



## Glass MELF Switching Diode

Qualified per MIL-PRF-19500/116

Qualified Levels:  
JAN, JANTX, and  
JANTXV

### DESCRIPTION

This popular 1N4148UR-1 JEDEC registered switching/signal diode features internal metallurgical bonded construction for military grade products per MIL-PRF-19500/116. Previously listed as a CDLL4148 this small low capacitance diode, with very fast switching speeds, is hermetically sealed and bonded into a double-plug DO-213AA package. It may be used in a variety of very high speed applications including switchers, detectors, transient OR'ing, logic arrays, blocking, as well as low-capacitance steering diodes, etc. Microsemi also offers a variety of other switching/signal diodes.

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

### FEATURES

- Surface mount equivalent of popular JEDEC registered 1N4148 number.
- Hermetically sealed glass construction.
- Metallurgically bonded.
- Double plug construction.
- Very low capacitance.
- Very fast switching speeds with minimal reverse recovery times.
- JAN, JANTX, and JANTXV qualification is available per MIL-PRF-19500/116. (See [part nomenclature](#) for all available options.)
- RoHS compliant version available (commercial grade only).

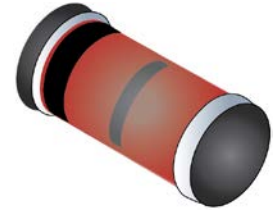
### APPLICATIONS / BENEFITS

- High frequency data lines.
- Small size for high density mounting using the surface mount method (see package illustration).
- RS-232 & RS-422 interface networks.
- Ethernet 10 Base T.
- Low capacitance steering or blocking.
- LAN.
- Computers.

### MAXIMUM RATINGS @ 25 °C


Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T <sub>J</sub> & T <sub>STG</sub>	-65 to +175	°C
Thermal Resistance Junction-to-Ambient <sup>(1)</sup>	R <sub>θJA</sub>	325	°C/W
Thermal Resistance Junction-to-Endcap <sup>(2)</sup>	R <sub>θJEC</sub>	100	°C/W
Maximum Breakdown Voltage	V <sub>(BR)</sub>	100	V
Working Peak Reverse Voltage	V <sub>RWM</sub>	75	V
Average Rectified Current @ T <sub>A</sub> = 75 °C <sup>(3)</sup>	I <sub>O</sub>	200	mA
Non-Repetitive Sinusoidal Surge Current (tp = 8.3 ms)	I <sub>FSM</sub>	2	A (pk)

- 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 = .061 inch (1.55 mm) x .105 inch (2.67 mm); R<sub>θJA</sub> with a defined PCB thermal resistance condition included, is measured at I<sub>O</sub> = 200 mA dc.
  2. See [Figure 2](#) for thermal impedance curves.
  3. See [Figure 1](#) for derating.




### DO-213AA Package

Also available in:

**DO-35 package**  
(axial-leaded)  
 [1N4148-1](#)

**UB package**  
(surface mount)  
 [1N4148UB](#)

**UB2 package**  
(2-Pin surface mount)  
 [1N4148UB2](#)

**UBC package**  
(Ceramic Lid surface mount)  
 [1N4148UBC](#)

#### MSC – Lawrence

6 Lake Street,  
Lawrence, MA 01841  
Tel: 1-800-446-1158 or  
(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](http://www.microsemi.com)

## MECHANICAL and PACKAGING

- CASE: Hermetically sealed glass case package.
- TERMINALS: Tin/lead plated or RoHS compliant matte-tin (on commercial grade only) over copper clad steel. Solderable per MIL-STD-750, method 2026.
- POLARITY: Cathode end is banded.
- MOUNTING: The axial coefficient of expansion (COE) of this device is approximately +6PPM/°C. The COE of the mounting surface system should be selected to provide a suitable match with this device.
- MARKING: Part number.
- TAPE & REEL option: Standard per EIA-296. Consult factory for quantities.
- WEIGHT: 0.2 grams.
- See [Package Dimensions](#) on last page.

## PART NOMENCLATURE

**JAN 1N4148 UR -1 (e3)**

**Reliability Level**

JAN = JAN level  
 JANTX = JANTX level  
 JANTXV = JANTXV level  
 See **1N6642US** for JANS level  
 Blank = Commercial grade

**JEDEC type number**

(see [Electrical Characteristics](#) table)

**RoHS Compliance**

e3 = RoHS compliant (on commercial grade only)  
 Blank = non-RoHS compliant

**Metallurgically Bonded**

**MELF Surface Mount**

## SYMBOLS & DEFINITIONS

Symbol	Definition
$I_R$	Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.
$I_o$	Average Rectified Forward 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.
$t_{rr}$	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.
$V_F$	Forward Voltage: The forward voltage the device will exhibit at a specified current (typically shown as maximum value).
$V_R$	Reverse Voltage: The reverse voltage dc value, no alternating component.
$V_{RWM}$	Working Peak Reverse Voltage: The maximum peak voltage that can be applied over the operating temperature range excluding all transient voltages (ref JESD282-B). Also sometimes known as PIV.

## ELECTRICAL CHARACTERISTICS @ 25 °C unless otherwise noted

FORWARD VOLTAGE $V_{F1}$ @ $I_F=10$ mA	FORWARD VOLTAGE $V_{F2}$ @ $I_F=100$ mA	REVERSE RECOVERY TIME $t_{rr}$ (Note 1)	FORWARD RECOVERY TIME $t_{fr}$ (Note 2)	REVERSE CURRENT $I_{R1}$ @ 20 V	REVERSE CURRENT $I_{R2}$ @ 75 V	REVERSE CURRENT $I_{R3}$ @ 20 V $T_A=150^\circ\text{C}$	REVERSE CURRENT $I_{R4}$ @ 75 V $T_A=150^\circ\text{C}$	CAPACITANCE C (Note 3)	CAPACITANCE C (Note 4)
V	V	ns	ns	nA	$\mu\text{A}$	$\mu\text{A}$	$\mu\text{A}$	pF	pF
0.8	1.2	5	20	25	0.5	35	75	4.0	2.8

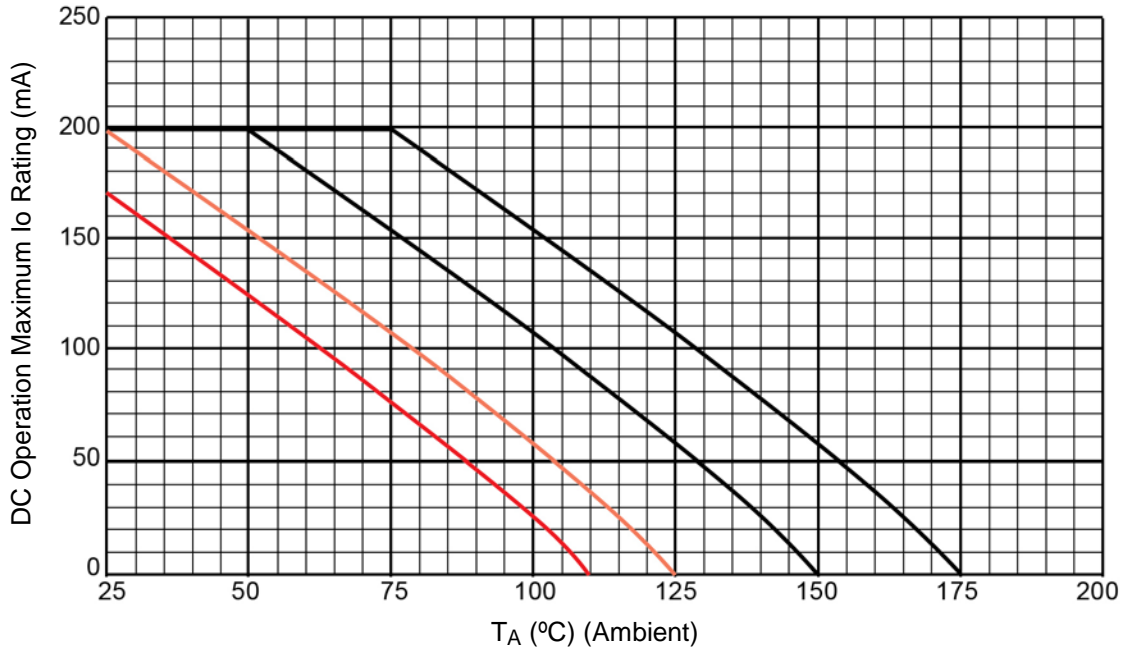
**NOTE 1:**  $I_F = I_R = 10$  mA,  $R_L = 100$  Ohms.

**NOTE 2:**  $I_F = 50$  mA.

**NOTE 3:**  $V_R = 0$  V,  $f = 1$  MHz,  $V_{SIG} = 50$  mV (pk to pk).

**NOTE 4:**  $V_R = 1.5$  V,  $f = 1$  MHz,  $V_{SIG} = 50$  mV (pk to pk).

**GRAPHS**



**FIGURE 1 – Temperature – Current Derating**



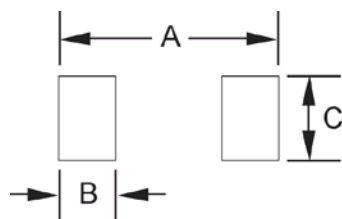
**FIGURE 2 – Thermal Impedance**

**PACKAGE DIMENSIONS**


DIM	INCH		MILLIMETERS	
	MIN	MAX	MIN	MAX
<b>BD</b>	0.063	0.067	1.60	1.70
<b>BL</b>	0.130	0.146	3.30	3.71
<b>ECT</b>	0.016	0.022	0.41	0.56
<b>S</b>	.001 min		0.03 min	

**NOTES:**

1. Dimensions are in inches. Millimeters are given for general information only.
2. Dimensions are pre-solder dip.
3. Referencing to dimension S, minimum clearance of glass body to mounting surface on all orientations.
4. In accordance with ASME Y14.5M, diameters are equivalent to  $\Phi$ x symbology.

**PAD LAYOUT**


	INCH	mm
<b>A</b>	.200	5.08
<b>B</b>	.055	1.40
<b>C</b>	.080	2.03