



U74HCT14

CMOS IC

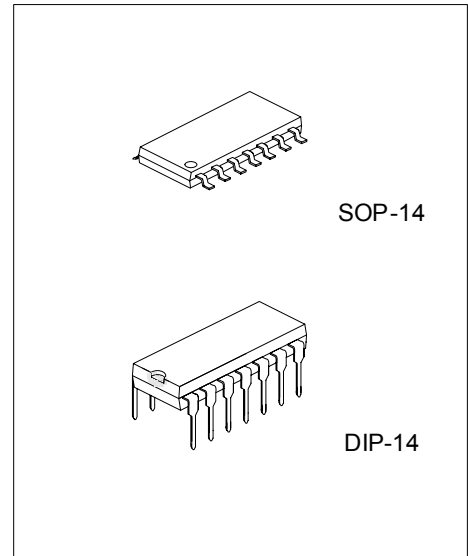
HIGH-SPEED CMOS LOGIC HEX INVERTING SCHMITT TRIGGER

DESCRIPTION

The UTC **74HCT14** each contain six inverting Schmitt triggers in one package. Each of them perform the Boolean function $Y=\bar{A}$.

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



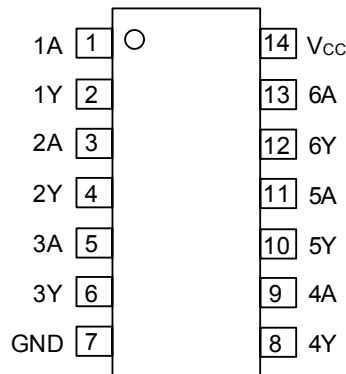
*Pb-free plating product number: 74HCT14L

ORDERING INFORMATION

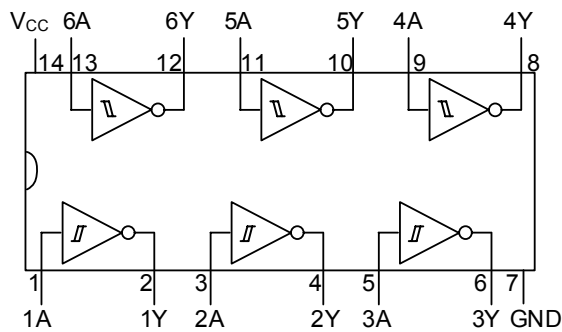
Order Number		Package	Packing
Normal	Lead Free Plating		
U74HCT14-D14-T	U74HCT14L-D14-T	DIP-14	Tube
U74HCT14-S14-R	U74HCT14L-S14-R	SOP-14	Tape Reel
U74HCT14-S14-T	U74HCT14L-S14-T	SOP-14	Tube

<p>U74HCT14L-D14-T</p> <p>(1)Packing Type (2)Package Type (3)Lead Plating</p>	<p>(1) R: Tape Reel, T: Tube (2) D14: DIP-14, S14: SOP-14 (3) L: Lead Free Plating, Blank: Pb/Sn</p>
---	--

■ PIN CONFIGURATION



■ FUNCTIONAL DIAGRAM



■ TRUTH TABLE

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

H=High level
L=Low Level

■ LOGIC DIAGRAM

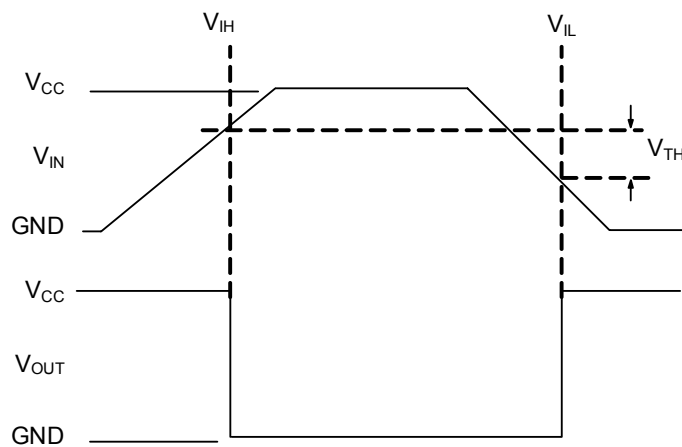
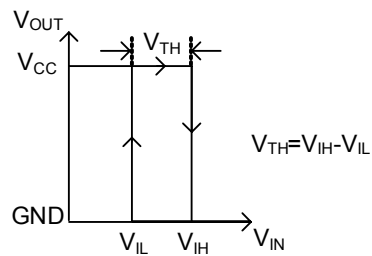
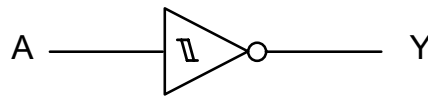


Figure 1. Hysteresis Definition, Characteristic, And Test Setup

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
DC Supply Voltage		V_{CC}	-0.5V~7V	V
DC Input Clamp Current	For $V_{IN} < -0.5V$ or $V_{IN} > V_{CC} + 0.5V$	I_{IK}	± 20	mA
DC Output Clamp Current	For $V_{OUT} < -0.5V$ or $V_{OUT} > V_{CC} + 0.5V$	I_{OK}	± 20	mA
DC Drain Current, per Output	For $-0.5V < V_{OUT} < V_{CC} + 0.5V$	I_{OUT}	± 25	mA
DC Output Source or Sink Current per Output Pin	For $V_{OUT} > -0.5V$ or $V_{OUT} < V_{CC} + 0.5V$	I_{OUT}	± 25	mA
DC V_{CC} or Ground Current		I_{CC}	± 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	
Storage Temperature		T_{STG}	-65 ~ +150	

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	θ_{JA}	80	/W
	SOP-14		86	

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Switch Points	V_{IH}	$V_{CC}=4.5V$	1.7		1.79	V
		$V_{CC}=5.5V$	1.94		1.96	V
	V_{IL}	$V_{CC}=4.5V$	0.82		0.94	V
		$V_{CC}=5.5V$	0.96		1.15	V
	V_{TH}	$V_{CC}=4.5V$	0.8		0.86	V
		$V_{CC}=5.5V$	0.62		0.83	V
High Level Output Voltage CMOS Loads	V_{OH}	$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OUT}=-20\mu A$	4.49	4.495	4.498	V
High Level Output Voltage TTL Loads		$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OUT}=-4mA$	3.99	4.00	4.03	V
Low Level Output Voltage CMOS Loads	V_{OL}	$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OUT}=20\mu A$	0.41	0.66	1.0	mV
Low Level Output Voltage TTL Loads		$V_{CC}=4.5V, V_{IN}=V_{IH}$ or $V_{IL}, I_{OUT}=4mA$	0.18	0.185	0.19	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=5.5V, V_{IN}=V_{CC}$ and GND			<0.1	μA
Quiescent Device Current	I_{CC}	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0mA$			<1	μA
Additional Quiescent Device	I_{CC} (Note 1)	$V_{CC}=4.5V\sim 5.5V$, One input at 2.4V Other inputs at GND or V_{CC}			25	μA
SWITCHING SPECIFICATIONS (Input $t_R, t_F = 6ns$)						
Propagation Delay, A to Y	t_{PLH}, t_{PHL}	$V_{CC}=4.5V, C_L=50pF$			30	ns
		$V_{CC}=5V, C_L=15pF$			2	ns
Output Transition Times	t_{TLH}, t_{THL}	$V_{CC}=4.5V, C_L=50pF$			12.5	ns
Input Capacitance	C_{IN}				10	pF
Power Dissipation Capacitance(Note 2,3)	C_{PD}	$V_{CC}=5V$		20		pF

Note: 1. 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} .

2. C_{PD} is used to determine the dynamic power consumption, per inverter.

3. $P_D = V_{CC}^2 f_i (C_{PD} + C_L)$ where f_i = input frequency, C_L = output load capacitance, V_{CC} = supply voltage.

■ TEST WAVEFORM

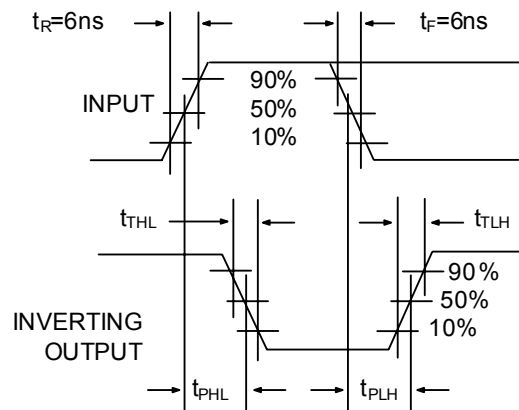


Figure 2. 74HCT14 Transition Times And Propagation Delay Times, Combination Logic

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.