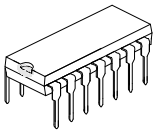
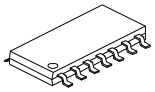
U74HCT14

CMOS IC

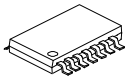
HIGH-SPEED CMOS LOGIC HEX INVERTING SCHMITT TRIGGER



DIP-14



SOP-14



TSSOP-14

■ DESCRIPTION

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

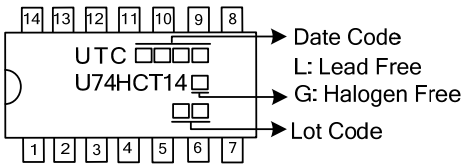
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HCT14L-D14-T	U74HCT14G-D14-T	DIP-14	Tube
U74HCT14L-S14-R	U74HCT14G-S14-R	SOP-14	Tape Reel
U74HCT14L-P14-R	U74HCT14G-P14-R	TSSOP-14	Tape Reel

U74HCT14G-D14-T
(1)Packing Type
(2)Package Type
(3)Green Package

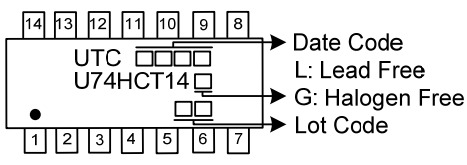
(1) R: Tape Reel, T: Tube
(2) D14: DIP-14, S14: SOP-14, P14: TSSOP-14
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

DIP-14



SOP-14 / TSSOP-14



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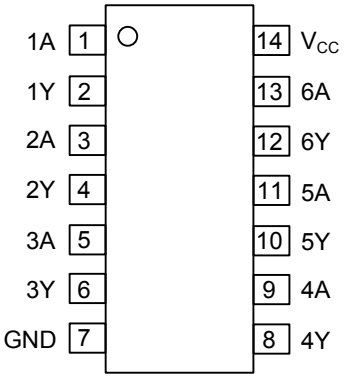
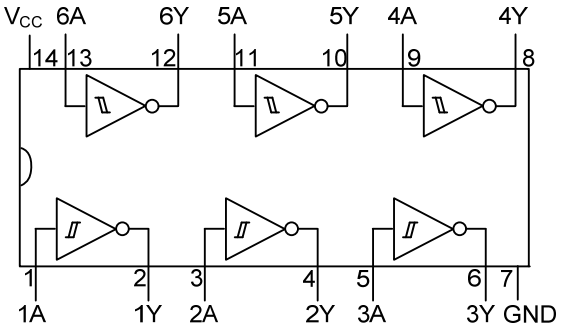
■ PIN CONFIGURATION



■ FUNCTIONAL DIAGRAM

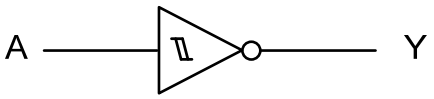


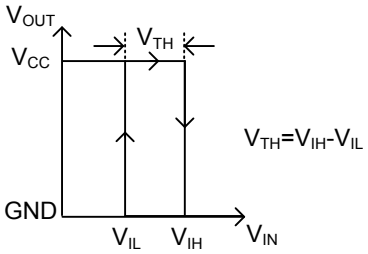
■ TRUTH TABLE

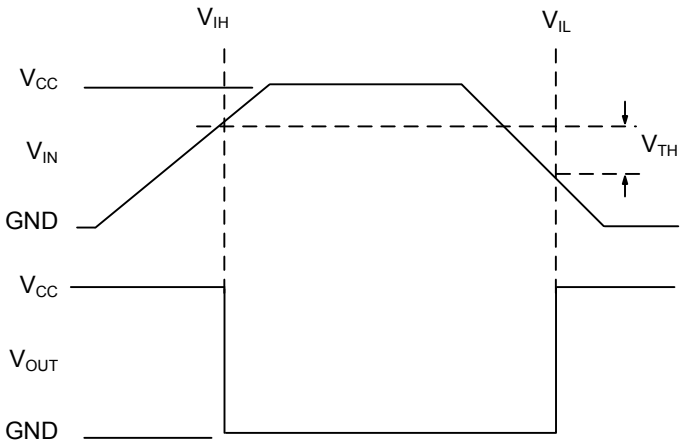
INPUT(A)	OUTPUT(Y)
L	H
H	L

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}	±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
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	℃/W
	TSSOP-14		113	℃/W

■ RECOMMENDED OPERATING CONDITIONS

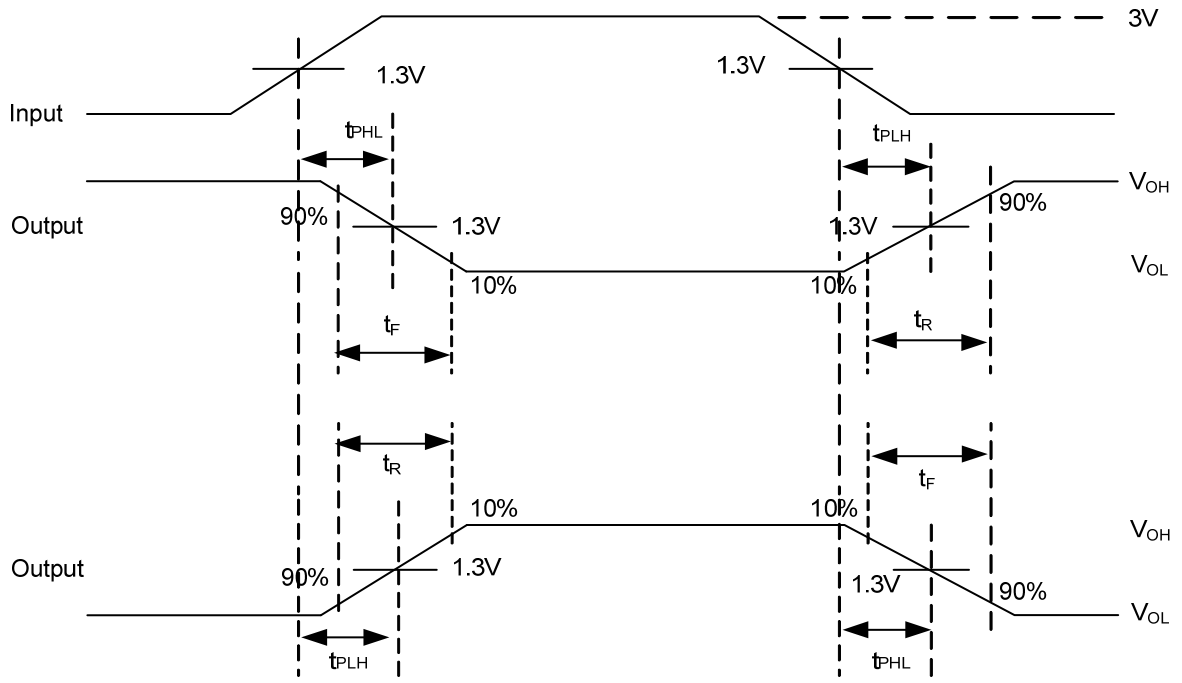
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage Range HC Types	V_{CC}		4.5		5.5	V
Input or Output Voltage	V_{IN}, V_{OUT}		0		V_{CC}	V
Operating Temperature	T_A		-40		85	℃

■ 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}=-20μA	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}=20μA			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			±0.1	μA
Quiescent Device Current	I_Q	V_{IN}=V_{CC} or GND, I_{OUT}=0mA			2	μA
Additional Quiescent Device	$\triangle I_Q$ (Note)	One input at 0.5V or 2.4V,Other inputs at GND or V_{CC}			2.4	mA
SWITCHING SPECIFICATIONS (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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