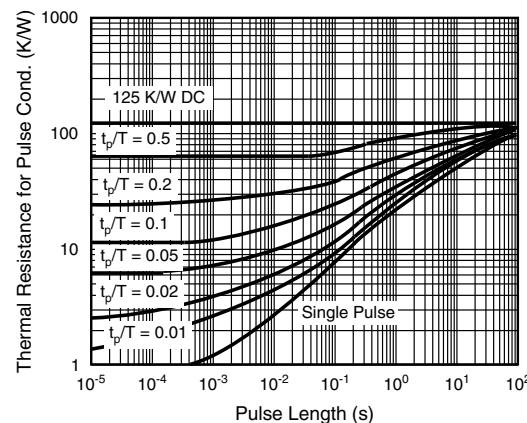


Fig. 7 - Thermal Response

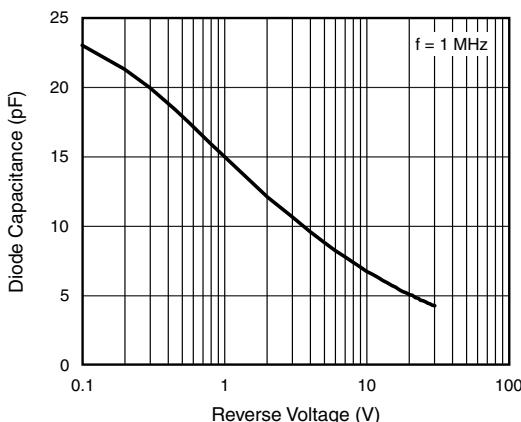
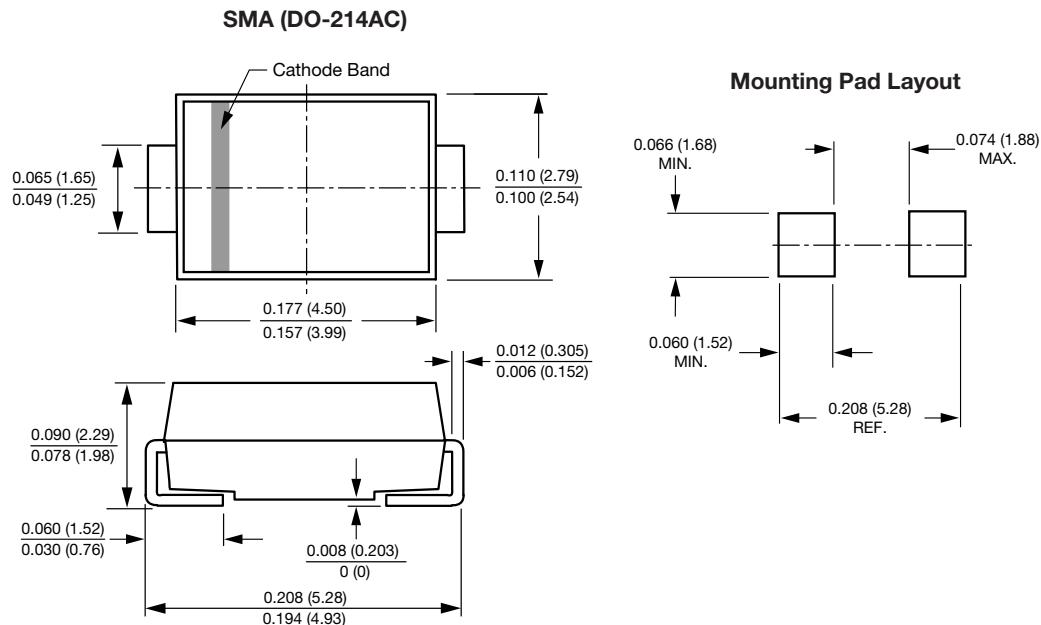


Fig. 5 - Diode Capacitance vs. Reverse Voltage

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


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