AUTOMOTIVE

RoHS

COMPLIANT

HALOGEN



## Vishay General Semiconductor

## **Fast Avalanche SMD Rectifier**



**SMA (DO-214AC)** 



#### **ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub>	1.5 A			
$V_{RRM}$	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)			
Circuit configuration	Single			

#### **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 available
  - Automotive ordering code 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 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-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

<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		Α	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	30		А	
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	



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CO	NDITIONS	SYMBOL	BYG21K	BYG21M	UNIT
Maximum instantaneous	I <sub>F</sub> = 1 A	T <sub>.1</sub> = 25 °C	V <sub>E</sub> (1)	1.	5	V
forward voltage	I <sub>F</sub> = 1.5 A	- I <sub>J</sub> = 25 <sup>-</sup> C	V <sub>F</sub> ('')	1.	6	V
Maximum vayaraa ayyaraat	V V	T <sub>J</sub> = 25 °C		-		
Maximum reverse current	$V_R = V_{RRM}$	T <sub>J</sub> = 100 °C	IR	10		- μΑ
Maximum reverse recovery time	$I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A},$ $I_{rr} = 0.25 \text{ A}$		t <sub>rr</sub>	120		ns

#### Note

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

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	BYG21K BYG21M		UNIT
Typical thermal resistance, junction to lead, T <sub>L</sub> = const.	$R_{\theta JL}$	25		°C/W
	R <sub>θJA</sub> <sup>(1)</sup>	150		
Typical thermal resistance, junction to ambient	R <sub>0JA</sub> (2)	125		°C/W
	R <sub>θJA</sub> <sup>(3)</sup>	10	00	

#### **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		
BYG21K-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel		
BYG21K-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel		
BYG21KHE3_A/H (1)	0.064	Н	1800	7" diameter plastic tape and reel		
BYG21KHE3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel		
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 (1)	0.064	Н	1800	7" diameter plastic tape and reel		
BYG21KHM3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel		

#### Note

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

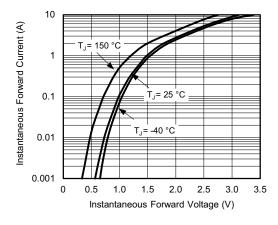


Fig. 1 - Forward Current vs. Forward Voltage

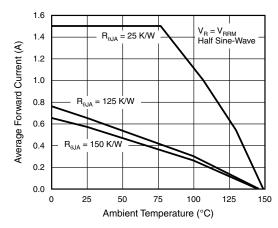


Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

<sup>(1)</sup> AEC-Q101 qualified

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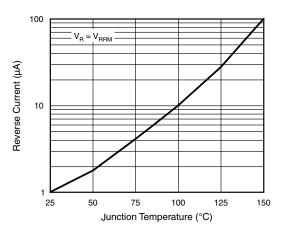


Fig. 3 - Reverse Current vs. Junction Temperature

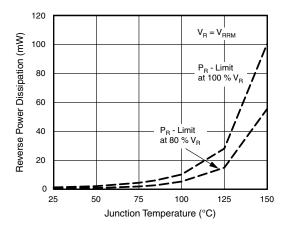


Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

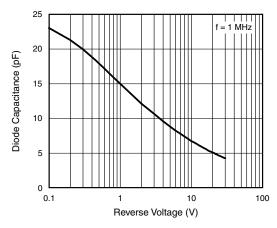


Fig. 5 - Diode Capacitance vs. Reverse Voltage

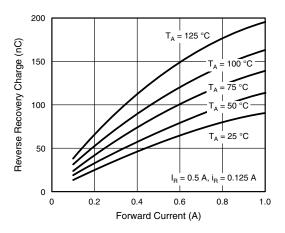


Fig. 6 - Max. Reverse Recovery Charge vs. Forward Current

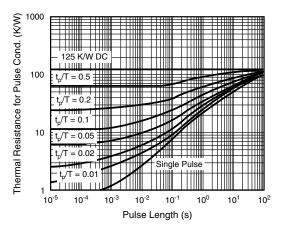


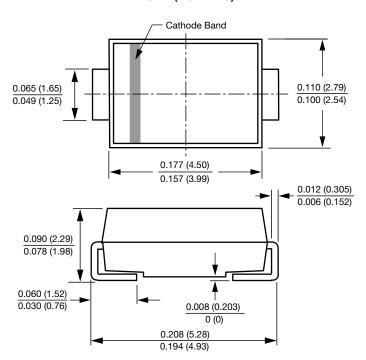
Fig. 7 - Thermal Response

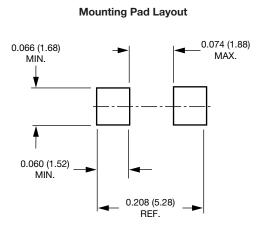


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### **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

#### SMA (DO-214AC)







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Vishay

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