



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).

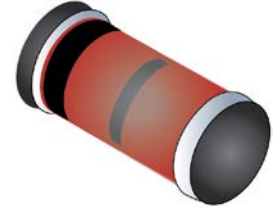
APPLICATIONS / BENEFITS

- 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 _J & T _{STG} | -65 to +175 | °C |
| Thermal Resistance Junction-to-Ambient ⁽¹⁾ | R _{θJA} | 325 | °C/W |
| Thermal Resistance Junction-to-Endcap ⁽²⁾ | R _{θJEC} | 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⁾ | I _O | 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_{θJA} 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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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 | μA | μA | μA | 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

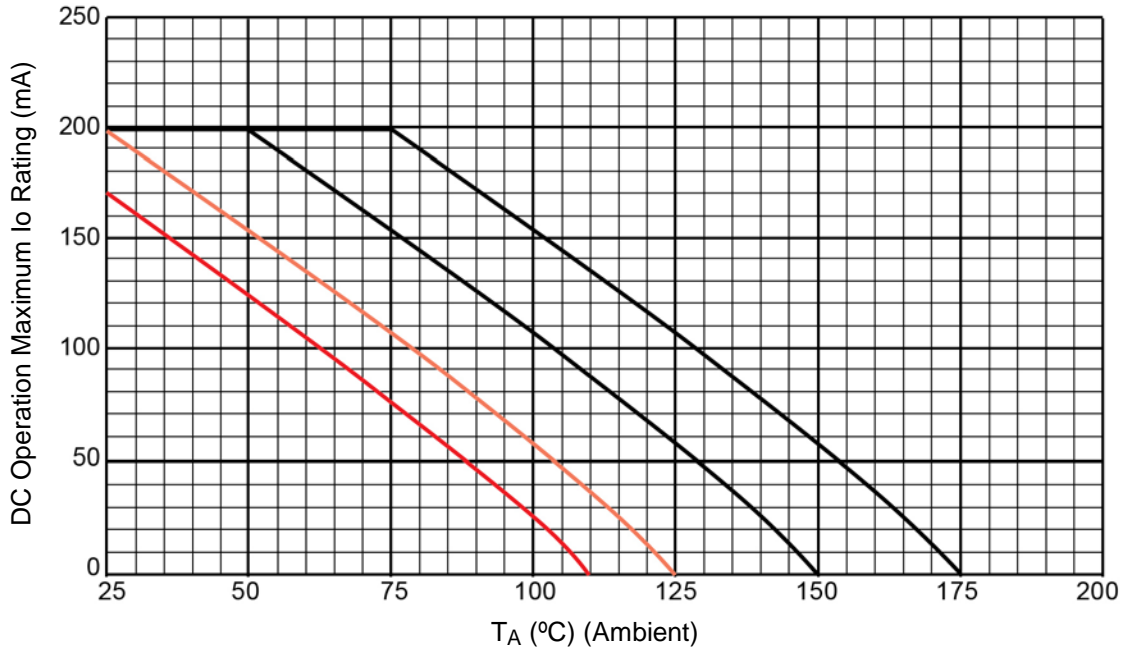


FIGURE 1 – Temperature – Current Derating



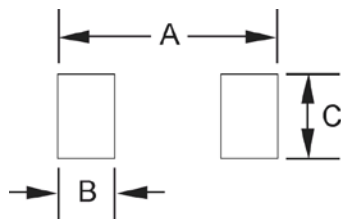
FIGURE 2 – Thermal Impedance

PACKAGE DIMENSIONS


| DIM | INCH | | MILLIMETERS | |
|------------|----------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| 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 Φ x symbology.

PAD LAYOUT


| | INCH | mm |
|----------|------|------|
| A | .200 | 5.08 |
| B | .055 | 1.40 |
| C | .080 | 2.03 |