



U74HC14

CMOS IC

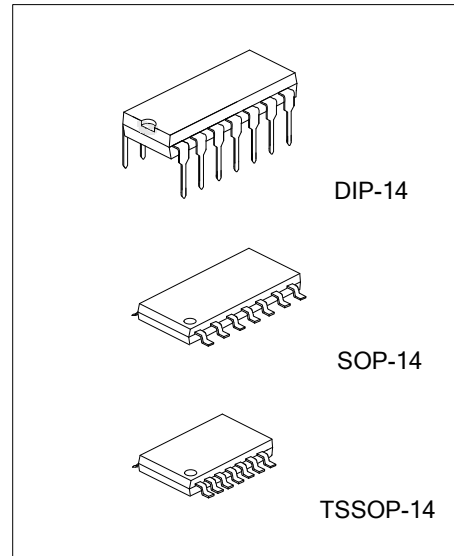
HIGH-SPEED CMOS LOGIC HEX INVERTING SCHMITT TRIGGER

DESCRIPTION

The UTC **U74HC14** 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: 2V ~ 6V



ORDERING INFORMATION

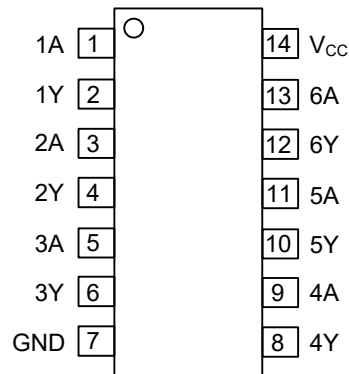
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC14L-D14-T	U74HC14G-D14-T	DIP-14	Tube
U74HC14L-S14-R	U74HC14G-S14-R	SOP-14	Tape Reel
U74HC14L-P14-R	U74HC14G-P14-R	TSSOP-14	Tape Reel

<p>U74HC14G-D14-T</p>	<p>(1) T: Tube, R: Tape Reel (2) D14: DIP-14, S14: SOP-14, P14: TSSOP-14 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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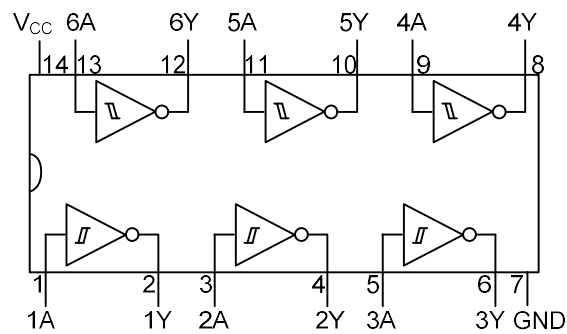
MARKING

DIP-14	SOP-14 / TSSOP-14

■ PIN CONFIGURATION



■ FUNCTIONAL DIAGRAM



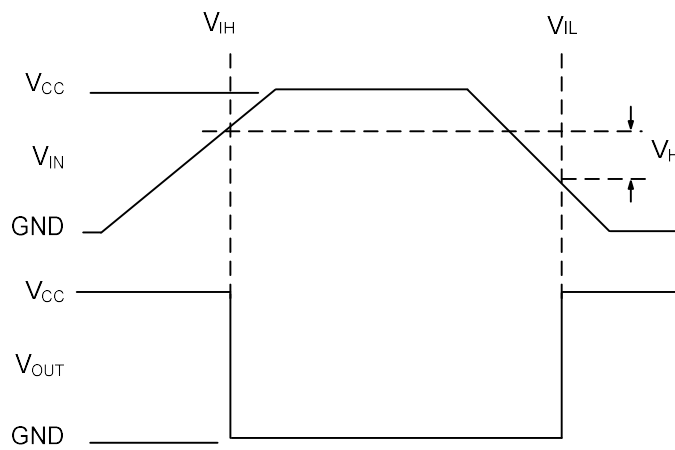
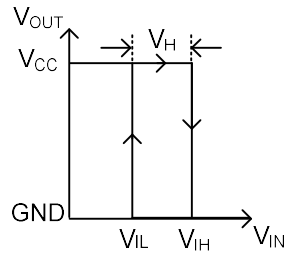
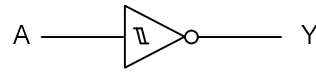
■ TRUTH TABLE

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

H=High level

L=Low Level

■ LOGIC DIAGRAM



Hysteresis Definition, Characteristic, And Test Setup

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	-0.5 ~ 7	V
Input Clamp Current	For $V_{IN} < 0$ or $V_{IN} > V_{CC}$	I_{IK}	± 20	mA
Output Clamp Current	For $V_{OUT} < 0$ or $V_{OUT} > V_{CC}$	I_{OK}	± 20	mA
Continuous Output Current	For $V_{OUT} = 0$ to V_{CC}	I_{OUT}	± 25	mA
V_{CC} or Ground Current		I_{CC}	± 50	mA
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	θ_{JA}	80	$^{\circ}C/W$
	SOP-14		76	$^{\circ}C/W$
	TSSOP-14		113	$^{\circ}C/W$

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage Range HC Types	V_{CC}		2	5	6	V
Input or Output Voltage	V_{IN}, V_{OUT}		0		V_{CC}	V
Operating Temperature	T_A		-40		+125	$^{\circ}C$

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^{\circ}C$			$T_A=-40^{\circ}C \sim +125^{\circ}C$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Input Switch Points	V_{IH}	$V_{CC}=2V$	0.7	1.2	1.5	0.7		1.5	V
		$V_{CC}=4.5V$	1.55	2.5	3.15	1.55		3.15	V
		$V_{CC}=6V$	2.1	3.3	4.2	2.1		4.2	V
	V_{IL}	$V_{CC}=2V$	0.3	0.6	1	0.3		1	V
		$V_{CC}=4.5V$	0.9	1.6	2.45	0.9		2.45	V
		$V_{CC}=6V$	1.2	2	3.2	1.2		3.2	V
	V_{TH}	$V_{CC}=2V$	0.2	0.6	1.2	0.2		1.2	V
		$V_{CC}=4.5V$	0.4	0.9	2.1	0.4		2.1	V
		$V_{CC}=6V$	0.5	1.3	2.5	0.5		2.5	V
High Level Output Voltage CMOS Loads	V_{OH}	$V_{IN}=V_{IH}$ or $V_{IL}, V_{CC}=2V,$ $I_{OH}=-0.02mA$	1.9			1.9			V
		$V_{IN}=V_{IH}$ or $V_{IL}, V_{CC}=4.5V,$ $I_{OH}=-0.02mA$	4.4			4.4			V
		$V_{IN}=V_{IH}$ or $V_{IL}, V_{CC}=6V,$ $I_{OH}=-0.02mA$	5.9			5.9			V
High Level Output Voltage TTL Loads	V_{OH}	$V_{IN}=V_{IH}$ or $V_{IL}, V_{CC}=4.5V,$ $I_{OH}=-4mA$	3.98			3.7			V
		$V_{IN}=V_{IH}$ or $V_{IL}, V_{CC}=6V,$ $I_{OH}=-5.2mA$	5.48			5.2			V

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Low Level Output Voltage CMOS Loads	V _{OL}	V _{IN} =V _{IH} or V _{IL} , V _{CC} =2V, I _{OL} =0.02mA			0.1			0.1	V
		V _{IN} =V _{IH} or V _{IL} , V _{CC} =4.5V, I _{OL} =0.02mA			0.1			0.1	V
		V _{IN} =V _{IH} or V _{IL} , V _{CC} =6V, I _{OL} =0.02mA			0.1			0.1	V
Low Level Output Voltage TTL Loads	V _{OL}	V _{IN} =V _{IH} or V _{IL} , V _{CC} =4.5V, I _{OL} =4mA			0.26			0.4	V
		V _{IN} =V _{IH} or V _{IL} , V _{CC} =6V, I _{OL} =5.2mA			0.26			0.4	V
Input Leakage Current	I _{IN}	V _{IN} =V _{CC} and GND, V _{CC} =6V			±0.1			±1	µA
Quiescent Device Current	I _Q	V _{IN} =V _{CC} or GND, V _{CC} =6V, I _{OUT} =0			2			40	µA

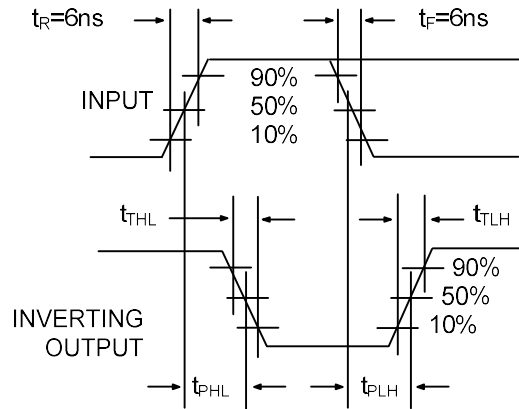
■ SWITCHING CHARACTERISTICS (C_L=50pF, Input t_R, t_F = 6ns, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40°C~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation Delay, A to Y	t _{PLH} , t _{PHL}	V _{CC} =2V		55	125			190	ns
		V _{CC} =4.5V		12	25			38	ns
		V _{CC} =6V		11	21			32	ns
Output Transition Times	t _{TLH} , t _{THL}	V _{CC} =2V		38	75			110	ns
		V _{CC} =4.5V		11	21			28	ns
		V _{CC} =6V		10	19			25	ns

■ OPERATING CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _{IN}			3	10	pF
Power Dissipation Capacitance	C _{PD}	No load		20		pF

■ TEST CIRCUIT AND WAVEFORMS



Transition Times And Propagation
Delay Times, Combination Logic

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