

LC4077B



3003A

CMOS Standard Logic LC4000B Series

Quad 2-Input Exclusive NOR Gate

©1504

The LC4077B is a quad 2-input Exclusive-NOR Gate IC (equivalent to B series) having such features as wide operating voltage range, high noise margin, low power dissipation.

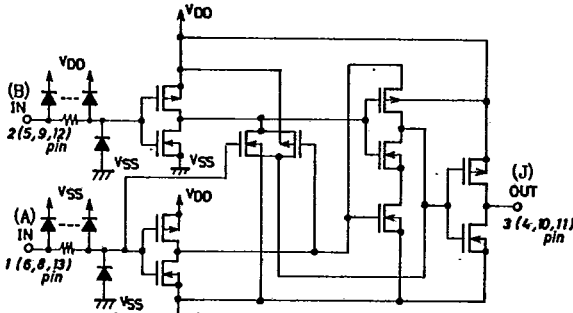
Absolute Maximum Ratings at $T_a=25^{\circ}\text{C}, V_{SS}=0\text{V}$

Parameter	Symbol	Value	Unit
Maximum Supply Voltage	V_{DD} max	$V_{SS}-0.5$ to $V_{SS}+20$	V
Input Voltage	V_{IN} max	$V_{SS}-0.5$ to $V_{DD}+0.5$	V
Output Voltage	V_{OUT} max	$V_{SS}-0.5$ to $V_{DD}+0.5$	V
Input Current	I_{IN}	± 10	mA
Allowable Power Dissipation	P_{dmax}	$T_a \leq 85^{\circ}\text{C}$	300 mW
Lead Temperature and Time	T_{sol}	$t=10\text{sec}$	260 $^{\circ}\text{C}$
Operating Temperature	T_{opg}	-40 to +85	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-65 to +150	$^{\circ}\text{C}$

Allowable Operating Conditions at $T_a=-40$ to $+85^{\circ}\text{C}$

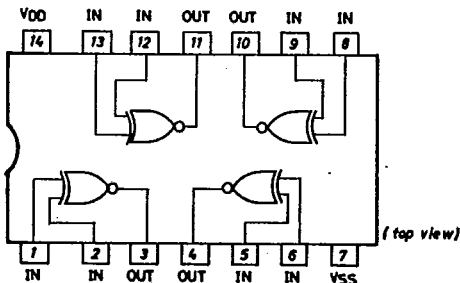
Parameter	Symbol	Value	Unit
Supply Voltage	V_{DD}	3 to 18	V
Input Voltage	V_{IN}	0 to V_{DD}	V

Equivalent Circuit(1/4 LC4077B)



Input protection circuit

Pin Assignment



Truth Table

1 of 4 Gates

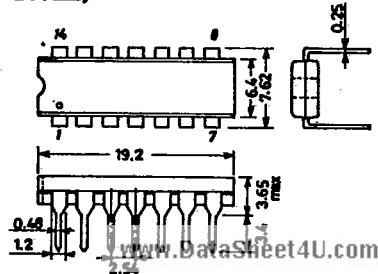
A	B	J
0	0	1
1	0	0
0	1	0
1	1	1

1 : HIGH LEVEL

0 : LOW LEVEL

J : $A \oplus B$

Case Outline 3003A-D14IC (unit:mm)



SANYO: DIP14

Electrical Characteristics at Ta=25°C, V _{SS} =0V			min	typ	max	unit
"H" Level Output Voltage	V _{OH}	V _{DD} =5V, I _{OUT} <1uA, Vin=V _{SS} , V _{DD}	4.95	5.00		V
		V _{DD} =10V, " " "	9.95	10.00		V
		V _{DD} =15V, " " "	14.95	15.00		V
"L" Level Output Voltage	V _{OL}	V _{DD} =5V, I _{OUT} <1uA, Vin=V _{SS} , V _{DD}		0.00	0.05	V
		V _{DD} =10V, " " "		0.00	0.05	V
		V _{DD} =15V, " " "		0.00	0.05	V
"H" Level Output Current	I _{OH}	V _{DD} =5V, Vo=4.6V, Vin=V _{SS} , V _{DD}	-0.44	-0.88		mA
		V _{DD} =10V, Vo=9.5V, " "	-1.1	-2.25		mA
		V _{DD} =15V, Vo=13.5V, " "	-3.0	-8.8		mA
"L" Level Output Current	I _{OL}	V _{DD} =5V, Vo=0.4V, Vin=V _{SS} , V _{DD}	0.44	0.88		mA
		V _{DD} =10V, Vo=1.0V, " "	1.1	2.25		mA
		V _{DD} =15V, Vo=1.5V, " "	3.0	8.8		mA
"H" Level Input Voltage	V _{IH}	V _{DD} =5V, Vo=0.5V or 4.5V, I _{OUT} <1uA	3.5	2.75		V
		V _{DD} =10V, Vo=1.0V or 9.0V, " "	7.0	5.5		V
		V _{DD} =15V, Vo=1.5V or 13.5V, " "	11.0	8.25		V
"L" Level Input Voltage	V _{IL}	V _{DD} =5V, Vo=0.5V or 4.5V, I _{OUT} <1uA		2.25	1.5	V
		V _{DD} =10V, Vo=1.0V or 9.0V, " "		4.5	3.0	V
		V _{DD} =15V, Vo=1.5V or 13.5V, " "		6.75	4.0	V
"H" Level Input Current	I _{IH}	V _{DD} =18V, Vin=18V		10	0.3	uA
"L" Level Input Current	I _{IL}	V _{DD} =18V, Vin=0V		-10	-0.3	uA
Quiescent Device Current	I _{DD}	V _{DD} =5V, Vin=V _{SS} , V _{DD}	0.001	1.0		uA
		V _{DD} =10V, " "	0.001	2.0		uA
		V _{DD} =15V, " "	0.001	4.0		uA
Input Capacitance	C _{IN}			5	7.5	pF

Electrical Characteristics at Ta=-40°C, V _{SS} =0V			min	typ	max	unit
"H" Level Output Voltage	V _{OH}	V _{DD} =5V, I _{OUT} <1uA, Vin=V _{SS} , V _{DD}	4.95			V
		V _{DD} =10V, " " "	9.95			V
		V _{DD} =15V, " " "	14.95			V
"L" Level Output Voltage	V _{OL}	V _{DD} =5V, I _{OUT} <1uA, Vin=V _{SS} , V _{DD}			0.05	V
		V _{DD} =10V, " " "			0.05	V
		V _{DD} =15V, " " "			0.05	V
"H" Level Output Current	I _{OH}	V _{DD} =5V, Vo=4.6V, Vin=V _{SS} , V _{DD}	-0.52			mA
		V _{DD} =10V, Vo=9.5V, " "	-1.3			mA
		V _{DD} =15V, Vo=13.5V, " "	-3.6			mA
"L" Level Output Current	I _{OL}	V _{DD} =5V, Vo=0.4V, Vin=V _{SS} , V _{DD}	0.52			mA
		V _{DD} =10V, Vo=1.0V, " "	1.3			mA
		V _{DD} =15V, Vo=1.5V, " "	3.6			mA
"H" Level Input Voltage	V _{IH}	V _{DD} =5V, Vo=0.5V or 4.5V, I _{OUT} <1uA	3.5			V
		V _{DD} =10V, Vo=1.0V or 9.0V, " "	7.0			V
		V _{DD} =15V, Vo=1.5V or 13.5V, " "	11.0			V
"L" Level Input Voltage	V _{IL}	V _{DD} =5V, Vo=0.5V or 4.5V, I _{OUT} <1uA			1.5	V
		V _{DD} =10V, Vo=1.0V or 9.0V, " "			3.0	V
		V _{DD} =15V, Vo=1.5V or 13.5V, " "			4.0	V
"H" Level Input Current	I _{IH}	V _{DD} =18V, Vin=18V		0.3	uA	
"L" Level Input Current	I _{IL}	V _{DD} =18V, Vin=0V		-0.3	uA	
Quiescent Device Current	I _{DD}	V _{DD} =5V, Vin=V _{SS} , V _{DD}		1.0		uA
		V _{DD} =10V, " "				uA
		V _{DD} =15V, " "				uA

Electrical Characteristics at Ta=85°C

			min	typ	max	unit
"H" Level Output Voltage	V _{OH}	V _{DD} =5V, I _{OUT} < 1μA, Vin=V _{SS} , V _{DD}	4.95			V
		V _{DD} =10V, " " "	9.95			V
		V _{DD} =15V, " " "	14.95			V
"L" Level Output Voltage	V _{OL}	V _{DD} =5V, I _{OUT} < 1μA, Vin=V _{SS} , V _{DD}			0.05	V
		V _{DD} =10V, " " "			0.05	V
		V _{DD} =15V, " " "			0.05	V
"H" Level Output Current	I _{OH}	V _{DD} =5V, Vo=4.6V, Vin=V _{SS} , V _{DD}	-0.36			mA
		V _{DD} =10V, Vo=9.5V, " " "	-0.9			mA
		V _{DD} =15V, Vo=13.5V, " " "	-2.4			mA
"L" Level Output Current	I _{OL}	V _{DD} =5V, Vo=0.4V, Vin=V _{SS} , V _{DD}	0.36			mA
		V _{DD} =10V, Vo=1.0V, " " "	0.9			mA
		V _{DD} =15V, Vo=1.5V, " " "	2.4			mA
"H" Level Input Voltage	V _{IH}	V _{DD} =5V, Vo=0.5V or 4.5V, I _{OUT} < 1μA	3.5			V
		V _{DD} =10V, Vo=1.0V or 9.0V, " " "	7.0			V
		V _{DD} =15V, Vo=1.5V or 13.5V, " " "	11.0			V
"L" Level Input Voltage	V _{IL}	V _{DD} =5V, Vo=0.5V or 4.5V, I _{OUT} < 1μA			1.5	V
		V _{DD} =10V, Vo=1.0V or 9.0V, " " "			3.0	V
		V _{DD} =15V, Vo=1.5V or 13.5V, " " "			4.0	V
"H" Level Input Current	I _{IH}	V _{DD} =18V, Vin=18V			1.0	μA
"L" Level Input Current	I _{IL}	V _{DD} =18V, Vin=0V			-1.0	μA
Quiescent Device Current	I _{DD}	V _{DD} =5V, Vin=V _{SS} , V _{DD}			7.5	μA
		V _{DD} =10V, " " "			15.0	μA
		V _{DD} =15V, " " "			30.0	μA

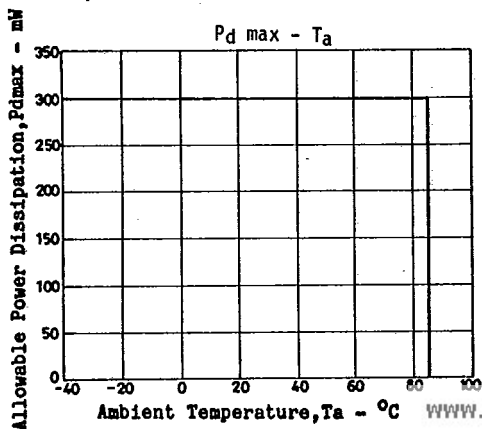
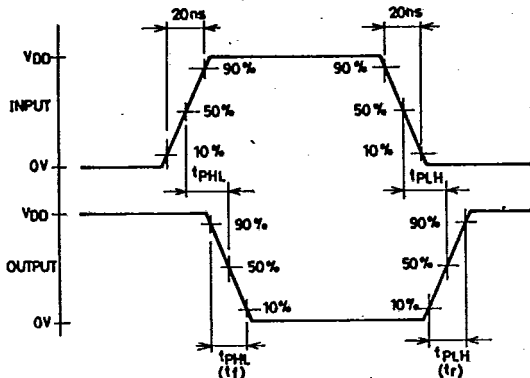
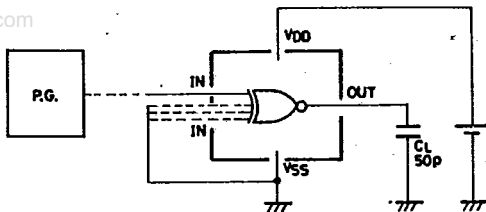
Note) Current direction: +, no sign : Flowing into device
 - : Flowing out of device.

Switching Characteristics at Ta=25±2°C, V_{SS}=0V, C_L=50pF

			min	typ	max	unit
Output Rise Time	t _r (t _{TLH})	V _{DD} =5V	100	200		ns
		V _{DD} =10V	50	100		ns
		V _{DD} =15V	40	80		ns
Output Fall Time	t _f (t _{THL})	V _{DD} =5V	100	200		ns
		V _{DD} =10V	50	100		ns
		V _{DD} =15V	40	80		ns
"H" Level Propagation Delay Time	t _{PLH}	V _{DD} =5V	175	350		ns
		V _{DD} =10V	75	150		ns
		V _{DD} =15V	50	100		ns
"L" Level Propagation Delay Time	t _{PHL}	V _{DD} =5V	175	350		ns
		V _{DD} =10V	75	150		ns
		V _{DD} =15V	50	100		ns

Switching Time Test Circuit and Waveforms

www.DataSheet4U.com



www.DataSheet4U.com