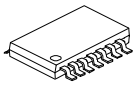
U74HCT20

CMOS IC

DUAL 4-INPUT NAND GATES



TSSOP-14

■ DESCRIPTION

The **U74HCT20** contains two independent 4-input NAND gates. They perform the Boolean function $Y=\overline{A \bullet B \bullet C \bullet D}$ or $Y=\overline{A}+\overline{B}+\overline{C}+\overline{D}$ in positive logic.

■ FEATURES

* Operation Voltage Range: 4.5V~5.5V
* Low Quiescent Current: I_{CC}=2μA(Max)
* High Speed: t_{PD}=16ns @ 4.5V(Typ)
* Low Input Current: 100nA Max
* Inputs are TTL Voltage Compatiabel

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HCT20L-P14-T	U74HCT20G-P14-T	TSSOP-14	Tube
U74HCT20L-P14-R	U74HCT20G-P14-R	TSSOP-14	Tape Reel

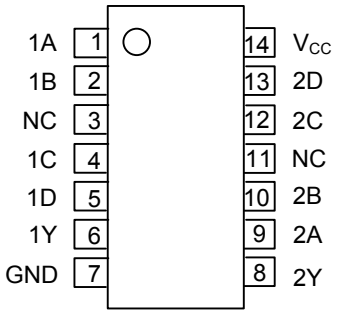
U74HCT20L-P14-T

(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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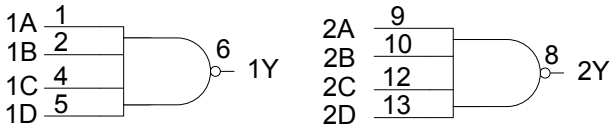
■ PIN CONFIGURATION



■ FUNCTION TABLE

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

■ LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATING (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	℃

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}		4.5		5.5	V
Input Voltage	V_{IN}		0		Vcc	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	t_R, t_F	V_{CC}=4.5V			500	ns
Operating Temperature	T_A		-40		85	℃

■ STATIC CHARACTERISTICS (T_A = 25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	V_{CC}= 4.5V to 5.5V	2.0			V
Low-Level Input Voltage	V_{IL}	V_{CC}= 4.5V to 5.5V			0.8	V
High-Level Output Voltage	V_{OH}	V_{CC}= 4.5V, I_O = -20μA	4.4	4.999		V
		V_{CC}= 4.5V, I_O = -4mA	3.98	4.3		
Low-Level Output Voltage	V_{OL}	V_{CC}= 4.5V, I_O = 20μA		0.001	0.1	V
		V_{CC}= 4.5V, I_O = 4mA		0.17	0.26	
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}= 5.5V ,V_{IN} = V_{CC} or GND		±0.1	±100	nA
Quiescent Supply Current	I_{CC}	V_{CC}= 5.5V, V_{IN} = V_{CC} or GND, I_O = 0			2	μA
Additional Quiescent Supply Current	$\triangle I_{CC}$	One input at V_{CC} -2.1V, other inputs at 0 or V_{CC}		100	360	uA
Input Capacitance	C_{IN}	V_{CC}=4.5V~5.5V		3	10	pF

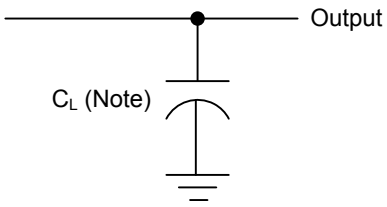
■ DYNAMIC CHARACTERISTICS (T_A=25°C, Input: t_R=t_F=6ns, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	t_{PLH}, t_{PHL}	V_{CC}=4.5V, C_L=50pF		16	28	ns
Output Transition Time	t_t	V_{CC}=4.5V, C_L=50pF		7	15	ns

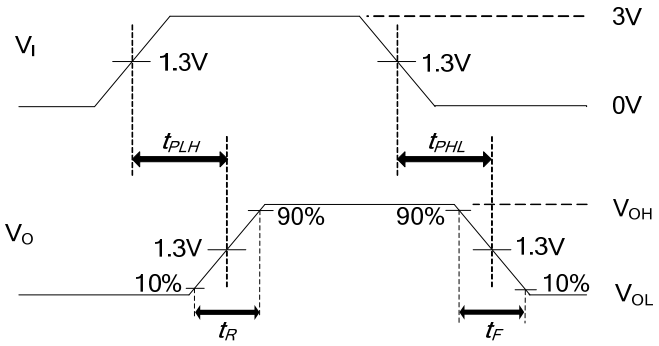
■ OPERATING CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	RATINGS	UNIT
Power Dissipation Capacitance	C_{PD}	No Load	38	pF

■ TEST CIRCUIT AND WAVEFORMS



Note : C_L includes probe and jig capacitance.



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