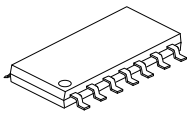
CD4001B **Preliminary** ***CMOS IC***

QUAD 2-INPUT NOR BUFFERED B SERIES GATE



SOP-14

■ DESCRIPTION

The **UTC CD4001B** contains four independent 2-input NOR gates,they perform the function $Y=\overline{A+B}$ in positive logic.

■ FEATURES

* 5V-10V-15V Parametric Ratings
* Quad 2-Input NOR Gate
* Symmetrical Output Characteristics
* Maximum Input Current of 1uA at 15V Over Full Package Temperature Rage
* Low Power TTL:

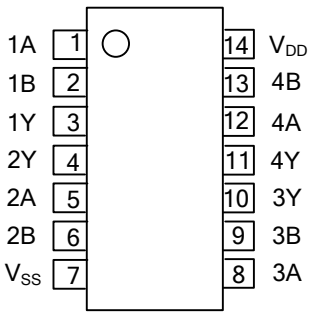
Fan Out of 2 Driving 74L Compatibility or 1 Driving 74LS

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
CD4001BL-S14-R	CD4001BG-S14-R	SOP-14	Tape Reel

CD4011BL-S14-R (1)Packing Type (2)Package Type (3)Lead Free	(1) R: Tape Reel (2) S14: SOP-14 (3) G: Halogen Free, L: Lead Free

■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

INPUT(A)	INPUT(B)	OUTPUT(Y)
H	H	L
H	L	L
L	H	L
L	L	H

■ LOGIC DIAGRAM (positive logic)

■ ABSOLUTE MAXIMUM RATING(T_a=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{DD}	-0.5 ~ 18	V
Input Voltage	V(nA,nB)	-0.5 ~ V_{DD} +0.5	V
Output Voltage	V(nY)	-0.5 ~ V_{DD} +0.5	V
Storage Temperature	T_{STG}	-65 ~ + 150	℃

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{DD}	3 ~ 15	V
Operating Temprature	T_{OP}	-40 ~ 125	℃

■ ELECTRICAL CHARACTERISTICS(T_a=25°C)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	High	V_{IH}	V_{DD}= 5V, V_O=0.5V	3.5	3		V
			V_{DD}= 10V, V_O=1.0V	7.0	6		
			V_{DD}= 15V, V_O=1.5V	11.0	9		
	Low	V_{IL}	V_{DD}= 5V, V_O=4.5V		2	1.5	V
			V_{DD}= 10V, V_O=9.0V		4	3.0	
			V_{DD}= 15V, V_O=13.5V		6	4.0	
Output Voltage	High	V_{OH}	V_{DD}= 5V, I_{OH}=-1μA	4.95	5		V
			V_{DD}= 10V, I_{OH}=-1μA	9.95	10		
			V_{DD}= 15V, I_{OH}=-1μA	14.95	15		
	Low	V_{OL}	V_{DD}= 5V, I_{OL} =1μA		0	0.05	V
			V_{DD}= 10V, I_{OL} =1μA		0	0.05	
			V_{DD}= 15V, I_{OL} =1μA		0	0.05	
Output Current (Note)	High	I_{OH}	V_{DD}= 5V, V_O=4.6V	-0.51	-0.88		mA
			V_{DD}= 10V, V_O=9.5V	-1.3	-2.25		
			V_{DD}= 15V, V_O=13.5V	-3.4	-8.8		
	Low	I_{OL}	V_{DD}= 5V, V_O=0.4V	0.51	0.88		
			V_{DD}= 10V, V_O=0.5V	1.3	2.25		
			V_{DD}= 15V, V_O=1.5V	3.4	8.8		
Input Leakage Current		$I_{I(LEAK)}$	V_{DD}= 15V ,V_{IN} = V_{DD} or GND			0.1	μA
Quiescent Supply Current		I_Q	V_{DD}= 5V, V_{IN} = V_{DD} or V_{SS}, I_{OUT} = 0		0.004	0.25	μA
			V_{DD}= 10V, V_{IN} = V_{DD} or V_{SS}, I_{OUT} = 0		0.005	0.5	
			V_{DD}= 15V, V_{IN} = V_{DD} or V_{SS}, I_{OUT} = 0		0.006	1.0	

Note: I_{OL} and I_{OH} are tested one output at a time

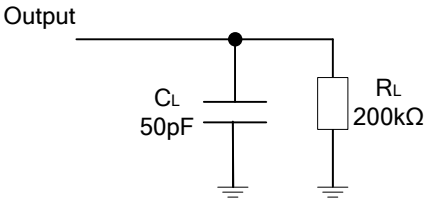
■ SWITCHING CHARACTERISTICS(T_A=25°C, Input: t_R=t_F=20ns,unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	t_{PLH}	V_{DD}=5V, C_L=50pF, R_L=200kΩ		110	250	ns
		V_{DD}=10V, C_L=50pF, R_L=200kΩ		50	100	
		V_{DD}=15V, C_L=50pF, R_L=200kΩ		35	70	
	t_{PHL}	V_{DD}=5V, C_L=50pF, R_L=200kΩ		120	250	
		V_{DD}=10V, C_L=50pF, R_L=200kΩ		50	100	
		V_{DD}=15V, C_L=50pF, R_L=200kΩ		35	70	
Transition Time	t_{TLH} t_{THL}	V_{DD}=5V, C_L=50pF, R_L=200kΩ		90	200	ns
		V_{DD}=10V, C_L=50pF, R_L=200kΩ		50	100	
		V_{DD}=15V, C_L=50pF, R_L=200kΩ		40	80	

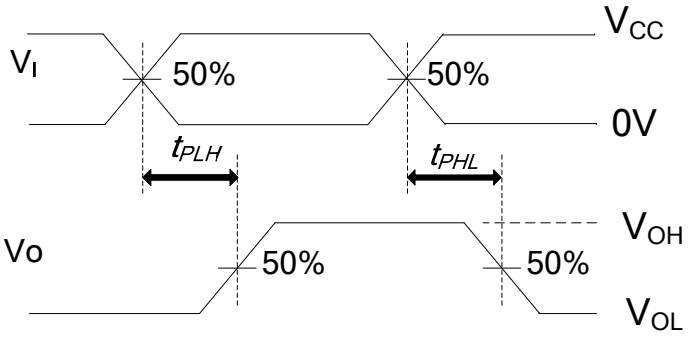
■ OPERATING CHARACTERISTICS(T_a=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Average Input Capacitance	C_{IN}	Any Input		5	7.5	pF
Power Dissipation Capacitance	C_{PD}	Any Gate		14		

■ TEST CIRCUIT AND WAVEFORMS



Definitions for test circuit



Propagation Delay Times

Note: CL includes probe and jig capacitance.