



U74AHC04

CMOS IC

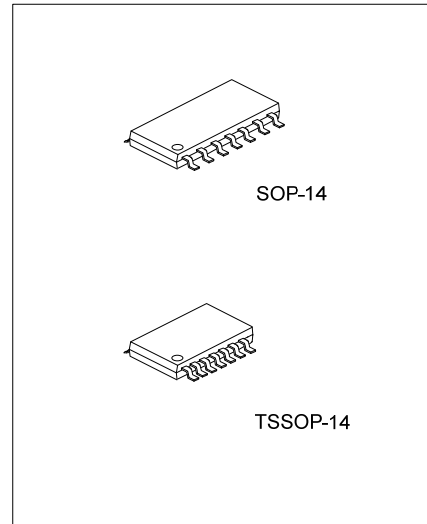
HEX INVERTER

DESCRIPTION

The **U74AHC04** is six independent inverters and each inverter provides the Function $Y = \overline{A}$

FEATURES

- * Operation Voltage Range: 2V~5.5V
- * High Noise Immunity
- * Low Power Dissipation
- * Balanced Propagation Delays

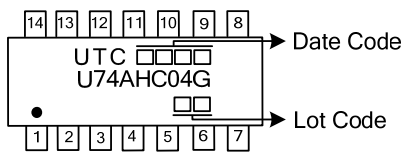


ORDERING INFORMATION

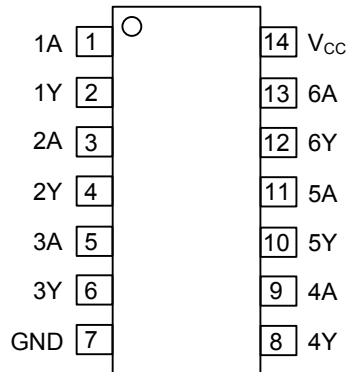
Ordering Number	Package	Packing
U74AHC04G-S14-R	SOP-14	Tape Reel
U74AHC04G-P14-R	TSSOP-14	Tape Reel

<p>U74AHC04G-S14-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S14: SOP-14, P14: TSSOP-14</p> <p>(3) G: Halogen Free and Lead Free</p>
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MARKING



■ PIN CONFIGURATION

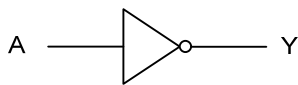


■ FUNCTION TABLE (Each Gate)

INPUT A	OUTPUT Y
H	L
L	H

Note: H: HIGH voltage level; L: LOW voltage level.

■ LOGIC DIAGRAM (Each Gate)



Logic Symbol



IEC Logic Symbol

■ ABSOLUTE MAXIMUM RATING (Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~+7.0	V
Input Voltage	V_{IN}	-0.5~+7.0	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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	SOP-14	76	°C/W
	TSSOP-14	113	

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2.0		5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
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 Current	I_{OH}	$V_{CC} = 2.0V$			-50	μA
		$V_{CC} = 3.3V \pm 0.3V$			-4	mA
		$V_{CC} = 5V \pm 0.5V$			-8	
Low-Level Output Current	I_{OL}	$V_{CC} = 2.0V$			50	μA
		$V_{CC} = 3.3V \pm 0.3V$			4	mA
		$V_{CC} = 5V \pm 0.5V$			8	
Input Transition Rise or Fall Rate	t_R / t_F	$V_{CC} = 3.3 \pm 0.3V$			100	ns/V
		$V_{CC} = 5.0 \pm 0.5V$			20	
Operating Temperature	T_A		-40		+85	°C

■ STATIC CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V _{OH}	I _{OH} =-50μA	V _{CC} =2.0V	1.9	2.0	V
			V _{CC} =3.0V	2.9	3.0	
			V _{CC} =4.5V	4.4	4.5	
		I _{OH} =-4 mA	V _{CC} =3.0V	2.58		
		I _{OH} =-8mA	V _{CC} =4.5V	3.94		
Low-Level Output Voltage	V _{OL}	I _{OL} =50μA	V _{CC} =2.0V		0.1	V
			V _{CC} =3.0V		0.1	
			V _{CC} =4.5V		0.1	
		I _{OL} =4 mA	V _{CC} =3.0V		0.36	
		I _{OL} =8mA	V _{CC} =4.5V		0.36	
Input Leakage Current	I _{I(LEAK)}	V _{IN} =5.5V or GND, V _{CC} =0V to 5.5V			0.1	μA
Quiescent Supply Current	I _Q	V _{IN} =V _{CC} or GND, I _{OUT} =0, V _{CC} =5.5V			2	μA
Input Capacitance	C _I	V _{IN} =V _{CC} or GND, V _{CC} =5V		2	10	pF

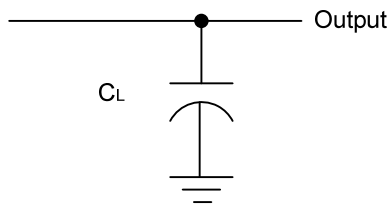
■ SWITCHING CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Propagation Delay, From Input(A) To Output(Y)	t _{PHL} / t _{PLH}	V _{CC} =3.3±0.3 V		C _L =15 pF	5	8.9	ns
				C _L =50 pF	7.5	11.4	ns
Propagation Delay, From Input(A) To Output(Y)	t _{PHL} / t _{PLH}	V _{CC} =5±0.5 V		C _L =15 pF	3.8	5.5	ns
				C _L =50 pF	5.3	7.5	ns

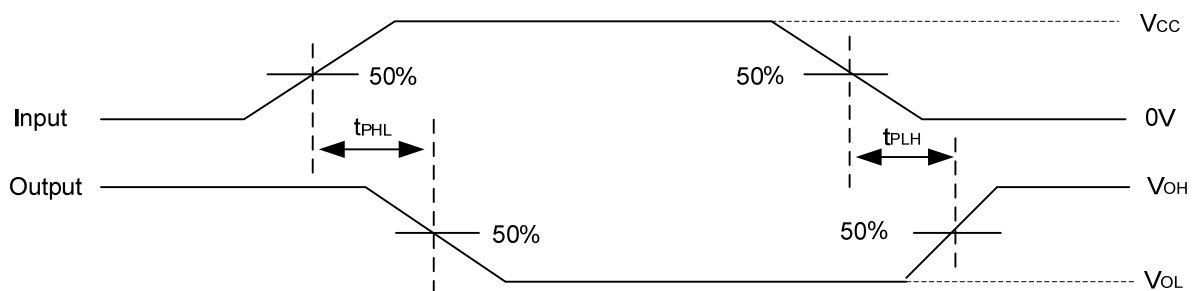
■ OPERATING CHARACTERISTICS (V_{CC}=5V; T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C _{PD}	NO Load, f=1MHz		12		pF

■ TEST CIRCUIT AND WAVEFORMS



Test circuit for measuring propagation delay



Waveforms showing the Input(A) to Output(Y) propagation delays.

Note: C_L includes probe and jig capacitance.

All input pulses are supplied by generators having the following characteristics: $PRR \leq 1\text{MHz}$, $Z_o = 50\Omega$, $t_R \leq 3\text{ns}$, $t_F \leq 3\text{ns}$.

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