



**THE DATASHEET OF  
BYG24D-M3/TR3**



## Fast Avalanche SMD Rectifier



SMA (DO-214AC)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated junction
- Low reverse current
- Soft recovery characteristics
- 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](http://www.vishay.com/doc?99912)

### 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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.5 A
$V_{RRM}$	200 V, 400 V, 600 V
$I_{FSM}$	30 A
$I_R$	1.0 $\mu$ A
$V_F$	1.25 V
$t_{rr}$	140 ns
$E_R$	20 mJ
$T_J$ max.	150 °C
Package	SMA (DO-214AC)
Circuit configuration	Single

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)					
PARAMETER	SYMBOL	BYG24D	BYG24G	BYG24J	UNIT
Device marking code		BYG24D	BYG24G	BYG24J	
Maximum repetitive peak reverse voltage	$V_{RRM}$	200	400	600	V
Average forward current at $T_A = 65$ °C	$I_{F(AV)}$	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



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	BYG24D	BYG24G	BYG24J	UNIT
Minimum breakdown voltage	$I_R = 100\text{ }\mu\text{A}$	$V_{BR}$	200	400	600	V
Maximum instantaneous forward voltage	$I_F = 1\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$		1.15		V
	$I_F = 1.5\text{ A}$			1.25		
Maximum reverse current	$V_R = V_{RRM}$	$T_J = 25\text{ }^\circ\text{C}$	1		$\mu\text{A}$	
		$T_J = 100\text{ }^\circ\text{C}$	10			
Maximum reverse recovery time	$I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$	$t_{rr}$	140		ns	

**Note**

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

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	BYG24D	BYG24G	BYG24J	UNIT
Junction to case	$R_{\theta JC}$		25		$^\circ\text{C/W}$
Maximum thermal resistance, junction to ambient	$R_{\theta JA}^{(1)}$		150		$^\circ\text{C/W}$
	$R_{\theta JA}^{(2)}$		125		

**Notes**

- (1) Mounted on epoxy-glass hard tissue 35  $\mu\text{m}$  x 17  $\text{mm}^2$  cooper area per electrode
- (2) Mounted on epoxy-glass hard tissue 35  $\mu\text{m}$  x 50  $\text{mm}^2$  cooper area per electrode

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
BYG24D-E3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG24D-E3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG24DHE3_A/H (1)	0.064	H	1800	7" diameter plastic tape and reel
BYG24DHE3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel
BYG24D-M3/TR	0.064	TR	1800	7" diameter plastic tape and reel
BYG24D-M3/TR3	0.064	TR3	7500	13" diameter plastic tape and reel
BYG24DHM3_A/H (1)	0.064	H	1800	7" diameter plastic tape and reel
BYG24DHM3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

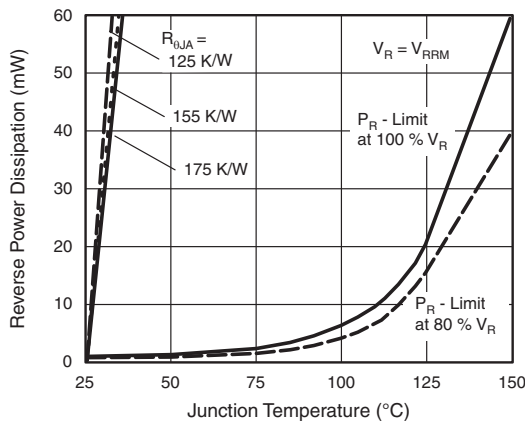


Fig. 1 - Max. Reverse Power Dissipation vs. Junction Temperature

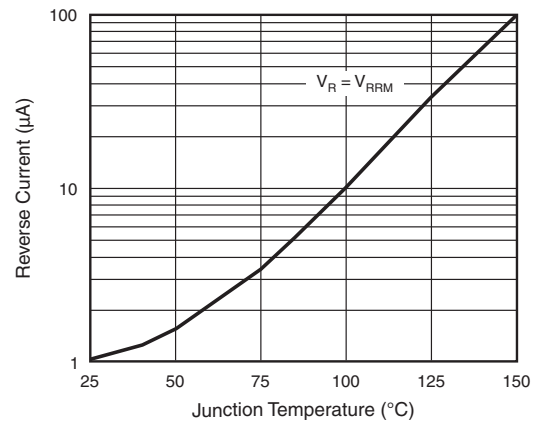


Fig. 2 - Reverse Current vs. Junction Temperature

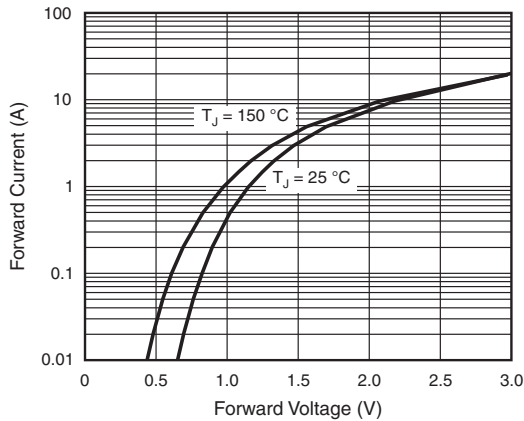


Fig. 3 - Forward Current vs. Forward Voltage

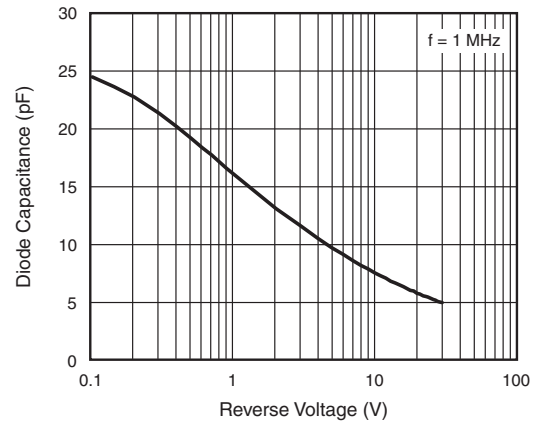


Fig. 5 - Diode Capacitance vs. Reverse Voltage

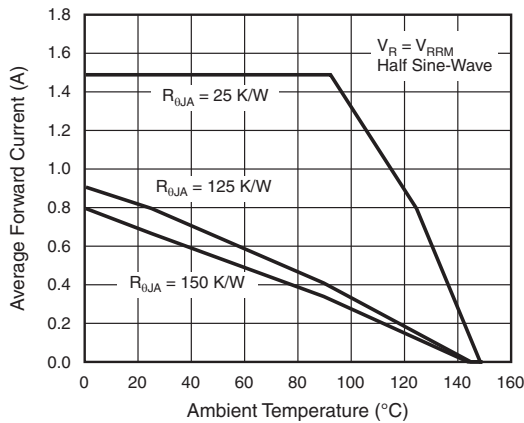
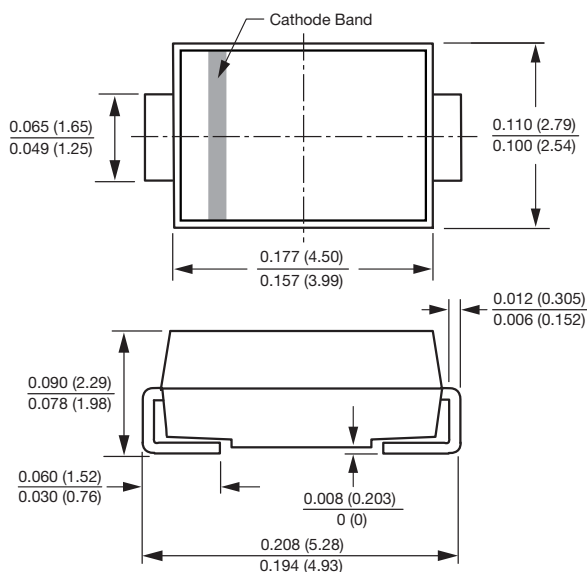


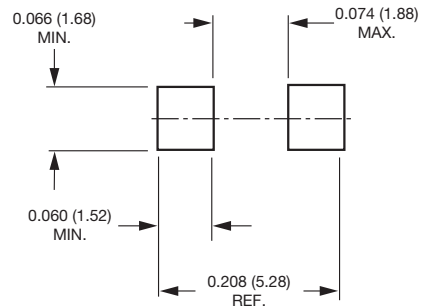
Fig. 4 - Average Forward Current vs. Ambient Temperature

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### SMA (DO-214AC)



### Mounting Pad Layout





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