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RoHS
Available on commercial versions

VOID-LESS HERMETICALLY SEALED ULTRAFAST RECOVERY GLASS RECTIFIERS

Qualified per MIL-PRF-19500/477

Qualified Levels:
JAN, JANTX, JANTXV and JANS

DESCRIPTION

This "Ultrafast Recovery" rectifier diode series is military qualified and is ideal for high-reliability applications where a failure cannot be tolerated. The industry-recognized 6.0 amp rated rectifiers with working peak reverse voltages from 50 to 150 volts are hermetically sealed with void-less glass construction using an internal *"Category 1"* metallurgical bond. These devices are available in both leaded and surface mount MELF package configurations. Microsemi also offers numerous other rectifier products to meet higher and lower current ratings with various recovery time requirements including standard, fast and ultrafast device types in both through-hole and surface mount packages.

Important: For the latest information, visit our website http://www.microsemi.com.

"B" Package

FEATURES

- JEDEC registered 1N5807, 1N5809, 1N5811 series.
- Void-less hermetically sealed glass package.
- Quadruple-layer passivation.
- Extremely robust construction.
- Internal *"Category 1"* metallurgical bonds.
- JAN, JANTX, JANTXV and JANS qualifications are availble per MIL-PRF-19500/477.
- RoHS compliant versions available (commercial grade only).

APPLICATIONS / BENEFITS

- Ultrafast recovery 6 amp rectifier series from 50 to 150 V.
- Military, space and other high-reliability applications.
- Switching power supplies or other applications requiring extremely fast switching & low forward loss.
- High forward surge current capability.
- Low thermal resistance.
- Controlled avalanche with peak reverse power capability.
- Inherently radiation hard as described in Microsemi MicroNote 050.

MAXIMUM RATINGS @ T_A= 25 °C unless otherwise specified

Parameters/Test Conditions		Symbol	Value	Unit
Junction and Storage Temperature		T_J and T_{STG}	-65 to +175	°C
Thermal Resistance Junction-to-Lead (L = .375 in) Fig. 1		$R_{\Theta JL}$	22	°C/W
Thermal Resistance		$R_{\Theta JX}$	52	°C/W
Working Peak Reverse Voltage:	1N5807 1N5809 1N5811	V_{RWM}	50 100 150	V
Forward Surge Current (3)		I_{FSM}	125	A
Average Rectified Output Current @ T_L = +75 °C at 3/8 inch lead length (1)		I_{O1}	6.0	A
Average Rectified Output-Current @ T_A = +55 °C at 3/8 inch lead length (2)		I_{O2}	3.0	A
Capacitance @ V_R = 10 V, f = 1 MHz; Vsig = 50 mV (p-p)		C_J	60	pF
Reverse Recovery Time (4)		t_{rr}	30	ns
Solder Temperature @ 10 s		T_{SP}	260	°C

Notes:
1. I_{O1} is rated at T_L = 75 °C at 3/8 inch lead length. Derate at 60 mA/°C for T_L above 75 °C.
2. I_{O2} is derated at 25 mA/ºC above T_A = 55 °C for PC boards where thermal resistance from mounting point to ambient is sufficiently controlled where $T_{J(max)}$ 175 °C is not exceeded.
3. T_A = 25 °C @ I_O = 3.0 A and V_{RWM} for ten 8.3 ms surges at 1 minute intervals.
4. I_F = 1.0 A, I_{RM} = 1.0 A, $I_{R(REC)}$ = .0.10 A and di/dt = 100 A/µs min.

Also available in:

"B" MELF Package
(surface mount)
1N5807, 09, 11US & URS

MSC – Lawrence
6 Lake Street,
Lawrence, MA 01841
Tel: 1-800-446-1158 or
(978) 620-2600
Fax: (978) 689-0803

MSC – Ireland
Gort Road Business Park,
Ennis, Co. Clare, Ireland
Tel: +353 (0) 65 6840044
Fax: +353 (0) 65 6822298

Website:
www.microsemi.com

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MECHANICAL and PACKAGING

- CASE: Hermetically sealed voidless hard glass with tungsten slugs.
- TERMINALS: Tin/lead (Sn/Pb) or RoHS compliant matte/tin (commercial grade only) over nickel plate over copper.
- MARKING: Body coated in blue with part number.
- POLARITY: Cathode indicated by band.
- TAPE & REEL option: Standard per EIA-296. Consult factory for quantities.
- WEIGHT: 750 milligrams.
- See Package Dimensions on last page.

PART NOMENCLATURE

JAN **1N5807** **(e3)**

Reliability Level
JAN = JAN Level
JANTX = JANTX Level
JANTXV = JANTXV Level
JANS = JANS Level
Blank = Commercial

RoHS Compliance
e3 = RoHS compliant (available on commercial grade only)
Blank = non-RoHS compliant

JEDEC type number
(See Electrical Characteristics table)

SYMBOLS & DEFINITIONS

Symbol	Definition
V_{BR}	Minimum Breakdown Voltage: The minimum voltage the device will exhibit at a specified current.
V_{RWM}	Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range.
I_O	Average Rectified Output Current: Output current averaged over a full cycle with a 50 Hz or 60 Hz sine-wave input and a 180 degree conduction angle.
V_F	Maximum Forward Voltage: The maximum forward voltage the device will exhibit at a specified current.
I_R	Maximum Leakage Current: The maximum leakage current that will flow at the specified voltage and temperature.
C	Capacitance: The capacitance in pF at a frequency of 1 MHz and specified voltage.
t_{rr}	Reverse Recovery Time: The time interval between the instant the current passes through zero when changing from the forward direction to the reverse direction and a specified recovery decay point after a peak reverse current occurs.

ELECTRICAL CHARACTERISTICS @ T_A = 25 ºC unless otherwise stated

	BREAKDOWN VOLTAGE (MIN.) @ 100 µA $V_{(BR)}$	MAXIMUM FORWARD VOLTAGE @ 4 A (8.3 ms pulse) V_{FM}		REVERSE CURRENT (MAX.) @ V_{RWM} I_R		SURGE CURRENT (MAX) I_{FSM} (Note 1)	REVERSE RECOVERY TIME (MAX) t_{rr} (Note 2)
TYPE		Volts		µA			
	Volts	25 °C	125 °C	25 °C	125 °C	Amps	ns
1N5807	60	0.875	0.800	5	525	125	30
1N5809	110	0.875	0.800	5	525	125	30
1N5811	160	0.875	0.800	5	525	125	30

NOTES: 1. T_A = 25 °C @ I_O = 3.0 A and V_{RWM} for ten 8.3 ms surges at 1 minute intervals.
2. I_F = 1.0 A, I_{RM} = 1.0 A, $I_{R(REC)}$ = 0.10 A and di/dt = 100 A/µs min.

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GRAPHS

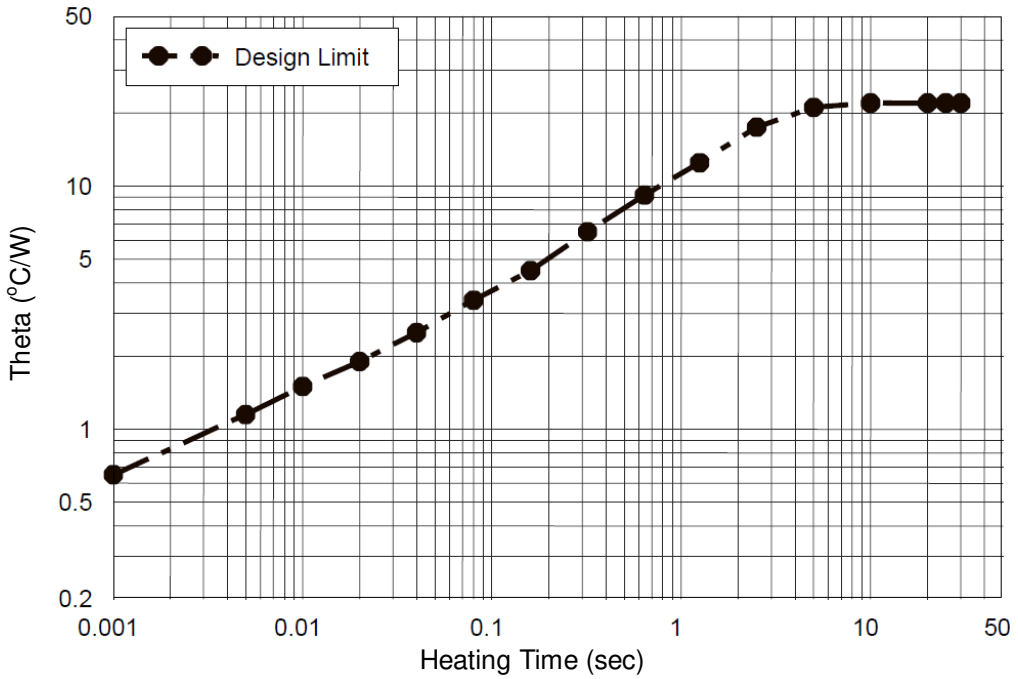

FIGURE 1
Maximum Thermal Impedance

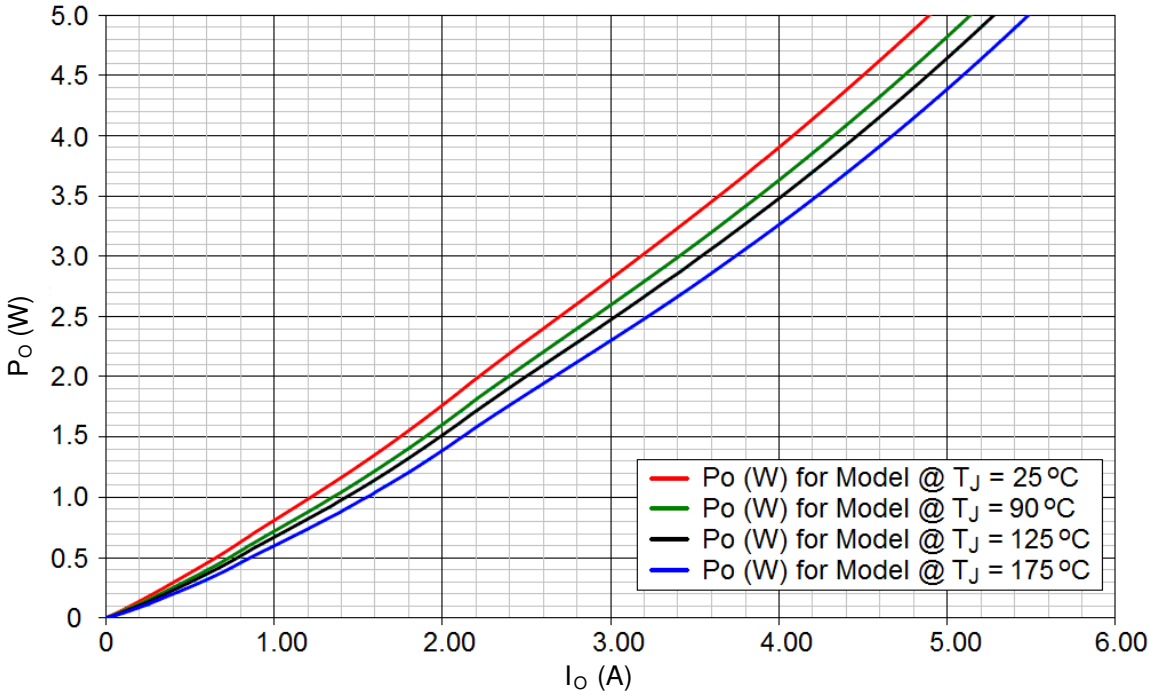

FIGURE 2
Rectifier Power vs I_O (Average Forward Current)

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GRAPHS (continued)

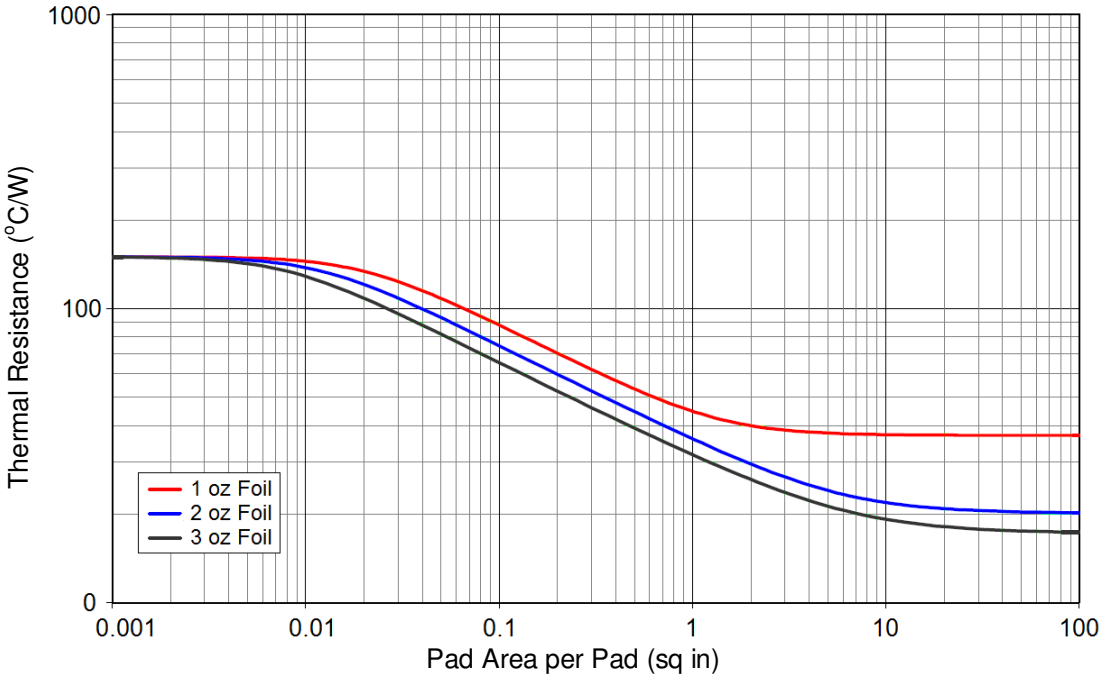

FIGURE 3

Thermal Resistance vs FR4 Pad Area At Ambient

PCB horizontal (for each pad) with 1, 2, and 3 oz copper

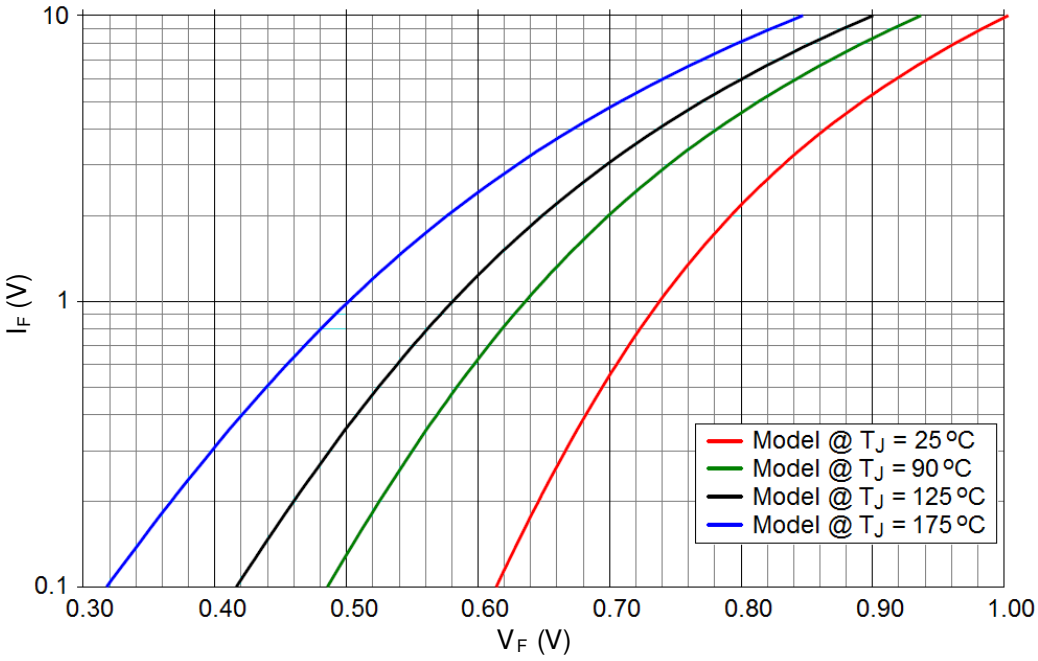

FIGURE 4

Forward Voltage vs Forward Current

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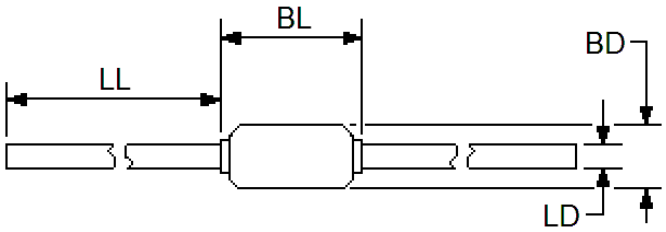
PACKAGE DIMENSIONS



NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Dimension BL shall include the entire body including slugs and sections of the lead over which the diameter is uncontrolled. This uncontrolled area is defined as the zone between the edge of the diode body and extending .050 inch (1.27 mm) onto the leads.
4. Dimension BD shall be measured at the largest diameter.
5. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.

Ltr	DIMENSIONS				Notes
	INCH		MILLIMETERS		
	Min	Max	Min	Max	
BD	.115	.142	2.92	3.61	4
BL	.130	.300	3.30	7.62	3
LD	0.036	.042	0.91	1.07	3
LL	.900	1.30	22.86	33.02	

Lead Tolerance = +.002 - .003 in.
(Includes sections of the lead or fillet over which the lead diameter is uncontrolled.)

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