Ultrafast Avalanche SMD Rectifier

SMA (DO-214AC)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V, 100 V, 200 V
I_{FSM}	35 A
I_R	1.0 μA
V_F at I_F	1.1 V
t_{rr}	25 ns
E_R	20 mJ
T_J max.	150 °C
Package	SMA (DO-214AC)
Diode variations	Single

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Low reverse current
- Low forward voltage
- Soft recovery characteristic
- Ultra 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: base P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE

TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, 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	BYG22A	BYG22B	BYG22D	UNIT
Device marking code		BYG22A	BYG22B	BYG22D	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	200	V
Average forward current	$I_{F(AV)}$	2.0			A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	35			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**	**BYG22A**	**BYG22B**	**BYG22D**	**UNIT**
Maximum instantaneous forward voltage	I_F = 1.0 A	T_J = 25 °C	V_F (1)	1.0			V
	I_F = 2.0 A			1.1			
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}	25			ns

Note

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

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**BYG22A**	**BYG22B**	**BYG22D**	**UNIT**
Maximum thermal resistance, junction to lead, T_L = const.	$R_{\theta JL}$	25			°C/W
Maximum 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**
BYG22D-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG22D-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG22DHE3_A/H (1)	0.064	H	1800	7" diameter plastic tape and reel
BYG22DHE3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel
BYG22D-M3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG22D-M3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG22DHM3_A/H (1)	0.064	H	1800	7" diameter plastic tape and reel
BYG22DHM3_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_A = 25 °C unless otherwise noted)

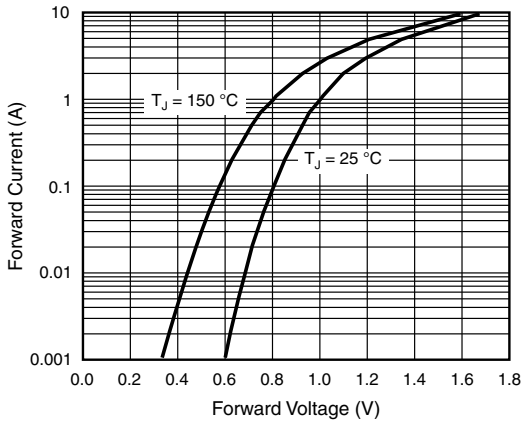

Fig. 1 - Forward Current vs. Forward Voltage

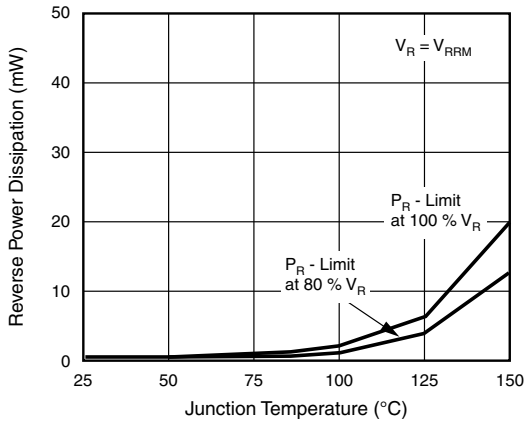

Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

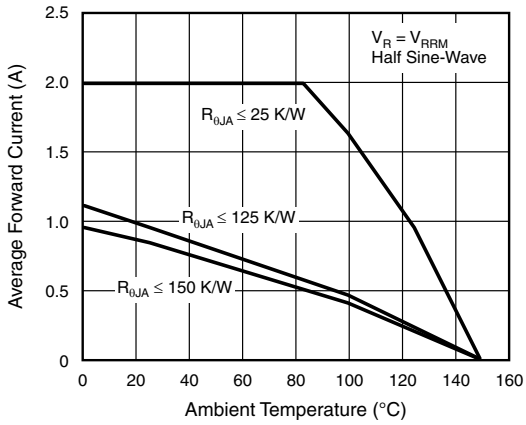

Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

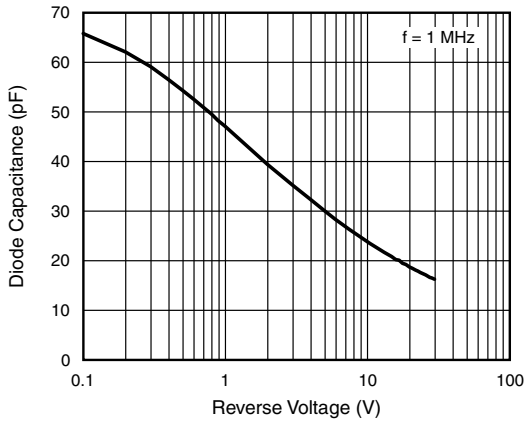

Fig. 5 - Diode Capacitance vs. Reverse Voltage

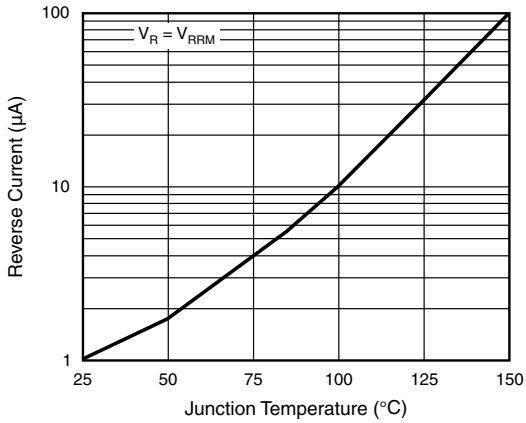

Fig. 3 - Reverse Current vs. Junction Temperature

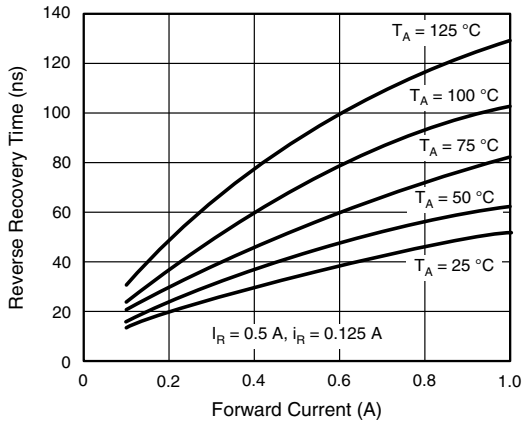

Fig. 6 - Max. Reverse Recovery Time vs. Forward Current

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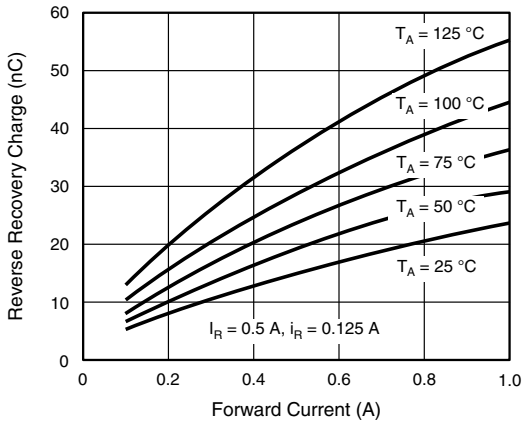


Fig. 7 - Max. Reverse Recovery Charge vs. Forward Current

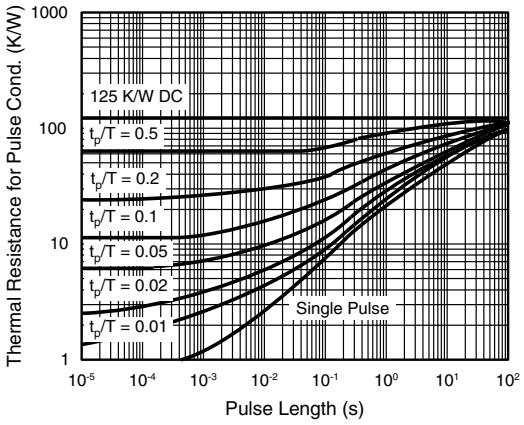
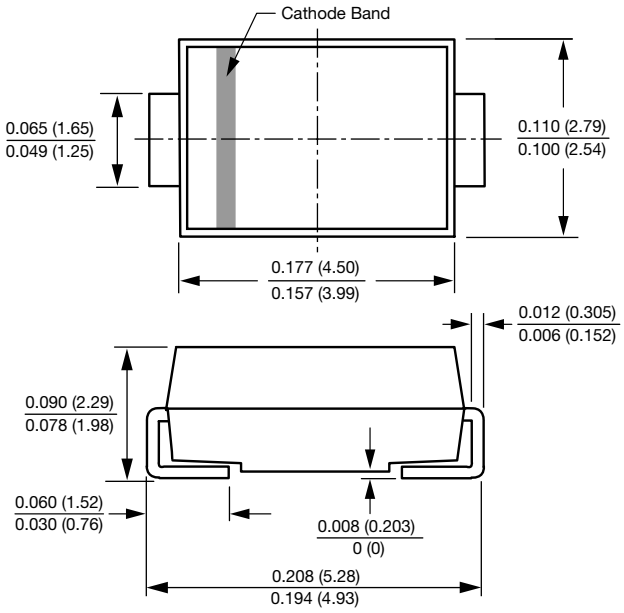


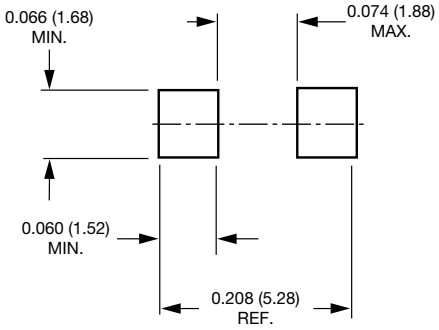
Fig. 8 - Thermal Response

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)



Mounting Pad Layout



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