Microsemi
SCOTTSDALE DIVISION

1N5615 thru 1N5623

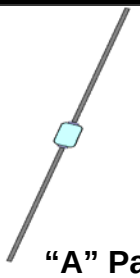
VOIDLESS-HERMETICALLY SEALED FAST RECOVERY GLASS RECTIFIERS

ALSO AVAILABLE IN SURFACE MOUNT

DESCRIPTION

This "fast recovery" rectifier diode series is military qualified to MIL-PRF-19500/429 and is ideal for high-reliability applications where a failure cannot be tolerated. These industry-recognized 1.0 Amp rated rectifiers for working peak reverse voltages from 200 to 1000 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 1N5615US thru 1N5623US). Microsemi also offers numerous other rectifier products to meet higher and lower current ratings with various recovery time speed requirements including fast and ultrafast device types in both through-hole and surface mount packages.

APPEARANCE



"A" Package

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

FEATURES

- Popular JEDEC registered 1N5615 to 1N5623 series
- Voidless hermetically sealed glass package
- Triple-Layer Passivation
- Internal "*Category I*" Metallurgical bonds
- Working Peak Reverse Voltage 200 to 1000 Volts.
- JAN, JANTX, JANTXV, and JANS available per MIL-PRF-19500/429
- Surface mount equivalents also available in a square end-cap MELF configuration with "US" suffix (see separate data sheet for 1N5615US thru 1N5623US)

APPLICATIONS / BENEFITS

- Fast recovery 1 Amp rectifiers 200 to 1000 V
- Military and other high-reliability applications
- General rectifier applications including bridges, half-bridges, catch diodes, etc.
- High forward surge current capability
- Extremely robust construction
- Low thermal resistance
- Controlled avalanche with peak reverse power capability
- Inherently radiation hard as described in Microsemi MicroNote 050

MAXIMUM RATINGS

- Junction & Storage Temperature: -65°C to +175°C
- Thermal Resistance: 38°C/W junction to lead at 3/8 inch (10 mm) lead length from body
- Thermal Impedance: 4.5°C/W @ 10 ms heating time
- Average Rectified Forward Current (I_O): 1.0 Amps @ T_A = 55ºC
- Forward Surge Current: 30 Amps @ 8.3 ms half-sine
- Solder Temperatures: 260ºC for 10 s (maximum)

MECHANICAL AND PACKAGING

- CASE: Hermetically sealed voidless hard glass with Tungsten slugs (package dimensions on last page)
- TERMINATIONS: Axial leads are copper with Tin/Lead (Sn/Pb) finish. Note: Previous inventory had solid Silver axial-leads and no finish.
- MARKING: Body paint and part number, etc.
- POLARITY: Cathode band
- TAPE & REEL option: Standard per EIA-296
- WEIGHT: 340 mg

ELECTRICAL CHARACTERISTICS

TYPE	WORKING PEAK REVERSE VOLTAGE V_{RWM}	MINIMUM BREAKDOWN VOLTAGE V_{BR} @ 50µA	AVERAGE RECTIFIED CURRENT I_O @ T_A (NOTE 1)		FORWARD VOLTAGE (MAX.) V_F @ 3A	REVERSE CURRENT (MAX.) I_R @ V_{RWM}		CAPACITANCE (MAX.) C @ V_R =12 V f=1 MHz	MAXIMUM SURGE CURRENT I_{FSM} (NOTE 2)	REVERSE RECOVERY (MAX.) (NOTE 3) t_{rr}
	VOLTS	VOLTS	AMPS		VOLTS	µA		pF	AMPS	ns
			50°C	100°C		25°C	100°C			
1N5615	200	220	1.00	.750	.8 MIN.	.5	25	45	25	150
1N5617	400	440	1.00	.750		.5	25	35	25	150
1N5619	600	660	1.00	.750		.5	25	25	25	250
1N5621	800	880	1.00	.750	1.6	.5	25	20	25	300
1N5623	1000	1100	1.00	.750	MAX.	.5	25	15	25	500

NOTE 1: From 1 Amp at T_A = 55°C, derate linearly at 5.56 mA/°C to 0.75 Amp at T_A = 100°C. From T_A = 100°C, derate linearly at 7.5 mA/°C to 0 Amps at T_A = 200 °C. These ambient ratings are for PC boards where thermal resistance from mounting point to ambient is sufficiently controlled where $T_{J(max)}$ does not exceed 175 °C.

NOTE 2: T_A = 100 °C, f = 60 Hz, I_O = 750 mA for ten 8.3 ms surges @ 1 minute intervals

NOTE 3: I_F = 0.5 A, I_{RM} = 1 A, $I_{R(REC)}$ = 0.250 A

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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 decay point after a peak reverse current occurs.

GRAPHS

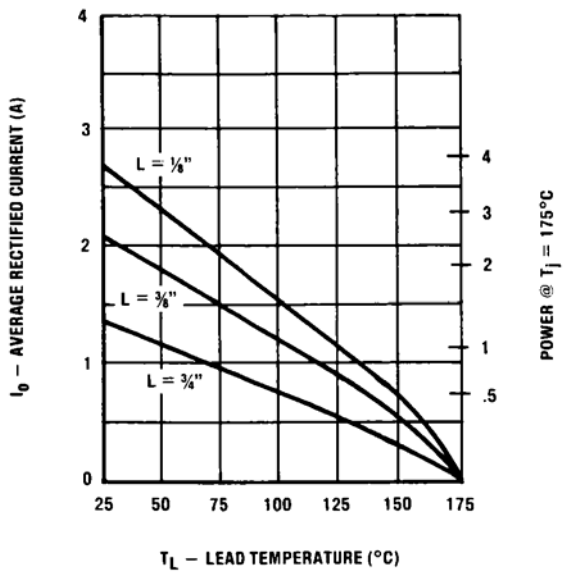

FIGURE 1
MAXIMUM CURRENT vs LEAD TEMPERATURE

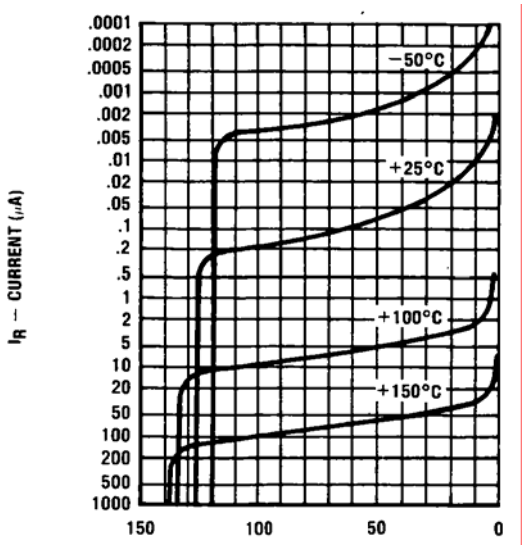

FIGURE 2
TYPICAL REVERSE CURRENT vs PIV

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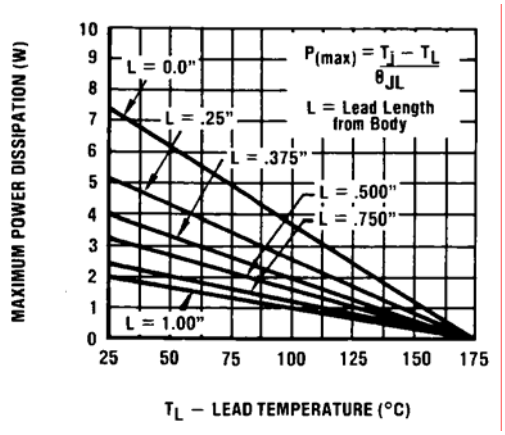


FIGURE 3
MAXIMUM POWER vs LEAD TEMPERATURE

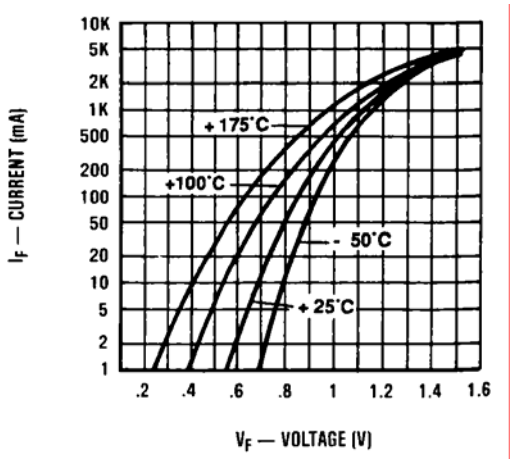
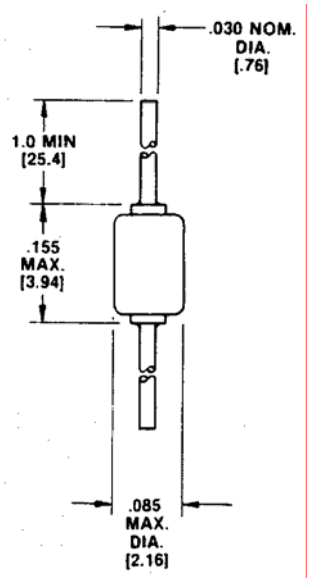


FIGURE 4
TYPICAL FORWARD VOLTAGE vs FORWARD CURRENT

PACKAGE DIMENSIONS



Dimensions: Inches/[mm]
NOTE: Lead tolerance = +0.003/-0.004 inches

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