



## U74AHCT14

CMOS IC

### HEX SCHMITT-TRIGGER INVERTER

#### DESCRIPTION

The **U74AHCT14** is a high speed Si-gate CMOS device which contains six independent Schmitt-trigger inverters and they perform the function  $Y=\overline{A}$ .

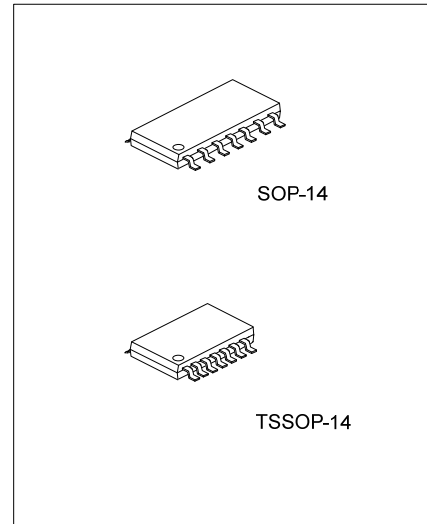
The device have different input threshold levels for positive-going ( $V_{T+}$ ) and negative-going ( $V_{T-}$ ) signals because of the Schmitt-trigger action in the input.

#### FEATURES

- \* All inputs have Schmitt-trigger action
- \* Inputs are TTL-Voltage compatible
- \* Balanced propagation delays

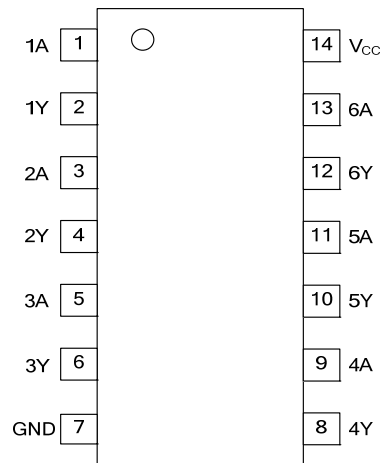
#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHCT14L-S14-R	U74AHCT14G-S14-R	SOP-14	Tape Reel
U74AHCT14L-P14-R	U74AHCT14G-P14-R	TSSOP-14	Tape Reel



<p>U74AHCT14G-S14-R</p> <p>(1) Packing Type (2) Package Type (3) Halogen Free</p>	<p>(1) R: Tape Reel (2) S14: SOP-14, P14: TSSOP-14 (3) L: Lead Free, G: Halogen Free</p>
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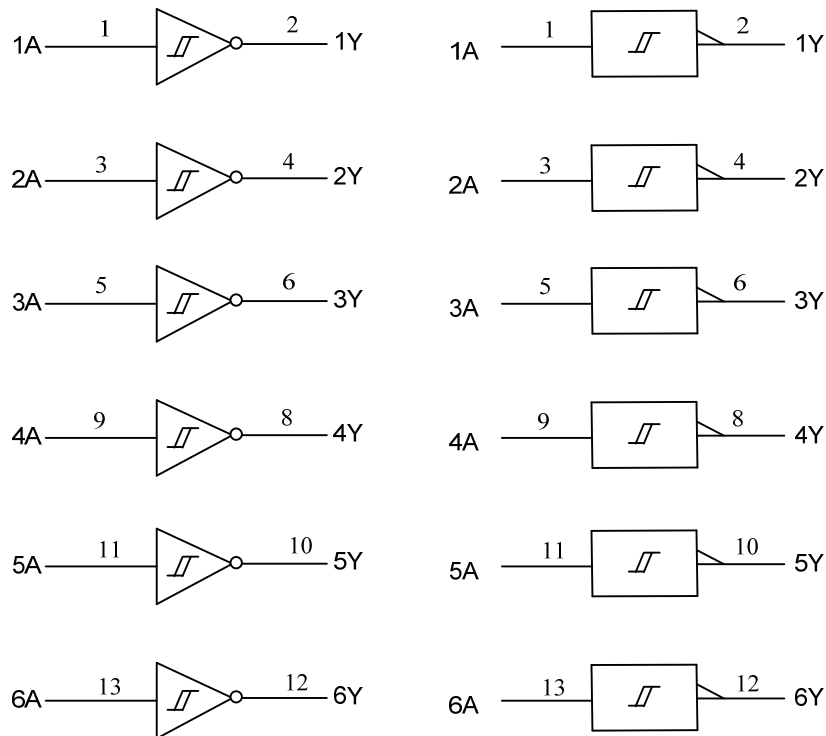
## ■ PIN CONFIGURATION



## ■ FUNCTION TABLE (each gate)

INPUT	OUTPUT
A	Y
L	H
H	L

## ■ LOGIC DIAGRAM (positive logic)



IEC logic symbol

■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C, unless otherwise specified)(Note 1)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sub>CC</sub>	-0.5~7	V
Input Voltage	V <sub>IN</sub>	-0.5~7	V
Output Voltage(active mode)	V <sub>OUT</sub>	-0.5~V <sub>CC</sub> +0.5	V
Input Clamp Current(V <sub>IN</sub> <0)	I <sub>IK</sub>	-20	mA
Output Clamp Current(V <sub>OUT</sub> <0)	I <sub>OK</sub>	±20	mA
Output Current	I <sub>OUT</sub>	±25	mA
V <sub>CC</sub> or GND Current	I <sub>CC</sub>	±50	mA
Storage Temperature	T <sub>STG</sub>	-65 ~ +150	°C

Note 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

2. 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.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V <sub>CC</sub>	Operating	4.5		5.5	V
Input Voltage	V <sub>IN</sub>		0		5.5	V
Output Voltage	V <sub>OUT</sub>		0		V <sub>CC</sub>	V
Operating Temperature	T <sub>A</sub>		-40		+85	°C

■ STATIC CHARACTERISTICS (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Positive-Going Input Threshold Voltage	V <sub>T+</sub>	V <sub>CC</sub> = 4.5V	0.9		1.9	V
		V <sub>CC</sub> = 5.5V	1		2.1	
Negative-Going Input Threshold Voltage	V <sub>T-</sub>	V <sub>CC</sub> = 4.5V	0.5		1.5	V
		V <sub>CC</sub> = 5.5V	0.6		1.7	
Hysteresis Voltage (V <sub>T+</sub> -V <sub>T-</sub> )	ΔV <sub>T</sub>	V <sub>CC</sub> = 4.5V	0.4		1.4	V
		V <sub>CC</sub> = 5.5V	0.4		1.5	
High-Level Output Voltage	V <sub>OH</sub>	V <sub>CC</sub> = 4.5V, I <sub>OH</sub> = -50μA	4.4			V
		V <sub>CC</sub> = 4.5V, I <sub>OH</sub> = -8mA	3.94			
Low-Level Output Voltage	V <sub>OL</sub>	V <sub>CC</sub> = 4.5V, I <sub>OL</sub> = 50μA			0.1	V
		V <sub>CC</sub> = 4.5V, I <sub>OL</sub> = 8mA			0.36	
Input Leakage Current	I <sub>I(LEAK)</sub>	V <sub>CC</sub> = 0V ~ 5.5V, V <sub>IN</sub> = V <sub>CC</sub> or GND			±0.1	μA
Quiescent Supply Current	I <sub>CC</sub>	V <sub>CC</sub> = 5.5V, V <sub>IN</sub> = 5.5V or GND, I <sub>OUT</sub> = 0		0.1	2	μA
Additional Quiescent Supply Current	ΔI <sub>CC</sub>	V <sub>CC</sub> = 5.5V, One input at 3.4V, other inputs at V <sub>CC</sub> or GND			1.35	mA
Input Capacitance	C <sub>IN</sub>	V <sub>CC</sub> = 3.3V, V <sub>IN</sub> = V <sub>CC</sub> or GND		2	10	pF

■ DYNAMIC CHARACTERISTICS (Input: t<sub>R</sub>, t<sub>F</sub> ≤ 3ns; PRR ≤ 1MHz)

See Fig. 1 and Fig. 2 for test circuit and waveforms.

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A or B) to output(Y)	t <sub>PLH</sub> /t <sub>PHL</sub>	V <sub>CC</sub> = 5V ± 0.5V, C <sub>L</sub> = 15pF		4	7	ns
		V <sub>CC</sub> = 5V ± 0.5V, C <sub>L</sub> = 50pF		5.5	8	

■ OPERATING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C <sub>pd</sub>	No load, f = 1MHz, V <sub>CC</sub> = 5V		12		pF

## ■ TEST CIRCUIT AND WAVEFORMS

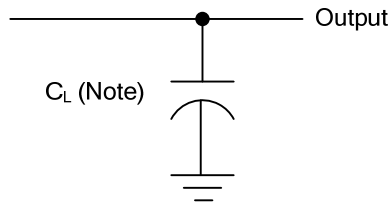


Fig. 1 Load circuitry for switching times.

Note: CL includes probe and jig capacitance.

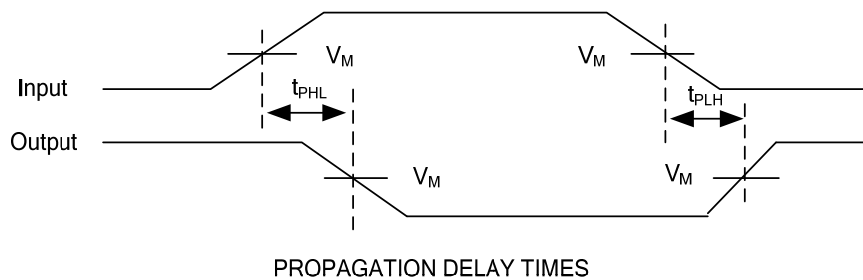


Fig. 2 Propagation delay from input(A) to output(Y) and Output transition time.

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