

## Ultrafast Avalanche SMD Rectifier



**DO-214AC (SMA)**

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Low reverse current
- Soft recovery characteristics
- Ultrafast reverse recovery time
- Meets MSL level 1, per J-STD-020C, LF max peak of 260 °C
- Solder Dip 260 °C, 40 seconds
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



### MAJOR RATINGS AND CHARACTERISTICS

$I_{F(AV)}$	1.5 A
$V_{RRM}$	200 V to 600 V
$I_{FSM}$	30 A
$I_R$	1.0 $\mu$ A
$V_F$	1.4 V
$t_{rr}$	75 ns
$E_R$	20 mJ
$T_j$ max.	150 °C

### TYPICAL APPLICATIONS

For use in high frequency rectification of power supply, inverters, converters and free-wheeling diodes for consumer, automotive and telecommunication.

### MECHANICAL DATA

**Case:** DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D

E3 suffix for commercial grade, HE3 suffix for high reliability grade (AEC Q101 qualified)

**Polarity:** Color band denotes the cathode end

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

PARAMETER	SYMBOL	BYG20D	BYG20G	BYG20J	UNIT
Device marking code		BYG20D	BYG20G	BYG20J	
Maximum repetitive peak reverse voltage	$V_{RRM}$	200	400	600	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

ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	BYG20D	BYG20G	BYG20J	UNIT
Maximum instantaneous forward voltage (1)	at I <sub>F</sub> = 1 A I <sub>F</sub> = 1.5 A T <sub>j</sub> = 25 °C	V <sub>F</sub>		1.3 1.4		V
Maximum DC reverse current	at V <sub>R</sub> = V <sub>RRM</sub> T <sub>j</sub> = 25 °C T <sub>j</sub> = 100 °C	I <sub>R</sub>		1 10		μA
Maximum reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>tr</sub> = 0.25 A	t <sub>rr</sub>		75		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	BYG20D	BYG20G	BYG20J	UNIT
Typical thermal resistance - Junction lead T <sub>L</sub> = const.	R <sub>θJL</sub>		25		°C/W
Typical thermal resistance - Junction Ambient	R <sub>θJA</sub>		150 (1) 125 (2) 100 (3)		°C/W

**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)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
BYG20D-E3/TR	0.064	TR	1800	7" Diameter Plastic Tape & Reel
BYG20D-E3/TR3	0.064	TR3	7500	13" Diameter Plastic Tape & Reel
BYG20DHE3/TR (1)	0.064	TR	1800	7" Diameter Plastic Tape & Reel
BYG20DHE3/TR3 (1)	0.064	TR3	7500	13" Diameter Plastic Tape & Reel

**Note:**

(1) Automotive grade AEC Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

(T<sub>A</sub> = 25 °C unless otherwise noted)

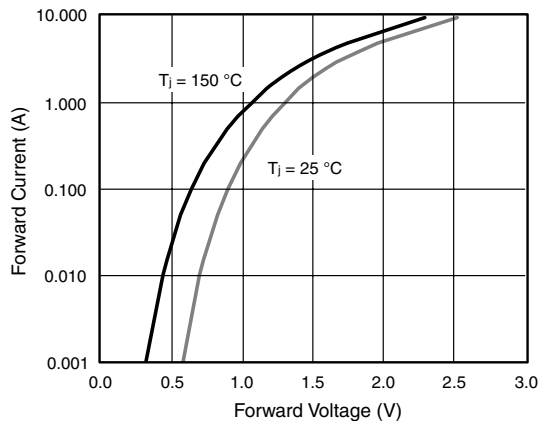


Figure 1. Forward Current vs. Forward Voltage

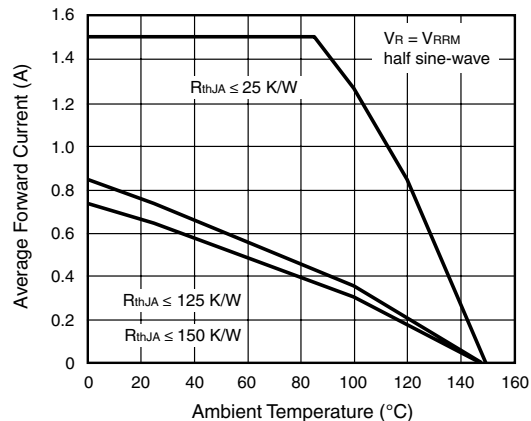


Figure 2. Max. Average Forward Current vs. Ambient Temperature

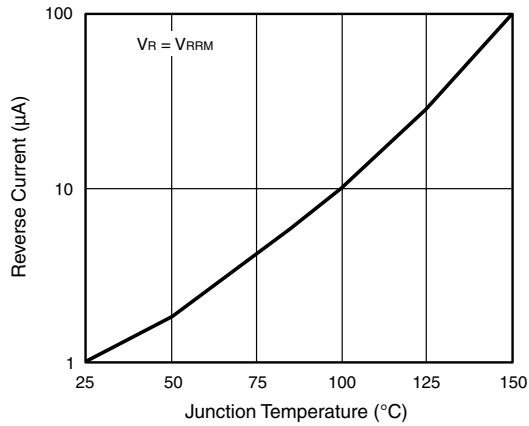


Figure 3. Reverse Current vs. Junction Temperature

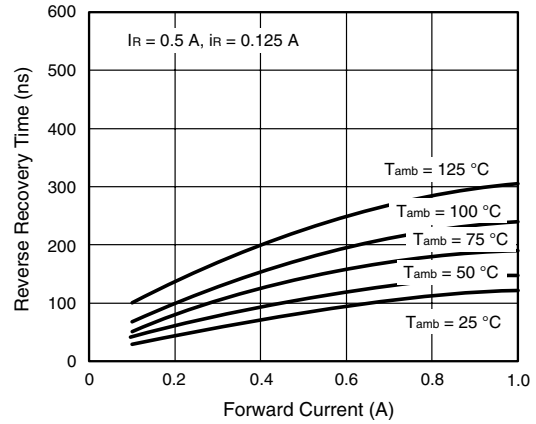


Figure 6. Reverse Recovery Time vs. Forward Current

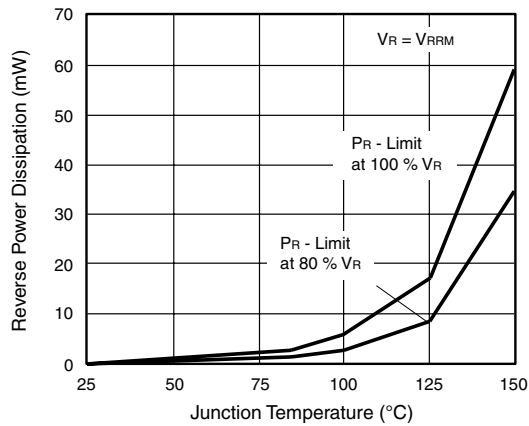


Figure 4. Max. Reverse Power Dissipation vs. Junction Temperature

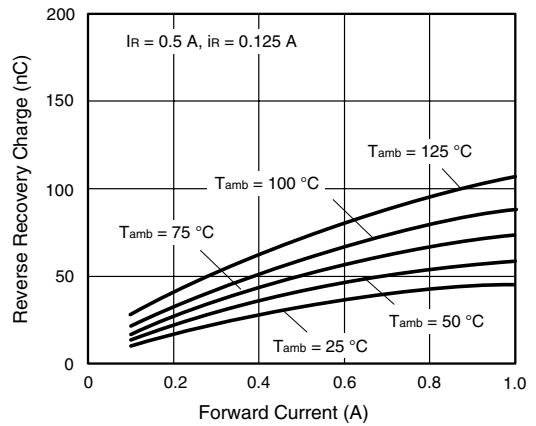


Figure 7. Reverse Recovery Charge vs. Forward Current

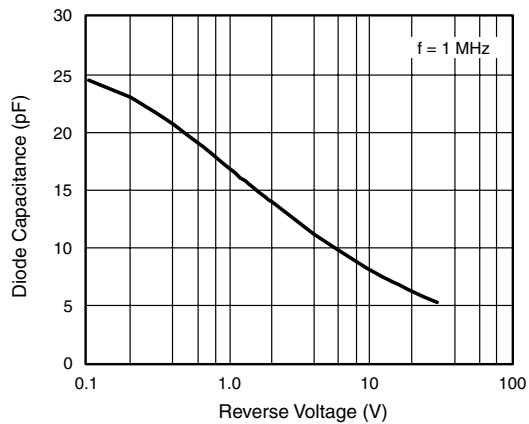


Figure 5. Diode Capacitance vs. Reverse Voltage

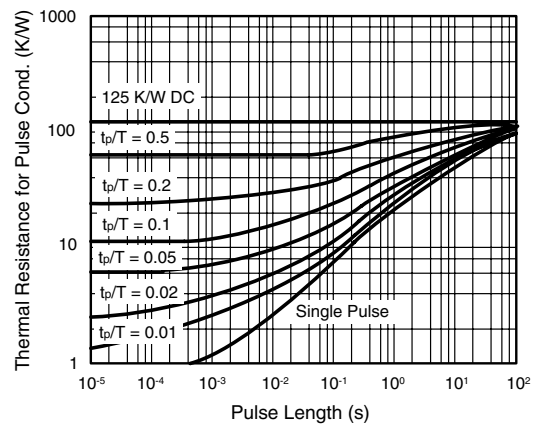
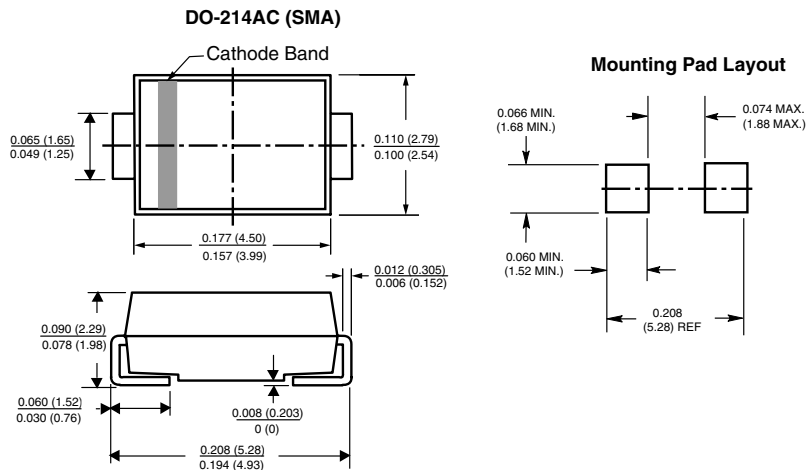


Figure 8. Thermal Response

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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