Fast Avalanche SMD Rectifier



SMA (DO-214AC)

Cathode ○—|◀—○ Anode

ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	800 V, 1000 V
I_{FSM}	30 A
I_R	1.0 µA
V_F	1.6 V
t_{rr}	120 ns
E_R	20 mJ
T_J max.	150 °C
Package	SMA (DO-214AC)
Circuit configuration	Single

FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT HALOGEN FREE

- 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 www.vishay.com/doc?99912

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

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	BYG21K	BYG21M	UNIT
Device marking code		BYG21K	BYG21M	
Maximum repetitive peak reverse voltage	V_{RRM}	800	1000	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 A, T_J = 25 °C	E_R	20		mJ
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150		°C

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

Note

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

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

Notes

(1) Mounted on epoxy-glass hard tissue
(2) Mounted on epoxy-glass hard tissue, 50 mm^2 35 µm Cu
(3) Mounted on Al-oxide-ceramic (Al_2O_3), 50 mm^2 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	H	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	H	1800	7" diameter plastic tape and reel
BYG21KHM3_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 °C unless otherwise noted)

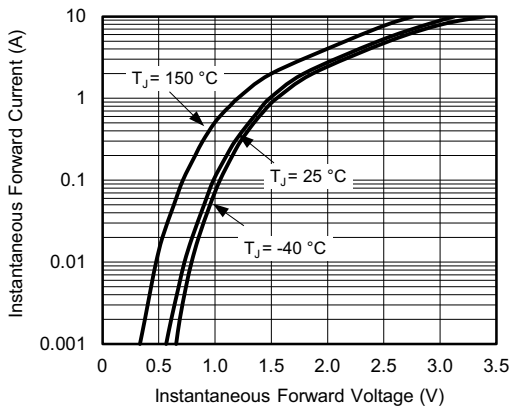

Fig. 1 - Forward Current vs. Forward Voltage

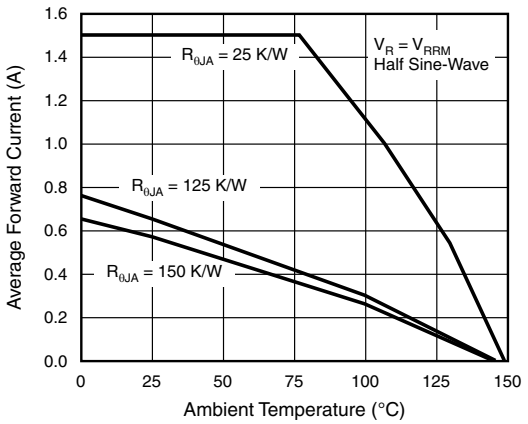

Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

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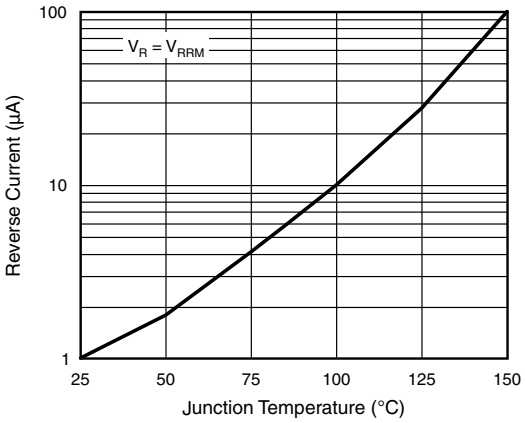

Fig. 3 - Reverse Current vs. Junction Temperature

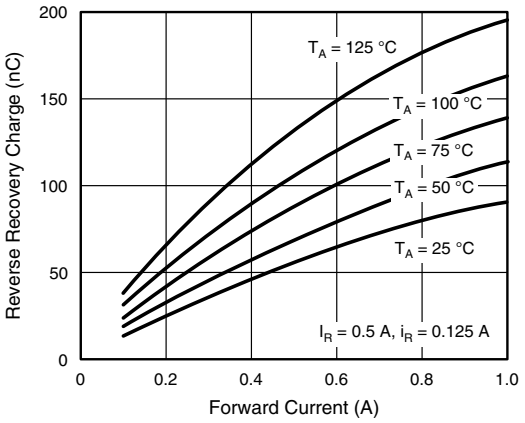

Fig. 6 - Max. Reverse Recovery Charge vs. Forward Current

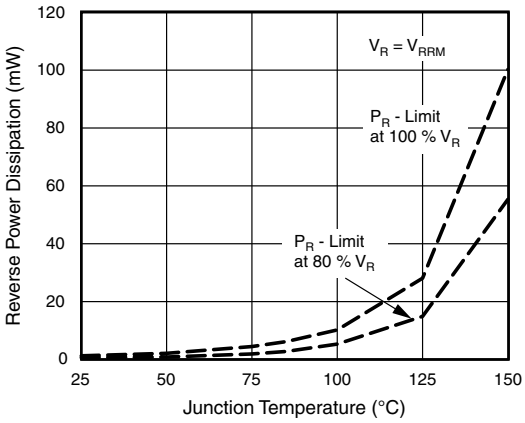

Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

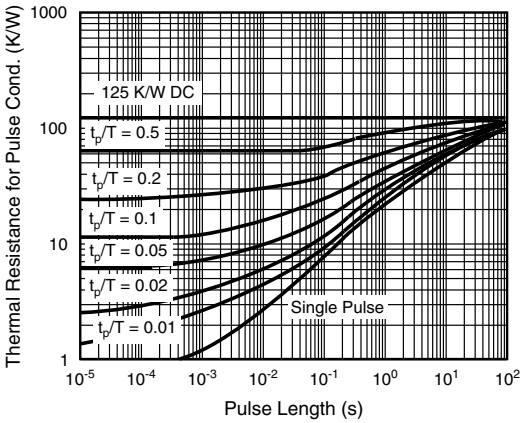

Fig. 7 - Thermal Response

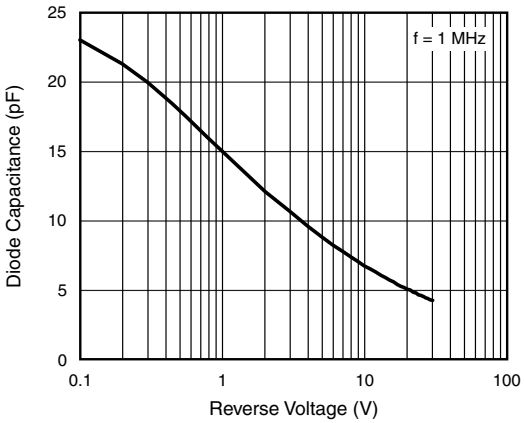

Fig. 5 - Diode Capacitance vs. Reverse Voltage

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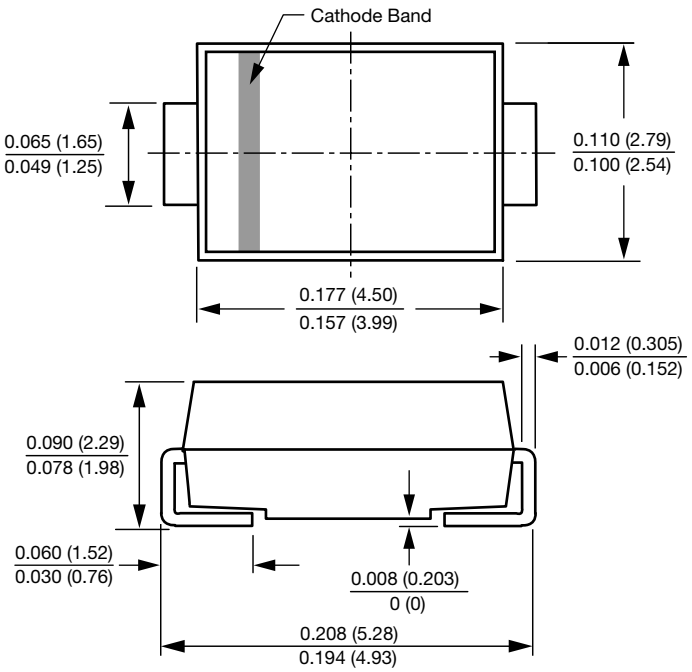
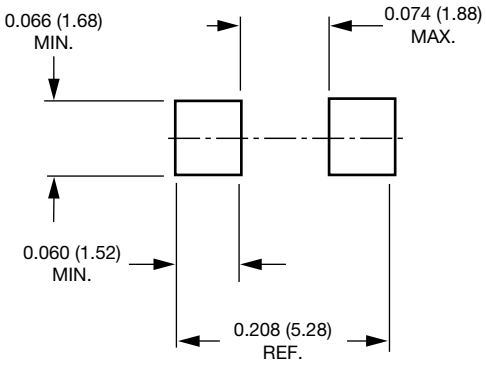
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)



Mounting Pad Layout



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