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RoHS

Available on commercial versions

Glass Axial Switching Diode

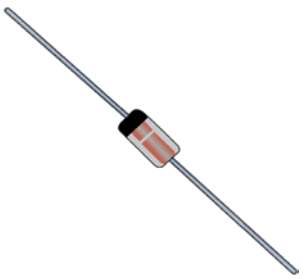
Qualified per MIL-PRF-19500/116

Qualified Levels:
JAN, JANTX, and JANTXV

DESCRIPTION

This popular 1N4148-1 JEDEC registered switching/signal diode features internal metallurgical bonded construction for military grade products per MIL-PRF-19500/116. This small low capacitance diode, with very fast switching speeds, is hermetically sealed and bonded into a double-plug DO-35 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.



DO-35 (DO-204AH) Package

Also available in:

DO-213AA package
(surface mount)
1N4148UR-1

UB package
(surface mount)
1N4148UB

UB2 package
(2-Pin surface mount)
1N4148UB2

UBC package
(Ceramic Lid surface mount)
1N4148UBC

FEATURES

- 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 qualifications are available per MIL-PRF-19500/116.
- MSP screening is also available in reference to MIL-PRF-19500 (JANS). (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 flexible thru-hole leads (see package illustration).
- RS-232 & RS–422 interface networks.
- Ethernet 10 base T.
- Low capacitance steering or blocking.
- LAN.
- Computers.

MAXIMUM RATINGS @ 25 ºC unless otherwise stated

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T_J & T_{STG}	-65 to +175	°C
Thermal Resistance Junction-to-Lead (1)	$R_{\Theta JL}$	250	°C/W
Thermal Resistance Junction-to-Ambient (2)	$R_{\Theta JA}$	325	°C/W
Maximum Breakdown Voltage	$V_{(BR)}$	100	V
Working Peak Reverse Voltage	V_{RWM}	75	V
Average Rectified Current @ T_A = 75 ºC (3)	I_O	200	mA
Non-Repetitive Sinusoidal Surge Current (tp = 8.3 ms)	I_{FSM}	2	A (pk)

NOTES: 1. Lead length = .375 inch (9.35 mm). See Figure 2 for thermal impedance curves.
2. 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 ≤ 0.187 inch (≤ 4.75 mm); $R_{\Theta JA}$ with a defined PCB thermal resistance condition included, is measured at I_O = 200 mA.
3. See Figure 1 for derating.

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MECHANICAL and PACKAGING

- CASE: Hermetically sealed glass 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 indicated by band.
- 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 -1 (e3)

Reliability Level
JAN = JAN level
JANTX = JANTX level
JANTXV = JANTXV level
MSP (reference JANS)
See 1N6642 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

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°C	REVERSE CURRENT I_{R4} @ 75 V T_A=150°C	CAPACI-TANCE C (Note 3)	CAPACI-TANCE 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 = 1.5V, f = 1 MHz, V_{SIG} = 50 mV (pk to pk).

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GRAPHS

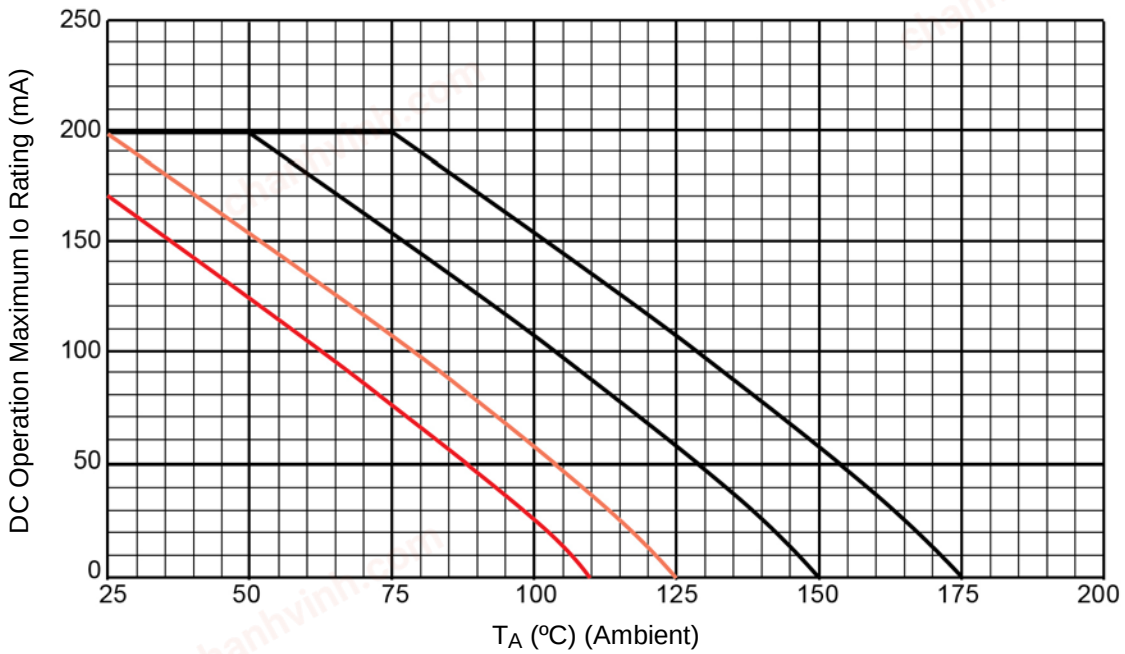

FIGURE 1 – Temperature – Current Derating

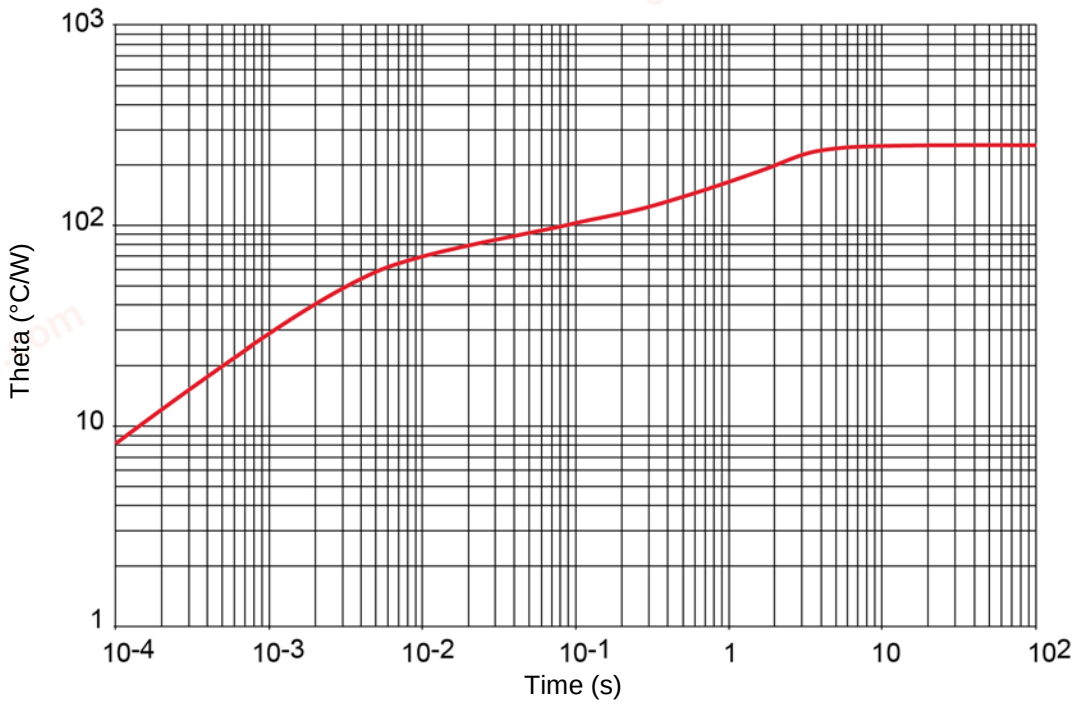

FIGURE 2 – Thermal Impedance

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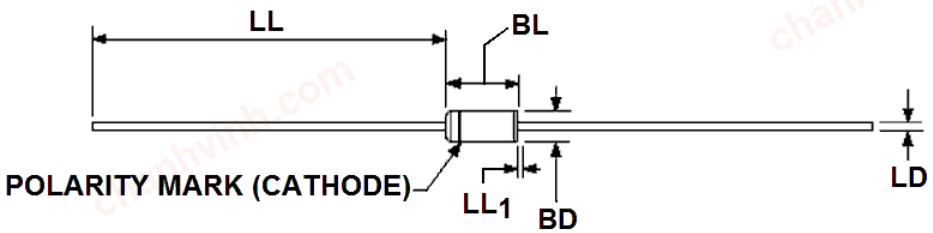
PACKAGE DIMENSIONS



Ltr	Dimensions				Notes
	Inch		Millimeters		
	Min	Max	Min	Max	
BD	.056	.075	1.42	1.91	3
BL	.140	.180	3.56	4.57	3
LD	.018	.022	0.46	0.56	
LL	1.000	1.500	25.40	38.10	
LL_1		.050		1.27	4

NOTES:

1. Dimensions are in inch.
2. Millimeters are given for general information only.
3. Package contour optional within BD and length BL. Heat slugs, if any, shall be included within this cylinder but shall not be subject to minimum limit of BD. The BL dimension shall include the entire body including slugs.
4. Within this zone lead, diameter may vary to allow for lead finishes and irregularities other than heat slugs.
5. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.

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