

## Glass Passivated Junction Rectifier

SUPERECTIFIER®



DO-204AL (DO-41)

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
$V_{RRM}$	50 V to 1000 V
$I_{FSM}$ (8.3 ms sine-wave)	30 A
$I_{FSM}$ (square wave $t_p = 1$ ms)	45 A
$I_R$	5.0 $\mu$ A
$V_F$	1.1 V
$T_J$ max.	175 °C

### 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 application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current, typical  $I_R$  less than 0.1  $\mu$ 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

### 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	1N4001GP	1N4002GP	1N4003GP	1N4004GP	1N4005GP	1N4006GP	1N4007GP	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	50	100	200	400	600	800	1000	V
Maximum RMS voltage	$V_{RMS}^{(1)}$	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	$V_{DC}^{(1)}$	50	100	200	400	600	800	1000	V
Maximum average forward rectified current 0.375" (9.5 mm) lead length at $T_A = 75$ °C	$I_{F(AV)}^{(1)}$	1.0							A
Non-repetitive peak forward surge current square waveform $T_A = 25$ °C (fig. 3)	$t_p = 1$ ms	45							A
	$t_p = 2$ ms	35							
	$t_p = 5$ ms	30							
Maximum full load reverse current, full cycle average 0.375" (9.5 mm) lead length $T_A = 75$ °C	$I_{R(AV)}^{(1)}$	30							$\mu$ A
Rating for fusing ( $t < 8.3$ ms)	$I^2t^{(2)}$	3.7							A <sup>2</sup> s
Operating junction and storage temperature range	$T_J, T_{STG}^{(1)}$	- 65 to + 175							°C

### Notes

(1) JEDEC registered values

(2) For device using on bridge rectifier application

# 1N4001GP thru 1N4007GP

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ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 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 at rated DC blocking voltage	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(1)</sup>				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>				2.0				μs
Typical junction capacitance	4.0 V, 1 MHz	C <sub>J</sub>				8.0				pF

**Note**

(1) JEDEC registered values

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)										
PARAMETER	SYMBOL	1N4001GP	1N4002GP	1N4003GP	1N4004GP	1N4005GP	1N4006GP	1N4007GP	UNIT	
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>				55				°C/W	
	R <sub>θJL</sub> <sup>(1)</sup>				25					

**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	
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 <sup>(1)</sup>	0.335	54	5500	13" diameter paper tape and reel	
1N4004GPHE3/73 <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)

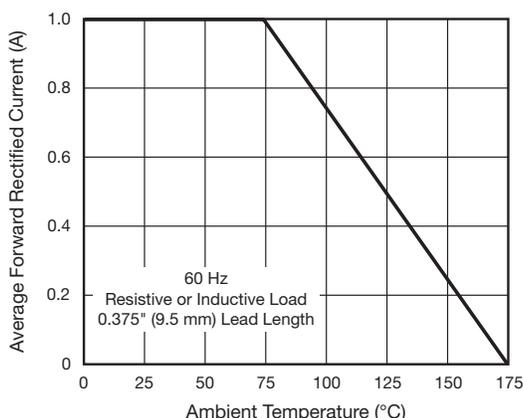


Fig. 1 - Forward Current Derating Curve

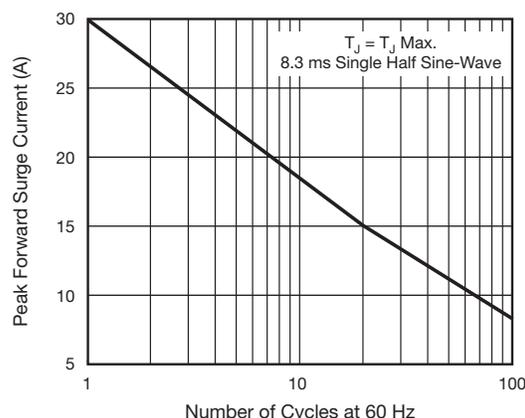


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

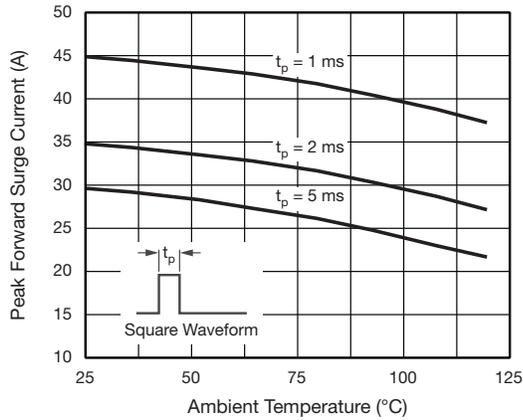


Fig. 3 - Non-Repetitive Peak Forward Surge Current

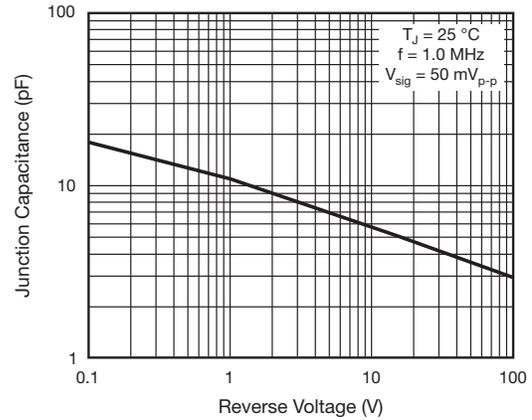


Fig. 6 - Typical Junction Capacitance

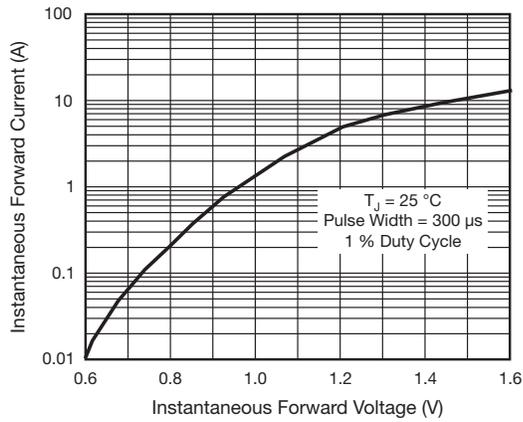


Fig. 4 - Typical Instantaneous Forward Characteristics

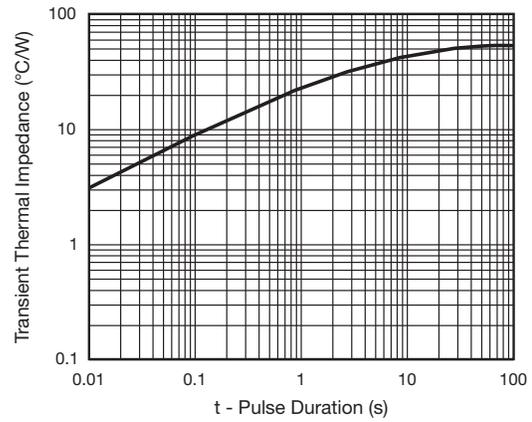


Fig. 7 - Typical Transient Thermal Impedance

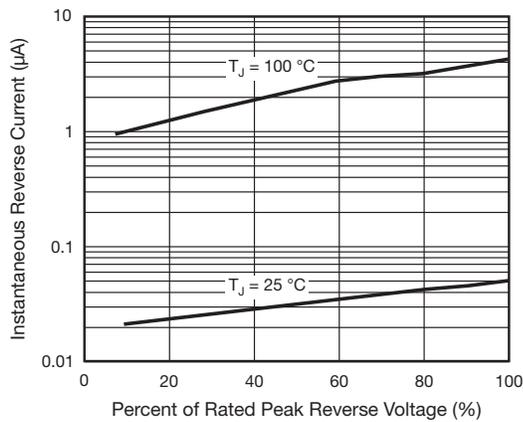


Fig. 5 - Typical Reverse Characteristics

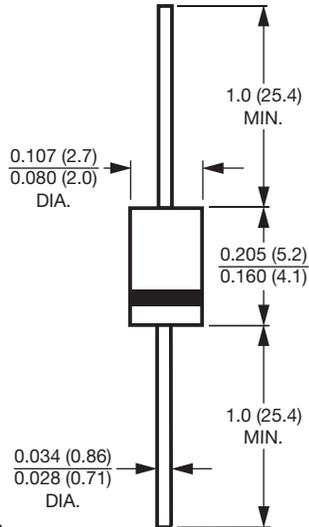
# 1N4001GP thru 1N4007GP

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## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

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



#### Note

- Lead diameter is  $\frac{0.026}{0.023}$  (0.66 / 0.58) for suffix "E" part numbers



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