



U74AHC02

CMOS IC

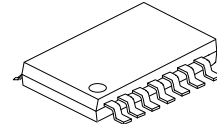
2-INPUT NOR GATE

■ DESCRIPTION

The UTC **U74AHC02** are independent 2-input NOR gates which provides the function $Y = \overline{A+B}$.

■ FEATURES

- * Operation Voltage Range: 2.0~5.5V
- * Low Power Dissipation
- * High Noise Immunity
- * Balanced Propagation Delays
- * Halogen Free



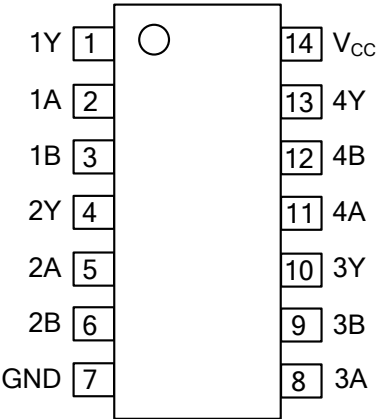
TSSOP-14

■ ORDERING INFORMATION

Ordering Number	Package	Packing
U74AHC02G-P14-R	TSSOP-14	Tape Reel

U74AHC02G-P14-R (1) Packing Type (2) Package Type (3) Halogen Free	(1) R: Tape Reel (2) P14: TSSOP-14 (3) G: Halogen Free
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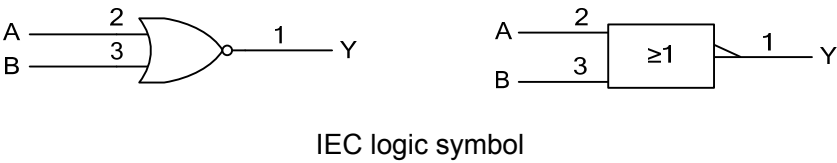
PIN CONFIGURATION



FUNCTION TABLE

INPUT		OUTPUT
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

LOGIC DIAGRAM (positive logic)



■ ABSOLUTE MAXIMUM RATINGS (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
Continuous 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	TEST 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}	High or low state	0		V_{CC}	V
Input Voltage	High	V_{IH}	$V_{CC}=2V$			V
			$V_{CC}=3V$			V
			$V_{CC}=5.5V$			V
	Low	V_{IL}	$V_{CC}=2V$		0.5	V
			$V_{CC}=3V$		0.9	V
			$V_{CC}=5.5V$		1.65	V
Output Current	High	I_{OH}	$V_{CC}=2V$		-50	μA
			$V_{CC}=3.3V \pm 0.3V$		-4	mA
			$V_{CC}=5V \pm 0.5V$		-8	mA
	Low	I_{OL}	$V_{CC}=2V$		50	μA
			$V_{CC}=3.3V \pm 0.3V$		4	mA
			$V_{CC}=5V \pm 0.5V$		8	mA
Input Rise or Fall Times	$\frac{\Delta t}{\Delta V}$		$V_{CC}=3.3V \pm 0.3V$		100	ns/V
			$V_{CC}=5V \pm 0.5V$		20	ns/V
Operating Temperature	T_A		-40		85	°C

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

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Output Voltage	High	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	
			V _{CC} =4.5V, I _{OH} =-50μA	4.4	4.5		V	
			V _{CC} =3.0V, I _{OH} =-4mA	2.58			V	
			V _{CC} =4.5V, I _{OH} =-8mA	3.94			V	
	Low	V _{OL}	V _{CC} =2.0V, I _{OL} =50μA			0.1	V	
			V _{CC} =3.0V, I _{OL} =50μA			0.1	V	
			V _{CC} =4.5V, I _{OL} =50μA			0.1	V	
			V _{CC} =3.0V, I _{OL} =4mA			0.36	V	
			V _{CC} =4.5V, I _{OL} =8mA			0.36	V	
Input Leakage Current		I _{I(LEAK)}	V _{CC} =0~5.5V, V _{IN} =5.5V 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			4	10	pF

Note: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation.

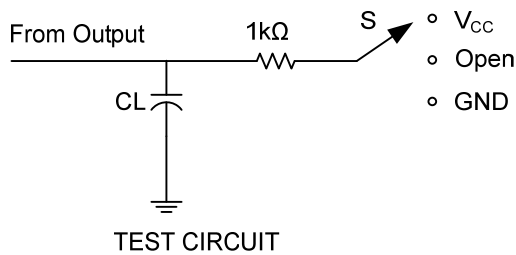
■ SWITCHING CHARACTERISTICS (see TEST CIRCUIT AND WAVEFORMS)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t_{PLH}/t_{PHL}	$V_{CC}=3.3V\pm0.3V, C_L=15pF$		5.6	7.9	ns
		$V_{CC}=3.3V\pm0.3V, C_L=50pF$		8.1	11.4	ns
	t_{PLH}/t_{PHL}	$V_{CC}=5.0V\pm0.5V, C_L=15pF$		3.6	5.5	ns
		$V_{CC}=5.0V\pm0.5V, C_L=50pF$		5.1	7.5	ns

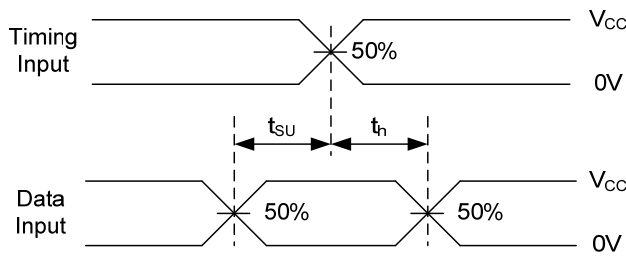
■ OPERATING CHARACTERISTICS ($V_{CC}=5V, T_a=25^{\circ}C$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	Cpd	No load, $f=1MHz$		15		pF

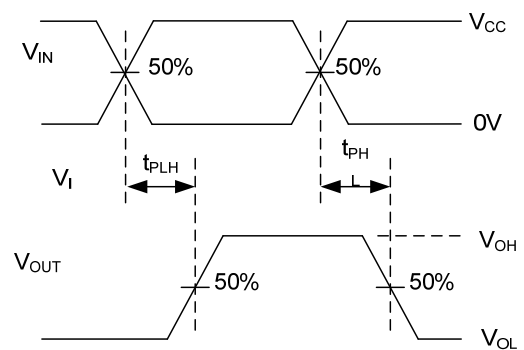
■ TEST CIRCUIT AND WAVEFORMS



TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PZL}	V_{CC}



SETUP TIME AND HOLD TIME



PROPAGATION DELAY TIMES

Note: CL includes probe and jig capacitance.

PRR $\leq$ 1MHz, $Z_O = 50\Omega$, $t_R \leq 3ns$, $t_F \leq 3ns$.

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