

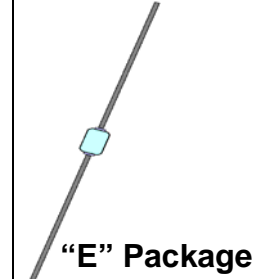
**VOIDLESS-HERMETICALLY-SEALED  
ULTRAFAST RECOVERY GLASS  
RECTIFIERS**

ALSO  
AVAILABLE IN  
SURFACE  
MOUNT

**DESCRIPTION**

This "Ultrafast Recovery" rectifier diode series is military qualified to MIL-PRF-19500/742 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 III" metallurgical bond. These devices are also available in surface mount MELF package configurations by adding a "US" suffix (see separate data sheet for 1N5807CBUS thru 1N5811CBUS). 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**



**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 III" Metallurgical bonds
- JAN, JANTX, & JANTXV available per MIL-PRF-19500/742
- Further screening options are available for JANS in accordance with MIL-PRF-19500/742 by using a "SP" prefix
- Surface mount equivalents also available in a square end-cap MELF configuration with "US" suffix (see separate data sheet for 1N5807CBUS thru 1N5811CBUS)

**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 @  $T_L = 75^\circ\text{C}$  at 3/8 inch lead length (see note 1)
- Thermal Resistance: 22 °C/W junction to lead ( $L=0.375$  in)
- Thermal Impedance: 1.5 °C/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: 260°C 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.
- 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 $I_{O1}$ @ $T_L=75^\circ\text{C}$ (Note 1)	AVERAGE RECTIFIED CURRENT $I_{O2}$ @ $T_A=55^\circ\text{C}$ 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		µA			
					25°C	100°C	25°C	125°C		
1N5807CB	50	60	6.0	3.0	0.875	0.800	5	525	125	30
1N5809CB	100	110	6.0	3.0	0.875	0.800	5	525	125	30
1N5811CB	150	160	6.0	3.0	0.875	0.800	5	525	125	30

**NOTE 1:** Rated at  $T_L = 75^\circ\text{C}$  at 3/8 inch lead length. Derate at 60 mA/°C for  $T_L$  above 75°C.

**NOTE 2:** Derate linearly at 25 mA/°C above  $T_A = 55^\circ\text{C}$ . 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 175°C

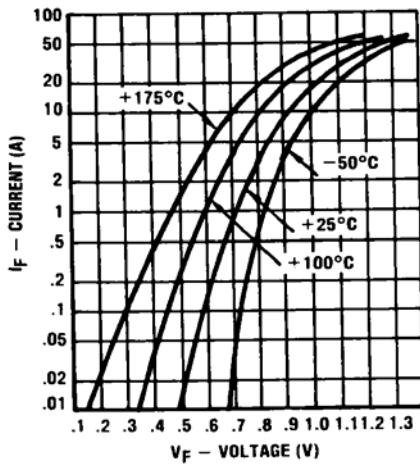
**NOTE 3:**  $T_A = 25^\circ\text{C}$  @  $I_O = 3.0$  A and  $V_{RWM}$  for ten 8.3 ms surges at 1 minute intervals

**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

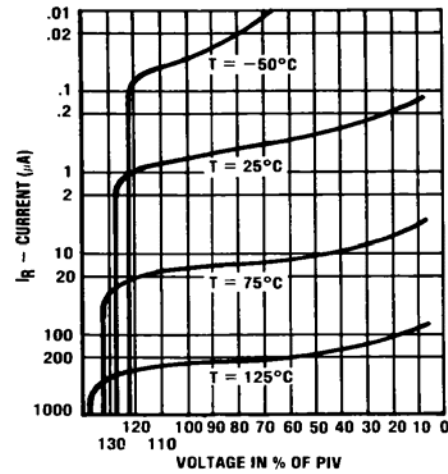
SYMBOLS & DEFINITIONS

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.

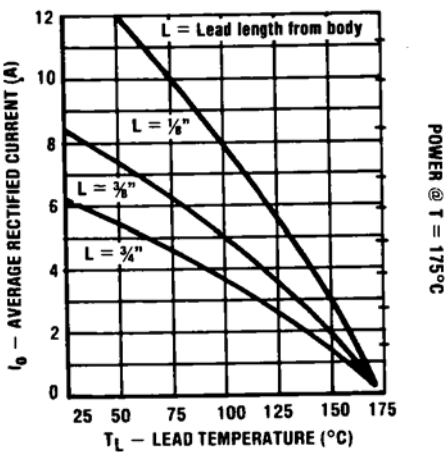
GRAPHS



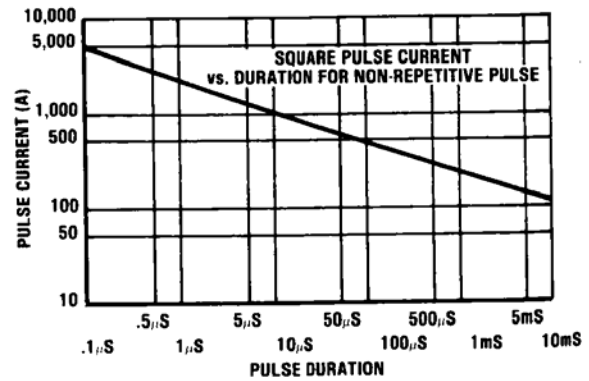
**FIGURE 1**  
TYPICAL FORWARD CURRENT  
vs. FORWARD VOLTAGE



**FIGURE 2**  
TYPICAL REVERSE CURRENT vs. VOLTAGE

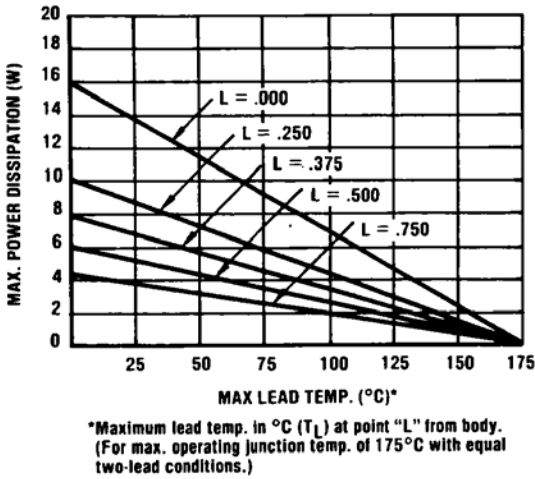


**FIGURE 3**  
OUTPUT CURRENT vs LEAD TEMPERATURE

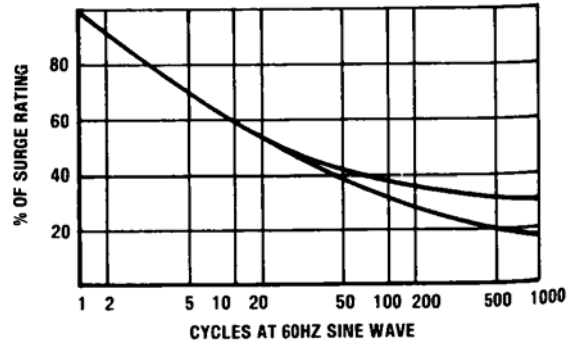


**FIGURE 4**  
FORWARD PULSE CURRENT vs. DURATION



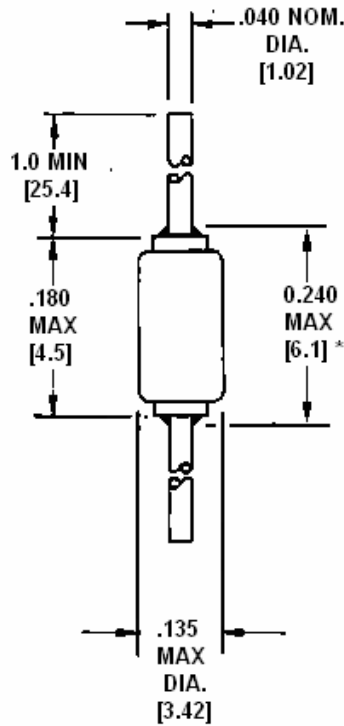


**FIGURE 6**  
MAXIMUM LEAD TEMP. vs. PD



**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.

