National Semiconductor

MICROCIRCUIT DATA SHEET

MNCD4071BM-X REV 1A0

Original Creation Date: 10/12/95
Last Update Date: 06/16/98
Last Major Revision Date: 03/05/98

QUAD 2-INPUT OR BUFFERED B SERIES GATE

General Description

These quad gates are monolithic complemenatary MOS (CMOS) integrated circuits constructed with N- and P-channel enhancement mode transitors. They have equal source and sink current capabilities and conform to standard B series output drive. The devices also have buffered outputs which improve transfer characteristics by providing very high gain.

All inputs protected against static discharge with diodes to Vdd and Vss.

Industry Part Number

CD4071BM

NS Part Numbers

CD4071BMJ/883
CD4071BMW/883

Prime Die

CD4071BM

Processing

MIL-STD-883, Method 5004

Quality Conformance Inspection

MIL-STD-883, Method 5005

Subgrp	Description	Temp (^{o}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

Features

- Low power TTL compatibility — Fan out of 2 driving 74L or 1 driving 74LS
- 5V-10V-15V parametric ratings
- Symmetrical output characteristics
- Maximum input leakage 1uA at 15V over full temperature range

(Absolute Maximum Ratings)

(Note 1, 2)

DC Supply Voltage (Vdd)	-0.5 to +18Vdc
Input Voltage (Vin)	-0.5 to Vdd +0.5Vdc
Storage Temperature Range (Ts)	-65 C to +150 C
Power Dissipation (Pd)	
Dual-In-Line	700mW
Small Outline	500mW
Lead Temperature (Tl) (Soldering, 10 seconds)	260 C

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply that the devices should be operated at these limits. The table of "Electrical Characteristics" provides conditions for actual device operation.

Note 2: All voltages measured with respect to Vss unless otherwise specified.

Recommended Operating Conditions

DC Supply Voltage (Vdd)	3V to 15Vdc
Input Voltage (Vin)	0V to Vdd Vdc
Operating Temperature Range (TA)	
CD4071BM	-55 C to +125 C

Electrical Characteristics

DC PARAMETERS

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Idd	Quiescent Device Current	Vcc = 5V				0.25	uA	1, 3
						7.5	uA	2
		Vcc = 10V				0.5	uA	1, 3
						15	uA	2
		Vcc = 15V				1	uA	1, 3
						30	uA	2
Vol	Logical "0" Output Voltage	Vcc = 5V, Iout < 1uA				0.05	V	1, 2, 3
		Vcc = 10V, Iout < 1uA				0.05	V	1, 2, 3
		Vcc = 15V, Iout < 1uA				0.05	V	1, 2, 3
Voh	Logical "1" Output Voltage	Vcc = 5V, Iout < 1uA			4.95		V	1, 2, 3
		Vcc = 10V, Iout < 1uA			9.95		V	1, 2, 3
		Vcc = 15V, Iout < 1uA			14.95		V	1, 2, 3
Iol	Logical "0" Output Current	Vcc = 5V, Vout = 0.4V			0.51		mA	1
					0.36		mA	2
					0.64		mA	3
		Vcc = 10V, Vout = 0.5V			1.3		mA	1
					0.9		mA	2
					1.6		mA	3
		Vcc = 15V, Vout = 1.5V			3.4		mA	1
					2.4		mA	2
					4.2		mA	3

Electrical Characteristics

DC PARAMETERS(Continued)

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Ioh	Logical "1" Output Current	Vcc = 5V, Vout = 4.6V			-0.51		mA	1
					-0.36		mA	2
					-0.64		mA	3
		Vcc = 10V, Vout = 9.5V			-1.3		mA	1
					-0.9		mA	2
					-1.6		mA	3
		Vcc = 15V, Vout = 13.5V			-3.4		mA	1
					-2.4		mA	2
					-4.2		mA	3
Iih	Logical "1" Input Current	Vcc = 15V, Vin = 15V				0.1	uA	1, 3
						1	uA	2
Iil	Logical "0" Input Current	Vcc = 15V, Vin = 0V				-0.1	uA	1, 3
						-1	uA	2
Vil	Logical "0" Input Voltage	Vcc = 5V, Vout = 0.5V	1			1.5	V	1, 2, 3
		Vcc = 10V, Vout = 1V	1			3	V	1, 2, 3
		Vcc = 15V, Vout = 1.5V	1			4	V	1, 2, 3
Vih	Logical "1" Input Voltage	Vcc = 5V, Vout = 4.5V	1		3.5		V	1, 2, 3
		Vcc = 10V, Vout = 9V	1		7		V	1, 2, 3
		Vcc = 15V, Vout = 13.5V	1		11		V	1, 2, 3

Electrical Characteristics

AC PARAMETERS

(The following conditions apply to all the following parameters, unless otherwise specified.)
AC: tr = tf = 20nS, Cl = 50pF, Rl = 20K Ohms or equivalent impedance provided by diode load.

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
tPHL	Propagation Delay Time:	Vdd = 5V	3			250	nS	9
			3			350	nS	10
			3			200	nS	11
		Vdd = 10V	2			100	nS	9
			2			140	nS	10
			2			80	nS	11
		Vdd = 15V	2			70	nS	9
			2			100	nS	10
			2			55	nS	11
tPLH	Propagation Delay Time:	Vdd = 5V	3			250	nS	9
			3			350	nS	10
			3			200	nS	11
		Vdd = 10V	2			100	nS	9
			2			140	nS	10
			2			80	nS	11
		Vdd = 15V	2			70	nS	9
			2			100	nS	10
			2			55	nS	11
tTHL	Transition Time	Vdd = 5V	3			200	nS	9
			3			300	nS	10, 11
		Vdd = 10V	2			100	nS	9
			2			150	nS	10, 11
		Vdd = 15V	2			80	nS	9
			2			120	nS	10, 11
tTLH	Transition Time	Vdd = 5V	3			200	nS	9
			3			300	nS	10, 11
		Vdd = 10V	2			100	nS	9
			2			150	nS	10, 11
		Vdd = 15V	2			80	nS	9
			2			120	nS	10, 11

Electrical Characteristics

AC PARAMETERS(Continued)

(The following conditions apply to all the following parameters, unless otherwise specified.)
AC: tr = tf = 20nS, Cl = 50pF, Rl = 20K Ohms or equivalent impedance provided by diode load.

SYMBOL	PARAMETER	CONDITIONS	NOTES	PIN-NAME	MIN	MAX	UNIT	SUB-GROUPS
Cin	Average Input Capacitance		2			7.5	pF	9

Note 1: Parameter tested go-no-go only.
Note 2: Guaranteed parameter not tested.
Note 3: Tested at 25 C; guaranteed but not tested at +125 C & -55 C.

Revision History

Rev	ECN #	Rel Date	Originator	Changes
1A0	M0000540	06/16/98	Linda Collins	Converted from RETS4071BX rev. 8A to MDS MNCD4071BM-X rev. 1A0. Deleted the DC Rad Hard stress tests and the Drift values.