



## Switching Diode

Qualified per MIL-PRF-19500/116

Qualified Levels:  
JAN, JANTX, and  
JANTXV

### DESCRIPTION

This 1N4148UBC switching/signal diode features ceramic body with ceramic lid construction for military grade products per MIL-PRF-19500/116. This small low capacitance diode, with very fast switching speeds, is featured in a surface mount UBC package and is available in different polarities. 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.
- Very low capacitance.
- Very fast switching speeds with minimal reverse recovery times.
- Unidirectional as well as doubling and common cathode polarities are available.
- JAN, JANTX, and JANTXV qualification is available per MIL-PRF-19500/116.  
(See [part nomenclature](#) for all available options.)
- RoHS compliant by design.

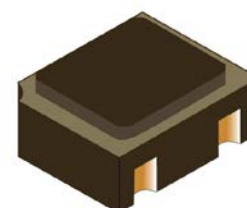
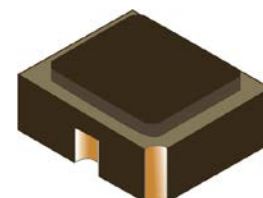
### APPLICATIONS / BENEFITS

- High frequency data lines.
- Low-profile ceramic bodied surface mount package with a ceramic lid (see package illustration).
- RS-232 & RS-422 interface networks.
- Ethernet 10 Base T.
- Switching core drivers.
- LAN.
- Computers.

### MAXIMUM RATINGS @ 25 °C

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	$T_J$ & $T_{STG}$	-65 to +200	°C
Thermal Resistance Junction-to-Ambient <sup>(1)</sup>	$R_{\theta JA}$	325	°C/W
Thermal Resistance Junction-to-Solder Pad <sup>(1)</sup>	$R_{\theta JSP}$	120	°C/W
Maximum Breakdown Voltage	$V_{(BR)}$	100	V
Working Peak Reverse Voltage	$V_{RWM}$	75	V
Average Rectified Current @ $T_A = 75$ °C <sup>(2)</sup>	$I_o$	200	mA
Non-Repetitive Sinusoidal Surge Current ( $t_p = 8.3$ ms)	$I_{FSM}$	2	A (pk)


**NOTES:** 1. See [Figure 2](#) for thermal impedance curves.  
2. See [Figure 1](#) for derating.




### UBC Package

Also available in:


**UB package**  
(surface mount)

 [1N4148UB](#)


**UB2 package**  
(2-Pin surface mount)

 [1N4148UB2](#)

**DO-35 package**  
(axial-leaded)

 [1N4148-1](#)

**DO-213AA package**  
(MELF surface mount)

 [1N4148UR-1](#)

### 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

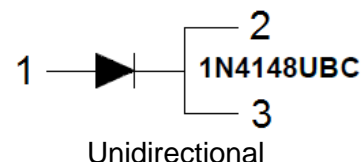
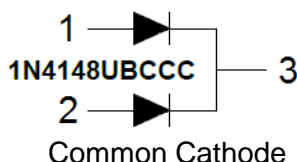
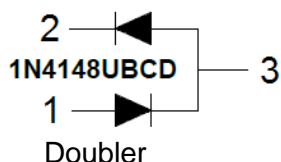
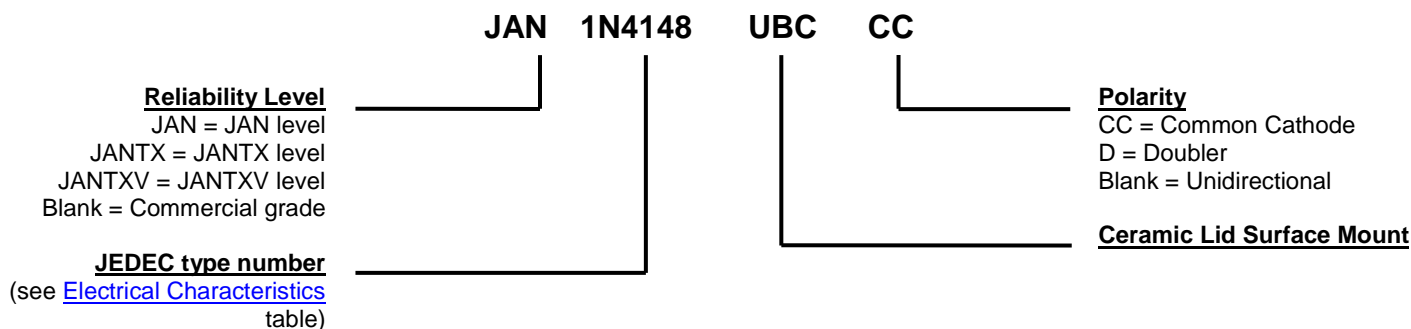
**Website:**

[www.microsemi.com](http://www.microsemi.com)

## MECHANICAL and PACKAGING

- CASE: Ceramic with a ceramic lid.
- TERMINALS: Gold plating over nickel under plate.
- MARKING: Part number, date code, manufacturer's ID.
- TAPE & REEL option: Standard per EIA-418D. Consult factory for quantities.
- WEIGHT: < 0.04 Grams.
- See [Package Dimensions](#) 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.
$I_O$	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 JEESD282-B). Also sometimes known as PIV.

**ELECTRICAL CHARACTERISTICS @ 25 °C unless otherwise noted**

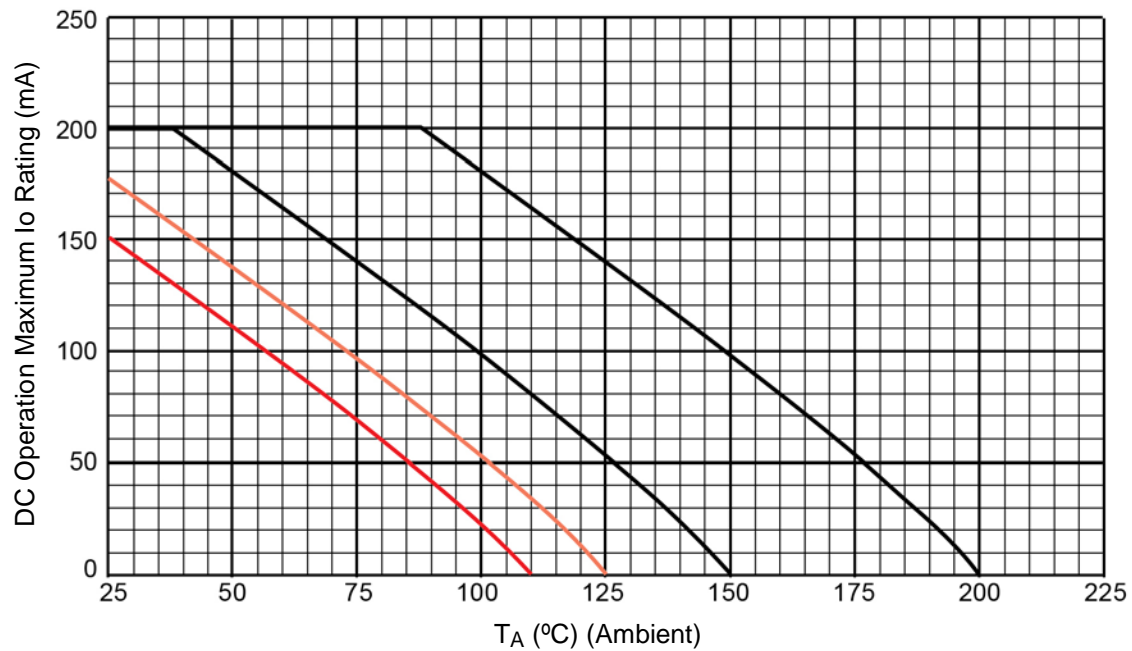
FORWARD VOLTAGE $V_{F1}$ @ $I_F=10\text{mA}$	FORWARD VOLTAGE $V_{F2}$ @ $I_F=100\text{mA}$	REVERSE RECOVERY TIME $t_{rr}$ (Note 1)	FORWARD RECOVERY TIME $t_{fr}$ (Note 2)	REVERSE CURRENT $I_{R1}$ @ 20 V	REVERSE CURRENT $I_{R2}$ @ 75 V	REVERSE CURRENT $I_{R3}$ @ 20 V $T_A=150^\circ\text{C}$	REVERSE CURRENT $I_{R4}$ @ 75 V $T_A=150^\circ\text{C}$	CAPACI- TANCE C (Note 3)	CAPACI- TANCE 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:**  $I_F = I_R = 10\text{ mA}$ ,  $R_L = 100\text{ Ohms} \pm 5\%$ .

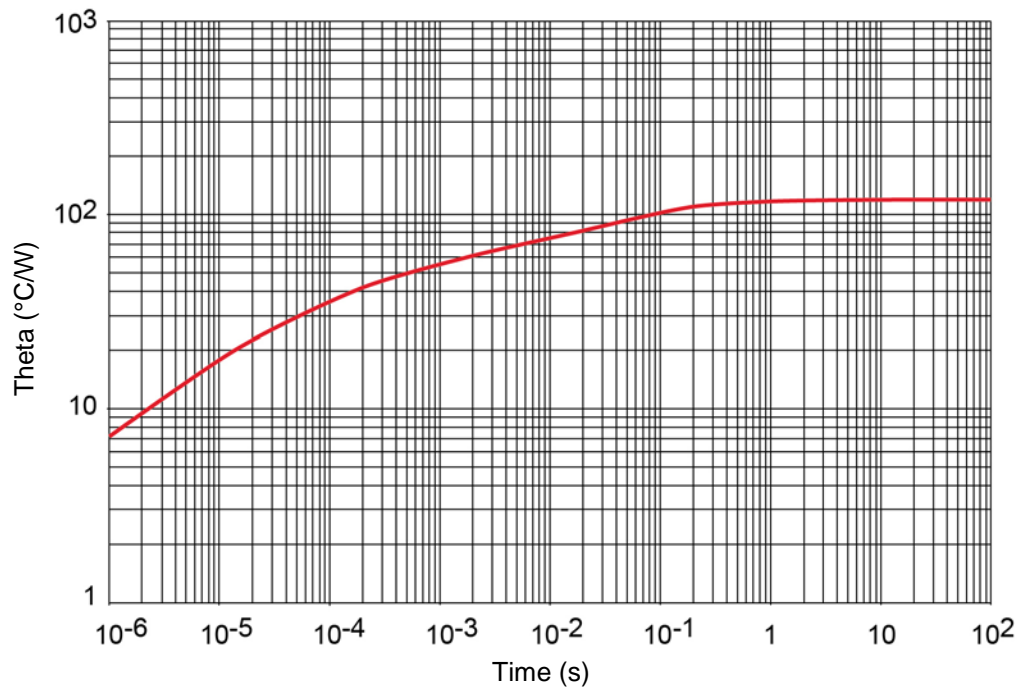
**NOTE 2:**  $I_F = 50\text{ mA}$ .

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

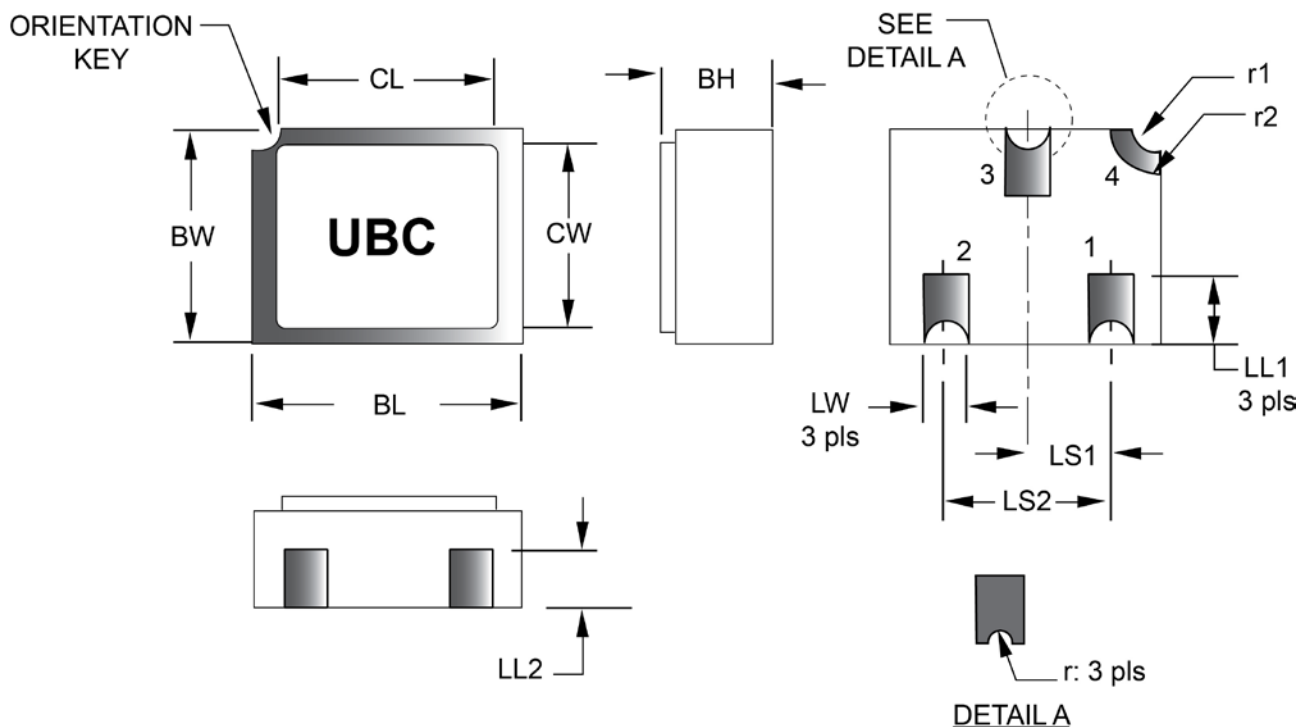
**NOTE 4:**  $V_R = 1.5\text{ V}$ ,  $f = 1\text{ MHz}$ ,  $V_{SIG} = 50\text{ mV}$  (pk to pk).

**GRAPHS**


**FIGURE 1 – Temperature – Current Derating**



**FIGURE 2 – Thermal Impedance**

**PACKAGE DIMENSIONS**


Symbol	Dimensions				Note	Symbol	Dimensions				Note
	inch		millimeters				inch		millimeters		
	Min	Max	Min	Max			Min	Max	Min	Max	
BH	.046	.071	1.17	1.80		LS1	.036	.040	.091	1.02	
BL	.115	.128	2.92	3.25		LS2	.071	.079	1.81	2.01	
BW	.085	.108	2.16	2.74		LW	.016	.024	0.41	0.61	
CL		.128		3.25		r		.008		0.203	
CW		.108		2.74		r1		.012		0.305	
LL1	.022	.038	0.56	0.96		r2		.022		0.559	
LL2	.017	.035	0.43	0.89							

**NOTES:**

1. Dimensions are in inches. Millimeters are given for general information only.
2. Ceramic package only.
3. Hatched areas on package denote metallized areas.
4. Pad 1 = Base, Pad 2 = Emitter, Pad 3 = Collector, Pad 4 = Shielding connected to the lid.
5. In accordance with ASME Y14.5M, diameters are equivalent to  $\Phi$ x symbology.