



U74HC02

CMOS IC

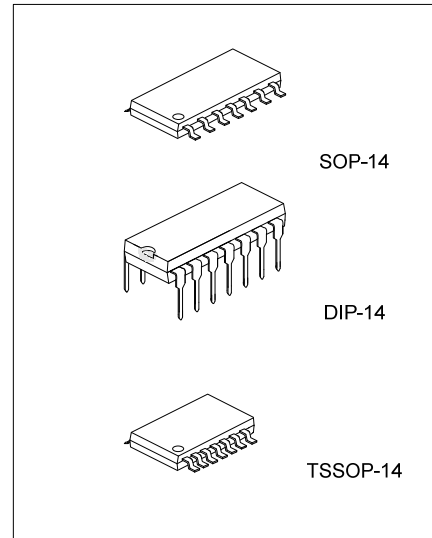
HCQUADRUPLE 2-INPUT NOR GATES

DESCRIPTION

The **U74HC02** contains four independent 2-input NOR gates, which provides the Function $Y=A+B$ in positive logic.

FEATURES

- * Operation voltage range: 2~6V
- * Low Quiescent Current: $I_{CC}=2\mu A(\text{Max})$
- * High speed: $t_{PD} = 8\text{ns}(\text{Typ}) V_{CC}=6\text{V}$
- * Low input current: 100nA Max



ORDERING INFORMATION

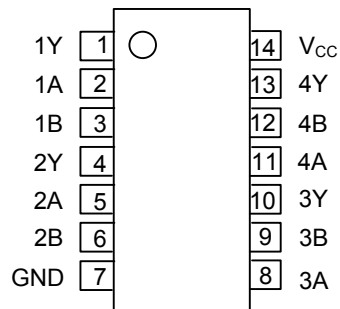
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC02L-D14-T	U74HC02G-D14-T	DIP-14	Tube
-	U74HC02G-S14-R	SOP-14	Tape Reel
-	U74HC02G-P14-R	TSSOP-14	Tape Reel

<p>U74HC02L-D14-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) R: Tape Reel, T: Tube (2) D14: DIP-14, P14: TSSOP-14, S14: SOP-14 (3) L: Lead Free, G: Halogen Free and Lead Free</p>
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MARKING

DIP-14	SOP-14 / TSSOP-14
<p>Date Code L: Lead Free G: Halogen Free Lot Code</p>	<p>Date Code Lot Code</p>

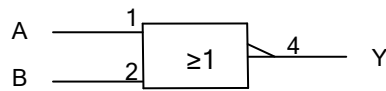
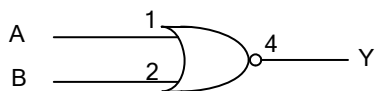
■ PIN CONFIGURATION



■ FUNCTION TABLE

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

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-14	80	°C/W
	SOP-14	86	
	TSSOP-14	113	

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V _{CC}		2	5	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, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
High-Level Input Voltage	V _{IH}	V _{CC} =2V	1.5			V	
		V _{CC} =4.5V	3.15				
		V _{CC} =6V	4.2				
Low-Level Input Voltage	V _{IL}	V _{CC} =2V			0.5	V	
		V _{CC} =4.5V			1.35		
		V _{CC} =6V			1.8		
High-Level Output Voltage	V _{OH}	V _{CC} =2V, I _{OH} =20μA	V _{IN} = V _{IH} or V _{IL}	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	V _{IN} = V _{IH} or V _{IL}		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	

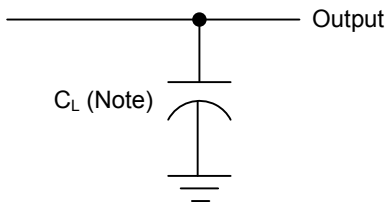
■ DYNAMIC CHARACTERISTICS ($T_A=25^\circ\text{C}$, Input: $t_R=t_F=6\text{ns}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from Input(A or B) to Output(Y)	t_{PLH}, t_{PHL}	$V_{CC}=2\text{V}, C_L=50\text{pF}$		45	90	ns
		$V_{CC}=4.5\text{V}, C_L=50\text{pF}$		9	18	
		$V_{CC}=6\text{V}, C_L=50\text{pF}$		8	15	
Output Transition Time	t_T	$V_{CC}=2\text{V}$		38	75	ns
		$V_{CC}=4.5\text{V}$		8	15	
		$V_{CC}=6\text{V}$		6	13	

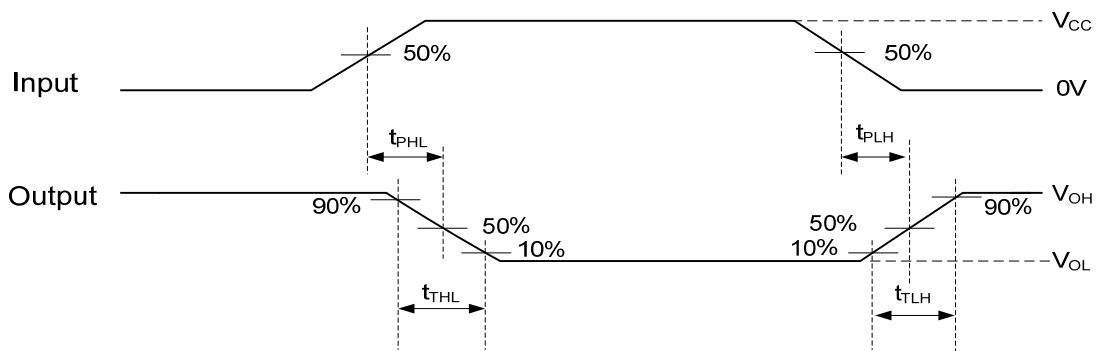
■ OPERATING CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	RATINGS	UNIT
Power Dissipation Capacitance	C_{PD}	No Load	22	pF

■ TEST CIRCUIT AND WAVEFORMS



Note : C_L includes probe and jig capacitance.



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