



Glass MELF Switching Diode

Qualified per MIL-PRF-19500/116

<u>Qualified Levels:</u> 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 <u>part nomenclature</u> 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 _J & T _{STG}	-65 to +175	°C
Thermal Resistance Junction-to-Ambient (1)	$R_{\Theta JA}$	325	°C/W
Thermal Resistance Junction-to-Endcap (2)	R _{OJEC}	100	°C/W
Maximum Breakdown Voltage	V _(BR)	100	V
Working Peak Reverse Voltage	V_{RWM}	75	V
Average Rectified Current @ T _A = 75 °C (3)	Io	200	mA
Non-Repetitive Sinusoidal Surge Current (tp = 8.3 ms)	I _{FSM}	2	A (pk)

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 = .061 inch (1.55 mm) x.105 inch (2.67 mm); R_{eJA} with a defined PCB thermal resistance condition included, is measured at I_O = 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

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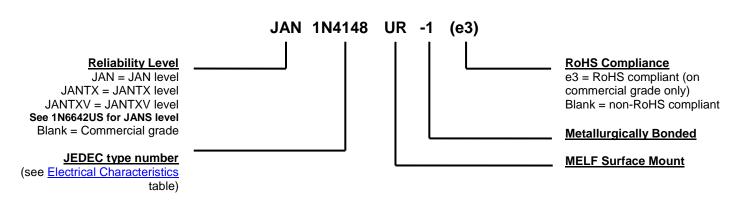
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MECHANICAL and PACKAGING

- 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 <u>Package Dimensions</u> on last page.

PART NOMENCLATURE



SYMBOLS & DEFINITIONS				
Symbol	Definition			
I _R	Reverse Current: The maximum reverse (leakage) current that will flow at the specified voltage and temperature.			
lo	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	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°C	REVERSE CURRENT I _{R4} @ 75 V T _A =150°C	CAPACI- TANCE C (Note 3)	CAPACI- TANCE C (Note 4)
V	٧	ns	ns	nA	μΑ	μΑ	μΑ	рF	pF
0.8	1.2	5	20	25	0.5	35	75	4.0	2.8

NOTE 1: $I_F = I_R = 10 \text{ mA}, R_L = 100 \text{ Ohms}.$

NOTE 2: $I_F = 50 \text{ mA}.$

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

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



GRAPHS

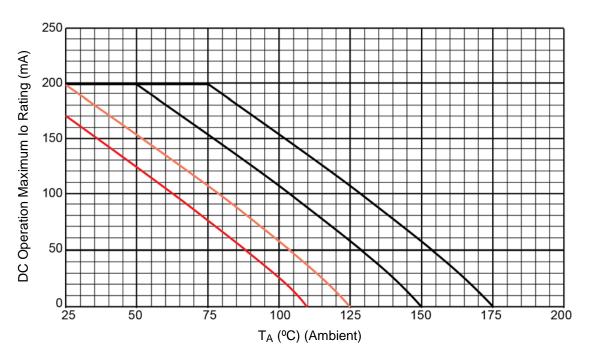


FIGURE 1 - Temperature - Current Derating

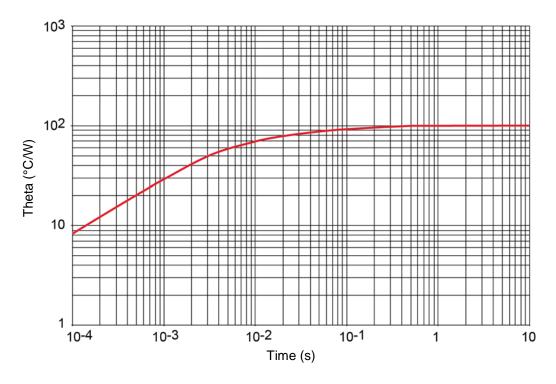
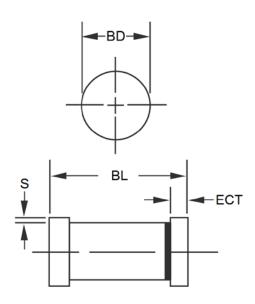


FIGURE 2 - Thermal Impedance



PACKAGE DIMENSIONS

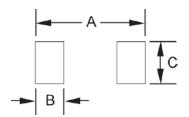


DIM	INC	CH	MILLIMETERS		
DIIVI	MIN	MAX	MIN	MAX	
BD	0.063	0.067	1.60	1.70	
BL	0.130	0.146	3.30	3.71	
ECT	0.016	0.022	0.41	0.56	
S	.001 min		0.03 min		

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 Φx symbology.

PAD LAYOUT



	INCH	mm
Α	.200	5.08
В	.055	1.40
С	.080	2.03