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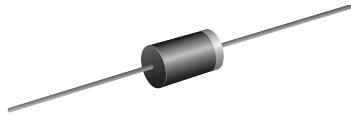
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## Avalanche Glass Passivated Junction Rectifier

SUPERECTIFIER®



DO-204AL (DO-41)

### FEATURES

- Superectifier structure for high reliability condition
- Cavity-free glass-passivated junction
- Avalanche surge capability guaranteed
- Low forward voltage drop
- Low leakage current, typical  $I_R$  less than 0.1  $\mu\text{A}$
- High forward surge capability
- Meets environmental standard MIL-S-19500
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS  
COMPLIANT

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	1.0 A
$V_{RRM}$	200 V to 1000 V
$I_{FSM}$	30 A
$E_{RSM}$	7 mJ
$V_F$	1.1 V, 1.2 V
$I_R$	5.0 $\mu\text{A}$
$T_J$ max.	175 °C

### TYPICAL APPLICATIONS

For use in general purpose rectification of power supply, inverters, converters and freewheeling applications for consumer, automotive, and telecommunication.

### MECHANICAL DATA

**Case:** DO-204AL, molded epoxy over glass body  
Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS compliant, commercial grade  
Base P/NHE3 - RoHS compliant, AEC-Q101 qualified

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

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

PARAMETER	SYMBOL	BYD13DGP	BYD13GGP	BYD13JGP	BYD13KGP	BYD13MGP	UNIT
Device marking code		13DGP	13GGP	13JGP	13KGP	13MGP	
Maximum repetitive peak reverse voltage	$V_{RRM}$	200	400	600	800	1000	V
Maximum DC blocking voltage	$V_{DC}$	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length (fig. 1)	$I_{F(AV)}$	1.0					A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	30					A
Non-repetitive peak reverse avalanche energy at $L = 120$ mH, $T_J = T_J$ maximum prior to surge	$E_{RSM}$	7					mJ
Maximum full load reverse current, full cycle average, 0.375" (9.5 mm) lead lengths at $T_A = 75$ °C	$I_{R(AV)}$	30					$\mu\text{A}$
Operating junction and storage temperature range	$T_J, T_{STG}$	- 65 to + 175					°C

# BYD13DGP thru BYD13MGP

Vishay General Semiconductor



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)									
PARAMETER	TEST CONDITIONS		SYMBOL	BYD13DGP	BYD13GGP	BYD13JGP	BYD13KGP	BYD13MGP	UNIT
Maximum instantaneous forward voltage	1.0 A		V <sub>F</sub> <sup>(1)</sup>	1.1			1.2		V
Maximum DC reverse current at rated DC blocking voltage		T <sub>A</sub> = 25 °C	I <sub>R</sub>	5.0					μA
		T <sub>A</sub> = 125 °C		50					
Typical 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>	3.0					μs
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	8.0			7.0		pF

**Note**

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

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	BYD13DGP	BYD13GGP	BYD13JGP	BYD13KGP	BYD13MGP	UNIT	
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	55					°C/W	

**Note**

(1) Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
BYD13JGP-E3/54	0.335	54	5500	13" diameter paper tape and reel	
BYD13JGP-E3/73	0.335	73	3000	Ammo pack packaging	
BYD13JGPHE3/54 <sup>(1)</sup>	0.335	54	5500	13" diameter paper tape and reel	
BYD13JGPHE3/73 <sup>(1)</sup>	0.335	73	3000	Ammo pack packaging	

**Note**

(1) AEC-Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

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

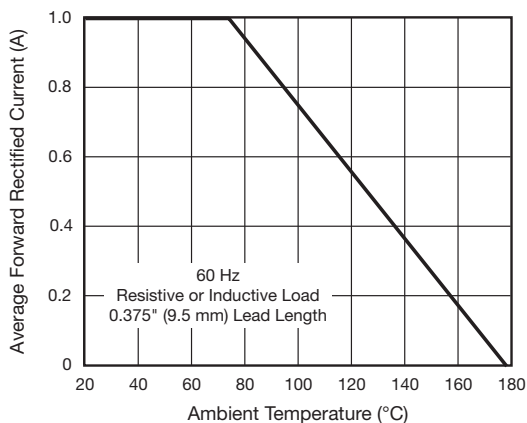


Fig. 1 - Forward Current Derating Curve

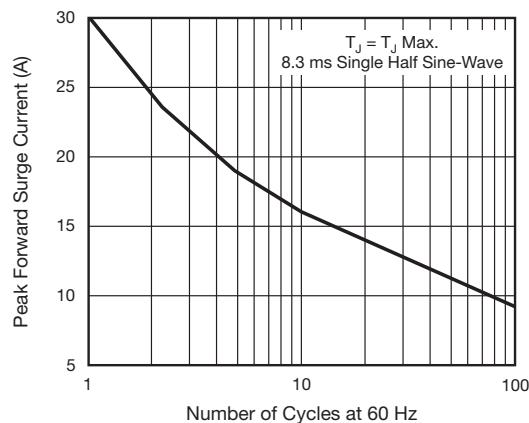


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current



# BYD13DGP thru BYD13MGP

Vishay General Semiconductor

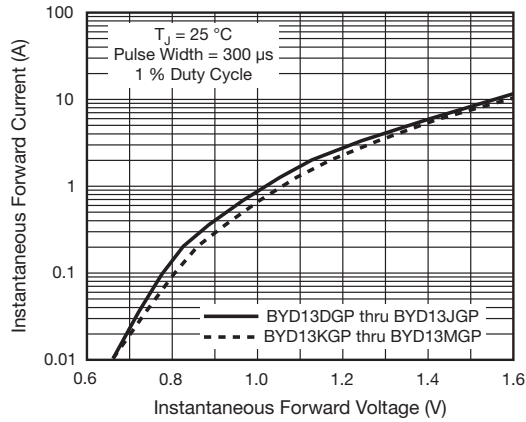


Fig. 3 - Typical Instantaneous Forward Characteristics

BYD13DGP.....200 V  
 BYD13GGP.....400 V  
 BYD13JGP.....600 V  
 BYD13KGP.....800 V  
 BYD13MGP.....1000 V

Fig. 5 - Maximum Repetitive Peak Reverse Voltage,  $V_{RRM}$

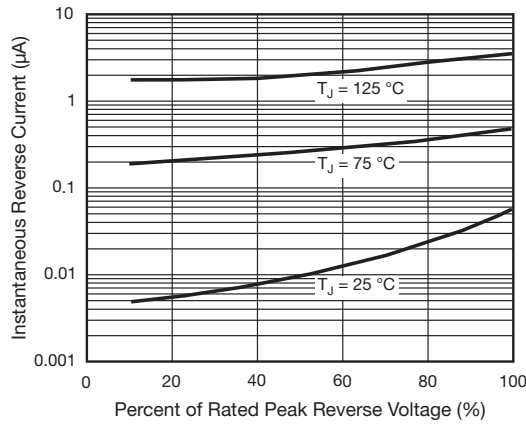


Fig. 4 - Typical Reverse Characteristics

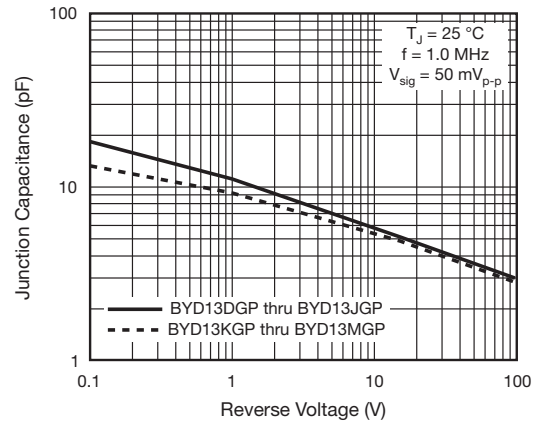
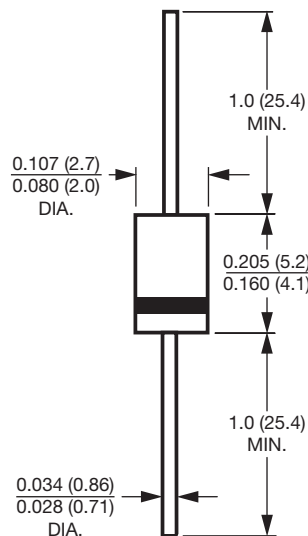


Fig. 6 - Typical Junction Capacitance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-204AL (DO-41)





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