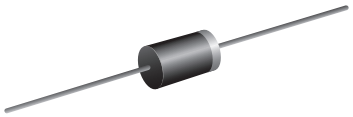
Glass Passivated Junction Plastic Rectifier

SUPERECTIFIER®



DO-204AL (DO-41)

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 µA
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.

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 µA
- 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

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

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
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 square waveform T_A = 25 °C (fig. 3) t_p = 1 ms	I_{FSM} (1)	45							A
Non-repetitive peak forward surge current square waveform T_A = 25 °C (fig. 3) t_p = 2 ms		35							
Non-repetitive peak forward surge current square waveform T_A = 25 °C (fig. 3) 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							µA
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

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ELECTRICAL CHARACTERISTICS (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_F	1.1							V
Maximum DC reverse current at rated DC blocking voltage	T_A = 25 °C	I_R (1)	5.0							µA
	T_A = 125 °C		50							
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 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 °C unless otherwise noted)									
PARAMETER	**SYMBOL**	**1N4001GP**	**1N4002GP**	**1N4003GP**	**1N4004GP**	**1N4005GP**	**1N4006GP**	**1N4007GP**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	55							°C/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 °C unless otherwise noted)

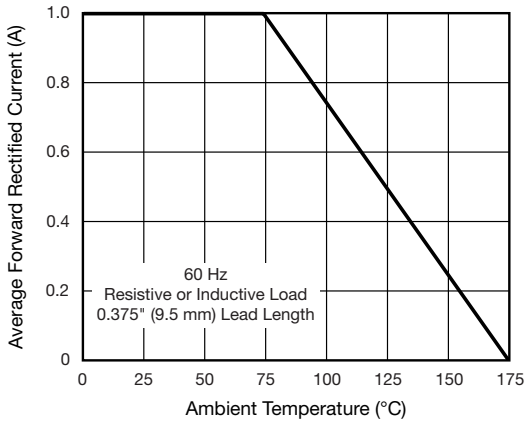

Fig. 1 - Forward Current Derating Curve

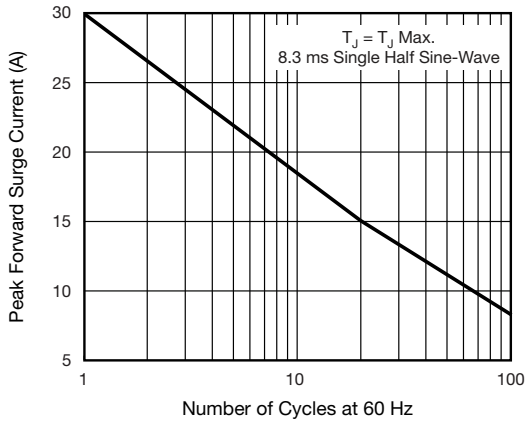

Fig. 2 - Maximum Non-repetitive Peak Forward Surge Current

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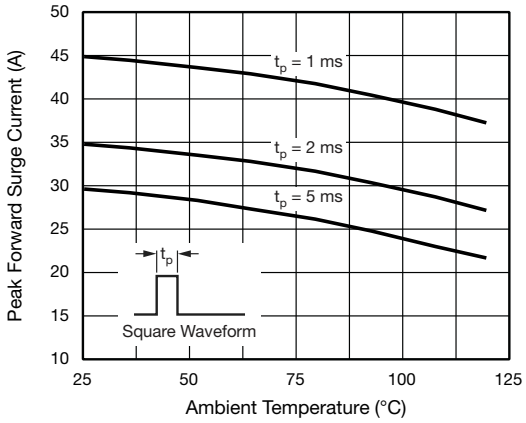

Fig. 3 - Non-Repetitive Peak Forward Surge Current

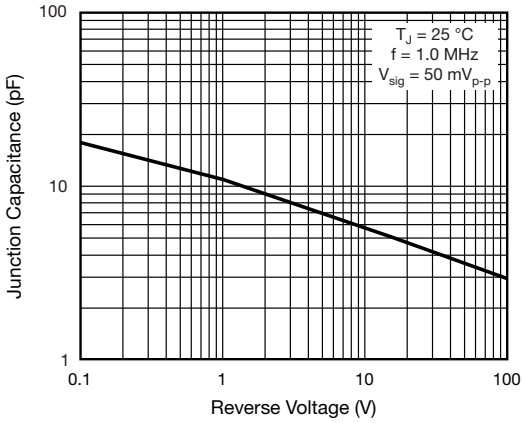

Fig. 6 - Typical Junction Capacitance

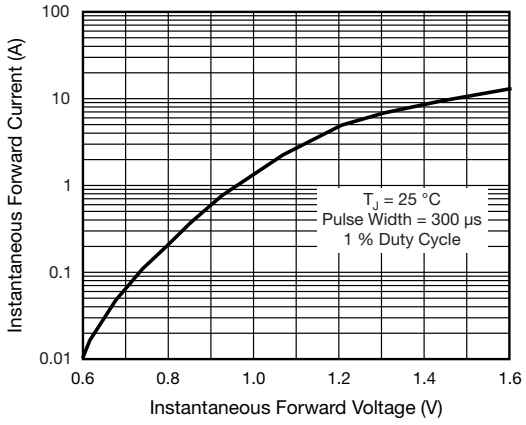

Fig. 4 - Typical Instantaneous Forward Characteristics

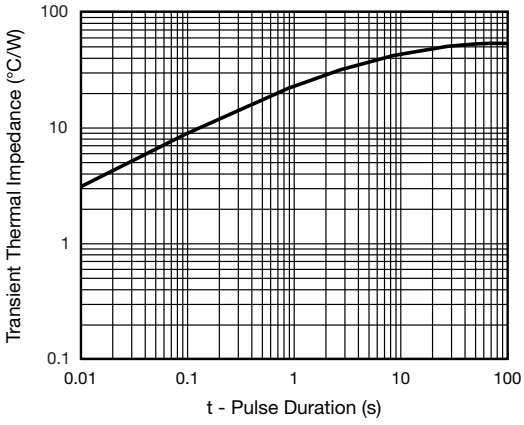

Fig. 7 - Typical Transient Thermal Impedance

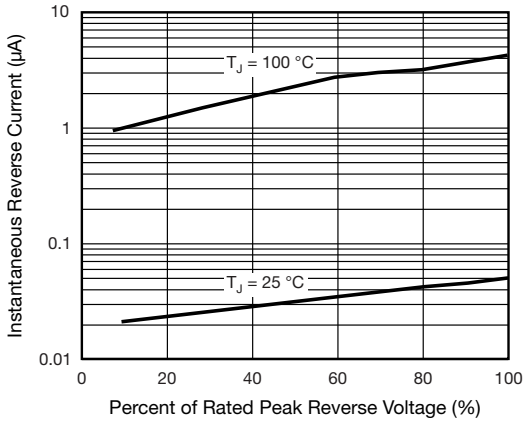

Fig. 5 - Typical Reverse Characteristics

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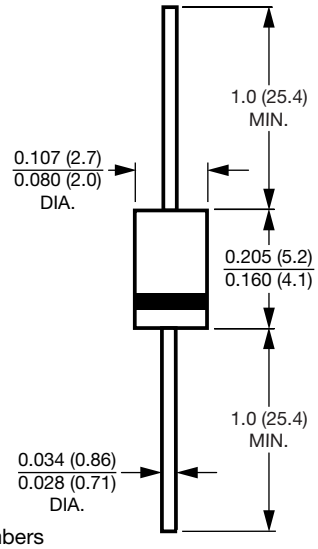
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-204AL (DO-41)



Note

• Lead diameter is $\frac{0.026\ (0.66)}{0.023\ (0.58)}$ for suffix “E” part numbers

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