1N4001GP, 1N4002GP, 1N4003GP, 1N4004GP, 1N4005GP, 1N4006GP, 1N4007GP



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Vishay General Semiconductor

# **Glass Passivated Junction Plastic Rectifier**



DO-204AL (DO-41)

PRIMARY CHARACTERISTICS						
I <sub>F(AV)</sub>	1.0 A					
V <sub>RRM</sub>	50 V, 100 V, 200 V, 400 V, 600 V, 800 V, 1000 V					
I <sub>FSM</sub> (8.3 ms sine-wave)	30 A					
$I_{FSM}$ (square wave $t_p = 1 ms$ )	45 A					
I <sub>R</sub>	5.0 µA					
V <sub>F</sub>	1.1 V					
T <sub>J</sub> max.	175 °C					
Package	DO-204AL (DO-41)					
Diode variations	Single die					

### **TYPICAL APPLICATIONS**

For use in general purpose rectification of power supplies, inverters, converters and freewheeling diodes for both consumer, and automotive applications.

### FEATURES

- Superectifier structure for high reliability
  plication
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current, typical I<sub>R</sub> less than 0.1 μA compliant
- · High forward surge capability
- Solder dip 275 °C max. 10 s, per JESD 22-B106
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see <u>www.vishay.com/doc?99912</u>

### **MECHANICAL DATA**

Case: DO-204AL (DO-41), 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

#### Note

• For part numbers with "E" suffix, they are"-E3" commercial grade only

<b>MAXIMUM RATINGS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)									
PARAMETER	SYMBOL	1N4001GP	1N4002GP	1N4003GP	1N4004GP	1N4005GP	1N4006GP	1N4007GP	UNIT
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V <sub>RMS</sub> <sup>(1)</sup>	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V <sub>DC</sub> <sup>(1)</sup>	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at $T_A=75\ ^\circ\text{C}$	I <sub>F(AV)</sub> <sup>(1)</sup>	1) 1.0					A		
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub> <sup>(1)</sup>	1) 30					A		
Non-repetitive peak $t_p = 1 \text{ ms}$		45							
forward surge current $t_p = 2 \text{ ms}$	I <sub>FSM</sub> <sup>(1)</sup>	35							А
$T_A = 25 \text{ °C (fig. 3)}$ $t_p = 5 \text{ ms}$		30							
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length $T_A = 75$ °C	I <sub>R(AV)</sub> <sup>(1)</sup>	30					μA		
Rating for fusing (t < 8.3 ms)	l <sup>2</sup> t <sup>(2)</sup>	3.7			A <sup>2</sup> s				
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub> <sup>(1)</sup>	- 65 to + 175					°C		

#### Notes

<sup>(1)</sup> JEDEC<sup>®</sup> registered values

<sup>(2)</sup> For device using on bridge rectifier application

Revision: 04--Dec-13

1

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(P4)

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<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25$ °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS	SYMBOL	1N4001GP	1N4002GP	1N4003GP	1N4004GP	1N4005GP	1N4006GP	1N4007GP	UNIT
Maximum instantaneous forward voltage	1.0 A	V <sub>F</sub>		1.1						v
Maximum DC reverse current	T <sub>A</sub> = 25 °C	L (1)	5.0							
at rated DC blocking voltage	T <sub>A</sub> = 125 °C	IR <sup>(1)</sup>	I <sub>R</sub> <sup>(1)</sup> 50						μA	
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>	2.0				μs			
Typical junction capacitance	4.0 V, 1 MHz	CJ	8.0				pF			

#### Note

<sup>(3)</sup> JEDEC<sup>®</sup> registered values

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)									
PARAMETER	SYMBOL	MBOL 1N4001GP 1N4002GP 1N4003GP 1N4004GP 1N4005GP 1N4006GP 1N4007GP U							UNIT
Typical thermal resistance	R <sub>0JA</sub> <sup>(1)</sup>	55						°C/	
Typical thermal resistance	R <sub>0JL</sub> <sup>(1)</sup>	25						W	

#### Note

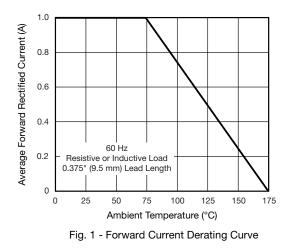
<sup>(1)</sup> Thermal resistance from junction to ambient at 0.375" (9.5 mm) lead length, PCB mounted

ORDERING INFORMATION (Example)									
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE					
1N4004GP-E3/54	0.335	54	5500	13" diameter paper tape and reel					
1N4004GP-E3/73	0.335	73	3000	Ammo pack packaging					
1N4004GPHE3/54 (1)	0.335	54	5500	13" diameter paper tape and reel					
1N4004GPHE3/73 (1)	0.335	73	3000	Ammo pack packaging					

Note

<sup>(1)</sup> AEC-Q101 qualified

## **RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25$ °C unless otherwise noted)



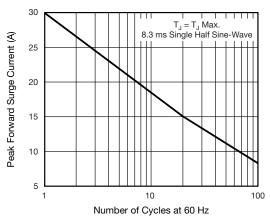


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

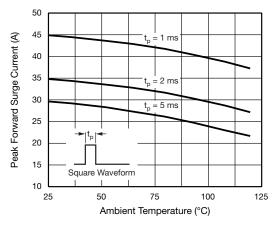
Revision: 04--Dec-13

2

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Fig. 3 - Non-Repetitive Peak Forward Surge Current

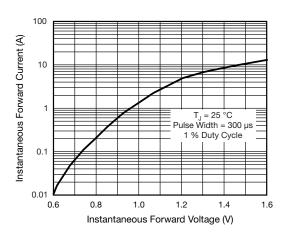


Fig. 4 - Typical Instantaneous Forward Characteristics

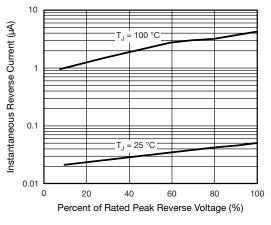


Fig. 5 - Typical Reverse Characteristics

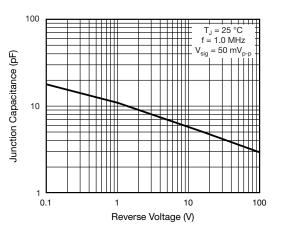


Fig. 6 - Typical Junction Capacitance

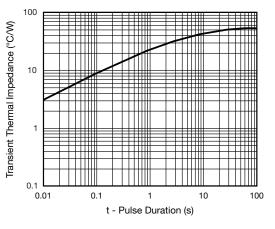


Fig. 7 - Typical Transient Thermal Impedance

Revision: 04--Dec-13

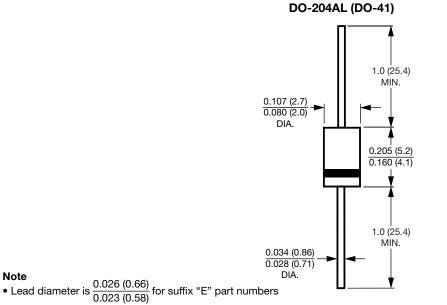
3

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## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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