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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



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

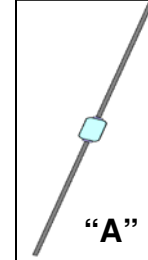
ALSO  
AVAILABLE IN  
SURFACE  
MOUNT

**DESCRIPTION**

These "Ultrafast Recovery" rectifier diodes are military qualified to MIL-PRF-19500/477 and are ideal for high-reliability applications where a failure cannot be tolerated. These industry-recognized 2.5 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. They are also available in surface-mount packages (see separate data sheet for 1N5802US thru 1N5806US). 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 in thru-hole and surface-mount packages.

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

**APPEARANCE**



"A" Package

**FEATURES**

- Popular JEDEC registered 1N5802 to 1N5806 series
- Voidless hermetically sealed glass package
- Extremely robust construction
- Triple-layer passivation
- Internal "Category I" Metallurgical bonds
- JAN, JANTX, 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 1N5802US thru 1N5806US)

**APPLICATIONS / BENEFITS**

- Ultrafast recovery 2.5 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**

- Junction Temperature: -65°C to +175°C
- Storage Temperature: -65°C to +175°C
- Average Rectified Forward Current (I<sub>O</sub>): 2.5 A @ T<sub>L</sub> = 75°C
- Thermal Resistance: 36 °C/W junction to lead (L=.375 in)
- Thermal Impedance: 4.5°C/W @ 10 ms heating time
- Forward Surge Current: 35 Amps @ 8.3 ms half-sine
- Capacitance: 25 pF @ V<sub>R</sub> = 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 (package dimensions on last page)
- TERMINATIONS: Axial-leads are Tin/Lead (Sn/Pb) over Copper. Note: Previous JANS inventory had solid Silver 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: 340 mg

**ELECTRICAL CHARACTERISTICS**

| TYPE   | WORKING<br>PEAK<br>REVERSE<br>VOLTAGE<br>V <sub>RWM</sub> | BREAKDOWN<br>VOLTAGE<br>(MIN.)<br>@ 100µA<br>V <sub>BR</sub> | AVERAGE<br>RECTIFIED<br>CURRENT<br>I <sub>O1</sub> @<br>T <sub>L</sub> =+75°C<br>(NOTE 1) | AVERAGE<br>RECTIFIED<br>CURRENT<br>I <sub>O2</sub> @<br>T <sub>A</sub> =+55°C<br>(Note 2) | MAXIMUM<br>FORWARD<br>VOLTAGE<br>@ 1 A<br>(8.3 ms pulse)<br>V <sub>F</sub> |       | REVERSE<br>CURRENT<br>(MAX)<br>@ V <sub>RWM</sub><br>I <sub>R</sub> |       | SURGE<br>CURRENT<br>(MAX)<br>I <sub>FSM</sub><br>(NOTE 3) | REVERSE<br>RECOVERY<br>TIME (MAX)<br>(NOTE 4)<br>t <sub>rr</sub> |      |    |
|--------|---|--|---|---|--|-------|---|-------|---|--|------|----|
|        |   |  |   |   | VOLTS  |       | µA  |       |   |  | AMPS | ns |
|        |   |  |   |   | 25°C   | 100°C | 25°C  | 100°C |   |  |      |    |
| 1N5802 | 50  | 55   | 2.5   | 1.0   | 0.875  | 0.800 | 1   | 50    | 35  | 25   |      |    |
| 1N5803 | 75  | 80   | 2.5   | 1.0   | 0.875  | 0.800 | 1   | 50    | 35  | 25   |      |    |
| 1N5804 | 100   | 110  | 2.5   | 1.0   | 0.875  | 0.800 | 1   | 50    | 35  | 25   |      |    |
| 1N5805 | 125   | 135  | 2.5   | 1.0   | 0.875  | 0.800 | 1   | 50    | 35  | 25   |      |    |
| 1N5806 | 150   | 160  | 2.5   | 1.0   | 0.875  | 0.800 | 1   | 50    | 35  | 25   |      |    |

**NOTE 1:** I<sub>O1</sub> is rated at 2.5 A @ T<sub>L</sub> = 75°C at 3/8 inch lead length. Derate at 25 mA/°C for T<sub>L</sub> above 75°C.

**NOTE 2:** I<sub>O2</sub> is rated at 1.0 A @ T<sub>A</sub> = 55°C for PC boards where thermal resistance from mounting point to ambient is sufficiently controlled where T<sub>J(max)</sub> does not exceed 175°C. Derate at 8.33 mA/°C for T<sub>A</sub> above 55°C.

**NOTE 3:** T<sub>A</sub> = 25°C @ I<sub>O</sub> = 1.0 A and V<sub>RWM</sub> for ten 8.3 ms surges at 1 minute intervals

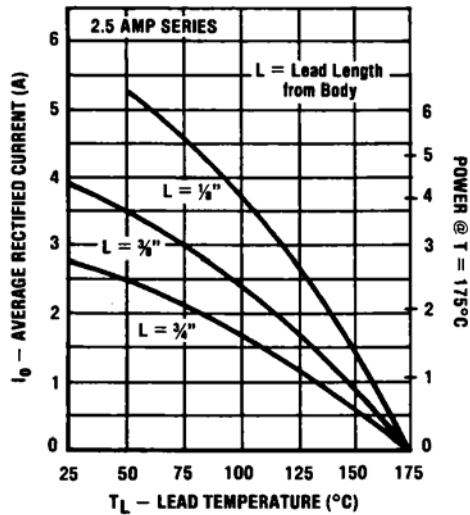
**NOTE 4:** I<sub>F</sub> = 0.5 A, I<sub>RM</sub> = 0.5 A, I<sub>R(REC)</sub> = .05 A



**SYMBOLS & DEFINITIONS**

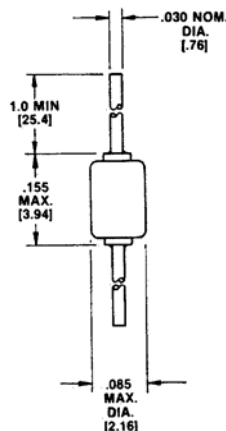
| Symbol    | Definition   |
|-----------|--|
| $V_{BR}$  | Minimum Breakdown Voltage: The minimum voltage the device will exhibit at a specified current  |
| $V_{RWM}$ | Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range  |
| $I_O$     | Average 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 recovery decay point after a peak reverse current occurs. |

**GRAPHS**



**FIGURE 1**  
OUTPUT CURRENT vs. LEAD TEMP.

**PACKAGE DIMENSIONS inches/[mm]**



NOTE: Lead tolerance = +0.002/-0.003 inches