



VOIDLESS HERMETICALLY SEALED SWITCHING DIODES

Qualified per MIL-PRF-19500/578

Qualified Levels:
JAN, JANTX,
JANTXV and JANS

DESCRIPTION

This popular surface mount equivalent JEDEC registered switching/signal diodes are military qualified and available with internal metallurgical bonded construction. These small low capacitance diodes with very fast switching speeds are hermetically sealed and bonded into a "D-5D" package. They may be used in a variety of fast switching applications including computers and peripheral equipment such as magnetic cores, thin-film memories, plated-wire memories, as well as decoding or encoding applications, etc. Microsemi also offers a variety of other switching/signal diodes.

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

FEATURES

- JEDEC registered surface mount equivalents of 1N6638, 1N6642, and 1N6643.
- Ultra fast recovery time.
- Very low capacitance.
- Metallurgically bonded.
- Non-cavity glass package.
- JAN, JANTX, JANTXV and JANS qualifications are available per MIL-PRF-19500/578.
- Replacements for 1N4148UR, 1N4148UR-1, 1N4150UR-1, and 1N914UR.
- RoHS compliant devices available (commercial grade only).

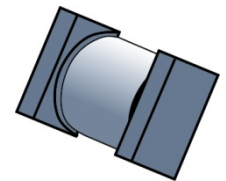
APPLICATIONS / BENEFITS

- Small size for high density mounting (see package illustration).
- Ideal for:
 - High frequency data lines
 - RS-232 & RS-422 Interface Networks
 - Ethernet: 10 Base T
 - Switching core drivers
 - LAN
 - Computers

MAXIMUM RATINGS @ T_A = +25 °C unless otherwise noted.

| Parameters/Test Conditions | Symbol | Value | Unit |
|---|-------------------------------------|-------------|------|
| Junction and Storage Temp | T _J and T _{STG} | -65 to +175 | °C |
| Thermal Resistance Junction-to-End Cap | R _{θJEC} | 40 | °C/W |
| Thermal Resistance Junction-to-Ambient ⁽¹⁾ | R _{θJA} | 250 | °C/W |
| Peak Forward Surge Current @ T _A = +25 °C (Test pulse = 8.3 ms, half-sine wave.) | I _{FSM} | 2.5 | A |
| Average Rectified Forward Current @ T _A = +75 °C (Derate at 4.6 mA/°C Above T _{EC} = + 110 °C) | I _O | 300 | mA |
| Breakdown Voltage: | | | |
| 1N6638US | V _{BR} | 150 | V |
| 1N6642US | | 100 | |
| 1N6643US | | 75 | |
| Working Peak Reverse Voltage: | | | |
| 1N6638US | V _{RWM} | 125 | V |
| 1N6642US | | 75 | |
| 1N6643US | | 50 | |

NOTES: 1. T_A = +75 °C on printed circuit board (PCB), PCB = FR4 - .0625 inch (1.59 mm) 1-layer 1-Oz Cu, horizontal, in still air; pads for US = .061 inch (1.55 mm) x .105 inch (2.67 mm); R_{θJA} with a defined PCB thermal resistance condition included, is measured at I_O = 300 mA.




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

Also available in:

"D" Package

(axial-leaded)

 [1N6638 42 43](#)

MSC – Lawrence

6 Lake Street,
Lawrence, MA 01841
1-800-446-1158
Tel: (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

MECHANICAL and PACKAGING

- CASE: Voidless hermetically sealed hard glass.
- TERMINALS: Tin-Lead plate with >3% Lead. Solder dip is available upon request.
- MARKING: Body painted and alpha numeric.
- POLARITY: Cathode indicated by band.
- Tape & Reel option: Standard per EIA-481-1-A with 12 mm tape. Consult factory for quantities.
- See [Package Dimensions](#) on last page.

PART NOMENCLATURE
JAN 1N6638 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

Surface Mount 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. |
| 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. |
| 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 is reached. |

ELECTRICAL CHARACTERISTICS @ 25°C unless otherwise noted.

| TYPE NUMBER | MAXIMUM FORWARD VOLTAGE $V_F @ I_F$ | | MAXIMUM DC REVERSE CURRENT | | | | REVERSE RECOVERY TIME t_{rr} (Note 1) | MAXIMUM FORWARD RECOVERY VOLTAGE AND TIME $I_F=200mA, t_r=1ns$ | | MAXIMUM JUNCTION CAPACITANCE $f = 1 MHz$ $V_{sig} = 50 mV$ (p-p) | |
|-------------|--|----------------|----------------------------|---------------|-----------------------------------|--------------------------------------|---|---|----------|---|-------------|
| | | | I_{R1} | I_{R2} | I_{R3} | I_{R4} | | V_{FRM} | t_{fr} | $V_R=0 V$ | $V_R=1.5 V$ |
| | | | $V_R=20 V$ | $V_R=V_{RWM}$ | $V_R=20 V$ $T_A=+150 ^\circ C$ | $V_R=V_{RWM}$ $T_A=+150 ^\circ C$ | | | | | |
| | V @ mA | V @ mA | nA | nA | μA | μA | ns | V | ns | pf | pf |
| 1N6638US | 0.8 V @ 10 mA | 1.1 V @ 200 mA | 35 | 500 | 50 | 100 | 4.5 | 5.0 | 20 | 2.5 | 2.0 |
| 1N6642US | 0.8 V @ 10 mA | 1.2 V @ 100 mA | 25 | 500 | 50 | 100 | 5.0 | 5.0 | 20 | 5.0 | 2.8 |
| 1N6643US | 0.8 V @ 10 mA | 1.2 V @ 100 mA | 50 | 500 | 75 | 100 | 6.0 | 5.0 | 20 | 5.0 | 2.8 |

NOTE: 1. Reverse Recovery Time Test Conditions – $I_F=I_R=10 mA$, $I_{R(REC)} = 1.0 mA$, $C=3 pF$, $R_L = 100 ohms$.

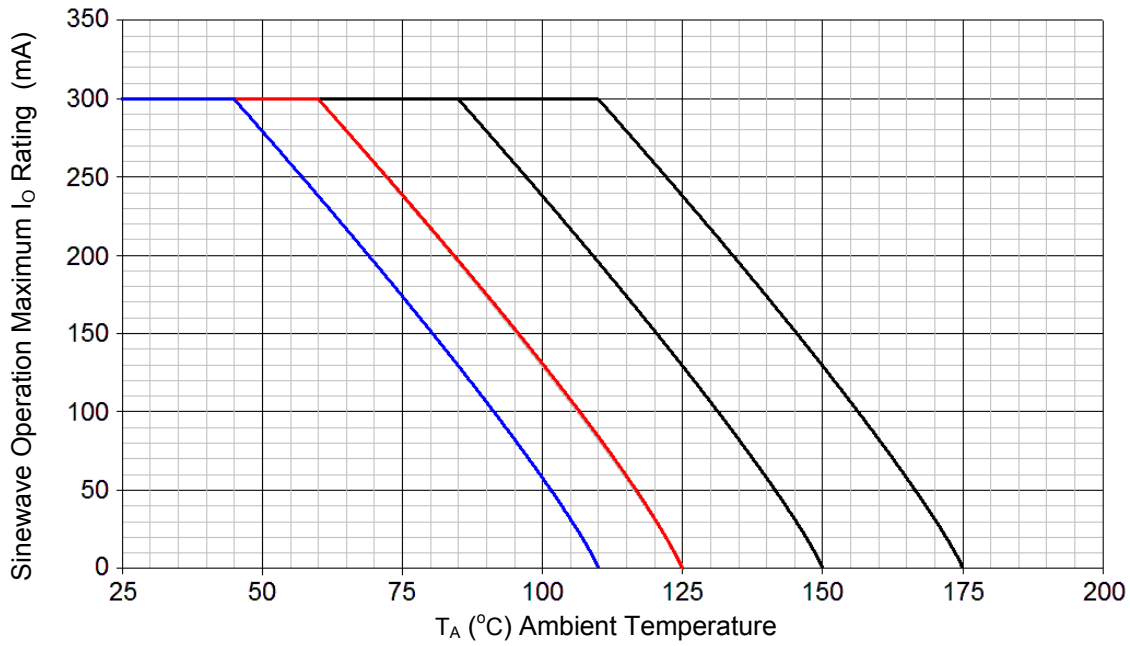
GRAPHS


FIGURE 1
Temperature - Current Derating

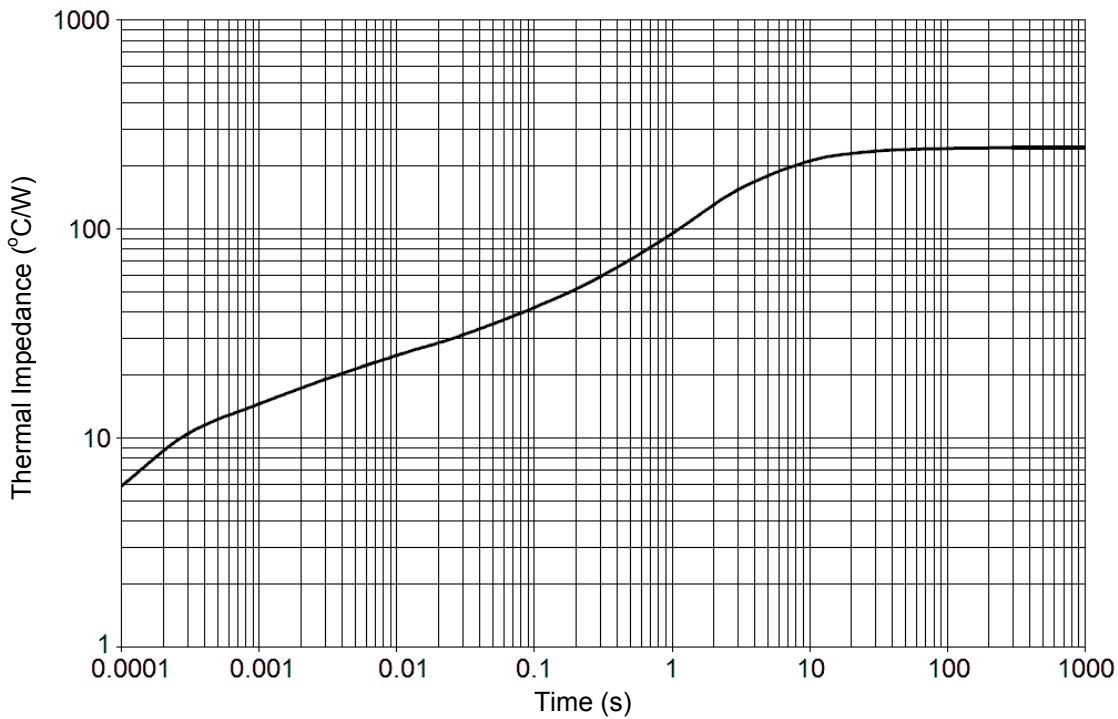


FIGURE 2
Maximum Thermal Impedance at $T_A = 55\text{ }^\circ\text{C}$

GRAPHS (continued)

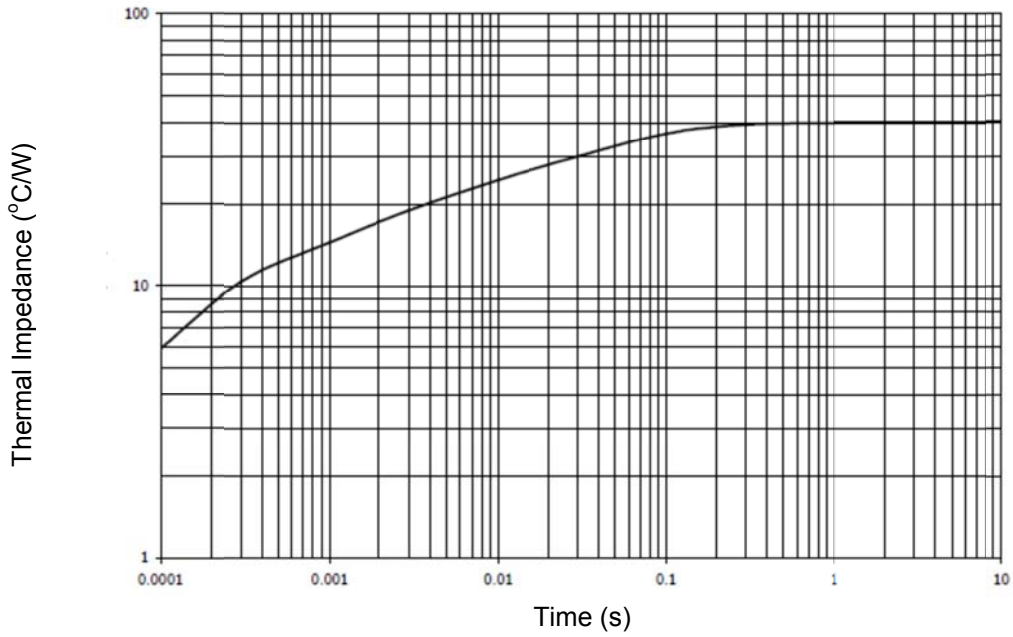
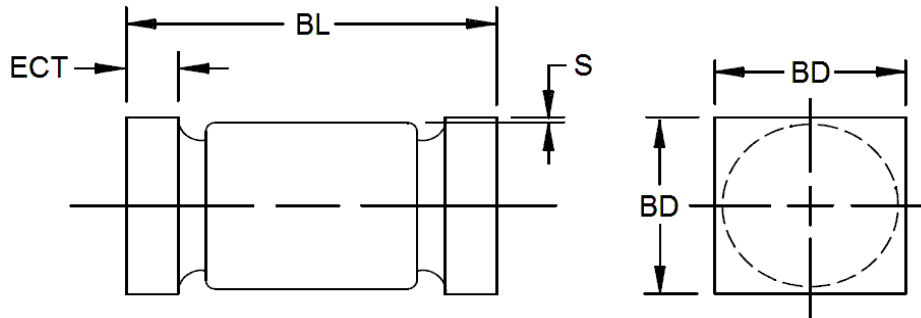


FIGURE 3
Maximum Thermal Impedance at $T_{EC} = 25\text{ }^{\circ}\text{C}$

PACKAGE DIMENSIONS
D-5D


| DIM | INCH | | MILLIMETERS | |
|------------|------------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| BD | 0.070 | 0.085 | 1.78 | 2.16 |
| ECT | 0.019 | 0.028 | 0.48 | 0.71 |
| BL | 0.165 | 0.195 | 4.19 | 4.95 |
| S | 0.003 MIN. | | 0.08 MIN. | |

NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. Dimensions are pre-solder dip.
3. U-suffix parts are structurally identical to the US-suffix parts.
4. In accordance with ASME Y14.5M, diameters are equivalent to Φ x symbology.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Microsemi:

[JANS1N6638U](#) [JANTX1N6643U](#) [JAN1N6638U](#) [JANTXV1N6638U](#) [JANTX1N6638US](#) [JAN1N6643US](#) [1N6643U](#)
[JANS1N6642U](#) [JANS1N6643U](#) [1N6638U](#) [JANTXV1N6643US](#) [JAN1N6642US](#) [1N6638US](#) [JANTX1N6638U](#)
[JANTXV1N6638US](#) [JANTX1N6642US](#) [JANTX1N6642U](#) [JANTXV1N6642U](#) [1N6643US](#) [JAN1N6638US](#)
[JANTXV1N6642US](#) [JAN1N6643U](#) [1N6642US](#)