1N5807CBUS thru 1N5811CBUS

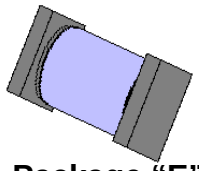
SURFACE MOUNT VOIDLESS-HERMETICALLY-SEALED ULTRA FAST RECOVERY GLASS RECTIFIERS

SCOTTSDALE DIVISION

DESCRIPTION

This "Ultrafast Recovery" surface mount 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 axial-leaded package configurations (see separate data sheet for 1N5807CB thru 1N5811CB). 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



Package "E" or D-5B

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

FEATURES

- Surface mount package series equivalent to the 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
- Axial-leaded equivalents also available (see separate data sheet for 1N5807CB thru 1N5811CB)

APPLICATIONS / BENEFITS

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

- Operating Temperature: -65°C to +175°C.
- Storage Temperature: -65°C to +175°C.
- Average Rectified Forward Current (I_O): 6 Amps @ T_{EC} = 75ºC End Cap temperature (see note 1)
- Thermal Resistance: 6.5 ºC/W junction to end cap
- 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
- TERMINALS: End caps are Copper with Tin/Lead (Sn/Pb) finish.
- MARKING & POLARITY: Cathode band only
- Tape & Reel option: Standard per EIA-481-B
- Weight: 539 mg
- See package dimensions and recommended pad layout on last page

ELECTRICAL CHARACTERISTICS

TYPE	WORKING PEAK REVERSE VOLTAGE V_{RWM}	BREAKDOWN VOLTAGE (MIN.) @ 100µA V_{BR}	AVERAGE RECTIFIED CURRENT I_{O1} @T_{EC}=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	AMPS	VOLTS		µA		AMPS	ns
					25°C	100°C	25°C	125°C		
1N5807CBUS	50	60	6.0	3.0	0.875	0.800	5	525	125	30
1N5809CBUS	100	110	6.0	3.0	0.875	0.800	5	525	125	30
1N5811CBUS	150	160	6.0	3.0	0.875	0.800	5	525	125	30

NOTE 1: Rated at T_{EC} = 75ºC. Derate at 60 mA/ºC for T_{EC} 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

SURFACE MOUNT VOIDLESS-HERMETICALLY-SEALED ULTRA FAST 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

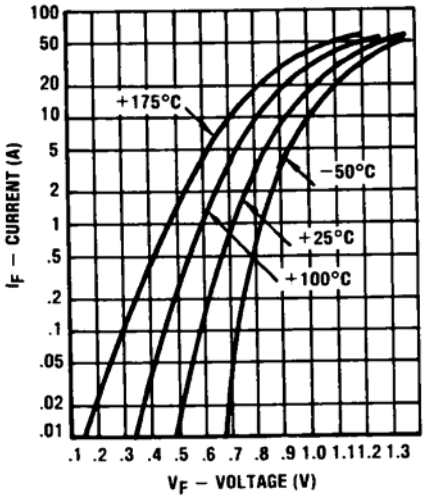


FIGURE 1
TYPICAL FORWARD CURRENT
vs. FORWARD VOLTAGE

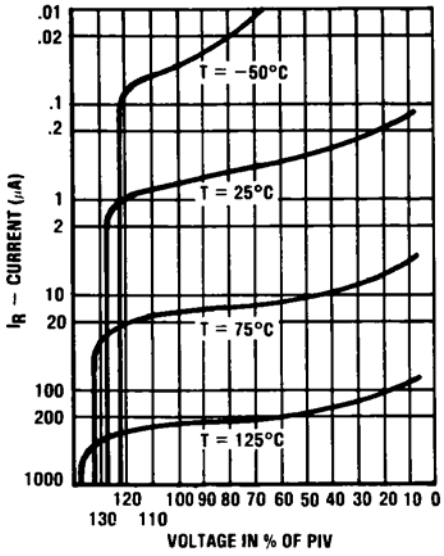


FIGURE 2
TYPICAL REVERSE CURRENT vs. VOLTAGE

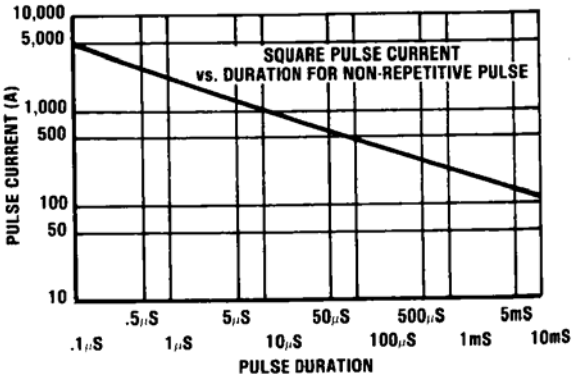


FIGURE 3
FORWARD PULSE CURRENT vs. DURATION

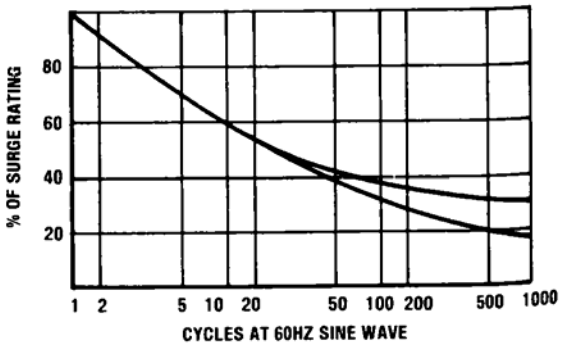
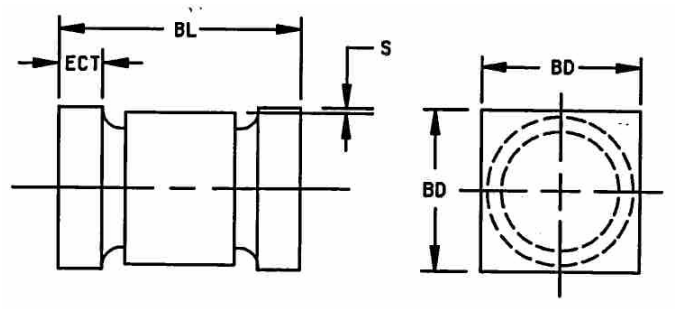


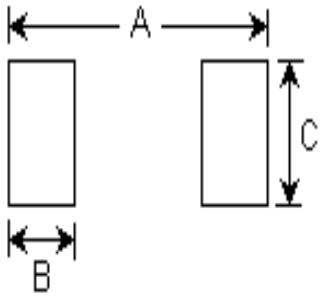
FIGURE 4
MULTIPLE SURGE CURRENT vs. DURATION

PACKAGE DIMENSIONS AND PAD LAYOUT



NOTE: This Package Outline has also previously been identified as "D-5B"

	INCHES		mm	
	MIN	MAX	MIN	MAX
BL	.205	.225	5.21	5.72
BD	.137	.142	3.48	3.61
ECT	.019	.028	0.48	0.711
S	.003	---	0.08	---



PAD LAYOUT

	INCHES	mm
A	0.288	7.32
B	0.070	1.78
C	0.155	3.94

Note: If mounting requires adhesive separate from the solder, an additional 0.080 inch diameter contact may be placed in the center between the pads as an optional spot for cement.