

**UCD4001B**

Preliminary

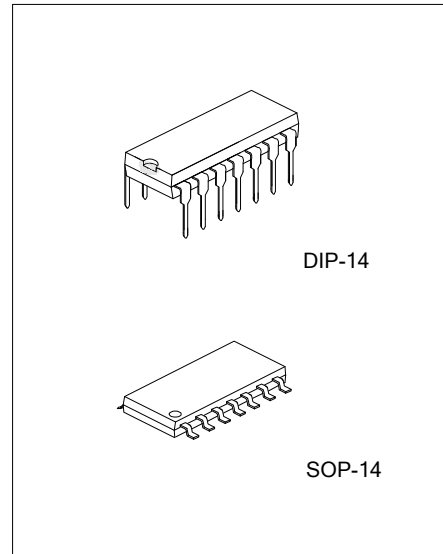
CMOS IC

**QUAD 2-INPUT NOR
BUFFERED B SERIES GATE****DESCRIPTION**

The **UTC UCD4001B** 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 Range
- * Low Power TTL:
Fan Out of 2 Driving 74L Compatibility or 1 Driving 74LS

**ORDERING INFORMATION**

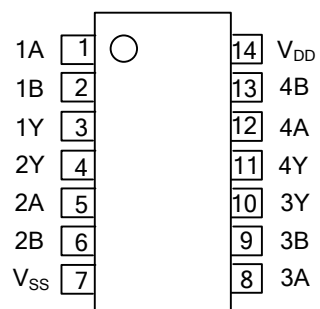
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UCD4001BL-D14-R	UD4001BG-D14-R	DIP-14	Tube
-	UD4001BG-S14-R	SOP-14	Tape Reel

UCD4001BL-D14-T	(1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) D14: DIP-14, S14: SOP-14 (3) L: Lead Free, G: Halogen Free and Lead Free
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MARKING

DIP-14	SOP-14
14 13 12 11 10 9 8 → Date Code UTC □□□□ UCD4001B □ L: Lead Free G: Halogen Free Lot Code	14 13 12 11 10 9 8 → Date Code UTC □□□□ UCD4001BG Lot Code

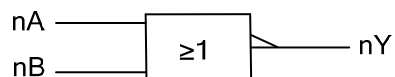
■ PIN CONFIGURATION



■ 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**($T_A=25^{\circ}\text{C}$, 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	$^{\circ}\text{C}$

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 Temperature	T_{OP}	-40 ~ 125	$^{\circ}\text{C}$

■ **ELECTRICAL CHARACTERISTICS**($T_A=25^{\circ}\text{C}$)

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}	$V_{DD}= 5V, I_{OH}=-1\mu A$	4.95	5		V
			$V_{DD}= 10V, I_{OH}=-1\mu A$	9.95	10		
			$V_{DD}= 15V, I_{OH}=-1\mu A$	14.95	15		
	Low	V_{OL}	$V_{DD}= 5V, I_{OL}=1\mu A$		0	0.05	V
			$V_{DD}= 10V, I_{OL}=1\mu A$		0	0.05	
			$V_{DD}= 15V, I_{OL}=1\mu A$		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

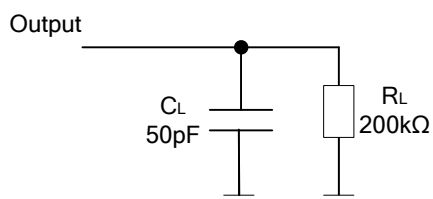
■ **SWITCHING CHARACTERISTICS**($T_A=25^{\circ}\text{C}$, Input: $t_R=t_F=20\text{ns}$, unless otherwise specified)

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

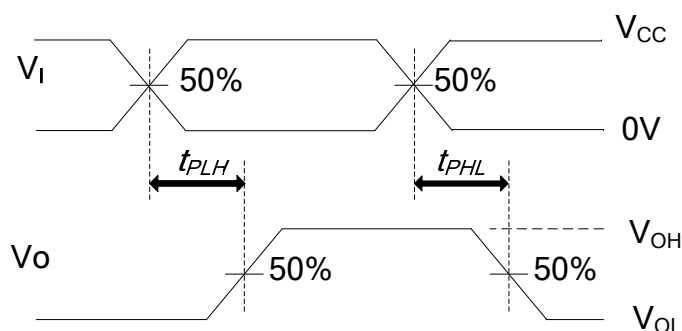
■ **OPERATING CHARACTERISTICS**($T_A=25^{\circ}\text{C}$)

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: C_L includes probe and jig capacitance.

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