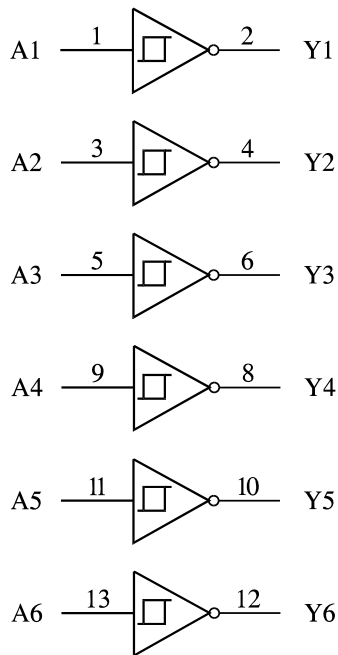## IN74LS14

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.
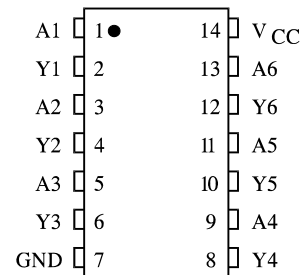
N SUFFIX
PLASTIC

D SUFFIX
SOIC

ORDERING INFORMATION
IN74LS14N Plastic
IN74LS14D SOIC
$T_A = 0°$ to $70°$ C for all packages

LOGIC DIAGRAM

A1 — 1 —▷○— 2 — Y1

A2 — 3 —▷○— 4 — Y2

A3 — 5 —▷○— 6 — Y3

A4 — 9 —▷○— 8 — Y4

A5 — 11 —▷○— 10 — Y5

A6 — 13 —▷○— 12 — Y6

PIN 14 = V_{CC}
PIN 7 = GND

PIN ASSIGNMENT

A1	1	14	V_{CC}
Y1	2	13	A6
A2	3	12	Y6
Y2	4	11	A5
A3	5	10	Y5
Y3	6	9	A4
GND	7	8	Y4

FUNCTION TABLE

Inputs	Output
A	Y
L	H
H	L

MAXIMUM RATINGS*

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	7.0	V
V_{IN}	Input Voltage	7.0	V
V_{OUT}	Output Voltage	5.5	V
Tstg	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_{CC}	Supply Voltage	4.75	5.25	V
I_{OH}	High Level Output Current		-15	mA
I_{OL}	Low Level Output Current		24	mA
T_A	Ambient Temperature Range	0	+70	°C

DC ELECTRICAL CHARACTERISTICS over full operating conditions

Symbol	Parameter		Test Conditions	Guaranteed Limit Min	Max	Unit
V_{T+}	Positive-Going Input Threshold Voltage		V_{CC} = 5 V	0.5	1	V
V_{T-}	Negative-Going Input Threshold Voltage		V_{CC} = 5 V	1.4	1.9	V
$V_{T+} - V_{T-}$	Hysteresis		V_{CC} = 5 V	0.4		V
V_{IK}	Input Clamp Voltage		V_{CC} = min, I_{IN} = -18 mA		-1.5	V
V_{OH}	High Level Output Voltage		V_{CC} = min, I_{OH} = -0.4 mA, V_I=0.5 V	2.7		V
V_{OL}	Low Level Output Voltage		V_{CC} = min, I_{OL} = 4 mA V_I=1.9 V		0.4	V
			V_{CC} = min, I_{OL} = 8 mA V_I=1.9 V		0.5	
I_{IH}	High Level Input Current		V_{CC} = max, V_{IN} = 2.7 V		20	μA
			V_{CC} = max, V_{IN} = 7.0 V		0.1	mA
I_{IL}	Low Level Input Current		V_{CC} = max, V_{IN} = 0.4 V		-0.4	mA
I_O	Output Short Circuit Current		V_{CC} = max, V_O =0 V (Note 1)	-20	-100	mA
I_{CC}	Supply Current	Total with outputs high	V_{CC} = max		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.

INTEGRAL

AC ELECTRICAL CHARACTERISTICS (T_A = 25°C, V_{CC} = 5.0 V, C_L = 15 pF, R_L = 2 kΩ, t_r = 15 ns, t_f = 6.0 ns)

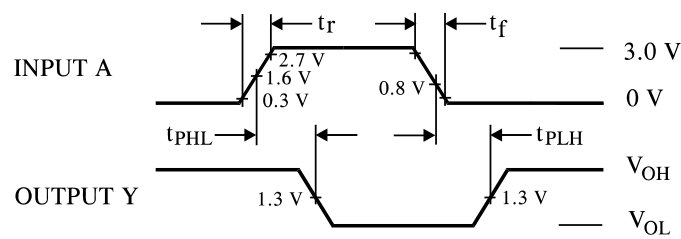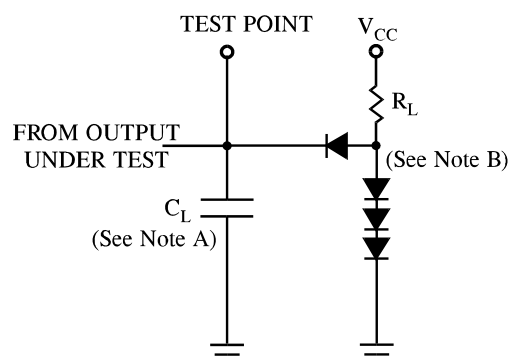| Symbol	Parameter	Min	Max	Unit
t_{PLH}	Propagation Delay, Input A to Output Y		22	ns
t_{PHL}	Propagation Delay, Input A to Output Y		22	ns

Figure 1. Switching Waveforms

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

Figure 2. Test Circuit