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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).

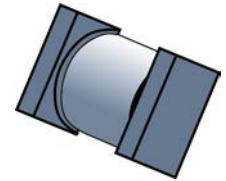
APPLICATIONS / BENEFITS

- 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 °C unless otherwise noted.

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T _J and T _{STG}	-65 to +175	°C
Thermal Resistance Junction-to-End Cap	R _{θJEC}	6.5	°C/W
Thermal Impedance @ 10 ms heating time ⁽¹⁾	Z _{θJX}	1.5	°C/W
Maximum Forward Surge Current (8.3 ms half sine)	I _{FSM}	100	A
Average Rectified Forward Current ⁽²⁾ @ T _{EC} = 130 °C	I _{O(L)}	5	A
Average Rectified Forward Current ⁽³⁾ @ T _A = 55 °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	°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 @ $T_A = 25^\circ\text{C}$ 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

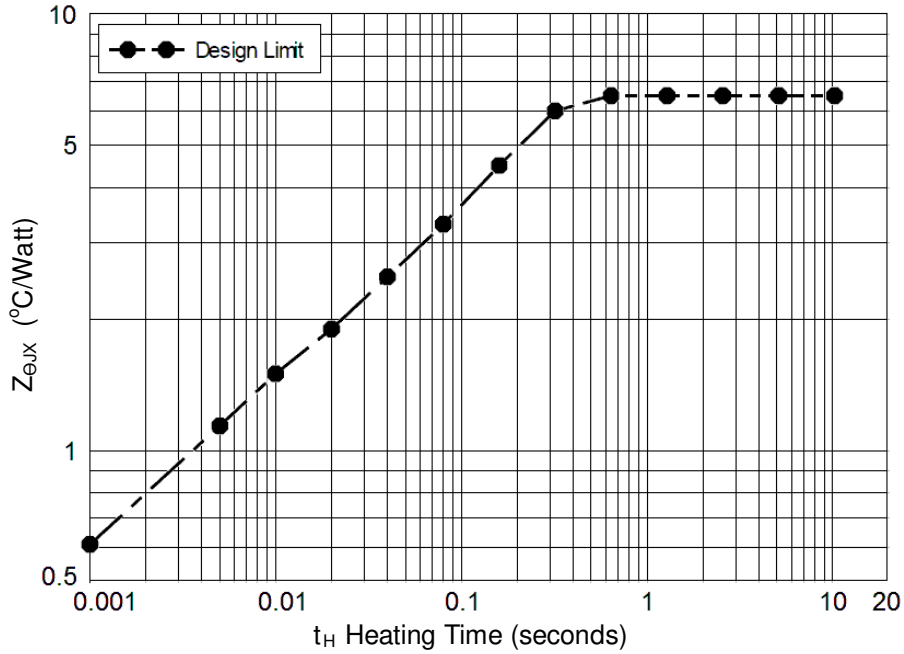


FIGURE 1
Maximum Thermal Impedance

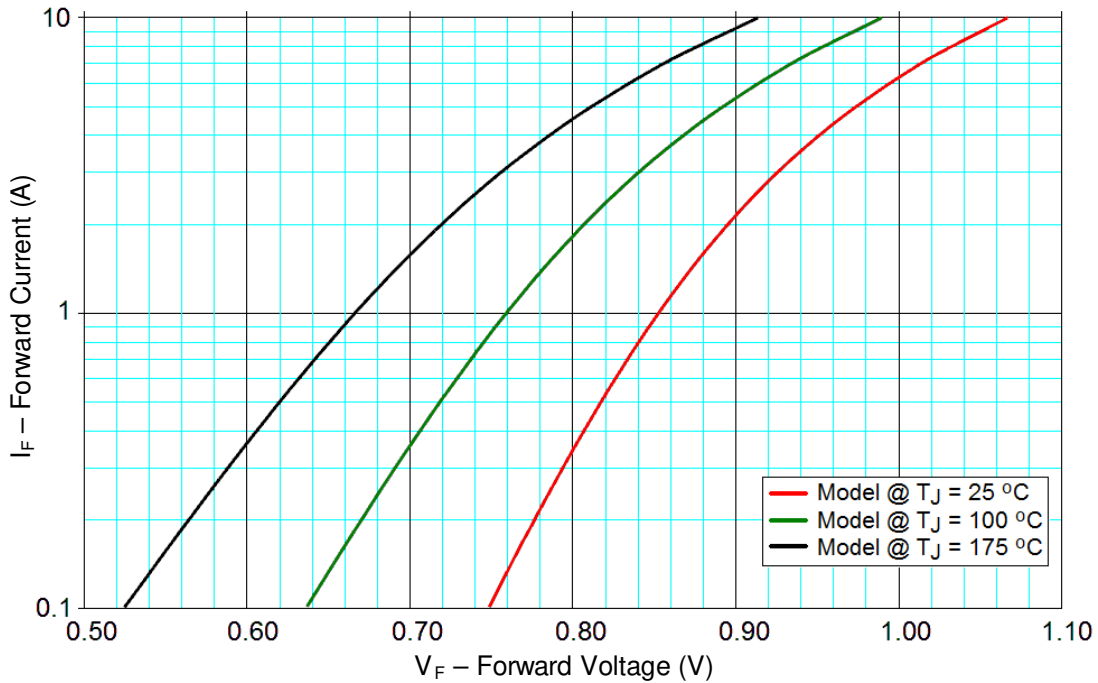
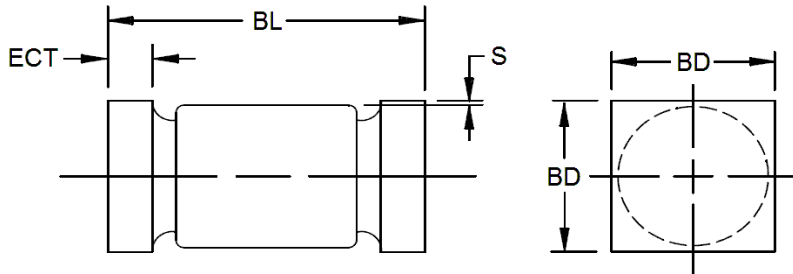


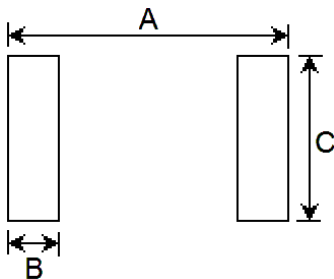
FIGURE 4
Typical Forward Voltage vs. Forward Current

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 Φx 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.