

### 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-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

#### PRIMARY 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 freewheeling 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-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC Q101 qualified), meets JESD 201 class 2 whisker test

**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 <sup>(1)</sup>	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>rr</sub> = 0.25 A		t <sub>rr</sub>	75			ns

**Note:**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	BYG20D	BYG20G	BYG20J	UNIT	
Typical thermal resistance - junction lead $T_L = \text{const.}$	$R_{\theta JL}$		25		$^{\circ}\text{C/W}$	
Typical thermal resistance - junction ambient	$R_{\theta JA}$		150 <sup>(1)</sup> 125 <sup>(2)</sup> 100 <sup>(3)</sup>		$^{\circ}\text{C/W}$	

**Notes:**

- (1) Mounted on epoxy-glass hard tissue
- (2) Mounted on epoxy-glass hard tissue, 50 mm<sup>2</sup> 35  $\mu\text{m}$  Cu
- (3) Mounted on Al-oxide-ceramic (Al<sub>2</sub>O<sub>3</sub>), 50 mm<sup>2</sup> 35  $\mu\text{m}$  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 and reel
BYG20D-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG20DHE3/TR <sup>(1)</sup>	0.064	TR	1800	7" diameter plastic tape and reel
BYG20DHE3/TR3 <sup>(1)</sup>	0.064	TR3	7500	13" diameter plastic tape and reel

**Note:**

(1) Automotive grade AEC Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

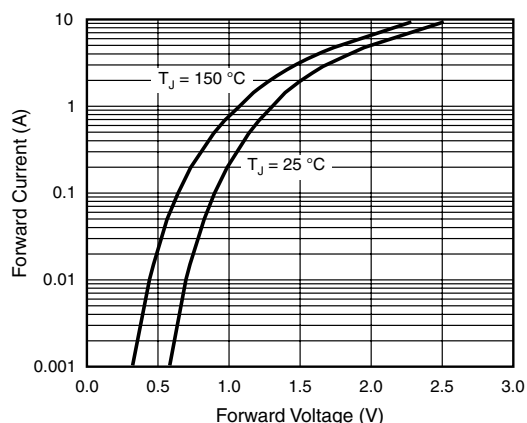


Figure 1. Forward Current vs. Forward Voltage

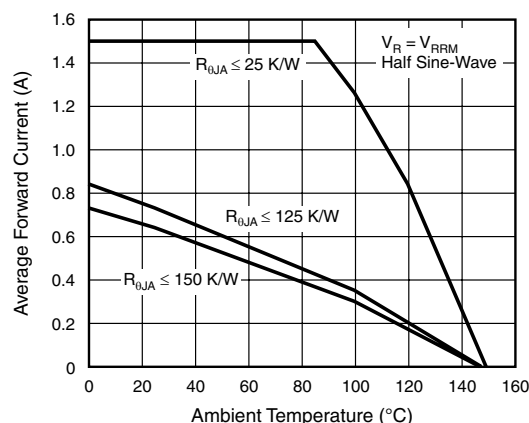


Figure 2. Max. Average Forward Current vs. Ambient Temperature

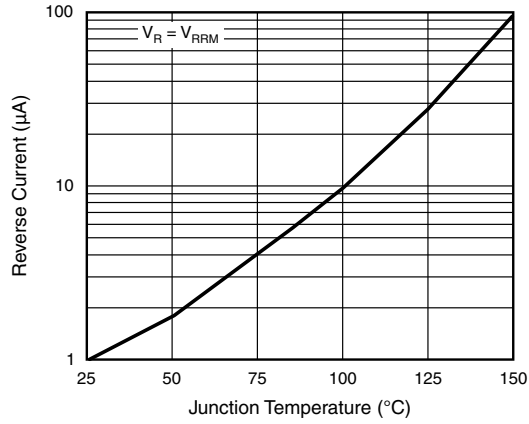


Figure 3. Reverse Current vs. Junction Temperature

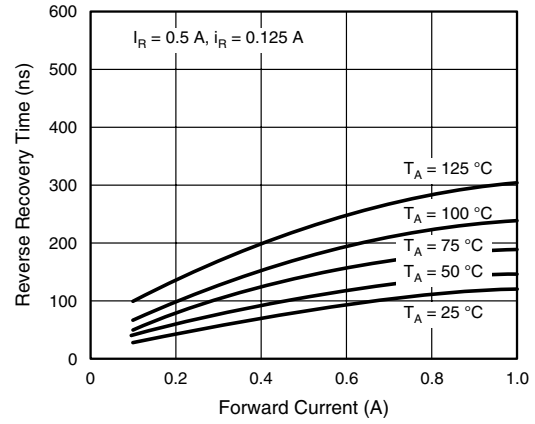


Figure 6. Reverse Recovery Time vs. Forward Current

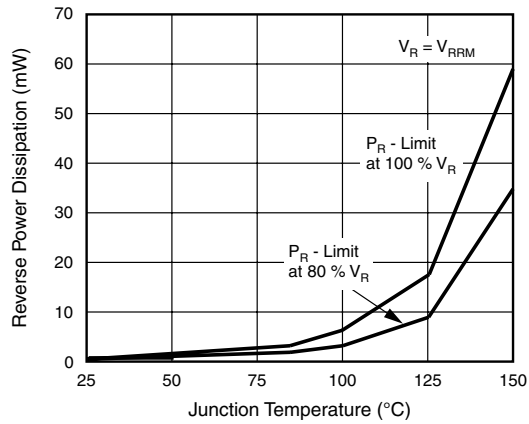


Figure 4. Max. Reverse Power Dissipation vs. Junction Temperature

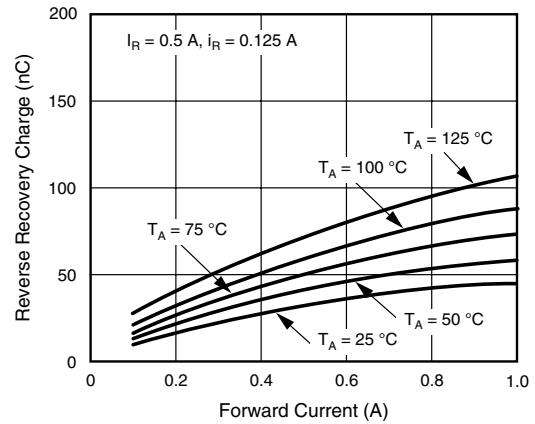


Figure 7. Reverse Recovery Charge vs. Forward Current

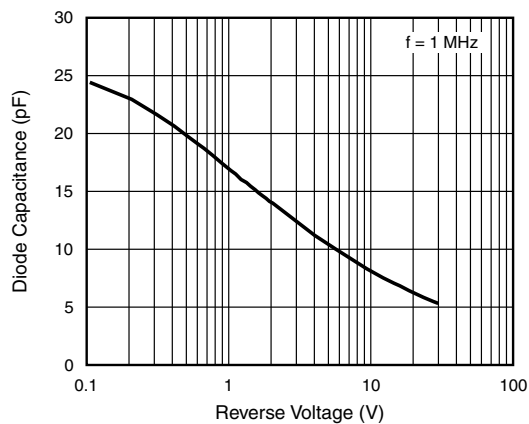


Figure 5. Diode Capacitance vs. Reverse Voltage

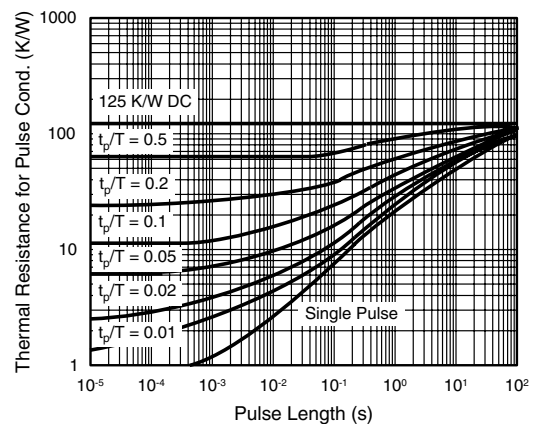
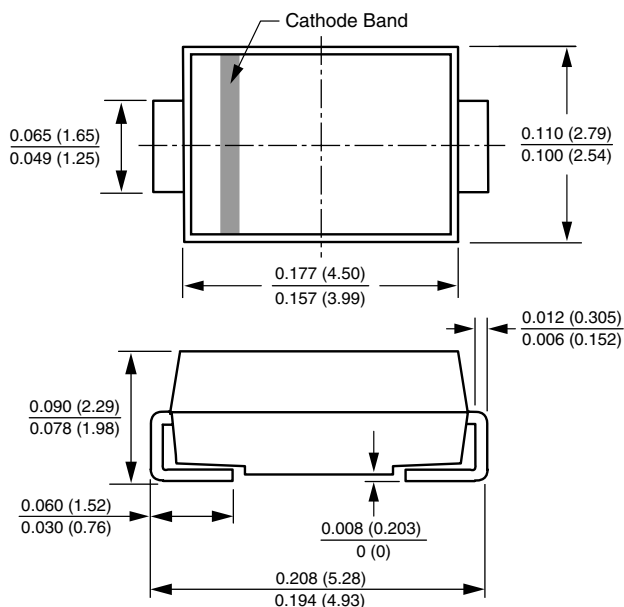


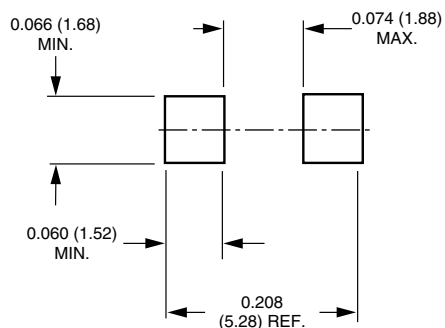
Figure 8. Thermal Response

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-214AC (SMA)



### Mounting Pad Layout





### Disclaimer

All product specifications and data are subject to change without notice.

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