Standard Avalanche SMD Rectifier

SMA (DO-214AC)

Cathode ○—◀—○ Anode

DESIGN SUPPORT TOOLS AVAILABLE

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
V_{RRM}	200 V, 400 V, 600 V, 800 V, 1000 V, 1600 V
I_{FSM}	30 A
I_R	1.0 µA
V_F	1.15 V
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
- 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 www.vishay.com/doc?99912

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

MAXIMUM RATINGS (T_A = 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_{RRM}	200	400	600	800	1000	1600	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 (for BYG10D thru BYG10M) $I_{(BR)R}$ = 0.4 A, T_J = 25 °C (for BYG10Y)	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**	**BYG10D**	**BYG10G**	**BYG10J**	**BYG10K**	**BYG10M**	**BYG10Y**	**UNIT**
Maximum instantaneous forward voltage [1]	I_F = 1 A	T_J = 25 °C	V_F	1.1						V
	I_F = 1.5 A			1.15						
Maximum DC 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}	4						µs

Note

[1] Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**BYG10D**	**BYG10G**	**BYG10J**	**BYG10K**	**BYG10M**	**BYG10Y**	**UNIT**
Typical thermal resistance, junction to lead	$R_{\theta JL}$	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**
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	H	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	H	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_A = 25 °C unless otherwise noted)

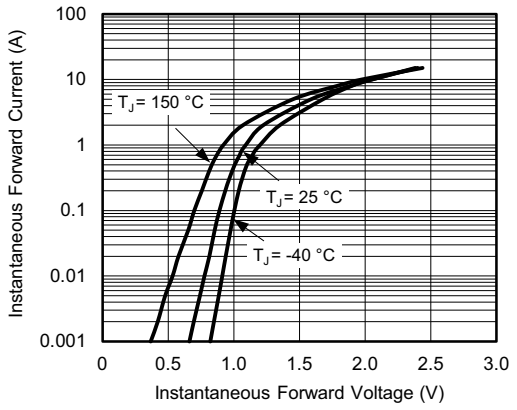

Fig. 1 - Forward Current vs. Forward Voltage

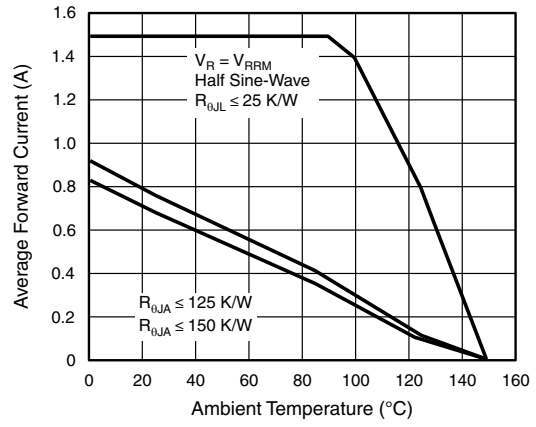

Fig. 2 - Max. Average Forward Current vs. Ambient Temperature

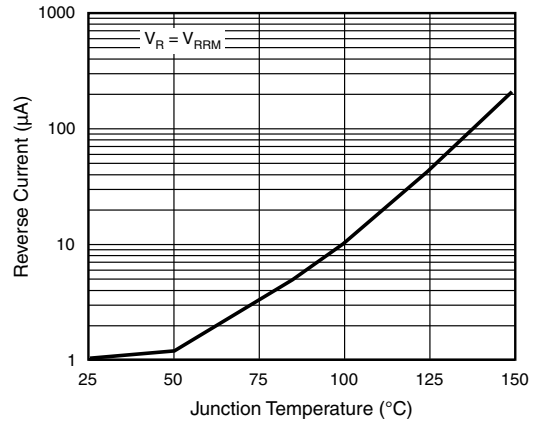

Fig. 3 - Reverse Current vs. Junction Temperature

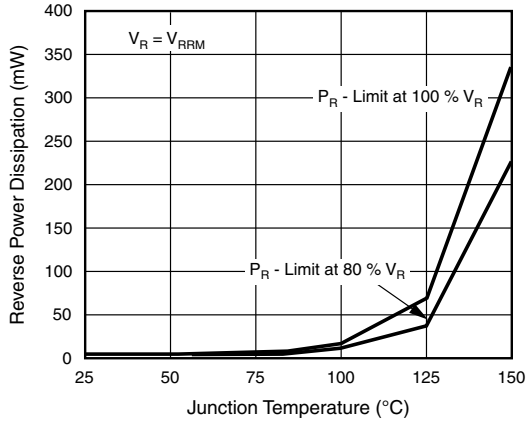

Fig. 4 - Max. Reverse Power Dissipation vs. Junction Temperature

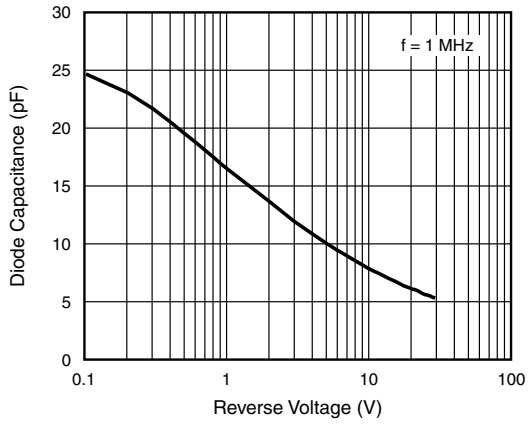

Fig. 5 - Diode Capacitance vs. Reverse Voltage

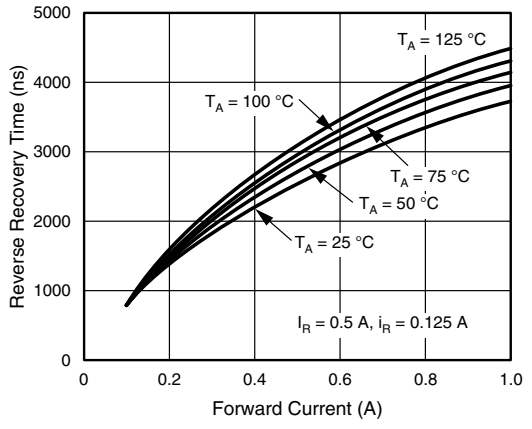

Fig. 6 - Reverse Recovery Time vs. Forward Current

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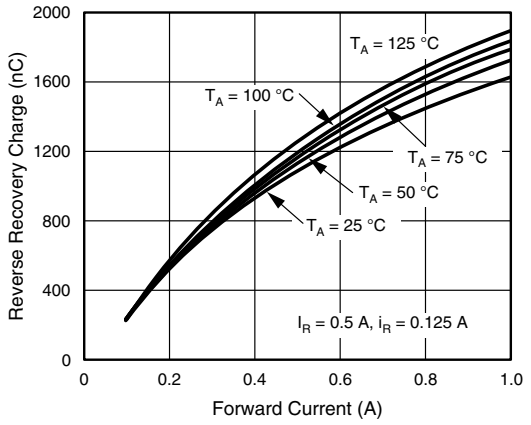
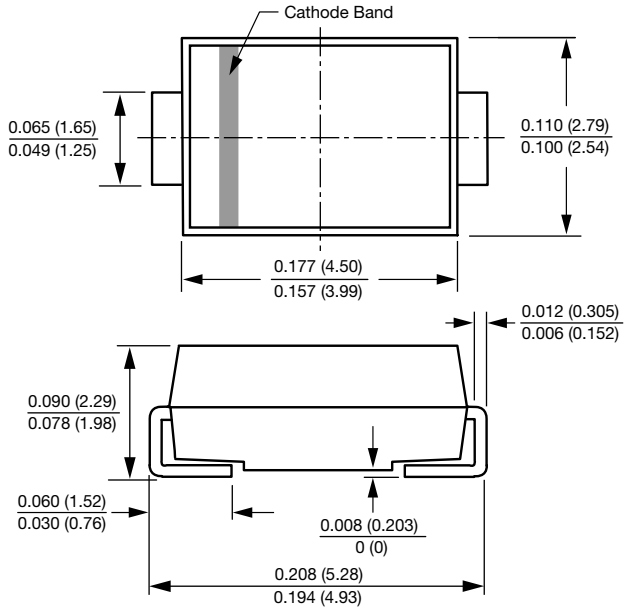


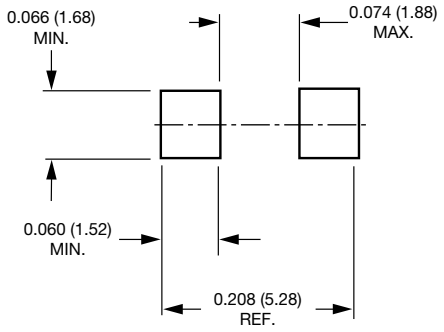
Fig. 7 - Reverse Recovery Charge vs. Forward Current

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)



Mounting Pad Layout



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