



U74AHCT00

CMOS IC

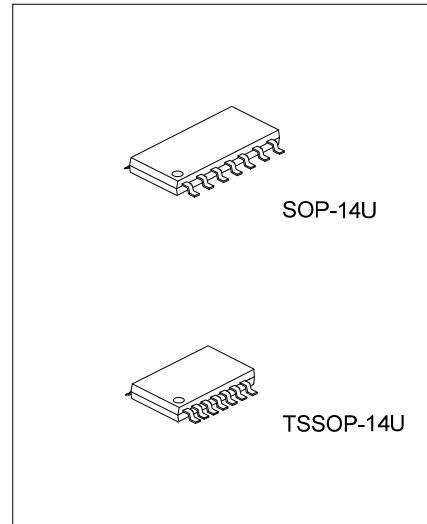
QUADRUPLE 2-INPUT POSITIVE-NAND GATE

DESCRIPTION

The **U74AHCT00** is a quadruple 2-input NAND gate which performs the function $Y=A \cdot B$ or $Y=\overline{A+B}$.

FEATURES

- * Low Power Dissipation: $I_{CC} = 2.0 \mu A$ (Max.)
- * High Speed: $t_{PD} = 5.7ns$ (Typ.)
- * High Noise Immunity

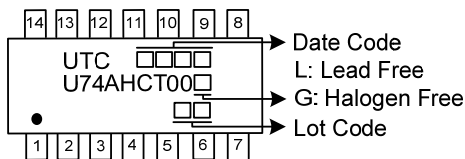


ORDERING INFORMATION

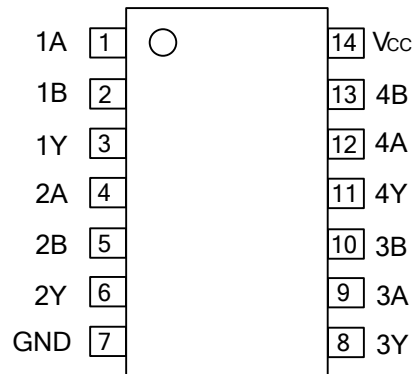
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHCT00L-UEA-R	U74AHCT00G-UEA-R	SOP-14U	Tape Reel
U74AHCT00L-UEB-R	U74AHCT00G-UEB-R	TSSOP-14U	Tape Reel

<p>U74AHCT00G-UEA-R</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel (2) UEA: SOP-14U, UEB: TSSOP-14U (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



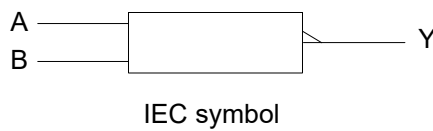
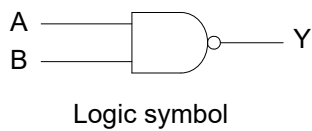
■ PIN CONFIGURATION



■ FUNCTION TABLE (Each Gate)

INPUTS		OUTPUT
A	B	Y
L	L	H
L	H	H
H	L	H
H	H	L

■ LOGIC DIAGRAM (Positive Logic)



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ 7	V
Input Voltage	V_{IN}	-0.5 ~ 7	V
Output Voltage	V_{OUT}	-0.5 ~ $V_{CC}+0.5$	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	°C

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

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		4.5		5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=5.0+0.5V$			20	ns/V
Operating Temperature	T_A		-40		+125	°C

■ STATIC CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^\circ C$			$T_A=-40\sim+125^\circ C$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-Level Input Voltage	V_{IH}	$V_{CC}=4.5\sim 5.5V$	2.0			2.0			V
Low-Level Input Voltage	V_{IL}	$V_{CC}=4.5\sim 5.5V$			0.8			0.8	V
High-Level Output Voltage	V_{OH}	$V_{CC}=4.5V, I_{OH}=-50\mu A$	4.4	4.5		4.4			V
		$V_{CC}=4.5V, I_{OH}=-8mA$	3.94			3.7			V
Low-Level Output Voltage	V_{OL}	$V_{CC}=4.5V, I_{OL}=50\mu A$			0.1			0.1	V
		$V_{CC}=4.5V, I_{OL}=8mA$			0.36			0.55	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=0\sim 5.5V, V_{IN}=V_{CC}$ or GND			±0.1			±2	μA
Quiescent Supply Current	I_Q	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			2			40	μA
Additional quiescent Supply Current	ΔI_Q	$V_{CC}=5.5V, V_{IN}=3.4V$; other input at V_{CC} or GND; $I_{OUT}=0$			1.35			1.5	mA

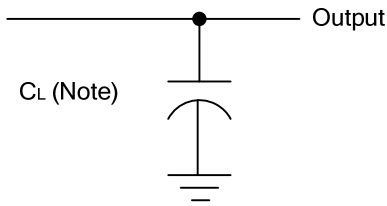
■ DYNAMIC CHARACTERISTICS ($t_R, t_F \leq 3$ ns, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^\circ C$			$T_A=-40\sim+125^\circ C$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (A and B) to output (Y)	t_{PLH}	$V_{CC}=5\pm 0.5V, C_L=15pF$		5.7	7.9	1.0		10	ns
	t_{PHL}			5.7	7.9	1.0		10	ns
	t_{PLH}	$V_{CC}=5\pm 0.5V, C_L=50pF$		6.2	8.9	1.0		11	ns
	t_{PHL}			6.2	8.9	1.0		11	ns

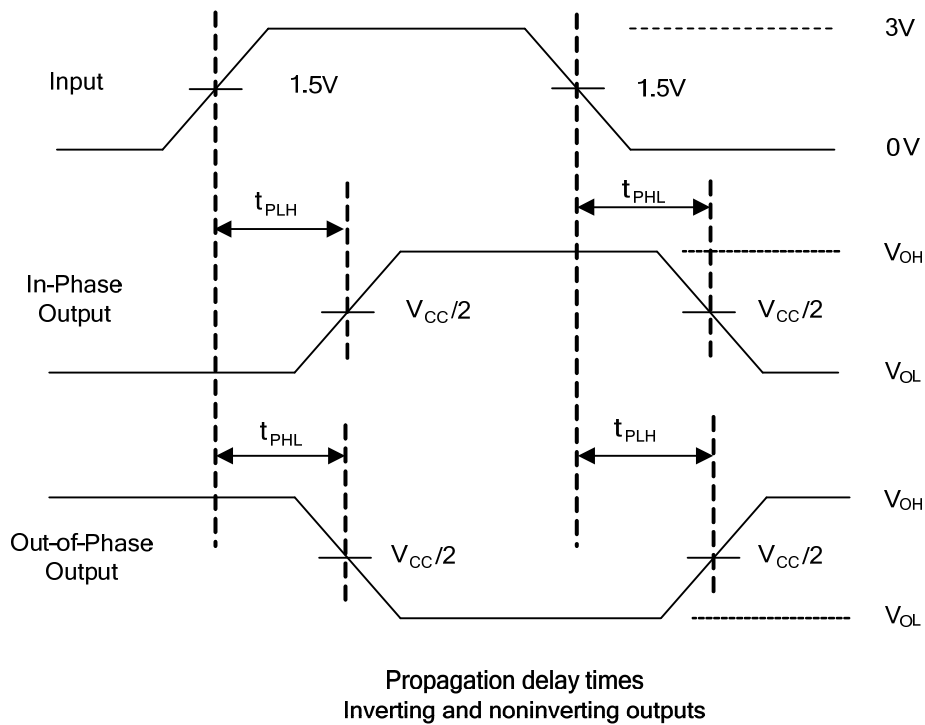
■ OPERATING CHARACTERISTICS ($V_{CC}=5V$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	$V_{CC}=5V, V_{IN}=V_{CC}$ or GND		2	10	pF
Power Dissipation Capacitance	C_{PD}	No load, $f=1MHz$		10.5		pF

■ TEST CIRCUIT AND WAVEFORM



Note: C_L includes probe and jig capacitance.



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