



## VOIDLESS HERMETICALLY SEALED SURFACE MOUNT STANDARD RECOVERY GLASS RECTIFIERS

Qualified to MIL-PRF-19500/420

Qualified Levels:  
JAN, JANTX, JANTXV  
and JANS

### DESCRIPTION

This “standard recovery” surface mount rectifier diode series is military qualified and is ideal for high-reliability applications where a failure cannot be tolerated. These industry-recognized 5.0 amp rated rectifiers for working peak reverse voltages from 200 to 1000 volts are hermetically sealed with voidless-glass construction using an internal “Category 1” metallurgical bond. These devices are also available in axial-leaded packages for thru-hole mounting. Microsemi also offers numerous other rectifier products to meet higher and lower current ratings with various recovery time speeds.

**Important:** For the latest information, visit our website <http://www.microsemi.com>.

### FEATURES

- Surface mount equivalent of JEDEC registered 1N5550 thru 1N5554 series.
- Voidless hermetically sealed glass package.
- Extremely robust construction.
- Quadruple-layer passivation.
- Internal “Category 1” metallurgical bonds.
- JAN, JANTX, JANTXV and JANS qualified versions available per MIL-PRF-19500/420.
- RoHS compliant versions available (commercial grade only).

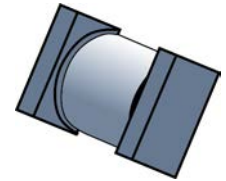
### APPLICATIONS / BENEFITS

- Standard recovery 5 amp 200 to 1000 volts rectifiers series.
- Military and other high-reliability applications.
- General rectifier applications including bridges, half-bridges, catch diodes, etc.
- High forward surge current capability.
- Low thermal resistance.
- Controlled avalanche with peak reverse power capability.
- Extremely robust construction.
- Inherently radiation hard as described in Microsemi “[MicroNote 050](#)”.

### MAXIMUM RATINGS @ T<sub>A</sub> = 25 °C unless otherwise noted.

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T <sub>J</sub> and T <sub>STG</sub>	-65 to +175	°C
Thermal Resistance Junction-to-End Cap	R <sub>θJEC</sub>	6.5	°C/W
Thermal Impedance @ 10 ms heating time <sup>(1)</sup>	Z <sub>θJX</sub>	1.5	°C/W
Maximum Forward Surge Current (8.3 ms half sine)	I <sub>FSM</sub>	100	A
Average Rectified Forward Current <sup>(2)</sup> @ T <sub>EC</sub> = 130 °C	I <sub>O(L)</sub>	5	A
Average Rectified Forward Current <sup>(3)</sup> @ T <sub>A</sub> = 55 °C	I <sub>O2</sub> <sup>(2)</sup>	3	A
	I <sub>O3</sub> <sup>(4)</sup>	2	A
Working Peak Reverse Voltage	1N5550US	200	V
	1N5551US	400	
	1N5552US	600	
	1N5553US	800	
	1N5554US	1000	
Solder Temperature @ 10 s	T <sub>SP</sub>	260	°C

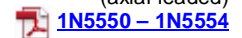
See notes on next page.



“B” SQ-MELF (D-5B) Package

Also available in:

“B” Package  
(axial-leaded)



[1N5550 – 1N5554](#)

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**MAXIMUM RATINGS**

- Notes:**
- Derate linearly at 66.6 mA/°C above  $T_{EC} = 100\text{ }^{\circ}\text{C}$ . An  $I_O$  of up to 6 Amps is allowable provided that appropriate heat sinking or forced air cooling maintains the junction temperature at or below +200 °C.
  - Derate linearly at 22.2 mA/°C from +55 °C to +100 °C.
  - These  $I_O$  ratings are for a thermally (PC boards or other) mounting methods where the lead or end-cap temperatures cannot be maintained and where thermal resistance from mounting point to ambient is still sufficiently controlled where  $T_{J(MAX)}$  does not exceed 175 °C. This equates to  $R_{\theta,JX} \leq 47\text{ }^{\circ}\text{C/W}$ .
  - Derate linearly at 26.7 mA/°C above  $T_A = +100\text{ }^{\circ}\text{C}$  to +175 °C ambient.

**MECHANICAL and PACKAGING**

- CASE: Hermetically sealed voidless hard glass with tungsten slugs.
- TERMINALS: End caps are copper with tin/lead (Sn/Pb) finish. RoHS compliant matte-tin is available for commercial only.
- MARKING: Cathode band only.
- POLARITY: Cathode indicated by band.
- TAPE & REEL option: Standard per EIA-481-B. Consult factory for quantities.
- WEIGHT: 539 milligrams.
- See [Package Dimensions](#) and recommended [Pad Layout](#) on last page.

**PART NOMENCLATURE**
**JAN 1N5550 US (e3)**
**Reliability Level**

JAN = JAN Level  
 JANTX = JANTX Level  
 JANTXV = JANTXV Level  
 JANS = JANS Level  
 Blank = Commercial

**JEDEC type number**

See [Electrical Characteristics](#) table

**RoHS Compliance**

e3 = RoHS compliant (available on commercial grade only)  
 Blank = non-RoHS compliant

**MELF Package**
**SYMBOLS & DEFINITIONS**

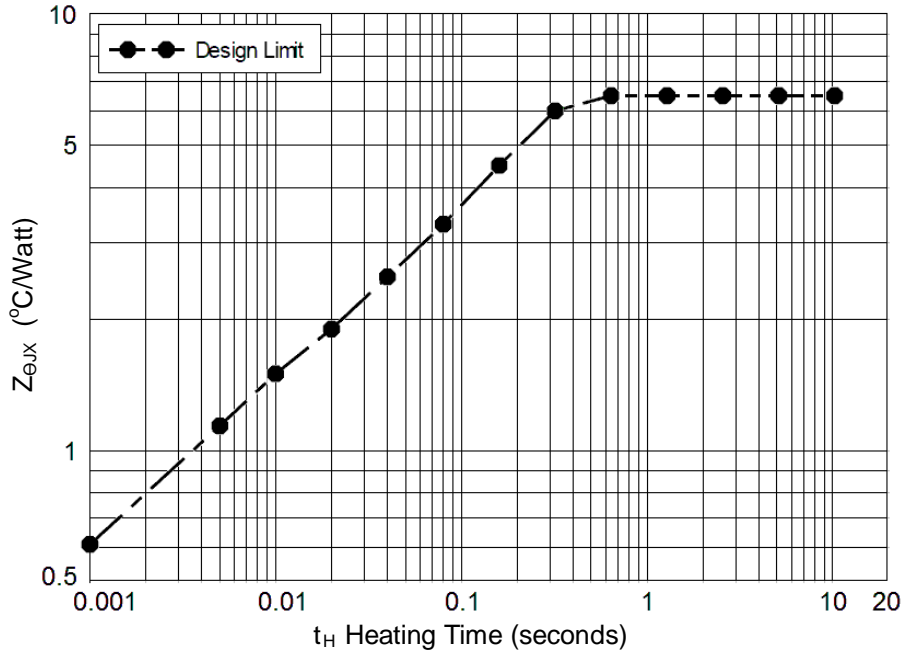
Symbol	Definition
$V_{BR}$	Minimum Breakdown Voltage: The minimum voltage the device will exhibit at a specified current.
$V_{RWM}$	Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range excluding all transient voltages (ref JESD282-B).
$I_O$	Average 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.

**ELECTRICAL CHARACTERISTICS @  $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted.**

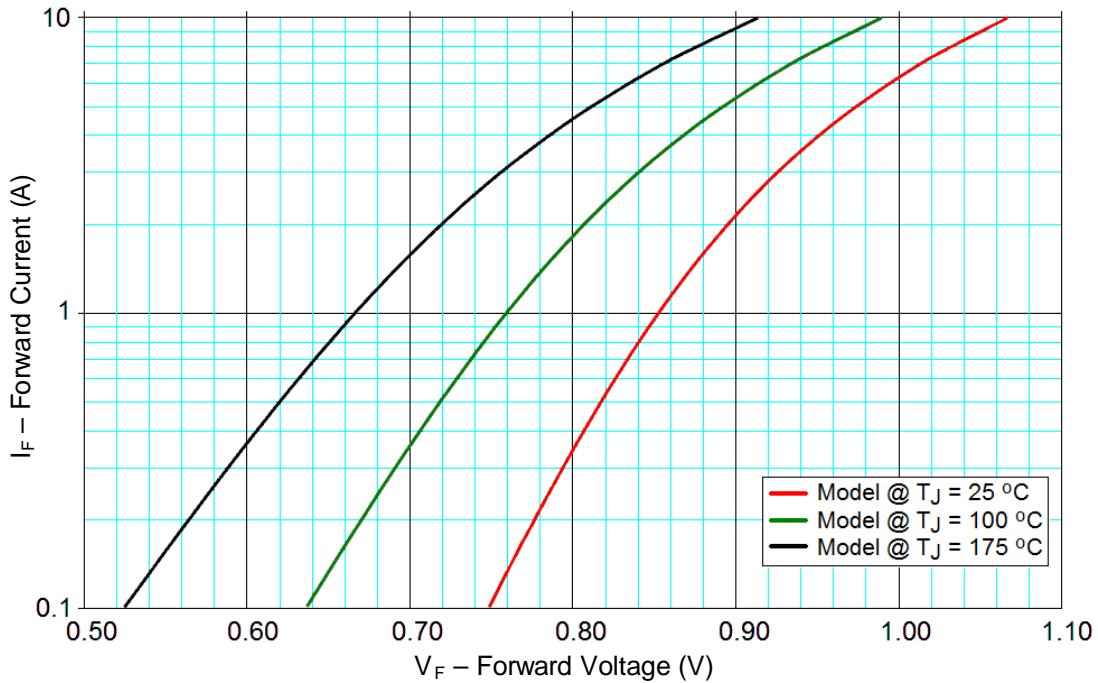
TYPE	MINIMUM BREAKDOWN VOLTAGE $V_{BR}$ $I_R @ 50\ \mu\text{A}$ Volts	FORWARD VOLTAGE $V_F @ 9\ \text{A (pk)}$		MAXIMUM REVERSE CURRENT $I_R @ V_{RWM}$  $\mu\text{A}$	REVERSE RECOVERY $t_{rr}$ (Note 1)  $\mu\text{s}$
		MIN. Volts	MAX. Volts		
1N5550US	220	0.6 V (pk)	1.2 V (pk)	1.0	2.0
1N5551US	440	0.6 V (pk)	1.2 V (pk)	1.0	2.0
1N5552US	660	0.6 V (pk)	1.2 V (pk)	1.0	2.0
1N5553US	880	0.6 V (pk)	1.3 V (pk)	1.0	2.0
1N5554US	1100	0.6 V (pk)	1.3 V (pk)	1.0	2.0

**NOTE 1:**  $I_F = 0.5\ \text{A}$ ,  $I_{RM} = 1.0\ \text{A}$ ,  $I_{R(REC)} = .250\ \text{A}$ .

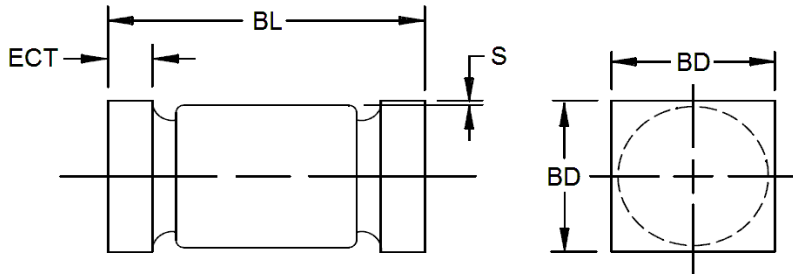
GRAPHS



**FIGURE 1**  
Maximum Thermal Impedance



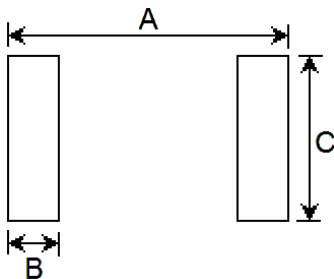
**FIGURE 4**  
Typical Forward Voltage vs. Forward Current

**PACKAGE DIMENSIONS**


Ltr	Inch		Millimeters	
	MIN	MAX	MIN	MAX
<b>BL</b>	.200	.275	5.08	6.99
<b>BD</b>	.137	.186	3.48	4.72
<b>ECT</b>	.019	.034	0.48	0.86
<b>S</b>	.003	---	0.08	---

**NOTES:**

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Dimensions are pre-solder dip.
4. Minimum clearance of glass body to mounting surface on all orientations.
5. In accordance with ASME Y14.5M, diameters are equivalent to  $\Phi x$  symbology.
6. This package outline has also previously been identified as "D5B".

**PAD LAYOUT**


Ltr	Inch	Millimeters
<b>A</b>	0.288	7.32
<b>B</b>	0.070	1.78
<b>C</b>	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.