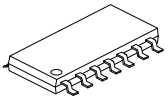
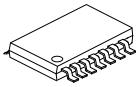
U74AHC00

CMOS IC

QUADRUPLE 2-INPUT POSITIVE-NAND GATES



SOP-14



TSSOP-14

■ DESCRIPTION

The **U74AHC00** is QUADRUPLE 2-INPUT POSITIVE-NAND GATES. Which provides the function $Y = \overline{A \times B}$.

■ FEATURES

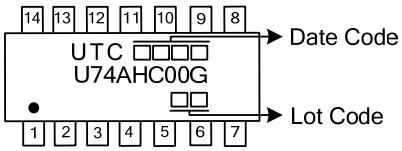
* Operation voltage range: 2~5.5V
* Max t_{Pd} of 6.5 ns at 5 V
* Low power consumption, 20-uA Max I_{CC}
* ±8mA output drive at 5 V

■ ORDERING INFORMATION

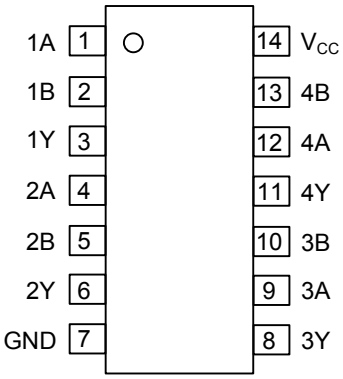
Ordering Number	Package	Packing
U74AHC00G-S14-R	SOP-14	Tape Reel
U74AHC00G-P14-R	TSSOP-14	Tape Reel

U74AHC00G-S14-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) S14: SOP-14, P14: TSSOP-14 (3) G: Halogen Free and Lead Free

■ MARKING



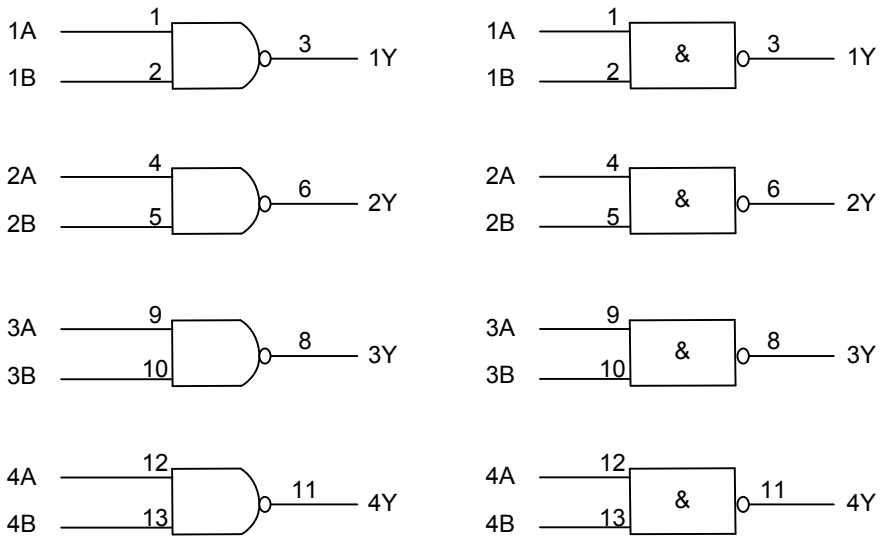
■ PIN CONFIGURATION



■ FUNCTION TABLE (each gate)

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

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)

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

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	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2		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	t_R, t_F	V_{CC}=3.3±0.3V			100	ns/V
		V_{CC}=5.0±0.5V			20	
Operating Temperature	T_A		-40		85	°C

■ STATIC CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	V_{CC}=2.0V	1.5			V
		V_{CC}=3.0V	2.1			
		V_{CC}=5.5V	3.85			
Low-Level Input Voltage	V_{IL}	V_{CC}=2.0V			0.5	V
		V_{CC}=3.0V			0.9	
		V_{CC}=5.5V			1.65	
High-Level Output Voltage	V_{OH}	V_{CC}=2.0V, I_{OH}=-50μA	1.9	2.0		V
		V_{CC}=3.0V, I_{OH}=-50μA	2.9	3.0		
		V_{CC}=4.5V, I_{OH}=-50μA	4.4	4.5		
		V_{CC}=3.0V,I_{OH}=-4mA	2.58			
		V_{CC}=4.5V,I_{OH}=-8mA	3.94			
Low-Level Output Voltage	V_{OL}	V_{CC}=2.0V, I_{OL}=50μA			0.1	V
		V_{CC}=3.0V, I_{OL}=50μA			0.1	
		V_{CC}=4.5V, I_{OL}=50μA			0.1	
		V_{CC}=3.0V,I_{OL} =4mA			0.36	
		V_{CC}=4.5V,I_{OL} =8mA			0.36	
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=0~5.5V,V_{IN}=5.5 or GND			±0.1	μA
Quiescent Supply Current	I_Q	V_{CC}=5.5V,V_{IN}=V_{CC} or GND,I_{OUT}=0			2	μA
Input Capacitance	C_{IN}	V_{CC}=5.0V,V_{IN}=V_{CC} or GND		2	10	pF

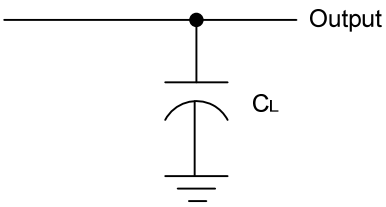
■ DYNAMIC CHARACTERISTICS(T_A=25°C) (Input: t_R, t_F≤3ns; PRR≤1MHz)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay from Input (A and B) to Output(Y)	t_{PLH}	V_{CC}=3.3±0.3V, C_L=15pF		5.5	7.9	ns
	t_{PHL}			5.5	7.9	
	t_{PLH}	V_{CC}=3.3±0.3V, C_L=50pF		8	11.4	
	t_{PHL}			8	11.4	
Propagation Delay from Input (A and B) to Output(Y)	t_{PLH}	V_{CC}=5.0±0.5V, C_L=15pF		3.7	5.5	ns
	t_{PHL}			3.7	5.5	
	t_{PLH}	V_{CC}=5.0±0.5V, C_L=50pF		5.2	7.5	
	t_{PHL}			5.2	7.5	

■ OPERATING CHARACTERISTICS (V_{CC}=5V; T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	Cpd	No load, f=1MHz		9.5		pF

■ TEST CIRCUIT AND WAVEFORM



C_L includes probe and jig capacitance.