



CD4071BM/CD4071BC Quad 2-Input OR Buffered B Series Gate **CD4081BM/CD4081BC Quad 2-Input AND Buffered B Series Gate**

General Description

These quad gates are monolithic complementary MOS (CMOS) integrated circuits constructed with N- and P-channel enhancement mode transistors. 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.

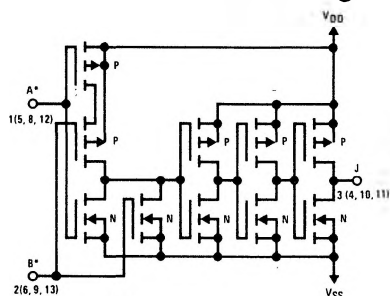
All inputs protected against static discharge with diodes to V_{DD} and V_{SS} .

Features

- Low power TTL compatibility
- 5 V-10-15 V parametric ratings
- Symmetrical output characteristics
- Maximum input leakage $1\mu A$ at 15 V over full temperature range

fan out of 2 driving 74L
or 1 driving 74LS

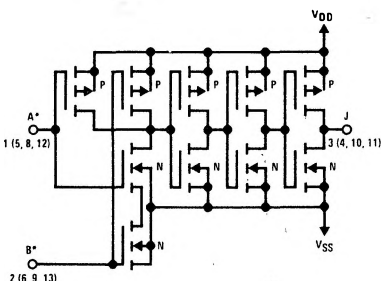
Schematic and Connection Diagrams



1/4 of device shown

$J = A + B$
Logical "1" = High
Logical "0" = Low

* All inputs protected by standard CMOS protection circuit

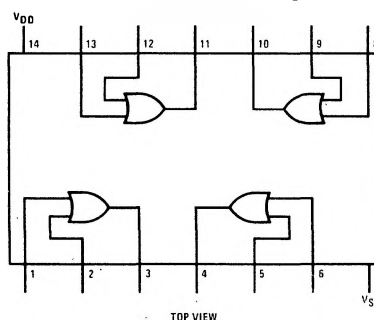


1/4 of device shown

$J = A \cdot B$
Logical "1" = High
Logical "0" = Low

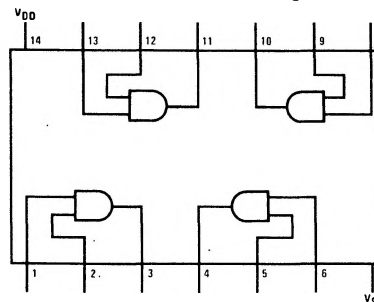
* All inputs protected by standard CMOS protection circuit.

CD4071B
Dual-In-Line and Flat Package



TOP VIEW

CD4081B
Dual-In-Line and Flat Package



TOP VIEW

Absolute Maximum Ratings

(Notes 1 and 2)

Voltage at Any Pin	-0.5V to $V_{DD} + 0.5V$
Package Dissipation	500 mW
V_{DD} Range	-0.5 V_{DC} to +18 V_{DC}
Storage Temperature	-65°C to +150°C
Lead Temperature (Soldering, 10 seconds)	300°C

Operating Conditions

Operating V_{DD} Range	3 V_{DC} to 15 V_{DC}
Operating Temperature Range	-55°C to +125°C
CD4071BM, CD4081BM	-55°C to +125°C
CD4071BC, CD4081BC	-40°C to +85°C

DC Electrical Characteristics — CD4071BM/CD4081BM (Note 2)

PARAMETER	CONDITIONS	-55°C		+25°C			+125°C		UNITS
		MIN	MAX	MIN	TYP	MAX	MIN	MAX	
I_{DD} Quiescent Device Current	$V_{DD} = 5V$		0.25		0.004	0.25		7.5	μA
	$V_{DD} = 10V$		0.50		0.005	0.50		15	μA
	$V_{DD} = 15V$		1.0		0.006	1.0		30	μA
V_{OL} Low Level Output Voltage	$V_{DD} = 5V$		0.05		0	0.05		0.05	V
	$V_{DD} = 10V$		0.05		0	0.05		0.05	V
	$V_{DD} = 15V$		0.05		0	0.05		0.05	V
V_{OH} High Level Output Voltage	$V_{DD} = 5V$	4.95		4.95	5		4.95		V
	$V_{DD} = 10V$	9.95		9.95	10		9.95		V
	$V_{DD} = 15V$	14.95		14.95	15		14.95		V
V_{IL} Low Level Input Voltage	$V_{DD} = 5V, V_O = 0.5V$		1.5		2	1.5		1.5	V
	$V_{DD} = 10V, V_O = 1.0V$		3.0		4	3.0		3.0	V
	$V_{DD} = 15V, V_O = 1.5V$		4.0		6	4.0		4.0	V
V_{IH} High Level Input Voltage	$V_{DD} = 5V, V_O = 4.5V$	3.5		3.5	3		3.5		V
	$V_{DD} = 10V, V_O = 9.0V$	7.0		7.0	6		7.0		V
	$V_{DD} = 15V, V_O = 13.5V$	11.0		11.0	9		11.0		V
I_{OL} Low Level Output Current	$V_{DD} = 5V, V_O = 0.4V$		0.64		0.51	0.88		0.36	mA
	$V_{DD} = 10V, V_O = 0.5V$		1.6		1.3	2.25		0.9	mA
	$V_{DD} = 15V, V_O = 1.5V$		4.2		3.4	8.8		2.4	mA
I_{OH} High Level Output Current	$V_{DD} = 5V, V_O = 4.6V$	-0.64		-0.51	-0.88		-0.36		mA
	$V_{DD} = 10V, V_O = 9.5V$	-1.6		-1.3	-2.25		-0.9		mA
	$V_{DD} = 15V, V_O = 13.5V$	-4.2		-3.4	-8.8		-2.4		mA
I_{IN} Input Current	$V_{DD} = 15V, V_{IN} = 0V$		-0.10		-10^{-5}	-0.10		-1.0	μA
	$V_{DD} = 15V, V_{IN} = 15V$		0.10		10^{-5}	0.10		1.0	μA

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 V_{SS} unless otherwise specified.

DC Electrical Characteristics

CD4071BC/CD4081BC (Note 2)

PARAMETER	CONDITIONS	-40°C		+25°C			+85°C		UNITS
		MIN	MAX	MIN	TYP	MAX	MIN	MAX	
I _{DD} Quiescent Device Current	V _{DD} = 5V		1		0.004	1		7.5	μA
	V _{DD} = 10V		2		0.005	2		15	μA
	V _{DD} = 15V		4		0.006	4		30	μA
V _{OL} Low Level Output Voltage	V _{DD} = 5V		0.05		0	0.05		0.05	V
	V _{DD} = 10V		0.05		0	0.05		0.05	V
	V _{DD} = 15V		0.05		0	0.05		0.05	V
V _{OH} High Level Output Voltage	V _{DD} = 5V	4.95		4.95	5		4.95		V
	V _{DD} = 10V	9.95		9.95	10		9.95		V
	V _{DD} = 15V	14.95		14.95	15		14.95		V
V _{IL} Low Level Input Voltage	V _{DD} = 5V, V _O = 0.5V		1.5		2	1.5		1.5	V
	V _{DD} = 10V, V _O = 1.0V		3.0		4	3.0		3.0	V
	V _{DD} = 15V, V _O = 1.5V		4.0		6	4.0		4.0	V
V _{IH} High Level Input Voltage	V _{DD} = 5V, V _O = 4.5V	3.5		3.5	3		3.5		V
	V _{DD} = 10V, V _O = 9.0V	7.0		7.0	6		7.0		V
	V _{DD} = 15V, V _O = 13.5V	11.0		11.0	9		11.0		V
I _{OL} Low Level Output Current	V _{DD} = 5V, V _O = 0.4V		0.52		0.44	0.88		0.36	mA
	V _{DD} = 10V, V _O = 0.5V		1.3		1.1	2.25		0.9	mA
	V _{DD} = 15V, V _O = 1.5V		3.6		3.0	8.8		2.4	mA
I _{OH} High Level Output Current	V _{DD} = 5V, V _O = 4.6V	-0.52		-0.44	-0.88		-0.36		mA
	V _{DD} = 10V, V _O = 9.5V	-1.3		-1.1	-2.25		-0.9		mA
	V _{DD} = 15V, V _O = 13.5V	-3.6		-3.0	-8.8		-2.4		mA
I _{IN} Input Current	V _{DD} = 15V, V _{IN} = 0V		-0.30		-10 ⁻⁵	-0.30		-1.0	μA
	V _{DD} = 15V, V _{IN} = 15V		0.30		10 ⁻⁵	0.30		1.0	μA

AC Electrical Characteristics

CD4071BC/CD4071BM

T_A = 25°C, Input t_r; t_f = 20 ns. C_L = 50 pF. R_L = 200KΩ Typical temperature coefficient is 0.3%/°C

PARAMETER	CONDITIONS	TYP	MAX	UNITS
t _{PHL} Propagation Delay Time, High-to-Low Level	V _{DD} = 5V	100	250	ns
	V _{DD} = 10V	40	100	ns
	V _{DD} = 15V	30	70	ns
t _{PLH} Propagation Delay Time, Low-to-High Level	V _{DD} = 5V	90	250	ns
	V _{DD} = 10V	40	100	ns
	V _{DD} = 15V	30	70	ns
t _{THL} , t _{TLH} Transition Time	V _{DD} = 5V	90	200	ns
	V _{DD} = 10V	50	100	ns
	V _{DD} = 15V	40	80	ns
C _{IN} Average Input Capacitance	Any Input	5	7.5	pF
CPD Power Dissipation Capacity	Any Gate	18		pF

AC Electrical Characteristics CD4081BC/CD4081BM

$T_A = 25^\circ\text{C}$, Input t_r ; $t_f = 20\text{ ns}$, $C_L = 50\text{ pF}$, $R_L = 200\text{ K}$ Typical temperature coefficient is $0.3\%/^\circ\text{C}$

PARAMETER		CONDITIONS	TYP	MAX	UNITS
t _{PHL}	Propagation Delay Time, High-to-Low Level	$V_{DD} = 5\text{ V}$	100	250	ns
		$V_{DD} = 10\text{ V}$	40	100	ns
		$V_{DD} = 15\text{ V}$	30	70	ns
t _{PLH}	Propagation Delay Time, Low-to-High Level	$V_{DD} = 5\text{ V}$	120	250	ns
		$V_{DD} = 10\text{ V}$	50	100	ns
		$V_{DD} = 15\text{ V}$	35	70	ns
t _{THL} , t _{TLH}	Transition Time	$V_{DD} = 5\text{ V}$	90	200	ns
		$V_{DD} = 10\text{ V}$	50	100	ns
		$V_{DD} = 15\text{ V}$	40	80	ns
C _{IN}	Average Input Capacitance	Any Input	5	7.5	pF
C _{PD}	Power Dissipation Capacity	Any Gate	18		pF

Typical Performance Characteristics

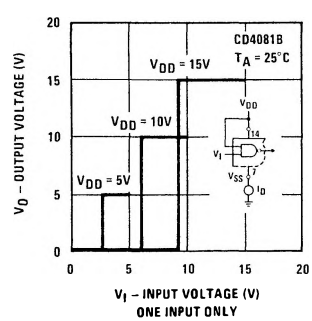


FIGURE 1. Typical Transfer Characteristics

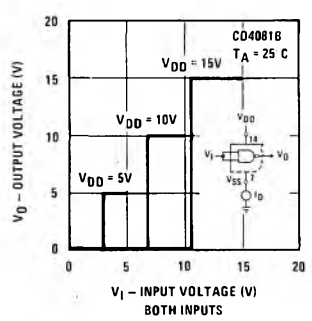


FIGURE 2. Typical Transfer Characteristics

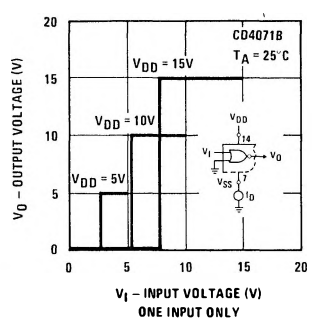


FIGURE 3. Typical Transfer Characteristics

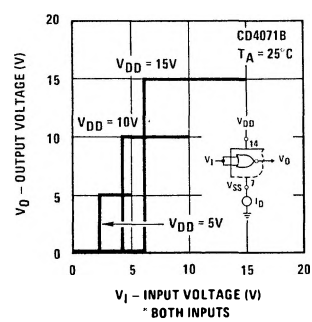


FIGURE 4. Typical Transfer Characteristics

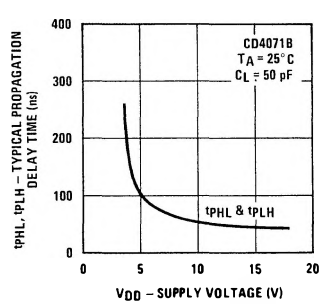


FIGURE 5

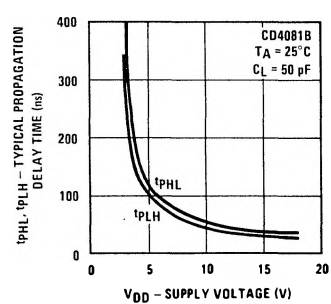


FIGURE 6

Typical Performance Characteristics (Cont'd.)

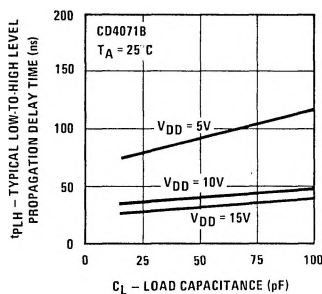


FIGURE 7

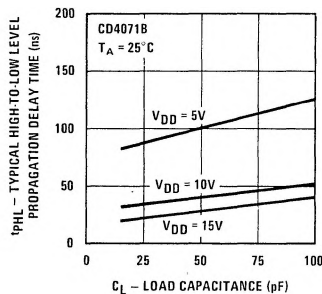


FIGURE 8

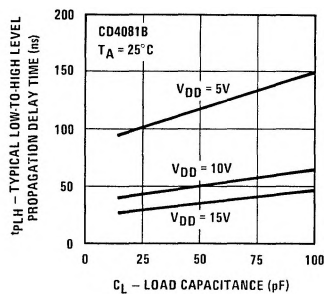


FIGURE 9

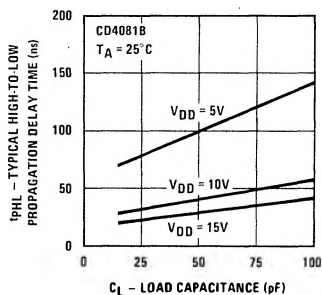


FIGURE 10

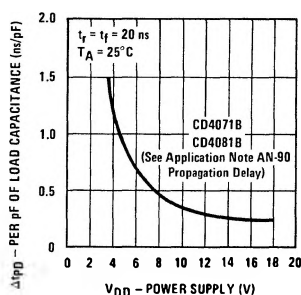


FIGURE 11

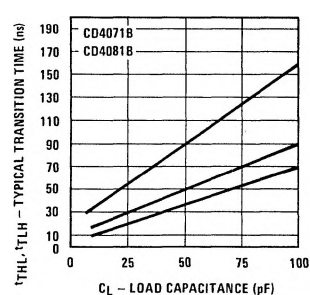


FIGURE 12

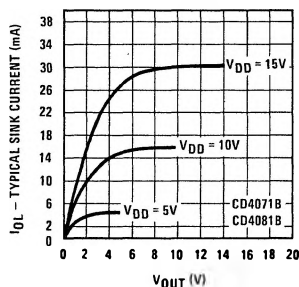


FIGURE 13

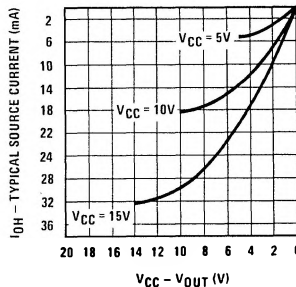


FIGURE 14