



## U74HCT00

CMOS IC

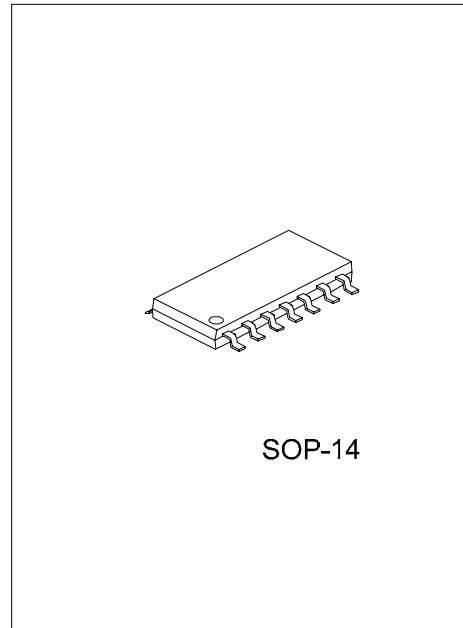
### QUADRUPLE 2-INPUT NAND GATE

#### DESCRIPTION

The U74HCT00 is a Quadruple 2-input NAND gate which provides the Function  $Y = \overline{A \cdot B}$ .

#### FEATURES

- \* Operation voltage range: 4.5~5.5V
- \* Low power dissipation:  $I_{CC} = 20\mu A$ (Max)
- \* High speed:  $t_{pd} = 10ns$ (Typ)
- \*  $\pm 4mA$  output drive at 5V
- \* Input are TTL-voltage compatible



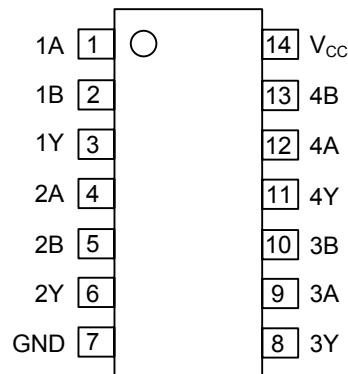
\*Pb-free plating product number:  
U74HCT00L

#### ORDERING INFORMATION

Ordering Number		Package	Packing
Normal	Lead Free Plating		
U74HCT00-S14-R	U74HCT00L-S14-R	SOP-14	Tape Reel
U74HCT00-S14-T	U74HCT00L-S14-T	SOP-14	Tube

<p>U74HCT00L-S14-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Plating</p>	<p>(1) R: Tape Reel, T: Tube (2) S14: SOP-14 (3) L: Lead Free Plating, Blank: Pb/Sn</p>
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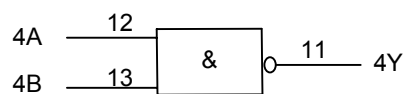
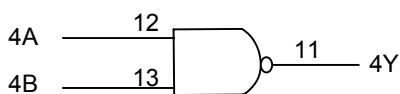
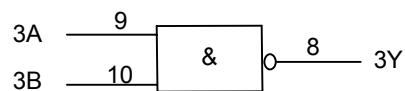
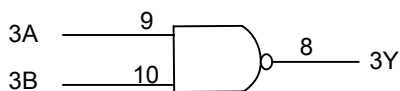
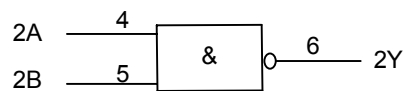
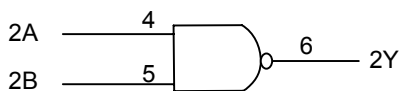
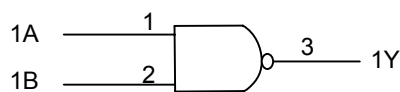
■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

INPUT		OUTPUT
A	B	Y
H	H	L
L	X	H
X	L	H

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATINGS (unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	-0.5~7	V
Input Clamp Current	$I_{IK}$	±20	mA
Output Clamp Current	$I_{OK}$	±20	mA
Output Current	$I_{OUT}$	±25	mA
$V_{CC}$ or GND Current	$I_{CC}$	±50	mA
Storage Temperature	$T_{STG}$	-65 ~ +150	

Note 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

2. 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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Thermal Resistance Junction Ambient	$\theta_{JA}$	76	/W

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$		4.5	5.0	5.5	V
Input Voltage	$V_{IN}$		0		$V_{CC}$	V
Output Voltage	$V_{OUT}$		0		$V_{CC}$	V
Input Transition Rise or Fall Times	$t_R, t_F$				500	ns
Operating Temperature	$T_A$		-40		85	

■ STATIC CHARACTERISTICS ( $T_A=25$  , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	$V_{IH}$	$V_{CC}=4.5V\sim 5.5V$	2			V
Low-Level Input Voltage	$V_{IL}$	$V_{CC}=4.5V\sim 5.5V$			0.8	V
High-Level Output Voltage	$V_{OH}$	$V_{CC}=4.5V, I_{OH}=-20\mu A$	4.4	4.499		V
		$V_{CC}=4.5V, I_{OH}=-4mA$	3.98	4.3		
Low-Level Output Voltage	$V_{OL}$	$V_{CC}=4.5V, I_{OL}=20\mu A$		0.001	0.1	V
		$V_{CC}=4.5V, I_{OL}=4mA$		0.17	0.26	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0\sim 6.0V, V_{IN}=V_{CC}$ or GND		±0.1	±100	nA
Quiescent Supply Current	$I_Q$	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			2	μA
Additional Quiescent Supply Current	$\Delta I_Q$	$V_{CC}=5.5V$ , One input at 0.5V or 2.4V, other inputs at 0 or $V_{CC}$		1.4	2.4	mA
Input Capacitance	$C_{IN}$	$V_{CC}=4.5V\sim 5.5V, V_{IN}=V_{CC}$ or GND		3	10	pF

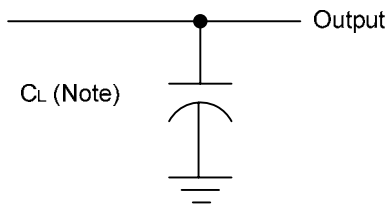
■ DYNAMIC CHARACTERISTICS ( $T_A=25$  , Input:  $t_R, t_F \leq 6ns$ ;  $PRR \leq 1MHz$ )

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (nA) and (nB) to output(nY)	$t_{PHL} / t_{PLH}$	$V_{CC}=4.5V, C_L = 50pF$		11	20	ns
		$V_{CC}=5.5V, C_L = 50pF$		10	18	
Output transition time	$t_{THL} / t_{TLH}$	$V_{CC}=4.5V, C_L = 50pF$		9	15	ns
		$V_{CC}=5.5V, C_L = 50pF$		8	14	

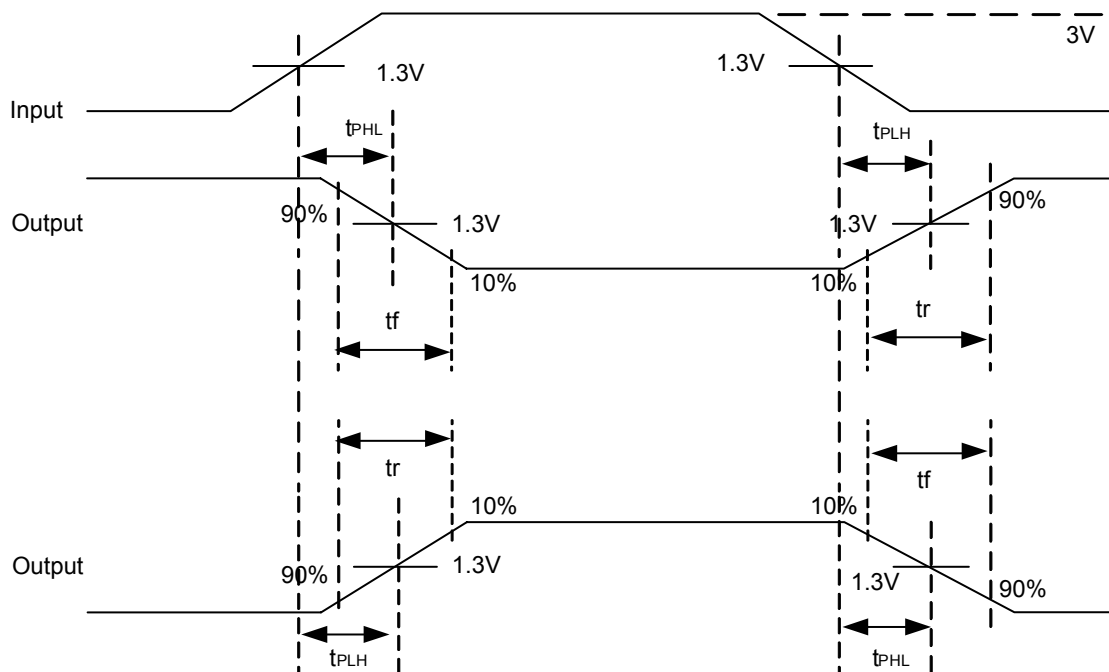
■ OPERATING CHARACTERISTICS ( $T_A=25$  , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	Cpd	No load		20		pF

## ■ TEST CIRCUIT AND WAVEFORMS



Note:  $C_L$  includes probe and jig capacitance.



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