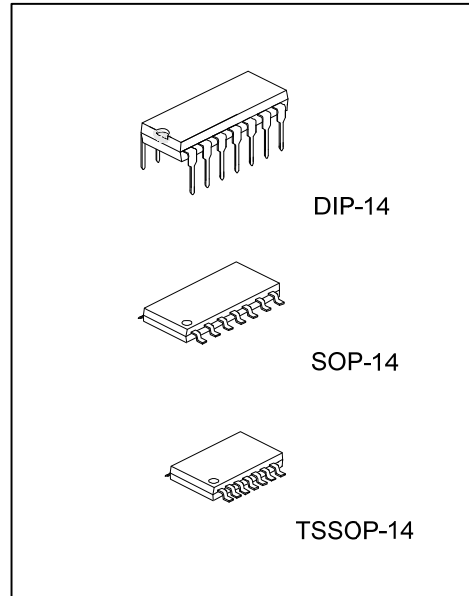




# U74HCT14

**CMOS IC**

## HIGH-SPEED CMOS LOGIC HEX INVERTING SCHMITT TRIGGER



■ **DESCRIPTION**

The UTC **U74HCT14** each contain six inverting schmitt triggers in one package. Each of them perform the Boolean function  $\bar{Y} = A$

■ **FEATURES**

- \* Widely range of input rise and fall time
- \* high noise immunity
- \* Fan-out parameters(over temperature range) up to 10 LSTTL Loads
- \* Low power consumption
- \* Wide range operation 4.5V ~ 5.5V

■ **ORDERING INFORMATION**

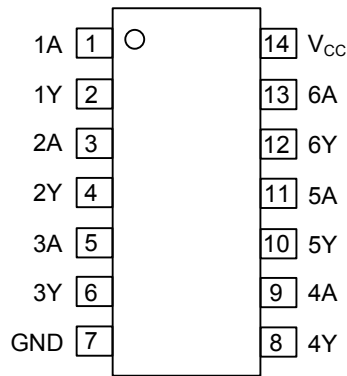
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HCT14L-D14-T	U74HCT14G-D14-T	DIP-14	Tube
-	U74HCT14G-S14-R	SOP-14	Tape Reel
-	U74HCT14G-P14-R	TSSOP-14	Tape Reel

<p>U74HCT14L-D14-T</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel, T: Tube</li> <li>(2) D14: DIP-14, S14: SOP-14, P14: TSSOP-14</li> <li>(3) L: Lead Free, G: Halogen Free and Lead Free</li> </ul>
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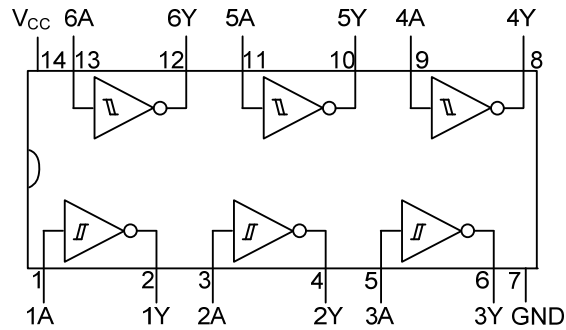
■ **MARKING**

DIP-14	SOP-14 / TSSOP-14

■ PIN CONFIGURATION



■ FUNCTIONAL DIAGRAM

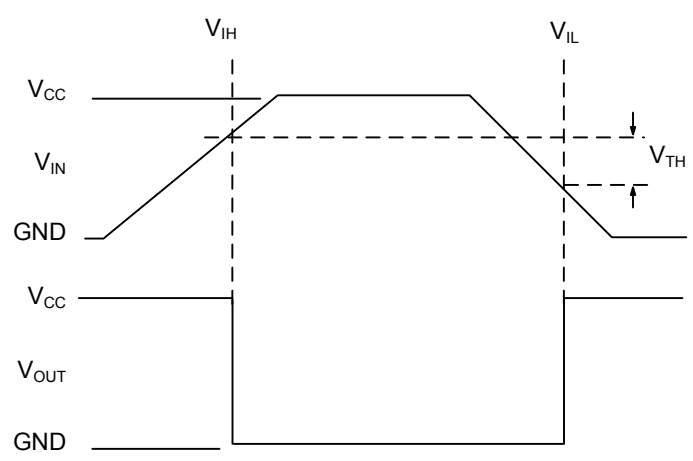
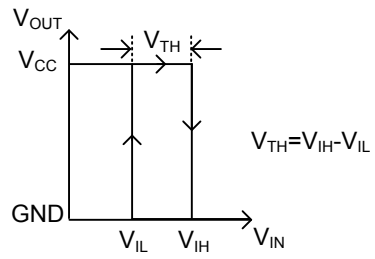
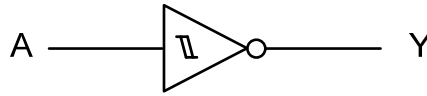


■ TRUTH TABLE

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

Note: H=High level, L=Low Level

■ LOGIC DIAGRAM



Hysteresis Definition, Characteristic, And Test Setup

### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
DC Supply Voltage		$V_{CC}$	-0.5V~7V	V
Input Clamp Current	For $V_{IN} < 0$ or $V_{IN} > V_{CC}$	$I_{IK}$	$\pm 20$	mA
Output Clamp Current	For $V_{OUT} < 0$ or $V_{OUT} > V_{CC}$	$I_{OK}$	$\pm 20$	mA
Continuous Output Current	For $V_{OUT} = 0$ to $V_{CC}$	$I_{OUT}$	$\pm 25$	mA
$V_{CC}$ or Ground Current		$I_{CC}$	$\pm 50$	mA
Operating Supply Voltage Range		$V_{CC}$	4.5~5.5	V
Operating DC Input or Output Voltage		$V_{IN}, V_{OUT}$	0V~ $V_{CC}$	V
Operating Temperature		$T_{OPR}$	-40 ~ +85	$^{\circ}C$
Storage Temperature		$T_{STG}$	-65 ~ +150	$^{\circ}C$

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
Thermal Resistance Junction Ambient	DIP-14	$\theta_{JA}$	80	$^{\circ}C/W$
	SOP-14		86	$^{\circ}C/W$
	TSSOP-14		113	$^{\circ}C/W$

### ■ RECOMMENDED OPERATING CONDITIONS

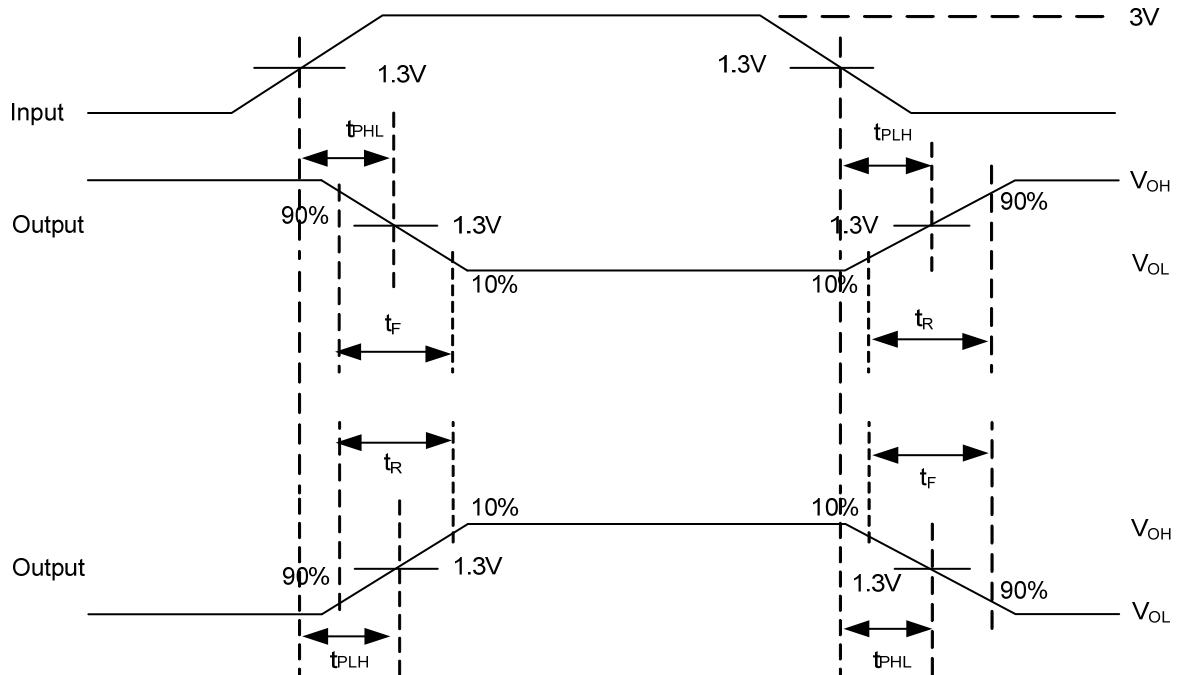
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage Range HC Types	$V_{CC}$		4.5		5.5	V
Input or Output Voltage	$V_{IN}, V_{OUT}$		0		$V_{CC}$	V
Operating Temperature	$T_A$		-40		85	$^{\circ}C$

### ■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	$V_{IH}$	$V_{CC}=4.5V$	1.2	1.5	1.9	V
		$V_{CC}=5.5V$	1.4	1.7	2.1	V
Low-Level Input Voltage	$V_{IL}$	$V_{CC}=4.5V$	0.5	0.9	1.2	V
		$V_{CC}=5.5V$	0.6	1	1.4	V
Hysteresis	$V_{TH}$	$V_{CC}=4.5V$	0.4	0.6	1.4	V
		$V_{CC}=5.5V$	0.4	0.65	1.5	V
High Level Output Voltage CMOS Loads	$V_{OH}$	$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OH}=-20\mu A$	4.4	4.49		V
High Level Output Voltage TTL Loads		$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OH}=-4mA$	3.98			V
Low Level Output Voltage CMOS Loads	$V_{OL}$	$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OL}=20\mu A$			0.1	V
Low Level Output Voltage TTL Loads		$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OL}=4mA$			0.26	V
Input Leakage Current	$I_{IN}$	$V_{CC}=5.5V, V_{IN}=V_{CC}$ and GND			$\pm 0.1$	$\mu A$
Quiescent Device Current	$I_Q$	$V_{IN}=V_{CC}$ or GND, $I_{OUT}=0mA$			2	$\mu A$
Additional Quiescent Device	$\Delta I_Q$ (Note)	One input at 0.5V or 2.4V, Other inputs at GND or $V_{CC}$			2.4	mA
<b>SWITCHING SPECIFICATIONS</b> (Input $t_R, t_F = 6ns$ )						
Propagation Delay, A to Y	$t_{PLH}, t_{PHL}$	$V_{CC}=4.5V, C_L=50pF$			32	ns
		$V_{CC}=5.5V, C_L=50pF$			30	ns
Output Transition Times	$t_{TLH}, t_{THL}$	$V_{CC}=4.5V, C_L=50pF$			15	ns
		$V_{CC}=5.5V, C_L=50pF$			14	ns
Input Capacitance	$C_{IN}$			3	10	pF
Power Dissipation Capacitance	$C_{pd}$	No load		10		pF

Note: This is the increase in supply current for each input that is at one of the specified TTL voltage levels, rather than 0 V or  $V_{CC}$ .

■ TEST WAVEFORM



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