

**U74HC14B**

Preliminary

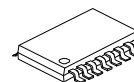
CMOS IC

**HIGH-SPEED CMOS LOGIC
HEX INVERTING SCHMITT
TRIGGER**■ **DESCRIPTION**

The UTC **U74HC14B** each contain six inverting Schmitt triggers in one package. Each of them perform the Boolean function $Y = \overline{A}$

■ **FEATURES**

- * Wide range operation: 2V ~ 6V
- * Low power consumption
- * Schmitt Trigger Inputs

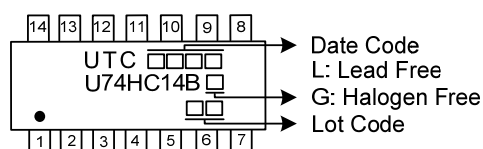


TSSOP-14

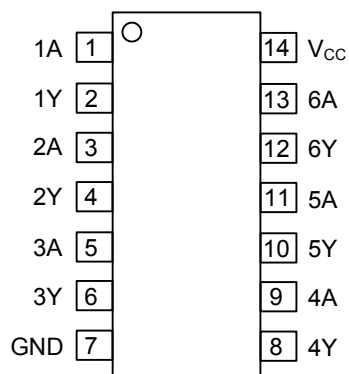
■ **ORDERING INFORMATION**

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC14BL-P14-R	U74HC14BG-P14-R	TSSOP-14	Tape Reel

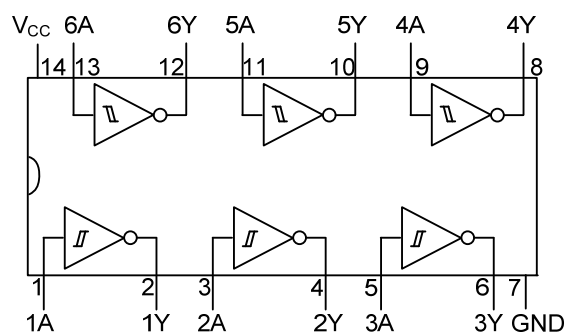
U74HC14BG-P14-R (1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) P14: TSSOP-14 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ **MARKING**

■ PIN CONFIGURATION



■ FUNCTIONAL DIAGRAM



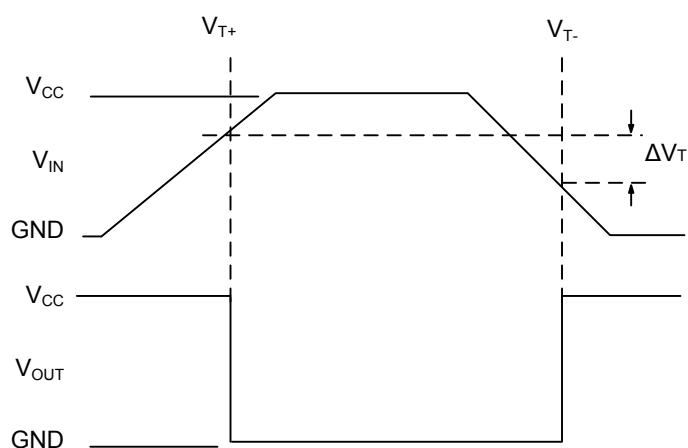
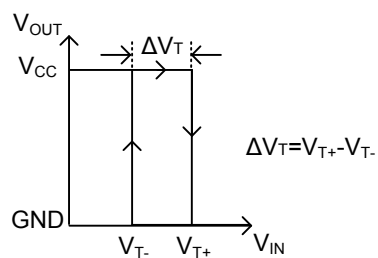
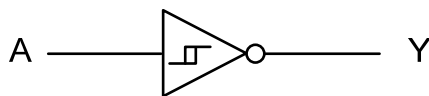
■ TRUTH TABLE

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	°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		θ_{JA}	113	°C/W

■ RECOMMENDED OPERATING CONDITIONS

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

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A = 25^\circ\text{C}$			$T_A = -40^\circ\text{C} \sim +125^\circ\text{C}$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Input Threshold Voltage	V_{T+}	$V_{CC} = 2\text{V}$	0.7	1.1	1.5	0.7		1.5	V
		$V_{CC} = 4.5\text{V}$	1.55	2.3	3.15	1.55		3.15	V
		$V_{CC} = 6\text{V}$	2.1	3	4.2	2.1		4.2	V
	V_{T-}	$V_{CC} = 2\text{V}$	0.3	0.6	1	0.3		1	V
		$V_{CC} = 4.5\text{V}$	0.9	1.6	2.45	0.9		2.45	V
		$V_{CC} = 6\text{V}$	1.2	2	3.2	1.2		3.2	V
	ΔV_T	$V_{CC} = 2\text{V}$	0.2	0.5	1.2	0.2		1.2	V
		$V_{CC} = 4.5\text{V}$	0.4	0.7	2.1	0.4		2.1	V
		$V_{CC} = 6\text{V}$	0.5	1	2.5	0.5		2.5	V
High-Level Output Voltage	V_{OH}	$V_{IN} = V_{T+}$ or V_{T-} , $V_{CC} = 2\text{V}$, $I_{OH} = -0.02\text{mA}$	1.9			1.9			V
		$V_{IN} = V_{T+}$ or V_{T-} , $V_{CC} = 4.5\text{V}$, $I_{OH} = -0.02\text{mA}$	4.4			4.4			V
		$V_{IN} = V_{T+}$ or V_{T-} , $V_{CC} = 6\text{V}$, $I_{OH} = -0.02\text{mA}$	5.9			5.9			V
		$V_{IN} = V_{T+}$ or V_{T-} , $V_{CC} = 4.5\text{V}$, $I_{OH} = -4\text{mA}$	3.98			3.7			V
		$V_{IN} = V_{T+}$ or V_{T-} , $V_{CC} = 6\text{V}$, $I_{OH} = -5.2\text{mA}$	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	V _{OL}	V _{IN} =V _{T+} or V _{T-} , V _{CC} =2V, I _{OL} =0.02mA			0.1			0.1	V
		V _{IN} =V _{T+} or V _{T-} , V _{CC} =4.5V, I _{OL} =0.02mA			0.1			0.1	V
		V _{IN} =V _{T+} or V _{T-} , V _{CC} =6V, I _{OL} =0.02mA			0.1			0.1	V
		V _{IN} =V _{T+} or V _{T-} , V _{CC} =4.5V, I _{OL} =4mA			0.26			0.4	V
		V _{IN} =V _{T+} or V _{T-} , 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 Supply Current	I _Q	V _{IN} =V _{CC} or GND, V _{CC} =6V, I _{OUT} =0			2			40	μA

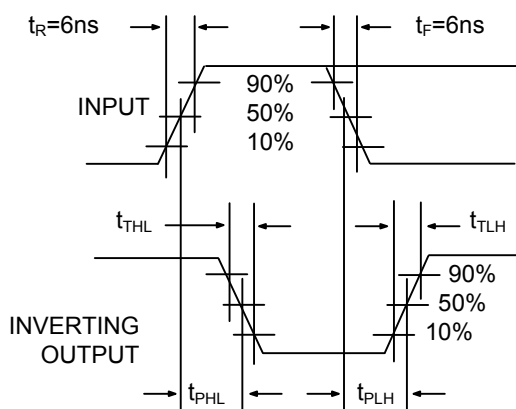
■ SWITCHING CHARACTERISTICS (C_L=50pF, Input t_R, t_F=6ns, unless otherwise specified)

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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