Microsemi
SCOTTSDALE DIVISION

1N5415 thru 1N5420

VOIDLESS-HERMETICALLY SEALED FAST RECOVERY GLASS RECTIFIERS

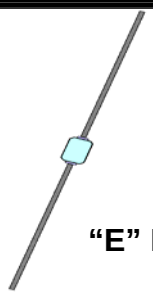
ALSO AVAILABLE IN SURFACE MOUNT

www.Microsemi.COM

DESCRIPTION

This "fast recovery" rectifier diode series is military qualified to MIL-PRF-19500/411 and is ideal for high-reliability applications where a failure cannot be tolerated. These industry-recognized 3.0 Amp rated rectifiers for working peak reverse voltages from 50 to 600 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 1N5415US thru 1N5420US). 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



"E" Package

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

FEATURES

- Popular JEDEC registered 1N5415 to 1N5420 series
- Voidless hermetically sealed glass package
- Triple-Layer Passivation
- Internal "*Category I*" Metallurgical bonds
- Working Peak Reverse Voltage 50 to 600 Volts.
- JAN, JANTX, JANTXV, and JANS available per MIL-PRF-19500/411
- Surface mount equivalents also available in a square end-cap MELF configuration with "US" suffix (see separate data sheet for 1N5415US thru 1N5420US)

APPLICATIONS / BENEFITS

- Fast recovery 3 Amp rectifiers 50 to 600 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 Temperature: -65°C to +175°C
- Storage Temperature: -65°C to +175°C
- Thermal Resistance: 20°C/W junction to lead at 3/8 inch (10 mm) lead length from body
- Thermal Impedance: 1.5°C/W @ 10 ms heating time
- Average Rectified Forward Current (I_O): 3 Amps @ T_A = 55ºC and 2 Amps @ T_A = 100ºC (see Note 1)
- Forward Surge Current (8.3 ms half sine): 80 Amps
- Solder temperatures: 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 except for JANS with solid Silver (Ag) and no finish
- MARKING: Body paint and part number, etc.
- POLARITY: Cathode band
- TAPE & REEL option: Standard per EIA-296
- WEIGHT: 750 mg
- See package dimensions on last page

ELECTRICAL CHARACTERISTICS

TYPE	V_{RWM}	MINIMUM BREAKDOWN VOLTAGE V_{BR} @ 50µA VOLTS	FORWARD VOLTAGE V_F @ 9 A		MAXIMUM REVERSE CURRENT I_R @ V_{RWM}		MAXIMUM REVERSE RECOVERY TIME t_{rr} (NOTE 2) ns	AVERAGE RECTIFIED CURRENT I_O (NOTE 1)	
			MIN. VOLTS	MAX. VOLTS	25°C µA	100°C µA		55°C AMPS	100°C AMPS
1N5415	50V	55V	0.6	1.5	1.0	20	150	3.0	2.0
1N5416	100V	110V	0.6	1.5	1.0	20	150	3.0	2.0
1N5417	200V	220V	0.6	1.5	1.0	20	150	3.0	2.0
1N5418	400V	440V	0.6	1.5	1.0	20	150	3.0	2.0
1N5419	500V	550V	0.6	1.5	1.0	20	250	3.0	2.0
1N5420	600V	660V	0.6	1.5	1.0	20	400	3.0	2.0

NOTE 1: From 3.0 Amps at T_A = 55°C, derate linearly at 22 mA/ °C to 2.0 Amps at T_A = 100°C. Above T_A = 100°C, derate linearly to zero at T_A = 175 °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: I_F = 0.5A, I_{RM} = 1A, $I_{R(REC)}$ = 0.250A

JANS

1N5415 thru 1N5420

6-11-2008 REV B

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VOIDLESS-HERMETICALLY SEALED 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 excluding all transient voltages (ref JESD282-B).
I_O	Average Rectified Output Current: The 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 Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.
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

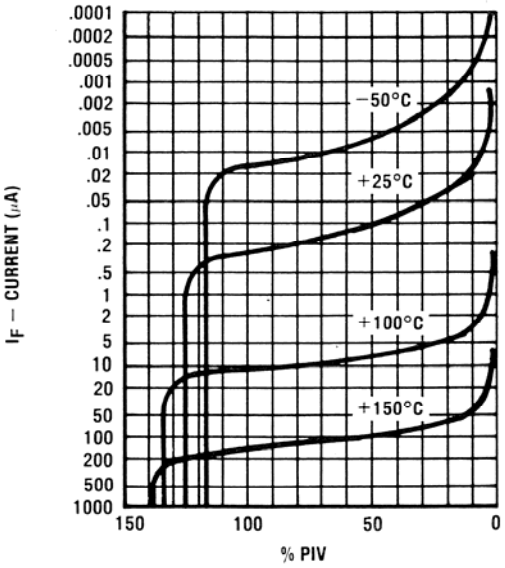


FIGURE 1 – Typical Reverse Current vs. PIV

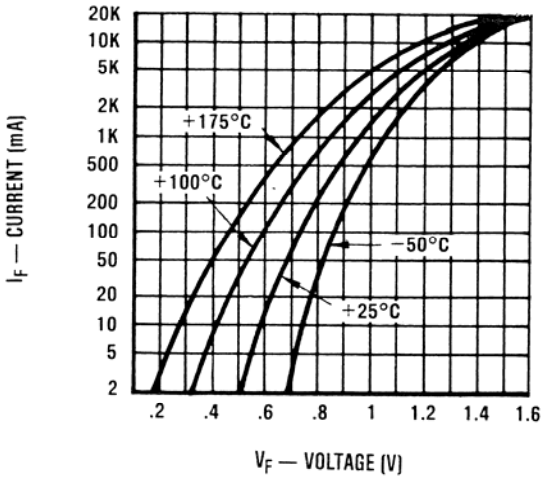


FIGURE 2 – Typical Forward Current vs. Forward Voltage

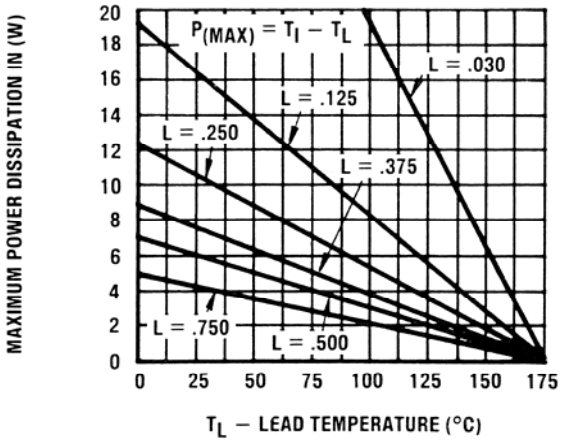


FIGURE 3 – Maximum Power vs. Lead Temperature

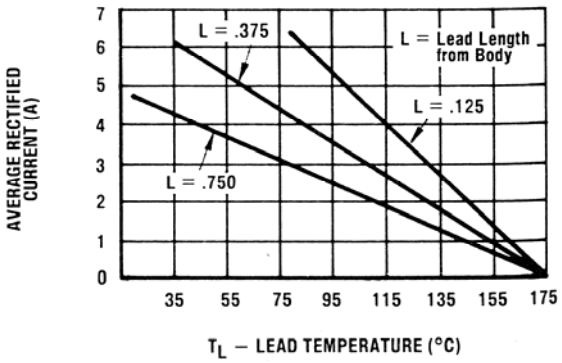
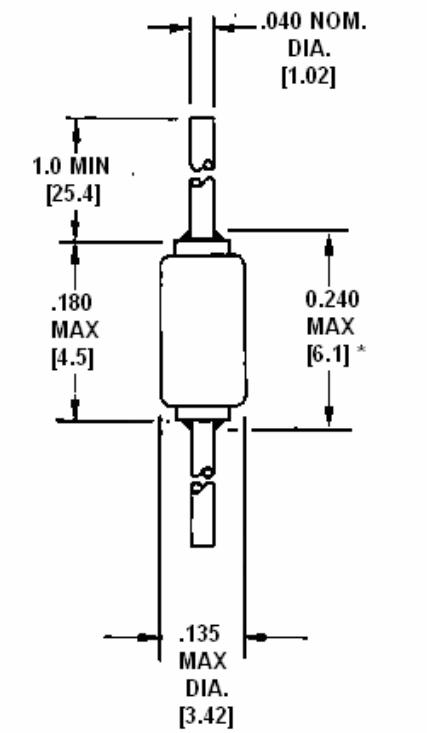


FIGURE 4 – Maximum Current vs. Lead Temperature

DIMENSIONS AND SCHEMATIC



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