RoHS
Available on commercial versions

VOIDLESS HERMETICALLY SEALED SWITCHING DIODES

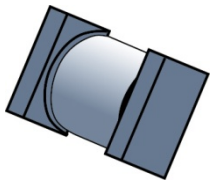
Qualified per MIL-PRF-19500/578

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.



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

Also available in:

"D" Package
(axial-leaded)
1N6638_42_43

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		$R_{\Theta JEC}$	40	°C/W
Thermal Resistance Junction-to-Ambient (1)		$R_{\Theta JA}$	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); $R_{\Theta JA}$ with a defined PCB thermal resistance condition included, is measured at I_O = 300 mA.

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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 Vsig = 50 mV (p-p)	
			I_{R1}	I_{R2}	I_{R3}	I_{R4}					
			V_R= 20 V	V_R=V_{RWM}	V_R=20 V T_A= +150 °C	V_R=V_{RWM} T_A= +150 °C		V_{FRM}	t_{fr}	V_R=0 V	V_R=1.5 V
	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.

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GRAPHS

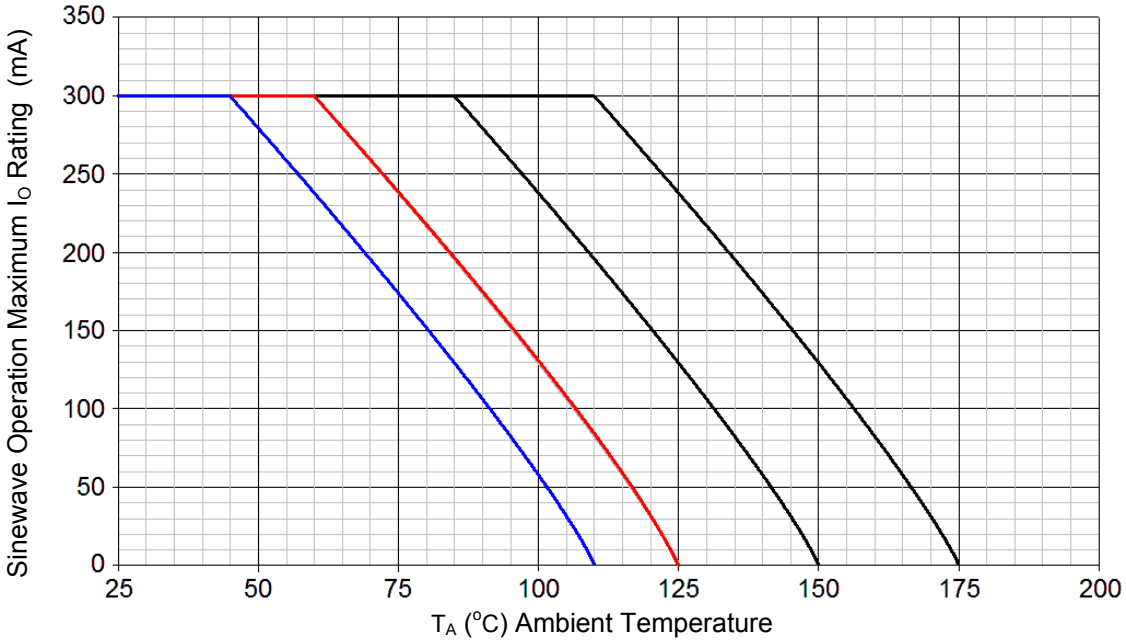

FIGURE 1
Temperature – Current Derating

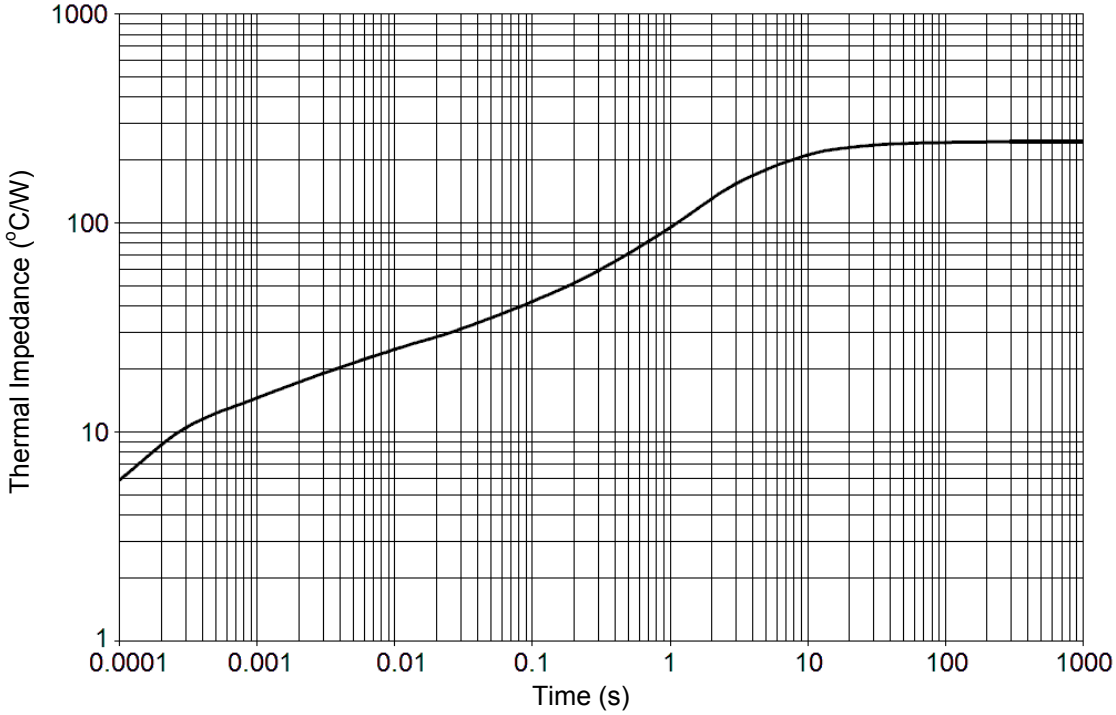

FIGURE 2
Maximum Thermal Impedance at T_A = 55 °C

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GRAPHS (continued)

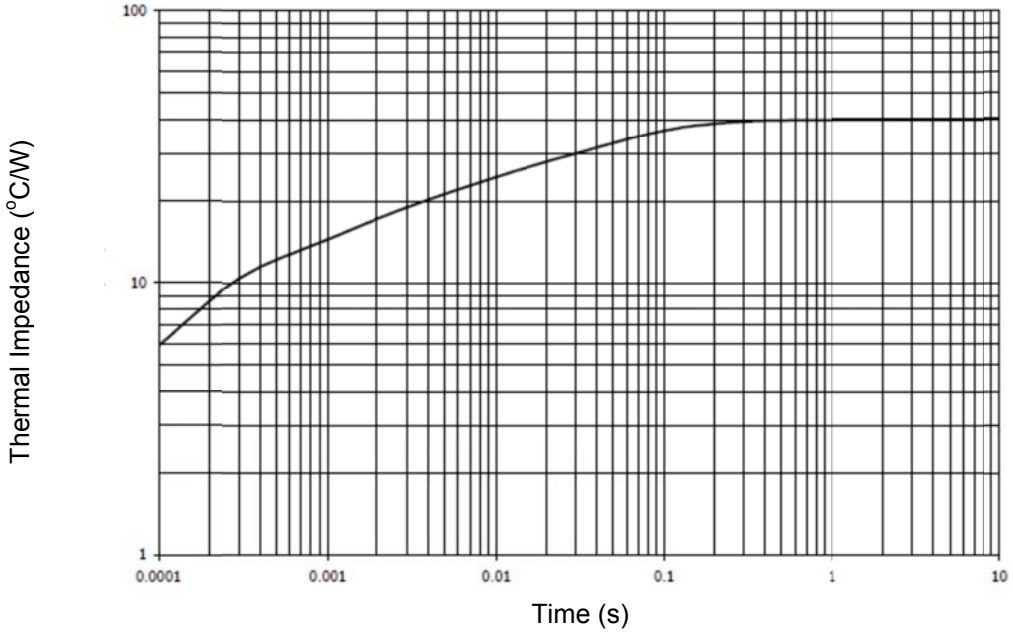

FIGURE 3
Maximum Thermal Impedance at T_{EC} = 25 °C

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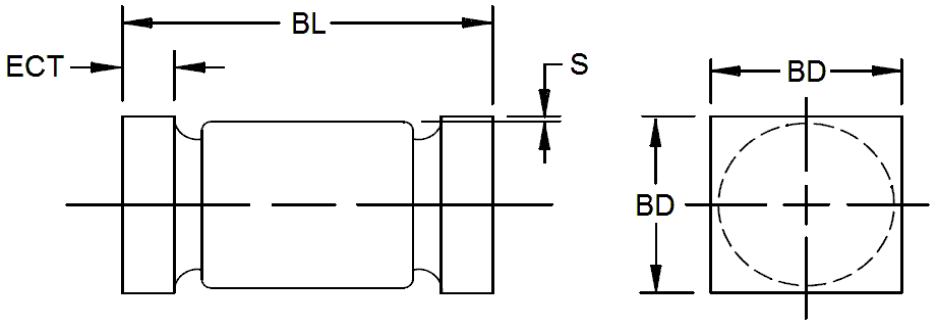
PACKAGE DIMENSIONS

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 Φx symbology.

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