This “Ultrafast Recovery” rectifier diode series is military qualified to MIL-PRF-19500/585 and is ideal for high-reliability applications where a failure cannot be tolerated. These industry-recognized 1.5 to 2.0 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 1N6620US thru 1N6625US). 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.

**DESCRIPTION**

- Popular JEDEC registered 1N6620 to 1N6625 series
- Voidless hermetically sealed glass package
- Extremely robust construction
- Triple-layer passivation
- Internal “Category I” Metallurgical bonds
- JAN, JANTX, and JANTXV available per MIL-PRF-19500/585
- Further options for screening in accordance with MIL-PRF-19500 for JANS by using a “SP” prefix, e.g. SP6620, SP6624, etc.
- Surface mount equivalents also available in a square end-cap MELF configuration with “US” suffix (see separate data sheet for 1N6620US thru 1N6625US)

**APPLICATIONS / BENEFITS**

- Ultrafast recovery rectifier series 200 to 1000 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

**FEATURES**

- Popular JEDEC registered 1N6620 to 1N6625 series
- Voidless hermetically sealed glass package
- Extremely robust construction
- Triple-layer passivation
- Internal “Category I” Metallurgical bonds
- JAN, JANTX, and JANTXV available per MIL-PRF-19500/585
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**APPEARANCE**

- Package “A” Axial

**MAXIMUM RATINGS**

- **Junction Temperature:** -65°C to +150°C
- **Storage Temperature:** -65°C to +175°C
- **Peak Forward Surge Current @ 25°C:** 20 Amps (except 1N6625 which is 15 Amps)
  - Note: Test pulse = 8.3 ms, half-sine wave.
- **Average Rectified Forward Current (I0) at TL= +55°C**
  - 1N6620 thru 1N6622: 2.0 Amps
  - 1N6623 thru 1N6625: 1.5 Amps
  - (Derate linearly at 0.833%/°C for TL> +55°C)
- **Average Rectified Forward Current (I0) at TA=25°C:**
  - 1N6620 thru 1N6622: 1.2 Amps
  - 1N6623 thru 1N6625: 1.0 Amp
  - (Derate linearly at 0.67%/°C for TA>+25°C. This I0 rating is typical for PC boards where thermal resistance from mounting point to ambient is sufficiently controlled where Tj(max) is not exceeded.)
- **Thermal Resistance**
  - L=0.375 inch (RθJL): 38°C/W
- **Capacitance at VR= 10 V:** 10 pF
- **Solder temperature:** 260°C for 10 s (maximum)

**MECHANICAL AND PACKAGING**

- **CASE:** Hermetically sealed voidless hard glass with Tungsten slugs
- **TERMINATIONS:** Axial-leads are Copper with Tin/Lead (Sn/Pb) finish
- **MARKING:** Body painted and part number, etc.
- **POLARITY:** Cathode indicated by band
- **Tape & Reel option:** Standard per EIA-296
- **Weight:** 340 mg
- See package dimensions on last page

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**ELECTRICAL CHARACTERISTICS @ 25°C**

<table>
<thead>
<tr>
<th>TYPE NUMBER</th>
<th>MINIMUM BREAKDOWN VOLTAGE</th>
<th>MAXIMUM FORWARD VOLTAGE</th>
<th>WORKING PEAK REVERSE VOLTAGE</th>
<th>MAXIMUM REVERSE CURRENT</th>
<th>MAXIMUM REVERSE RECOVERY TIME (LOW CURRENT)</th>
<th>MAXIMUM REVERSE RECOVERY TIME (HIGH CURRENT)</th>
<th>PEAK RECOVERY CURRENT</th>
<th>FORWARD RECOVERY VOLTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>V&lt;sub&gt;BK&lt;/sub&gt;</td>
<td>V&lt;sub&gt;F&lt;/sub&gt;</td>
<td>V&lt;sub&gt;FR&lt;/sub&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1N6620</td>
<td>220</td>
<td>1.40V @ 1.2A</td>
<td>1.60V @ 2.0A</td>
<td>200</td>
<td>0.5</td>
<td>150</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>1N6621</td>
<td>440</td>
<td>1.40V @ 1.2A</td>
<td>1.60V @ 2.0A</td>
<td>400</td>
<td>0.5</td>
<td>150</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td>1N6622</td>
<td>660</td>
<td>1.40V @ 1.2A</td>
<td>1.60V @ 2.0A</td>
<td>600</td>
<td>0.5</td>
<td>150</td>
<td>30</td>
<td>45</td>
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<tr>
<td>1N6623</td>
<td>880</td>
<td>1.55V @ 1.0A</td>
<td>1.80V @ 1.5A</td>
<td>800</td>
<td>0.5</td>
<td>150</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>1N6624</td>
<td>990</td>
<td>1.55V @ 1.0A</td>
<td>1.80V @ 1.5A</td>
<td>900</td>
<td>0.5</td>
<td>150</td>
<td>50</td>
<td>60</td>
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<tr>
<td>1N6625</td>
<td>1100</td>
<td>1.75V @ 1.0A</td>
<td>1.95V @ 1.5A</td>
<td>1000</td>
<td>1.0</td>
<td>200</td>
<td>60</td>
<td>80</td>
</tr>
</tbody>
</table>

**NOTE 1:** Low Current Reverse Recovery Time Test Conditions: I<sub>F</sub>=0.5A, I<sub>RM</sub>=1.0A, I<sub>IR(REC)</sub>=0.25A per MIL-STD-750, Method 4031, Condition B.

**NOTE 2:** High Current Reverse Recovery Time Test Conditions: I<sub>F</sub> = 2A, di/dt=100 A/µs MIL-STD-750, Method 4031, Condition D.

**SYMBOLS & DEFINITIONS**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>V&lt;sub&gt;BR&lt;/sub&gt;</td>
<td>Minimum Breakdown Voltage: The minimum voltage the device will exhibit at a specified current.</td>
</tr>
<tr>
<td>V&lt;sub&gt;RWM&lt;/sub&gt;</td>
<td>Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range.</td>
</tr>
<tr>
<td>V&lt;sub&gt;F&lt;/sub&gt;</td>
<td>Maximum Forward Voltage: The maximum forward voltage the device will exhibit at a specified current.</td>
</tr>
<tr>
<td>I&lt;sub&gt;R&lt;/sub&gt;</td>
<td>Maximum Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.</td>
</tr>
<tr>
<td>C</td>
<td>Capacitance: The capacitance of the TVS as defined @ 0 volts at a frequency of 1 MHz and stated in picofarads.</td>
</tr>
<tr>
<td>t&lt;sub&gt;rr&lt;/sub&gt;</td>
<td>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.</td>
</tr>
</tbody>
</table>

**CHARTS AND GRAPHS**

**FIGURE 1**
Typical Forward Current vs Forward Voltage

**FIGURE 2**
Typical Forward Current vs Forward Voltage
VOIDLESS-HERMETICALLY SEALED
ULTRA FAST RECOVERY GLASS RECTIFIERS

FIGURE 3
Typical Reverse Current vs. Applied Reverse Voltage

FIGURE 4
Typical Reverse Current vs. Applied Reverse Voltage

FIGURE 5
Average Forward Current vs. Lead Temperature (50% Duty Cycle, Square Wave)

FIGURE 6
Average Forward Current vs. Lead Temperature (50% Duty Cycle, Square Wave)
VOIDLESS-HERMETICALLY SEALED
ULTRA FAST RECOVERY GLASS
RECTIFIERS

**FIGURE 7**
Forward Pulse Current vs. Pulse Duration

**FIGURE 8**
Reverse Pulse Power vs. Pulse Duration

**PACKAGE DIMENSIONS**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Minimum</th>
<th>Maximum</th>
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</thead>
<tbody>
<tr>
<td>Length</td>
<td>1.625</td>
<td>1.635</td>
</tr>
<tr>
<td>Width</td>
<td>0.70</td>
<td>0.75</td>
</tr>
<tr>
<td>Height</td>
<td>0.155</td>
<td>0.161</td>
</tr>
</tbody>
</table>

Polarity mark (cathode): Ø 0.05 [1.401]

NOTE: DIMENSIONS IN INCHES [mm]

Lead tolerance = +0.002/-0.003 inches