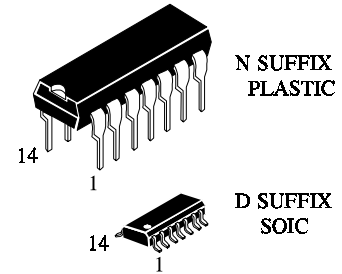


**IN74LS14**

## Hex Schmitt-Trigger Inverter

This device contains six independent gates each of which performs the logic INVERT function. Each input has hysteresis which increases the noise immunity and transforms a slowly changing input signal to a fast changing, jitter free output.



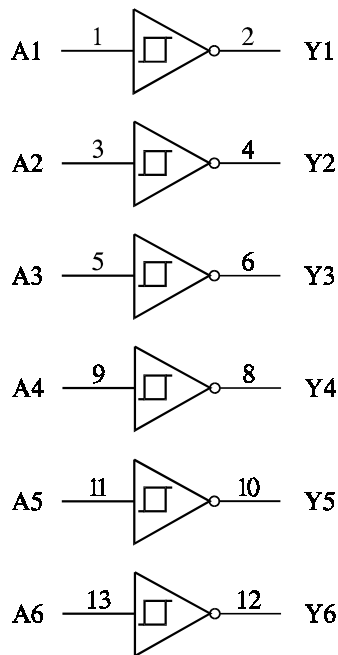
**ORDERING INFORMATION**

IN74LS14N Plastic

IN74LS14D SOIC

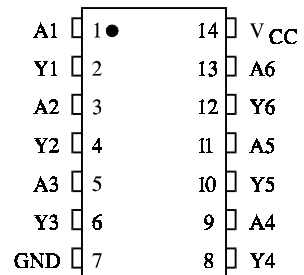
$T_A = 0^\circ$  to  $70^\circ$  C for all packages

**LOGIC DIAGRAM**



PIN 14 =  $V_{CC}$   
PIN 7 = GND

**PIN ASSIGNMENT**



**FUNCTION TABLE**

Inputs	Output
A	Y
L	H
H	L

## MAXIMUM RATINGS\*

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	Supply Voltage	7.0	V
V <sub>IN</sub>	Input Voltage	7.0	V
V <sub>OUT</sub>	Output Voltage	5.5	V
T <sub>stg</sub>	Storage Temperature Range	-65 to +150	°C

\*Maximum Ratings are those values beyond which damage to the device may occur. Functional operation should be restricted to the Recommended Operating Conditions.

## RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V <sub>CC</sub>	Supply Voltage	4.75	5.25	V
I <sub>OH</sub>	High Level Output Current		-15	mA
I <sub>OL</sub>	Low Level Output Current		24	mA
T <sub>A</sub>	Ambient Temperature Range	0	+70	°C

## DC ELECTRICAL CHARACTERISTICS over full operating conditions

Symbol	Parameter	Test Conditions	Guaranteed Limit		Unit
			Min	Max	
V <sub>T+</sub>	Positive-Going Input Threshold Voltage	V <sub>CC</sub> = 5 V	0.5	1	V
V <sub>T-</sub>	Negative-Going Input Threshold Voltage	V <sub>CC</sub> = 5 V	1.4	1.9	V
V <sub>T+</sub> - V <sub>T-</sub>	Hysteresis	V <sub>CC</sub> = 5 V	0.4		V
V <sub>IK</sub>	Input Clamp Voltage	V <sub>CC</sub> = min, I <sub>IN</sub> = -18 mA		-1.5	V
V <sub>OH</sub>	High Level Output Voltage	V <sub>CC</sub> = min, I <sub>OH</sub> = -0.4 mA, V <sub>I</sub> = 0.5 V	2.7		V
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = min, I <sub>OL</sub> = 4 mA, V <sub>I</sub> = 1.9 V		0.4	V
		V <sub>CC</sub> = min, I <sub>OL</sub> = 8 mA, V <sub>I</sub> = 1.9 V		0.5	
I <sub>IH</sub>	High Level Input Current	V <sub>CC</sub> = max, V <sub>IN</sub> = 2.7 V		20	μA
		V <sub>CC</sub> = max, V <sub>IN</sub> = 7.0 V		0.1	mA
I <sub>IL</sub>	Low Level Input Current	V <sub>CC</sub> = max, V <sub>IN</sub> = 0.4 V		-0.4	mA
I <sub>O</sub>	Output Short Circuit Current	V <sub>CC</sub> = max, V <sub>O</sub> = 0 V (Note 1)	-20	-100	mA
I <sub>CC</sub>	Supply Current	Total with outputs high		16	mA
		Total with outputs low		21	

Note 1: Not more than one output should be shorted at a time, and the duration should not exceed one second.

**AC ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$ ,  $V_{CC} = 5.0\text{ V}$ ,  $C_L = 15\text{ pF}$ ,  
 $R_L = 2\text{ k}\Omega$ ,  $t_r = 15\text{ ns}$ ,  $t_f = 6.0\text{ ns}$ )

Symbol	Parameter	Min	Max	Unit
$t_{PLH}$	Propagation Delay, Input A to Output Y		22	ns
$t_{PHL}$	Propagation Delay, Input A to Output Y		22	ns

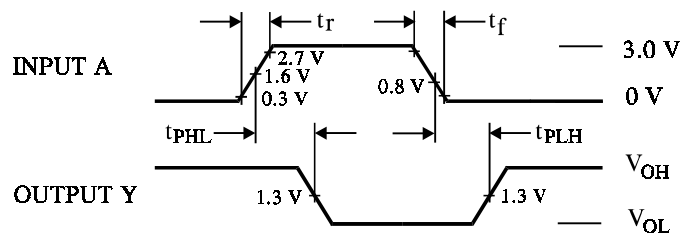
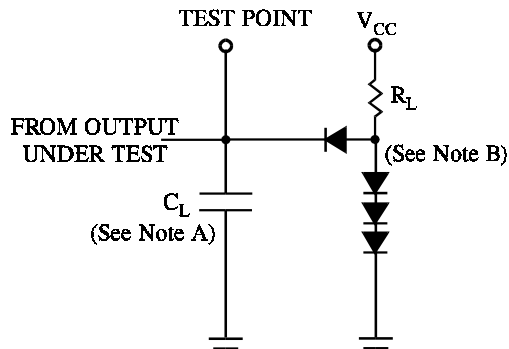


Figure 1. Switching Waveforms



NOTES A.  $C_L$  includes probe and jig capacitance.  
 B. All diodes are 1N916 or 1N3064.

Figure 2. Test Circuit