Microsemi
SCOTTSDALE DIVISION

1N5807 thru 1N5811

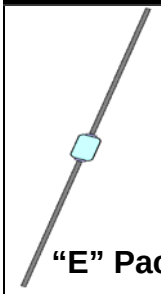
VOIDLESS-HERMETICALLY-SEALED ULTRAFAST RECOVERY GLASS RECTIFIERS

ALSO AVAILABLE IN SURFACE MOUNT

DESCRIPTION

This "Ultrafast Recovery" rectifier diode series is military qualified to MIL-PRF-19500/477 and is ideal for high-reliability applications where a failure cannot be tolerated. These industry-recognized 6.0 Amp rated rectifiers for working peak reverse voltages from 50 to 150 volts are hermetically sealed with voidless-glass construction using an internal "Category I" metallurgical bond. These devices are also available in surface mount MELF package configurations by adding a "US" suffix (see separate data sheet for 1N5807US thru 1N5811US). Microsemi also offers numerous other rectifier products to meet higher and lower current ratings with various recovery time speed requirements including standard, fast and ultrafast device types in both through-hole and surface mount packages.

APPEARANCE



"E" Package

IMPORTANT: For the most current data, consult *MICROSEMI's* website: http://www.microsemi.com

FEATURES

- Popular JEDEC registered 1N5807 to 1N5811 series
- Voidless hermetically sealed glass package
- Extremely robust construction
- Triple-layer passivation
- Internal "*Category I*" Metallurgical bonds
- JAN, JANTX, JANTXV, and JANS available per MIL-PRF-19500/477
- Surface mount equivalents also available in a square end-cap MELF configuration with "US" suffix (see separate data sheet for 1N5807US thru 1N5811US)

APPLICATIONS / BENEFITS

- Ultrafast recovery 6 Amp rectifier series 50 to 150 V
- Military 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

- Junction Temperature: -65°C to +175°C
- Storage Temperature: -65°C to +175°C
- Average Rectified Forward Current (I_O): 6 A @ T_L = 75ºC at 3/8 inch lead length (see note 1)
- Thermal Resistance: 22 ºC/W junction to lead (L=.375 in)
- Thermal Impedance: 1.5 ºC/W @ 10 ms heating time
- Forward Surge Current (8.3 ms half sine) 125 Amps
- Capacitance: 60 pF at 10 volts, f = 1 MHz
- Solder temperature: 260ºC for 10 s (maximum)

MECHANICAL AND PACKAGING

- CASE: Hermetically sealed voidless hard glass with Tungsten slugs
- TERMINATIONS: Axial-leads are Tin/Lead (Sn/Pb) over Copper. Note: Previous JANS inventory had solid Silver (Ag) axial-leads and no finish.
- MARKING: Body painted and part number, etc.
- POLARITY: Cathode indicated by band
- Tape & Reel option: Standard per EIA-296
- Weight: 750 mg
- See package dimensions on last page

ELECTRICAL CHARACTERISTICS

TYPE	WORKING PEAK REVERSE VOLTAGE V_{RWM}	BREAKDOWN VOLTAGE (MIN.) @ 100µA V_{BR}	AVERAGE RECTIFIED CURRENT I_{O1} @T_L=75°C (Note 1)	AVERAGE RECTIFIED CURRENT I_{O2} @T_A=55°C Note 2	MAXIMUM FORWARD VOLTAGE @ 4 A (8.3 ms pulse) V_F		REVERSE CURRENT (MAX) @ V_{RWM} I_R		SURGE CURRENT (MAX) I_{FSM} (NOTE 3)	REVERSE RECOVERY TIME (MAX) (NOTE 4) t_{rr}
	VOLTS	VOLTS	AMPS		VOLTS		µA		AMPS	ns
					25°C	100°C	25°C	125°C		
1N5807	50	60	6.0	3.0	0.875	0.800	5	525	125	30
1N5809	100	110	6.0	3.0	0.875	0.800	5	525	125	30
1N5811	150	160	6.0	3.0	0.875	0.800	5	525	125	30

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

2-25-2008 REVC

VOIDLESS-HERMETICALLY-SEALED ULTRAFAST RECOVERY GLASS RECTIFIERS

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.
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 is reached.

GRAPHS

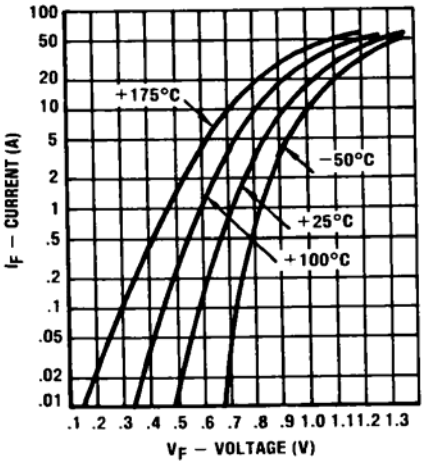


FIGURE 1
TYPICAL FORWARD CURRENT vs. FORWARD VOLTAGE

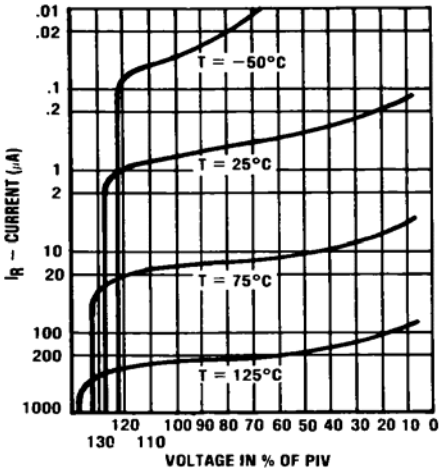


FIGURE 2
TYPICAL REVERSE CURRENT vs. VOLTAGE

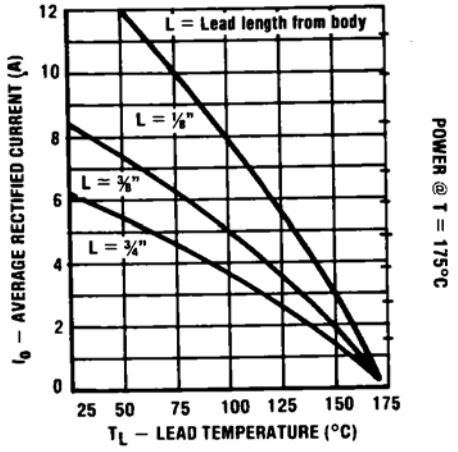


FIGURE 3
OUTPUT CURRENT vs LEAD TEMPERATURE

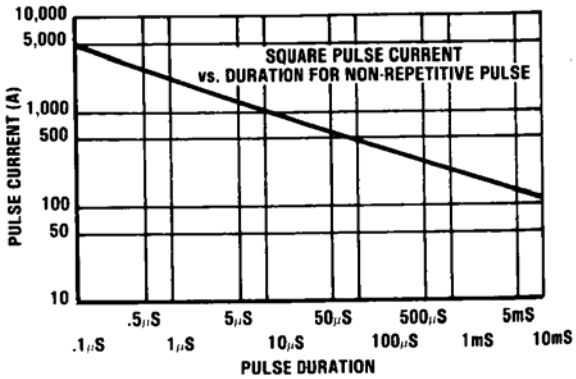


FIGURE 4
FORWARD PULSE CURRENT vs. DURATION

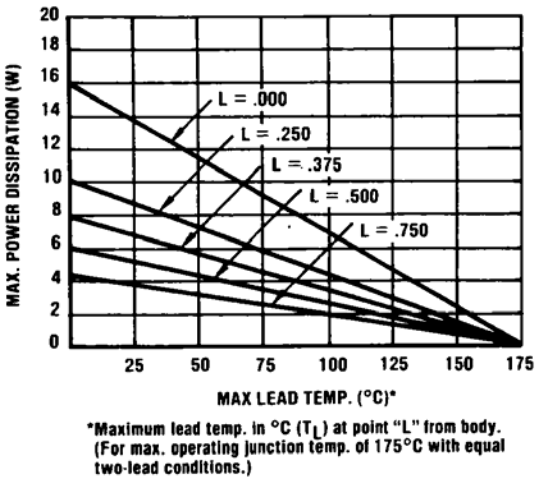


FIGURE 6
MAXIMUM LEAD TEMP. vs. PD

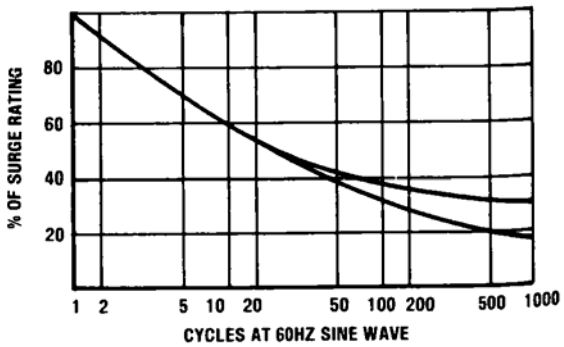
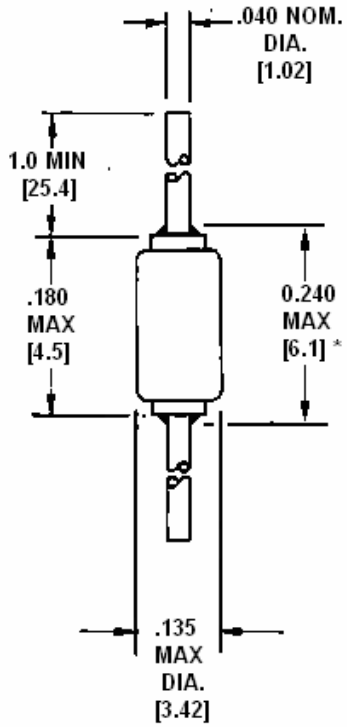


FIGURE 7
MULTIPLE SURGE CURRENT vs. DURATION

PACKAGE DIMENSIONS



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