



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).

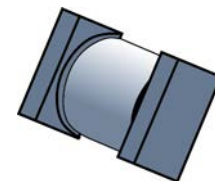
APPLICATIONS / BENEFITS

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

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T_J and T_{STG}	-65 to +175	$^\circ\text{C}$
Thermal Resistance Junction-to-End Cap	$R_{\theta JEC}$	6.5	$^\circ\text{C/W}$
Thermal Impedance @ 10 ms heating time ⁽¹⁾	$Z_{\theta JX}$	1.5	$^\circ\text{C/W}$
Maximum Forward Surge Current (8.3 ms half sine)	I_{FSM}	100	A
Average Rectified Forward Current ⁽²⁾ @ $T_{EC} = 130^\circ\text{C}$	I_{OL}	5	A
Average Rectified Forward Current ⁽³⁾ @ $T_A = 55^\circ\text{C}$ @ $T_A = 100^\circ\text{C}$	I_{O2} ⁽²⁾	3	A
	I_{O3} ⁽⁴⁾	2	A
Working Peak Reverse Voltage	1N5550US	200	V
	1N5551US	400	
	1N5552US	600	
	1N5553US	800	
	1N5554US	1000	
Solder Temperature @ 10 s	T_{SP}	260	$^\circ\text{C}$

See notes on next page.



"B" SQ-MELF (D-5B) Package

Also available in:

"B" Package
(axial-leaded)

 [1N5550 – 1N5554](#)

MSC – Lawrence

6 Lake Street,
Lawrence, MA 01841
Tel: 1-800-446-1158 or
(978) 620-2600
Fax: (978) 689-0803

MSC – Ireland

Gort Road Business Park,
Ennis, Co. Clare, Ireland
Tel: +353 (0) 65 6840044
Fax: +353 (0) 65 6822298

Website:

www.microsemi.com

MAXIMUM RATINGS

- Notes:**
1. Derate linearly at 66.6 mA/°C above $T_{EC} = 100^{\circ}\text{C}$. 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 $+200^{\circ}\text{C}$.
 2. Derate linearly at 22.2 mA/°C from $+55^{\circ}\text{C}$ to $+100^{\circ}\text{C}$.
 3. 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 $R_{\theta JX} \leq 47^{\circ}\text{C/W}$.
 4. Derate linearly at 26.7 mA/°C above $T_A = +100^{\circ}\text{C}$ to $+175^{\circ}\text{C}$ 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 @ $T_A = 25^\circ\text{C}$ 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 $I_R @ V_{RWM}$ μA	REVERSE RECOVERY t_{rr} (Note 1) μs
		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: $I_F = 0.5 \text{ A}$, $I_{RM} = 1.0 \text{ A}$, $I_{R(REC)} = .250 \text{ A}$.

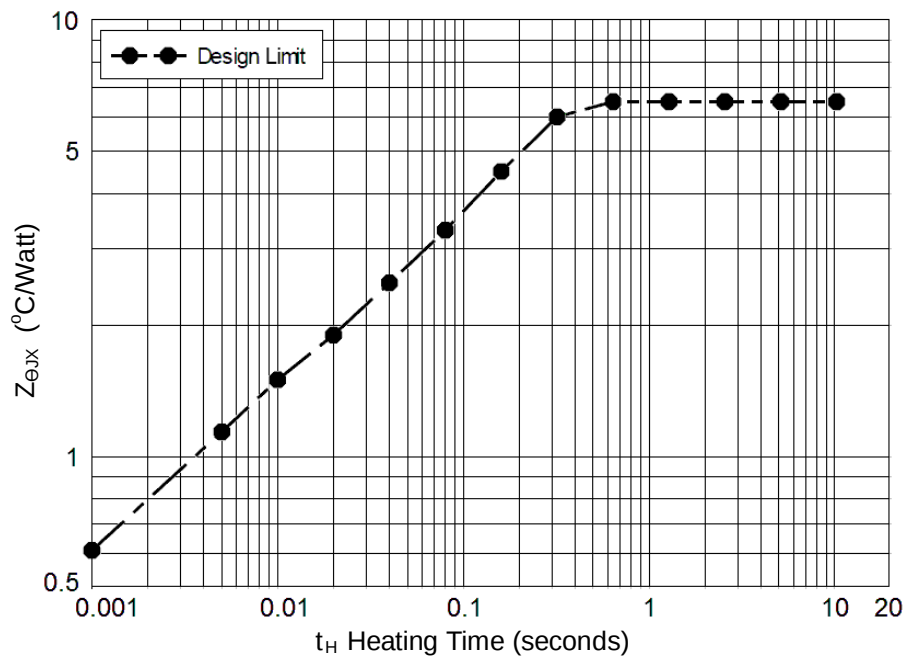
GRAPHS


FIGURE 1
Maximum Thermal Impedance

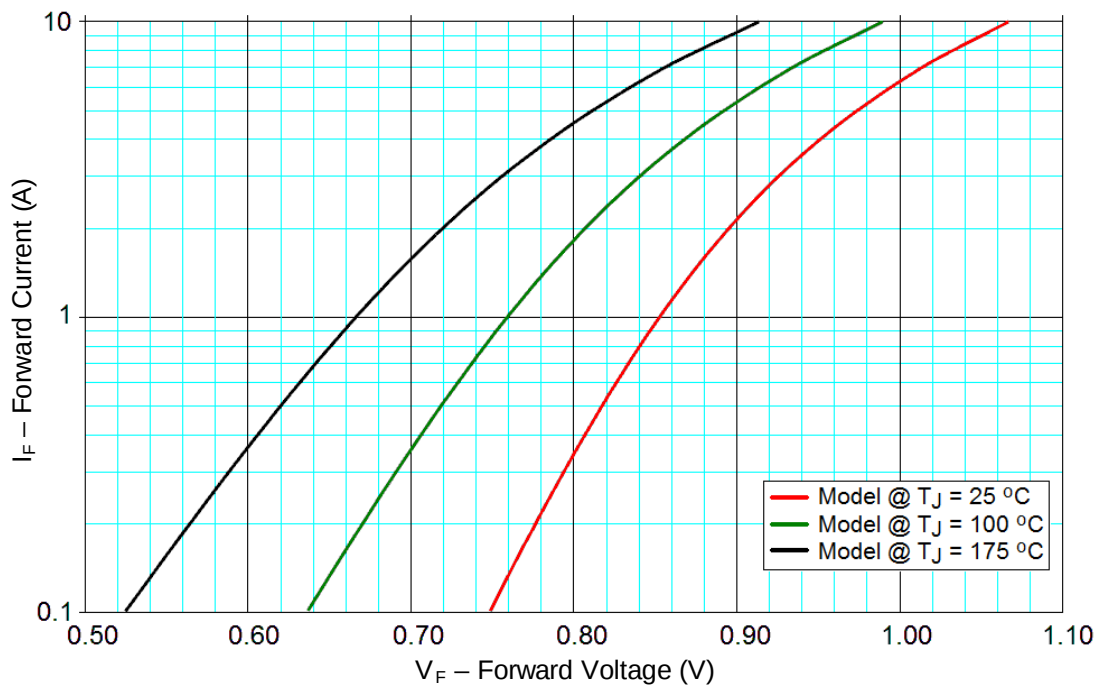
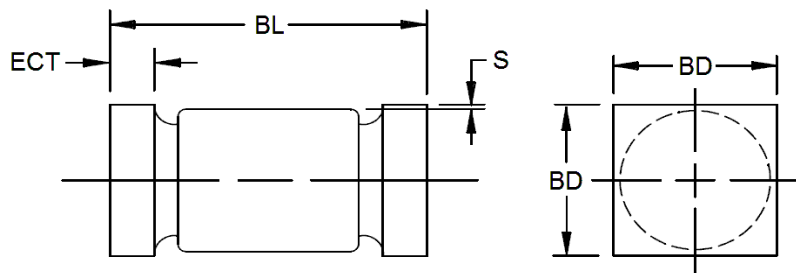


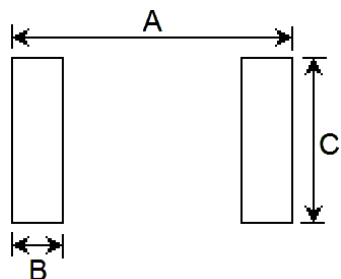
FIGURE 4
Typical Forward Voltage vs. Forward Current

PACKAGE DIMENSIONS


Ltr	Inch		Millimeters	
	MIN	MAX	MIN	MAX
BL	.200	.275	5.08	6.99
BD	.137	.186	3.48	4.72
ECT	.019	.034	0.48	0.86
S	.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 Φ x symbology.
6. This package outline has also previously been identified as "D5B".

PAD LAYOUT


Ltr	Inch	Millimeters
A	0.288	7.32
B	0.070	1.78
C	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.