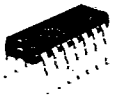
T-43-21

LC4001B



3003A CMOS Standard Logic LC4000B Series

Quad 2-Input NOR Gate

©858C

The LC4001B is a 2-input NOR logic IC ——— B series ——— having such features as wide operating voltage range, high noise margin, low power dissipation.

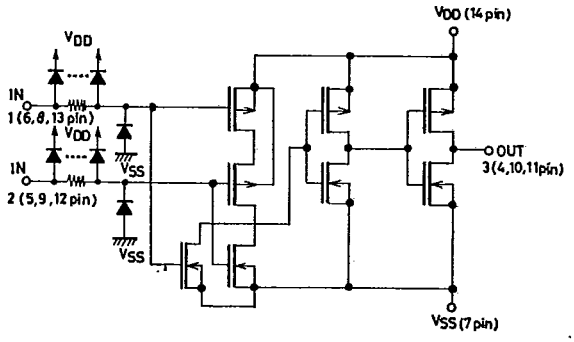
Absolute Maximum Ratings at Ta=25°C, V_{SS}=0V

				unit
Maximum Supply Voltage	V_{DD}max		V_{SS}-0.5 to V_{SS}+20	V
Maximum Input Voltage	V_{IN}max		V_{SS}-0.5 to V_{DD}+0.5	V
Maximum Output Voltage	V_{OUT}max		V_{SS}-0.5 to V_{DD}+0.5	V
Input Current	I_{IN}		±10	mA
Allowable Power Dissipation	$P_d$max	Ta≦85°C	300	mW
Lead Temeperature and Time	T_{sol}	t=10sec	260	°C
Operating Temperature	T_{opg}		-40 to +85	°C
Storage Temperature	T_{stg}		-65 to +150	°C

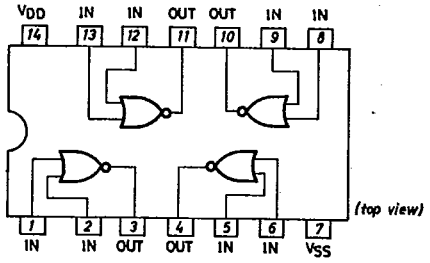
Allowable Operating Conditions at Ta=-40 to +85°C

Supply Voltage	V_{DD}	3 to 18	V
Input Voltage	V_{IN}	0 to V_{DD}	V

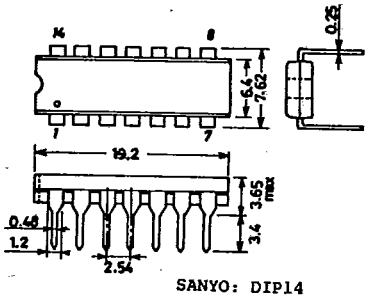
Equivalent Circuit



Pin Assignment



Case Outline 3003A-D14IC (unit:mm)



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Electrical Characteristics at Ta=25±2°C, VSS=0V			min	typ	max	unit
"H" Level Output Voltage	V_{OH}	V_{DD}=5V, $\|I_{OUT}\|$<1uA, V_{IN}=V_{SS}	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, V_{IN}=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, V_O=4.6V, V_{IN}=V_{SS}	-0.5	-1.0		mA
		V_{DD}=10V, V_O=9.5V, "	-1.0	-2.0		mA
		V_{DD}=15V, V_O=13.5V, "	-3.5	-7.0		mA
"L" Level Output Current	I_{OL}	V_{DD}=5V, V_O=0.4V, V_{IN}=V_{SS}, V_{DD}	0.5	1.0		mA
		V_{DD}=10V, V_O=0.5V, "	1.0	2.0		mA
		V_{DD}=15V, V_O=1.5V, "	3.5	7.0		mA
"H" Level Input Voltage	V_{IH}	V_{DD}=5V, V_O=0.5V, $\|I_{OUT}\|$<1uA	3.5	2.5		V
		V_{DD}=10V, V_O=1.0V, "	7.0	5.0		V
		V_{DD}=15V, V_O=1.5V, "	11.0	7.5		V
"L" Level Input Voltage	V_{IL}	V_{DD}=5V, V_O=0.5Vor4.5V, $\|I_{OUT}\|$<1uA		2.5	1.5	V
		V_{DD}=10V, V_O=1.0Vor9.0V "		5.0	3.0	V
		V_{DD}=15V, V_O=1.5Vor13.5V "		7.5	4.0	V
Input Leak Current	I_{IN}	V_{DD}=18V, V_{IN}=18V		10^{-5}	1.0	uA
		V_{DD}=18V, V_{IN}=0V		-10^{-5}	-1.0	uA
Quiescent Device Current	I_{DD}	V_{DD}=5V, V_{IN}=V_{SS}, V_{DD}		0.01	1.0	uA
		V_{DD}=10V, "		0.01	2.0	uA
		V_{DD}=15V, "		0.01	4.0	uA
Input Stray Capacitance	C_{IN}	Each input		5	7.5	pF

Electrical Characteristics at Ta=-40 to +85°C, VSS=0V			min	typ	max	unit
"H" Level Output Voltage	V_{OH}	V_{DD}=5V, $\|I_{OUT}\|$<1uA, V_{IN}=V_{SS}	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, V_{IN}=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, V_O=4.6V, V_{IN}=V_{SS}	-0.5			mA
		V_{DD}=10V, V_O=9.5V, "	-1.0			mA
		V_{DD}=15V, V_O=13.5V, "	-3.5			mA
"L" Level Output Current	I_{OL}	V_{DD}=5V, V_O=0.4V, V_{IN}=V_{SS}, V_{DD}	0.5			mA
		V_{DD}=10V, V_O=0.5V, "	1.0			mA
		V_{DD}=15V, V_O=1.5V, "	3.5			mA
"H" Level Input Voltage	V_{IH}	V_{DD}=5V, V_O=0.5V, $\|I_{OUT}\|$<1uA	3.5			V
		V_{DD}=10V, V_O=1.0V, "	7.0			V
		V_{DD}=15V, V_O=1.5V, "	11.0			V
"L" Level Input Voltage	V_{IL}	V_{DD}=5V, V_O=0.5Vor4.5V, $\|I_{OUT}\|$<1uA			1.5	V
		V_{DD}=10V, V_O=1.0Vor9.0V, "			3.0	V
		V_{DD}=15V, V_O=1.5Vor13.5V, "			4.0	V
Input Leak Current	I_{IN}	V_{DD}=18V, V_{IN}=18V			1.0	uA
		V_{DD}=18V, V_{IN}=0V			-1.0	uA
Quiescent Device Current	I_{DD}	V_{DD}=5V, V_{IN}=V_{SS}, V_{DD}			7.5	uA
		V_{DD}=10V, "			15.0	uA
		V_{DD}=15V, "			30.0	uA

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

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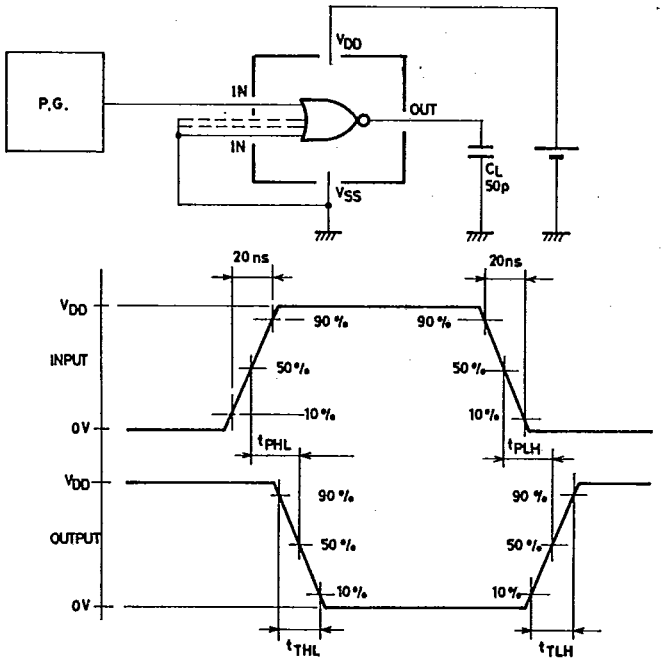
Switching Characteristics at Ta=25±2°C,CL=50pF,VSS=0V

			min	typ	max	unit
"H" Level Propagation Delay Time	t_{PLH}	V_{DD}=5V		125	250	ns
		V_{DD}=10V		50	100	ns
		V_{DD}=15V		40	80	ns
"L" Level Propagation Delay Time	t_{PHL}	V_{DD}=5V		125	250	ns
		V_{DD}=10V		50	100	ns
		V_{DD}=15V		40	80	ns
Rise Time	t_{TLH} (t_f)	V_{DD}=5V		100	200	ns
		V_{DD}=10V		50	100	ns
		V_{DD}=15V		40	80	ns
Fall Time	t_{THL} (t_f)	V_{DD}=5V		100	200	ns
		V_{DD}=10V		50	100	ns
		V_{DD}=15V		40	80	ns

Switching Time Test Circuit and Waveforms



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