



# VOIDLESS HERMETICALLY SEALED SWITCHING DIODES

Qualified per MIL-PRF-19500/578

#### 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

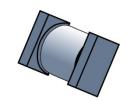
Computers

#### MAXIMUM RATINGS @ T<sub>A</sub> = +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	R <sub>ejec</sub>	40	°C/W	
Thermal Resistance Junction-to-Amb	R <sub>eja</sub>	250	°C/W	
Peak Forward Surge Current @ T <sub>A</sub> =	I <sub>FSM</sub>	2.5	А	
(Test pulse = 8.3 ms, half-sine wave.				
Average Rectified Forward Current @	lo	300	mA	
(Derate at 4.6 mA/°C Above $T_{EC}$ = +				
Breakdown Voltage: 1N6638US		V <sub>BR</sub>	150	V
	1N6642US		100	
	1N6643US		75	
Working Peak Reverse Voltage:	1N6638US	V <sub>RWM</sub>	125	V
	1N6642US		75	
	1N6643US		50	

**NOTES:** 1. T<sub>A</sub> = +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<sub>OJA</sub> with a defined PCB thermal resistance condition included, is measured at I<sub>o</sub> = 300 mA.

<u>Qualified Levels</u>: JAN, JANTX, JANTXV and JANS



### "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



**RoHS Compliance** 

e3 = RoHS compliant (available

on commercial grade only)

Surface Mount Package

Blank = non-RoHS compliant



#### **MECHANICAL and PACKAGING**

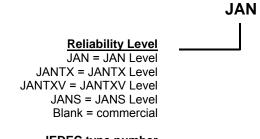
- CASE: Voidless hermetically sealed hard glass.
- TERMINALS: Tin-Lead plate with >3% Lead. Solder dip is available upon request.
- MARKING: Body painted and alpha numeric.
- POLARITY: Cathode indicated by band.
- Tape & Reel option: Standard per EIA-481-1-A with 12 mm tape. Consult factory for quantities.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

#### PART NOMENCLATURE

US

(e3)

1N6638



JEDEC type number

See <u>Electrical Characteristics</u> table

SYMBOLS & DEFINITIONS					
Symbol	Definition				
$V_{BR}$	Minimum Breakdown Voltage: The minimum voltage the device will exhibit at a specified current.				
V <sub>RWM</sub>	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 <sub>R</sub>	Maximum Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.				
С	Capacitance: The capacitance in pF at a frequency of 1 MHz and specified voltage.				
t <sub>rr</sub>	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.				

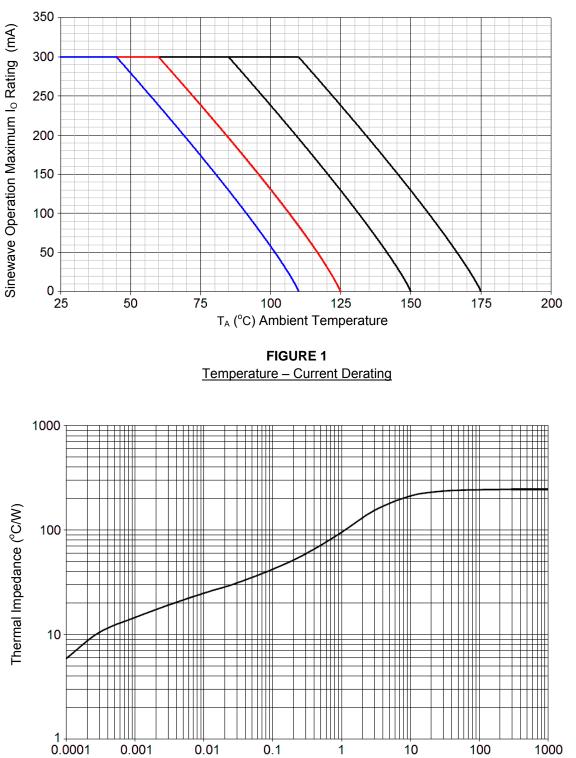
#### ELECTRICAL CHARACTERISTICS @ 25°C unless otherwise noted.

MAXIMUM        FORWARD        VOLTAGE        V <sub>F</sub> @ I <sub>F</sub> NUMBER		VARD	MAXIMUM DC REVERSE CURRENT			REVERSE RECOVERY TIME t <sub>rr</sub> (Note 1)	RECOVERY VOLTAGE AND TIME		MAXIMUM JUNCTION CAPACITANCE f = 1 MHz Vsig = 50 mV		
			Ι <sub>R1</sub> V <sub>R</sub> = 20 V	I <sub>R2</sub> V <sub>R</sub> =V <sub>RWM</sub>	I <sub>R3</sub> V <sub>R</sub> =20 V T <sub>A</sub> = +150 °C	I <sub>R4</sub> V <sub>R</sub> =V <sub>RWM</sub> T <sub>A</sub> = +150 °C	-	I <sub>F</sub> =200m/	A, t <sub>r</sub> =1ns t <sub>fr</sub>	(p V <sub>R</sub> =0 V	р-р) V <sub>R</sub> =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<sub>F</sub>=I<sub>R</sub>=10 mA, I<sub>R(REC)</sub> = 1.0 mA, C=3 pF, R<sub>L</sub> = 100 ohms.



GRAPHS



Time (s)

**FIGURE 2** <u>Maximum Thermal Impedance at  $T_A = 55 \degree C$ </u>



**GRAPHS** (continued)

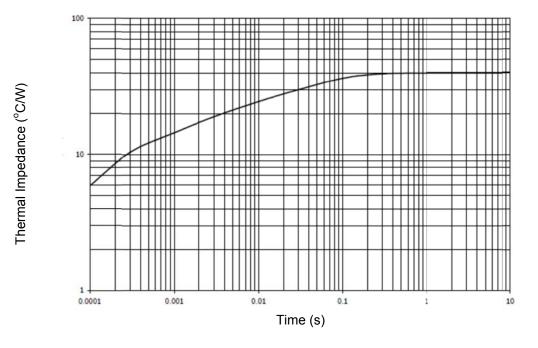


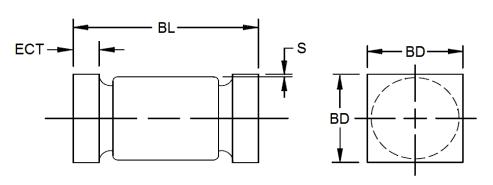
FIGURE 3 Maximum Thermal Impedance at T<sub>EC</sub> = 25 °C



# 1N6638US, 1N6642US, 1N6643US

#### PACKAGE DIMENSIONS





	IN	СН	MILLIMETERS			
DIM	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	3 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.

# **Mouser Electronics**

Authorized Distributor

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

Microchip:

JANS1N6638U JANTX1N6643U JAN1N6638U JANTXV1N6638U JANTX1N6638US JAN1N6643US 1N6643U JANS1N6642U JANS1N6643U 1N6638U JANTXV1N6643US 1N6642 JAN1N6642US 1N6638US JANTX1N6638U JANTXV1N6638US JANTX1N6642US JANTX1N6642U JANTXV1N6642U 1N6643US JAN1N6638US JANTXV1N6642US JAN1N6643U 1N6642US 1N6643 1N6638 1N6642USe3 1N6638US/TR 1N6642US/TR JANTXV1N6643US/TR