

Glass Passivated Junction Plastic Rectifier



FEATURES

- Superrectifier structure for high reliability application
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Low leakage current, typical I_R less than 0.1 μ A
- 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 www.vishay.com/doc?99912



RoHS
COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V, 100 V, 200 V, 400 V, 600 V, 800 V, 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 μ A
V_F	1.1 V
T_J 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.

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

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	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM} ⁽¹⁾	30							A	
Non-repetitive peak forward surge current $t_p = 1$ ms square waveform $T_A = 25$ °C (fig. 3)	I_{FSM} ⁽¹⁾	45							A	
Non-repetitive peak forward surge current $t_p = 2$ ms		35								
Non-repetitive peak forward surge current $t_p = 5$ 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							μ A	
Rating for fusing ($t < 8.3$ ms)	I^2t ⁽²⁾	3.7							A^2s	
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

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)										
PARAMETER	TEST CONDITIONS	SYMBOL	1N4001GP	1N4002GP	1N4003GP	1N4004GP	1N4005GP	1N4006GP	1N4007GP	UNIT
Maximum instantaneous forward voltage	1.0 A	V_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage	$T_A = 25^\circ\text{C}$	I_R ⁽¹⁾	5.0							μA
	$T_A = 125^\circ\text{C}$		50							
Typical reverse recovery time	$I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{rr} = 0.25\text{ A}$	t_{rr}	2.0							μs
Typical junction capacitance	4.0 V, 1 MHz	C_J	8.0							pF

Note

⁽³⁾ JEDEC® registered values

THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)									
PARAMETER	SYMBOL	1N4001GP	1N4002GP	1N4003GP	1N4004GP	1N4005GP	1N4006GP	1N4007GP	UNIT
Typical thermal resistance	$R_{\theta JA}$ ⁽¹⁾	55							$^\circ\text{C}/\text{W}$
	$R_{\theta JL}$ ⁽¹⁾	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 ⁽¹⁾	0.335	54	5500	13" diameter paper tape and reel
1N4004GPHE3/73 ⁽¹⁾	0.335	73	3000	Ammo pack packaging

Note

⁽¹⁾ AEC-Q101 qualified

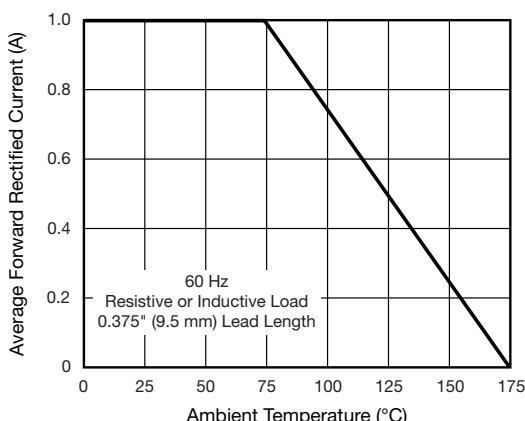
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

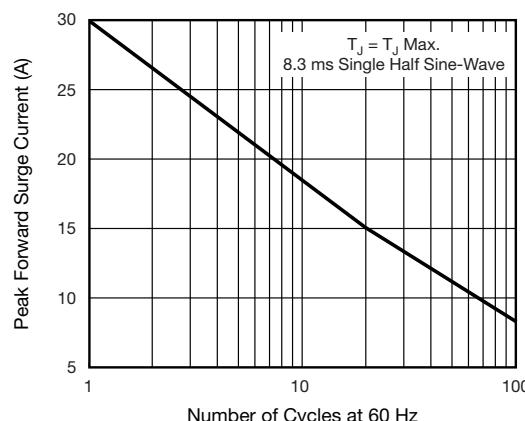


Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

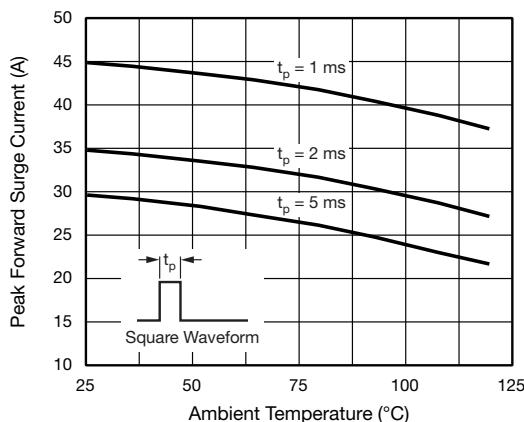


Fig. 3 - Non-Repetitive Peak Forward Surge Current

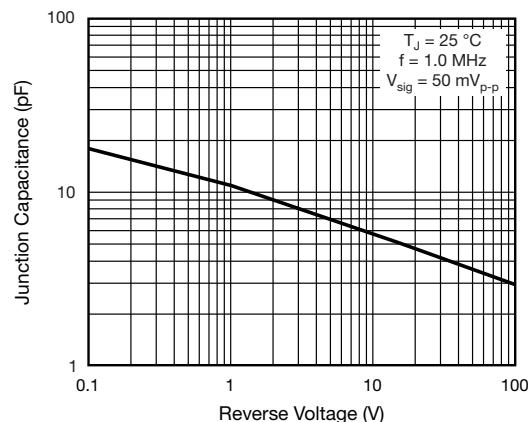


Fig. 6 - Typical Junction Capacitance

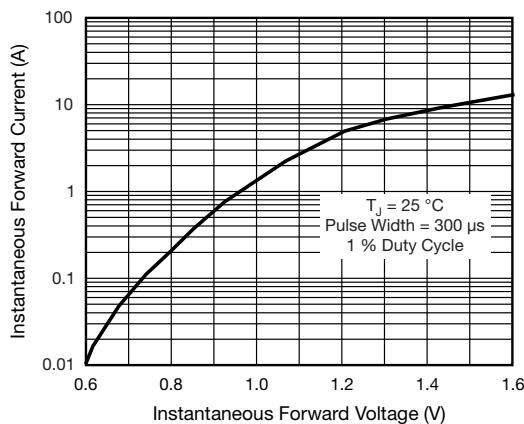


Fig. 4 - Typical Instantaneous Forward Characteristics

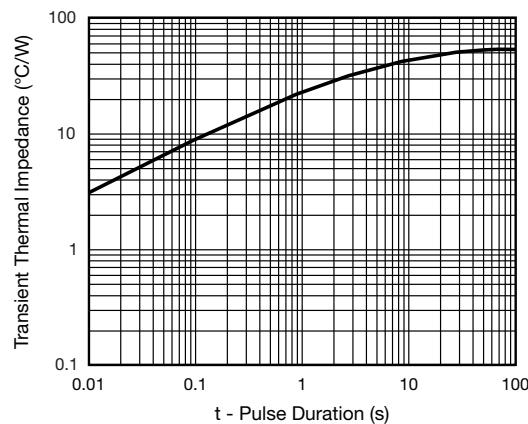


Fig. 7 - Typical Transient Thermal Impedance

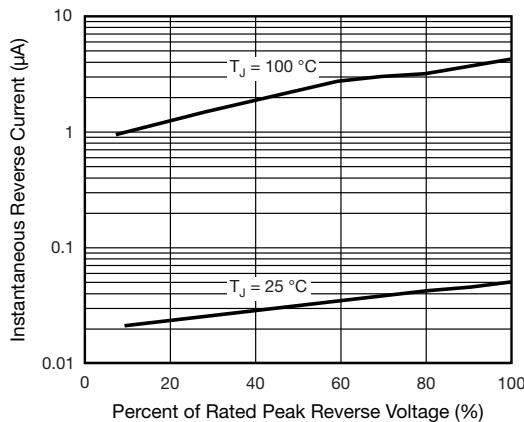
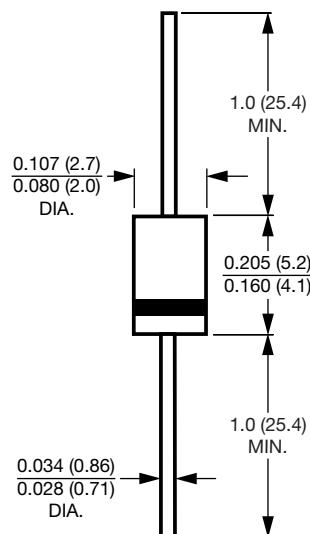


Fig. 5 - Typical Reverse Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)**DO-204AL (DO-41)****Note**

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

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