



## MILITARY DATA SHEET

**MNCD4001BM-X REV 0AL**

Original Creation Date: 10/05/95  
Last Update Date: 01/17/96  
Last Major Revision Date: 10/05/95

### QUAD 2-INPUT NOR BUFFERED B SERIES GATE

#### Industry Part Number

CD4001BM

#### Prime Die

CD4001BM

#### NS Part Numbers

CD4001BMJ/883  
CD4001BMW/883

#### Processing

MIL-STD-883, Method 5004

#### Quality Conformance Inspection

MIL-STD-883, Method 5005

#### Subgrp Description

#### Temp ( °C)

|    |                     |      |
|----|---------------------|------|
| 1  | Static tests at     | +25  |
| 2  | Static tests at     | +125 |
| 3  | Static tests at     | -55  |
| 4  | Dynamic tests at    | +25  |
| 5  | Dynamic tests at    | +125 |
| 6  | Dynamic tests at    | -55  |
| 7  | Functional tests at | +25  |
| 8A | Functional tests at | +125 |
| 8B | Functional tests at | -55  |
| 9  | Switching tests at  | +25  |
| 10 | Switching tests at  | +125 |
| 11 | Switching tests at  | -55  |

## Electrical Characteristics

## DC PARAMETERS

| SYMBOL  | PARAMETER                  | CONDITIONS                                   | NOTES | PIN-NAME | MIN   | MAX   | UNIT | SUB-GROUPS |
|---------|----------------------------|----------------------------------------------|-------|----------|-------|-------|------|------------|
| Vol     | Logical "0" Output Voltage | Vdd = 5V, Vih = 5V, Vil = 0V, Iout = 0uA     |       |          |       | .05   | V    | 1, 2, 3    |
|         |                            | Vdd = 10V, Vih = 10V, Vil = 0V, Iout = 0uA   |       |          |       | .05   | V    | 1, 2, 3    |
|         |                            | Vdd = 15V, Vih = 15V, Vil = 0V, Iout = 0uA   |       |          |       | .05   | V    | 1, 2, 3    |
| Voh     | Logical "1" Output Voltage | Vdd = 5V, Vih = 5V, Vil = 0V, Iout = 0uA     |       |          | 4.95  |       | V    | 1, 2, 3    |
|         |                            | Vdd = 10V, Vih = 10V, Vil = 0V, Iout = 0uA   |       |          | 9.95  |       | V    | 1, 2, 3    |
|         |                            | Vdd = 15V, Vih = 15V, Vil = 0V, Iout = 0uA   |       |          | 14.95 |       | V    | 1, 2, 3    |
| Iih     | Logical "1" Input Current  | Vdd = 15V, Vin = 15V (all inputs tied)       |       |          |       | 100   | nA   | 1, 3       |
|         |                            |                                              |       |          |       | 1000  | nA   | 2          |
| Iil     | Logical "0" Input Current  | Vdd = 15V, Vin = 0V (all inputs tied)        |       |          |       | -100  | nA   | 1, 3       |
|         |                            |                                              |       |          |       | -1000 | nA   | 2          |
| Isource | Output Source Current      | Vdd = 5V, Vih = 5V, Vil = 0V, Vout = 4.6V    |       |          | -510  |       | uA   | 1          |
|         |                            |                                              |       |          | -360  |       | uA   | 2          |
|         |                            |                                              |       |          | -640  |       | uA   | 3          |
|         |                            | Vdd = 10V, Vih = 10V, Vil = 0V, Vout = 9.5V  |       |          | -1.3  |       | mA   | 1          |
|         |                            |                                              |       |          | -.9   |       | mA   | 2          |
|         |                            |                                              |       |          | -1.6  |       | mA   | 3          |
|         |                            | Vdd = 15V, Vih = 15V, Vil = 0V, Vout = 13.5V | 3     |          | -3.4  |       | mA   | 1          |
|         |                            |                                              | 3     |          | -2.4  |       | mA   | 2          |
|         |                            |                                              | 3     |          | -4.2  |       | mA   | 3          |
| Isink   | Output Sink Current        | Vdd = 5V, Vih = 5V, Vil = 0V, Vout = .4V     |       |          | 510   |       | uA   | 1          |
|         |                            |                                              |       |          | 360   |       | uA   | 2          |
|         |                            |                                              |       |          | 640   |       | uA   | 3          |
|         |                            | Vdd = 10V, Vih = 10V, Vil = 0V, Vout = .5V   |       |          | 1.3   |       | mA   | 1          |
|         |                            |                                              |       |          | .9    |       | mA   | 2          |
|         |                            |                                              |       |          | 1.6   |       | mA   | 3          |
|         |                            | Vdd = 15V, Vih = 15V, Vil = 0V, Vout = 1.5V  | 3     |          | 3.4   |       | mA   | 1          |
|         |                            |                                              | 3     |          | 2.4   |       | mA   | 2          |
|         |                            |                                              | 3     |          | 4.2   |       | mA   | 3          |

**Electrical Characteristics****DC PARAMETERS (Continued)**

| SYMBOL | PARAMETER                 | CONDITIONS                      | NOTES | PIN-NAME | MIN | MAX | UNIT | SUB-GROUPS |
|--------|---------------------------|---------------------------------|-------|----------|-----|-----|------|------------|
| Icc    | Power Supply Current      | Vdd = 5V, Vih = 5V, Vil = 0V,   |       |          |     | .25 | uA   | 1, 3       |
|        |                           |                                 |       |          |     | 7.5 | uA   | 2          |
|        |                           | Vdd = 10V, Vih = 10V, Vil = 0V, |       |          |     | .5  | uA   | 1, 3       |
|        |                           |                                 |       |          |     | 15  | uA   | 2          |
|        |                           | Vdd = 15V, Vih = 15V, Vil = 0V, | 5     |          |     | 1   | uA   | 1, 3       |
|        |                           |                                 | 5     |          |     | 30  | uA   | 2          |
| Vih    | Logical "1" Input Voltage | Vdd = 5V, Vout = .5V            | 1     |          | 3.5 |     | V    | 1, 2, 3    |
|        |                           | Vdd = 10V, Vout = 1V            | 1     |          | 7   |     | V    | 1, 2, 3    |
|        |                           | Vdd = 15V, Vout = 1.5V          | 1     |          | 11  |     | V    | 1, 2, 3    |
| Vil    | Logical "0" Input Voltage | Vdd = 5V, Vout = 4.5V           | 1     |          |     | 1.5 | V    | 1, 2, 3    |
|        |                           | Vdd = 10V, Vout = 9V            | 1     |          |     | 3   | V    | 1, 2, 3    |
|        |                           | Vdd = 15V, Vout = 13.5V         | 1     |          |     | 4   | V    | 1, 2, 3    |

**DC RAD HARD STRESS TEST**

|     |                       |                      |  |  |  |       |    |   |
|-----|-----------------------|----------------------|--|--|--|-------|----|---|
| Iih | Input Leakage Current | Vdd = 15V, Vih = 15V |  |  |  | 1000  | nA | 2 |
| Iil | Input Leakage Current | Vdd = 15V, Vih = 0V  |  |  |  | -1000 | nA | 2 |
| Icc | Power Supply Current  | Vdd = 15V, Vih = 15V |  |  |  | 30    | uA | 2 |

## Electrical Characteristics

### AC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)

AC:  $t_r=t_f=20\text{nS}$ ,  $C_l = 50\text{pF}$ ,  $R_l = 200\text{K}$  or equivalent impedance provided by diode load.

| SYMBOL | PARAMETER              | CONDITIONS | NOTES | PIN-NAME | MIN | MAX | UNIT | SUB-GROUPS |
|--------|------------------------|------------|-------|----------|-----|-----|------|------------|
| tPHL   | Propagation Delay Time | Vdd = 5V   | 1, 4  |          |     | 250 | nS   | 9          |
|        |                        |            | 1, 4  |          |     | 350 | nS   | 10         |
|        |                        |            | 1, 4  |          |     | 200 | nS   | 11         |
|        |                        | Vdd = 10V  | 1, 2  |          |     | 100 | nS   | 9          |
|        |                        |            | 1, 2  |          |     | 140 | nS   | 10         |
|        |                        |            | 1, 2  |          |     | 80  | nS   | 11         |
|        |                        | Vdd = 15V  | 1, 2  |          |     | 70  | nS   | 9          |
|        |                        |            | 1, 2  |          |     | 100 | nS   | 10         |
|        |                        |            | 1, 2  |          |     | 55  | nS   | 11         |
| tPLH   | Propagation Delay Time | Vdd = 5V   | 1, 4  |          |     | 250 | nS   | 9          |
|        |                        |            | 1, 4  |          |     | 350 | nS   | 10         |
|        |                        |            | 1, 4  |          |     | 200 | nS   | 11         |
|        |                        | Vdd = 10V  | 1, 2  |          |     | 100 | nS   | 9          |
|        |                        |            | 1, 2  |          |     | 140 | nS   | 10         |
|        |                        |            | 1, 2  |          |     | 80  | nS   | 11         |
|        |                        | Vdd = 15V  | 1, 2  |          |     | 70  | nS   | 9          |
|        |                        |            | 1, 2  |          |     | 100 | nS   | 10         |
|        |                        |            | 1, 2  |          |     | 55  | nS   | 11         |
| tTHL   | Transition Time        | Vdd = 5V   | 1, 4  |          |     | 200 | nS   | 9          |
|        |                        |            | 1, 4  |          |     | 280 | nS   | 10         |
|        |                        |            | 1, 4  |          |     | 160 | nS   | 11         |
|        |                        | Vdd = 10V  | 1, 2  |          |     | 100 | nS   | 9          |
|        |                        |            | 1, 2  |          |     | 140 | nS   | 10         |
|        |                        |            | 1, 2  |          |     | 80  | nS   | 11         |
|        |                        | Vdd = 15V  | 1, 2  |          |     | 80  | nS   | 9          |
|        |                        |            | 1, 2  |          |     | 110 | nS   | 10         |
|        |                        |            | 1, 2  |          |     | 65  | nS   | 11         |

## Electrical Characteristics

### AC PARAMETERS (Continued)

(The following conditions apply to all the following parameters, unless otherwise specified.)

AC:  $t_r=t_f=20\text{nS}$ ,  $C_l = 50\text{pF}$ ,  $R_l = 200\text{K}$  or equivalent impedance provided by diode load.

| SYMBOL | PARAMETER                 | CONDITIONS | NOTES | PIN-NAME | MIN | MAX | UNIT | SUB-GROUPS |
|--------|---------------------------|------------|-------|----------|-----|-----|------|------------|
| tTLH   | Transition Time           | Vdd = 5V   | 1, 4  |          |     | 200 | nS   | 9          |
|        |                           |            | 1, 4  |          |     | 280 | nS   | 10         |
|        |                           |            | 1, 4  |          |     | 160 | nS   | 11         |
|        |                           | Vdd = 10V  | 1, 2  |          |     | 100 | nS   | 9          |
|        |                           |            | 1, 2  |          |     | 140 | nS   | 10         |
|        |                           |            | 1, 2  |          |     | 80  | nS   | 11         |
|        |                           | Vdd = 15V  | 1, 2  |          |     | 80  | nS   | 9          |
|        |                           |            | 1, 2  |          |     | 110 | nS   | 10         |
|        |                           |            | 1, 2  |          |     | 65  | nS   | 11         |
| Cin    | Average Input Capacitance | Any Input  | 2     |          |     | 7.5 | pF   | 9          |

Note 1: Parameter tested go-no-go only.

Note 2: Guaranteed parameter not tested.

Note 3:  $\pm 15\%$  of the reading, and also Applies to Class "S" only, except 38510.

Note 4: Tested at 25 C; guaranteed but not tested at +125 C and -55 C.

Note 5: Applies to Class "S" only, except 38510. Drift Limits at 25 C for  $I_{cc} = \pm 0.3\mu\text{A}$ . "THIS NOTE IS INVALID AND CURRENTLY BEING UPDATED. CONTACT FACTORY."