RoHS

Available on commercial versions

VOIDLESS HERMETICALLY SEALED SWITCHING DIODES

Qualified per MIL-PRF-19500/578

Qualified Levels:
JAN, JANTX, JANTXV and JANS

DESCRIPTION

These popular 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" 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 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 1N4148, 1N4148-1, 1N4150, 1N4150-1, and 1N914.
- RoHS compliant devices available (commercial grade only).

APPLICATIONS / BENEFITS

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

"D" Package

Also available in:

"B" SQ MELF or D-5B Package
(surface mount)
1N6638US_42US_43US

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-Lead = 0.375 inch (1)		$R_{\Theta JL}$	150	°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 3.0 mA/°C above T_L = +75 °C @ L = 3/8")		I_O	300	mA
Breakdown Voltage:	1N6638	V_{BR}	150	V
	1N6642		100	
	1N6643		75	
Working Peak Reverse Voltage:	1N6638	V_{RWM}	125	V
	1N6642		75	
	1N6643		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 axial = .092 inch (2.34 mm) diameter, strip = .030 inch (0.76 mm) x 1 inch (25.4 mm) long, lead length L ≤ .187 inch (≤ 4.75 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-296. Consult factory for quantities.
- See Package Dimensions on last page.

PART NOMENCLATURE

JAN 1N6638 (e3)

Reliability Level
JAN = JAN Level
JANTX = JANTX Level
JANTXV = JANTXV Level
JANS = JANS Level
Blank = commercial

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

JEDEC type number
See Electrical Characteristics table

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_F	Forward Current: The forward current dc value, no alternating component.
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
1N6638	0.8 V @ 10 mA	1.1 V @ 200 mA	35	500	50	100	4.5	5.0	20	2.5	2.0
1N6642	0.8 V @ 10 mA	1.2 V @ 100 mA	25	500	50	100	5.0	5.0	20	5.0	2.8
1N6643	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

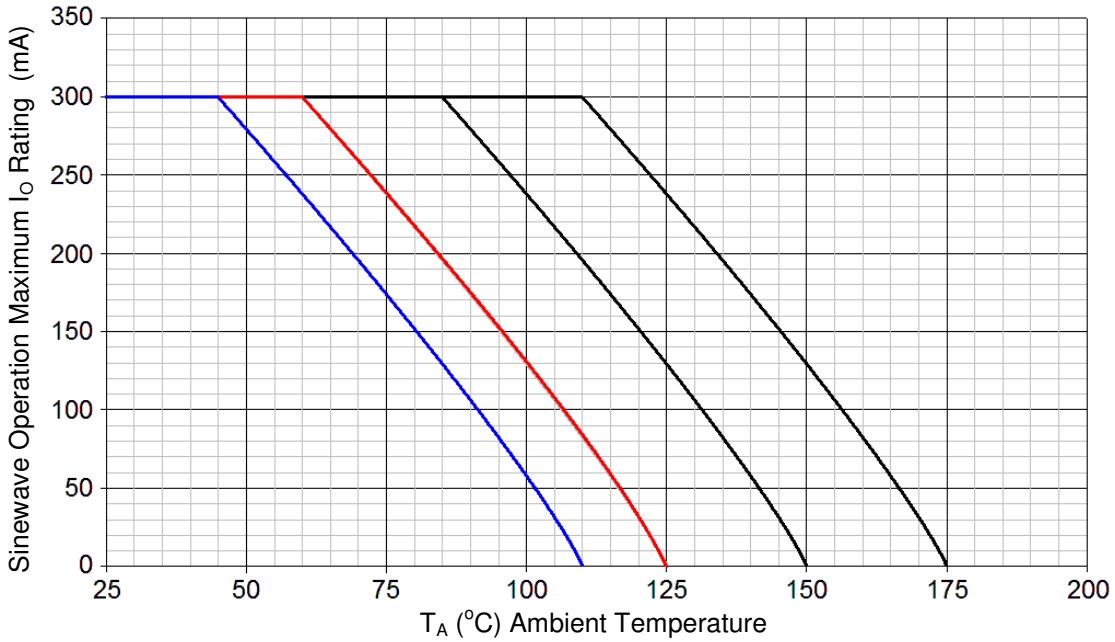


FIGURE 1
Temperature – Current Derating

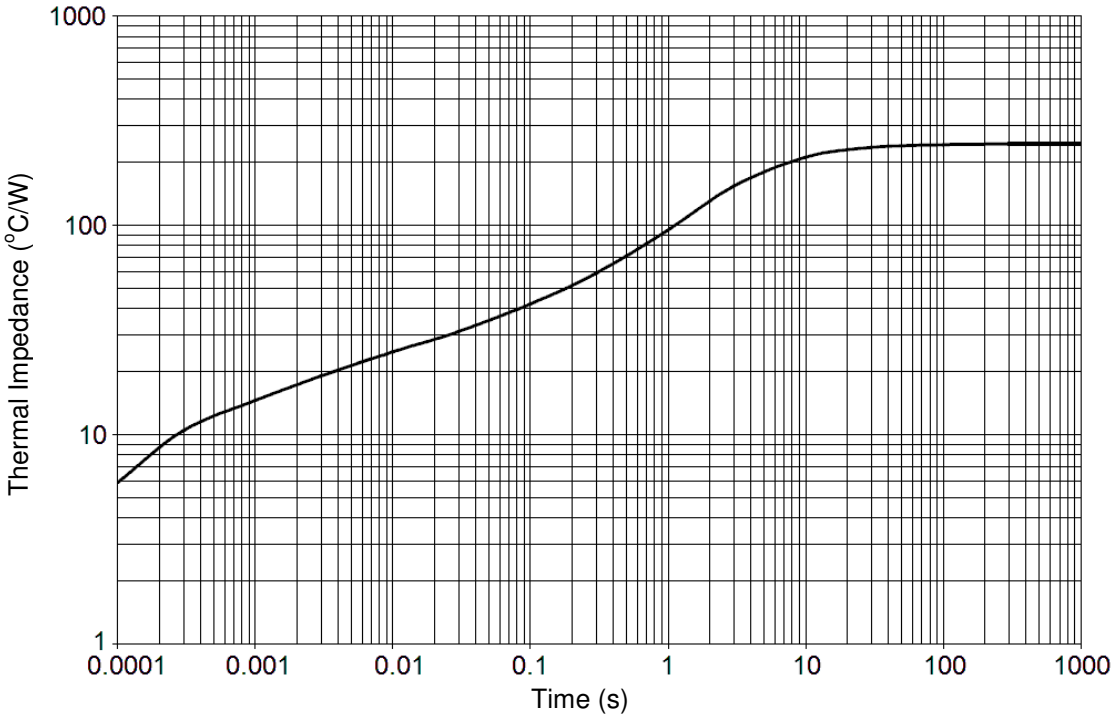


FIGURE 2
Maximum Thermal Impedance at T_A = 55 °C

GRAPHS (continued)

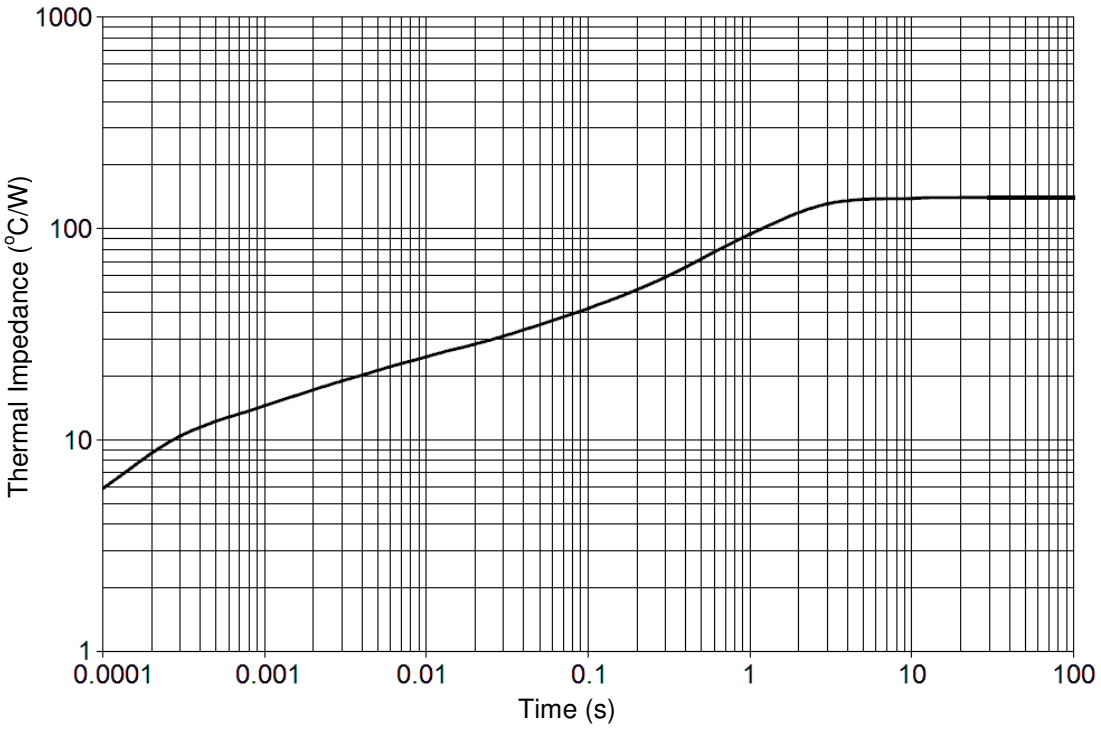
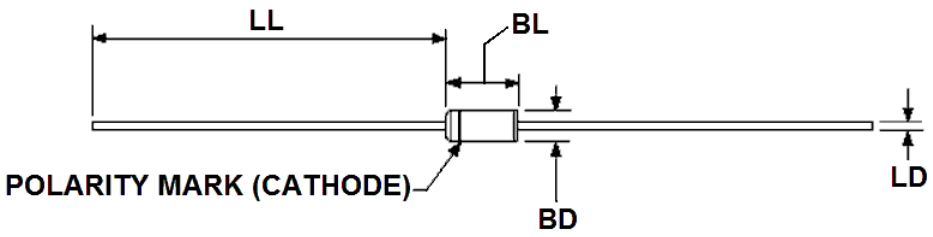


FIGURE 3

Maximum Thermal Impedance at T_L = 25 °C

PACKAGE DIMENSIONS



DIM	INCH		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
BD	0.056	0.080	1.42	2.03	2
BL	0.130	0.180	3.30	4.57	
LD	0.018	0.022	0.46	0.56	3
LL	1.00	1.50	25.40	38.10	

NOTES:

1. Dimensions are in inches. Millimeters are given for general information only.
2. Dimension BD shall be measured at the largest diameter.
3. The specified lead diameter applies in the zone between .050 inch (1.27 mm) from the diode body to the end of the lead. Outside of this zone lead shall not exceed BD.
4. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.