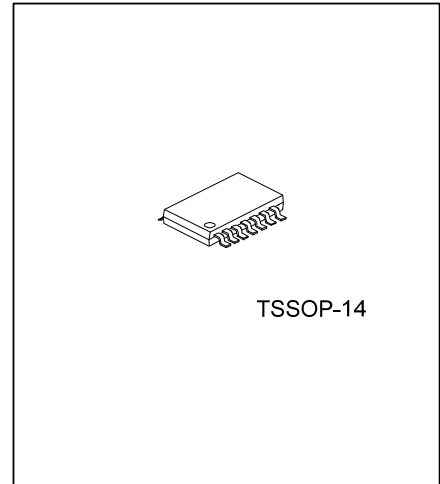


**U74HC21****CMOS IC****DUAL 4-INPUT AND GATES**■ **DESCRIPTION**

The **U74HC21** contains two independent 4-input AND gates. They perform the Boolean function $Y=A \bullet B \bullet C \bullet D$ or $Y=\overline{A} + \overline{B} + \overline{C} + \overline{D}$ in positive logic.

■ **FEATURES**

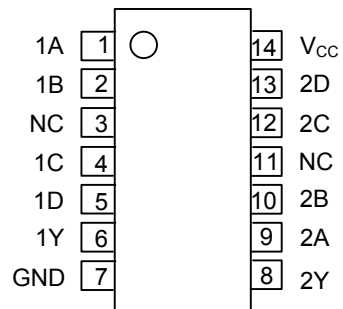
- * Operation Voltage Range: 2~6V
- * Low Quiescent Current: $I_{CC}=2\mu A(\text{Max})$
- * High Speed: $t_{PD}=11\text{ns}(\text{Typ})$
- * Low Input Current: 100nA Max

■ **ORDERING INFORMATION**

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC21L-P14-T	U74HC21G-P14-T	TSSOP-14	Tube
U74HC21L-P14-R	U74HC21G-P14-R	TSSOP-14	Tape Reel

U74HC21L-P14-T (1) Packing Type (2) Package Type (3) Lead Free	(1) R: Tape Reel, T: Tube (2) P14: TSSOP-14 (3) G: Halogen Free, L: Lead Free
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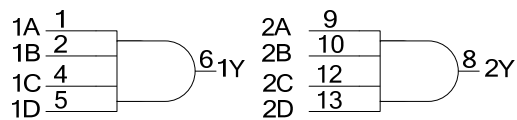
PIN CONFIGURATION



FUNCTION TABLE

INPUT(A)	INPUT(B)	INPUT(C)	INPUT(D)	OUTPUT(Y)
H	H	H	H	H
L	X	X	X	L
X	L	X	X	L
X	X	L	X	L
X	X	X	L	L

LOGIC DIAGRAM



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

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	°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		6	V
Input Voltage	V _{IN}		0		V _{CC}	V
Output Voltage	V _{OUT}		0		V _{CC}	V
Input Transition Rise or Fall Rate	t _R , t _F	V _{CC} =2V			1000	ns
		V _{CC} =4.5V			500	
		V _{CC} =6V			400	
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 V	1.5			V
		V _{CC} = 4.5V	3.15			
		V _{CC} = 6 V	4.2			
Low-Level Input Voltage	V _{IL}	V _{CC} = 2 V			0.5	V
		V _{CC} = 4.5 V			1.35	
		V _{CC} = 6 V			1.8	
High-Level Output Voltage	V _{OH}	V _{CC} = 2V, I _{OH} = 20μA	1.9	1.998		V
		V _{CC} = 4.5V, I _{OH} = 20μA	4.4	4.999		
		V _{CC} = 6V, I _{OH} = 20μA	5.9	5.999		
		V _{CC} = 4.5V, I _{OH} = 4mA	3.98	4.3		
		V _{CC} = 6V, I _{OH} = 5.2mA	5.48	5.8		
Low-Level Output Voltage	V _{OL}	V _{CC} = 2V, I _{OL} = 20μA		0.002	0.1	V
		V _{CC} = 4.5V, I _{OL} = 20μA		0.001	0.1	
		V _{CC} = 6V, I _{OL} = 20μA		0.001	0.1	
		V _{CC} = 4.5V, I _{OL} = 4mA		0.17	0.26	
		V _{CC} = 6V, I _{OL} = 5.2mA		0.15	0.26	
Input Leakage Current	I _{I(LEAK)}	V _{CC} = 6V, V _{IN} = V _{CC} or GND		±0.1	±100	nA
Quiescent Supply Current	I _Q	V _{CC} = 6V, V _{IN} = V _{CC} or GND, I _{OUT} = 0			2	μA
Input Capacitance	C _{IN}	V _{CC} =2V~6V		3	10	pF

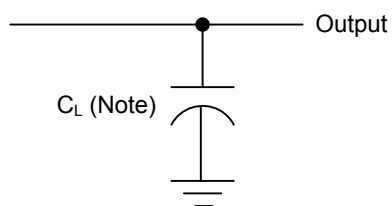
■ DYNAMIC CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, Input: $t_R=t_F=6\text{ns}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A, B, C or D) to Output(Y)	t_{PLH}, t_{PHL}	$V_{CC}=2\text{V}, C_L=50\text{pF}$		44	110	ns
		$V_{CC}=4.5\text{V}, C_L=50\text{pF}$		14	22	
		$V_{CC}=6\text{V}, C_L=50\text{pF}$		11	19	
Output Transition Time	t_T	$V_{CC}=2\text{V}, C_L=50\text{pF}$		29	75	ns
		$V_{CC}=4.5\text{V}, C_L=50\text{pF}$		10	15	
		$V_{CC}=6\text{V}, C_L=50\text{pF}$		8	13	

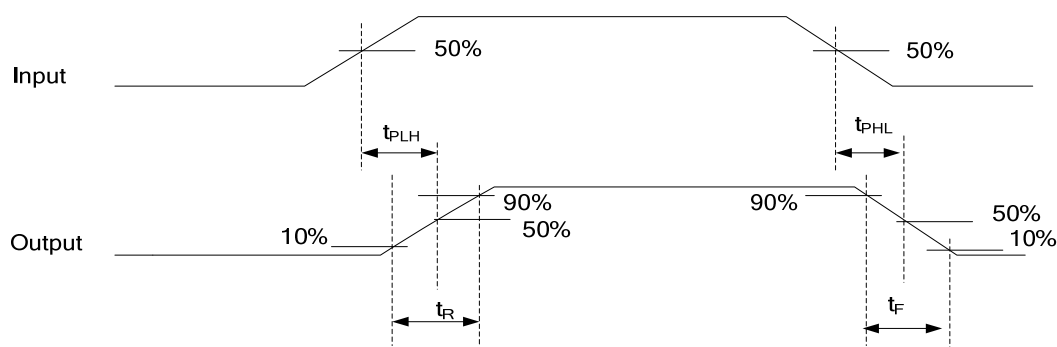
■ OPERATING CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	RATINGS	UNIT
Power Dissipation Capacitance	C_{PD}	No Load	25	pF

■ TEST CIRCUIT AND WAVEFORMS



Note : C_L includes probe and jig capacitance.



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