



U74AHC04

CMOS IC

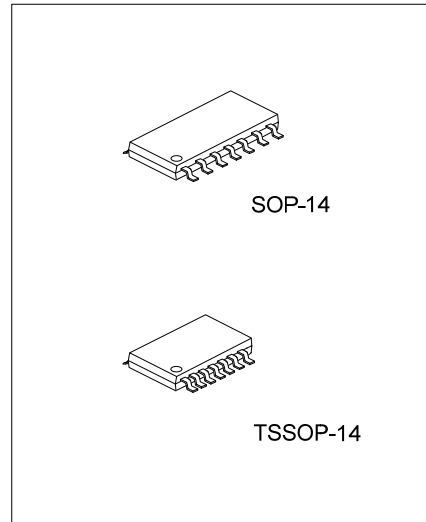
HEX INVERTER

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

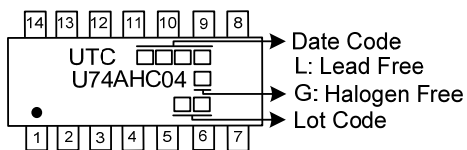


ORDERING INFORMATION

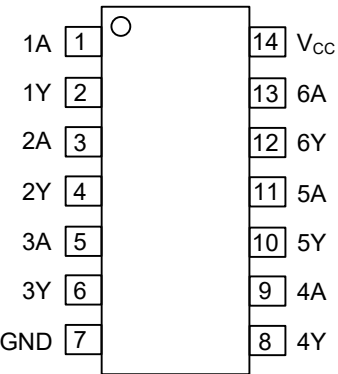
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC04L-S14-R	U74AHC04G-S14-R	SOP-14	Tape Reel
U74AHC04L-P14-R	U74AHC04G-P14-R	TSSOP-14	Tape Reel

U74AHC04G-S14-R └── (1)Packing Type └── (2)Package Type └── (3)Green Package	(1) R: Tape Reel (2) S14: SOP-14, P14: TSSOP-14 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



■ PIN CONFIGURATION

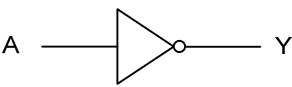


■ FUNCTION TABLE (Each Gate)

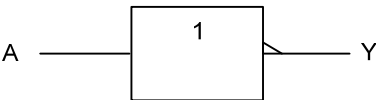
INPUT A	OUTPUT Y
H	L
L	H

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.

■ **RECOMMENDED OPERATING CONDITIONS** (Unless otherwise specified)

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	$\Delta t/\Delta v$	$V_{CC} = 3.3V \pm 0.3V$			100	ns/V
		$V_{CC} = 5V \pm 0.5V$			20	ns/V
Operating Temperature	T_A		-40		+125	°C

■ **THERMAL DATA**

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

■ **STATIC CHARACTERISTICS** (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Output Voltage	V_{OH}	$V_{CC}=2.0V$	1.9	2.0		V
		$V_{CC}=3.0V$	2.9	3.0		
		$V_{CC}=4.5V$	4.4	4.5		
		$V_{CC}=3.0V, I_{OH}=-4\text{ mA}$	2.58			
		$V_{CC}=4.5V, I_{OH}=-8\text{mA}$	3.94			
Low-Level Output Voltage	V_{OL}	$V_{CC}=2.0V$			0.1	V
		$V_{CC}=3.0V$			0.1	
		$V_{CC}=4.5V$			0.1	
		$V_{CC}=3.0V, I_{OL}=4\text{ mA}$			0.36	
		$V_{CC}=4.5V, I_{OL}=8\text{mA}$			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_{IN}	$V_{IN}=V_{CC}$ or GND, $V_{CC}=5V$		2	10	pF

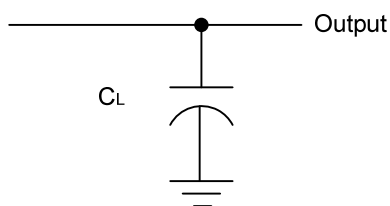
■ **SWITCHING CHARACTERISTICS** (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay, From Input(A) To Output(Y)	t_{PHL} / t_{PLH}	$V_{CC}=3.3\pm 0.3\text{ V}$	$C_L=15\text{ pF}$	5	8.9	ns
			$C_L=50\text{ pF}$	7.5	11.4	ns
Propagation Delay, From Input(A) To Output(Y)	t_{PHL} / t_{PLH}	$V_{CC}=5\pm 0.5\text{ V}$	$C_L=15\text{ pF}$	3.8	5.5	ns
			$C_L=50\text{ pF}$	5.3	7.5	ns

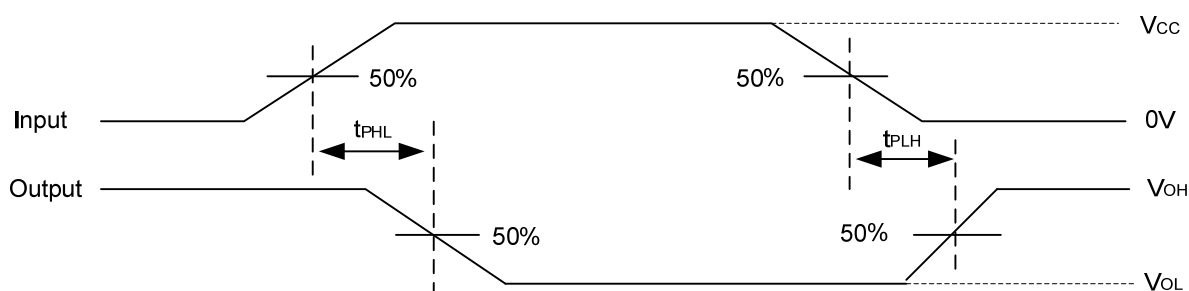
■ **OPERATING CHARACTERISTICS** ($V_{CC}=5V$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	NO Load, $f=1\text{MHz}$		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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