

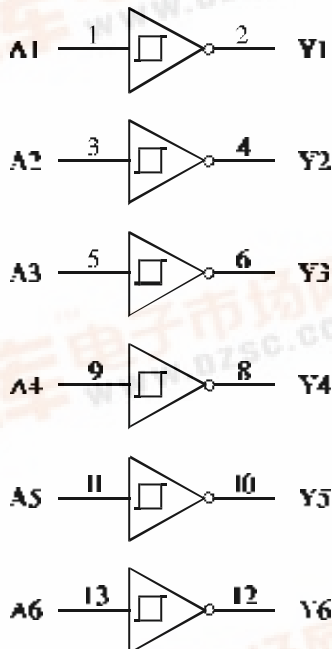
SL74LS14

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.



LOGIC DIAGRAM



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

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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
T_{stg}	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		Unit
			Min	Max	
V_{T+}	Positive-Going Input Threshold Voltage	$V_{CC} = 5\text{ V}$	0.5	1	V
V_{T-}	Negative-Going Input Threshold Voltage	$V_{CC} = 5\text{ V}$	1.4	1.9	V
$V_{T+} - V_{T-}$	Hysteresis	$V_{CC} = 5\text{ V}$	0.4		V
V_{IK}	Input Clamp Voltage	$V_{CC} = \text{min}, I_{IN} = -18\text{ mA}$		-1.5	V
V_{OH}	High Level Output Voltage	$V_{CC} = \text{min}, I_{OH} = -0.4\text{ mA}, V_I = 0.5\text{ V}$	2.7		V
V_{OL}	Low Level Output Voltage	$V_{CC} = \text{min}, I_{OL} = 4\text{ mA}, V_I = 1.9\text{ V}$		0.4	V
		$V_{CC} = \text{min}, I_{OL} = 8\text{ mA}, V_I = 1.9\text{ V}$		0.5	
I_{IH}	High Level Input Current	$V_{CC} = \text{max}, V_{IN} = 2.7\text{ V}$		20	μA
		$V_{CC} = \text{max}, V_{IN} = 7.0\text{ V}$		0.1	mA
I_{IL}	Low Level Input Current	$V_{CC} = \text{max}, V_{IN} = 0.4\text{ V}$		-0.4	mA
I_O	Output Short Circuit Current	$V_{CC} = \text{max}, V_O = 0\text{ V}$ (Note 1)	-20	-100	mA
I_{CC}	Supply Current	Total with outputs high	$V_{CC} = \text{max}$	16	mA
		Total with outputs low		21	

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

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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

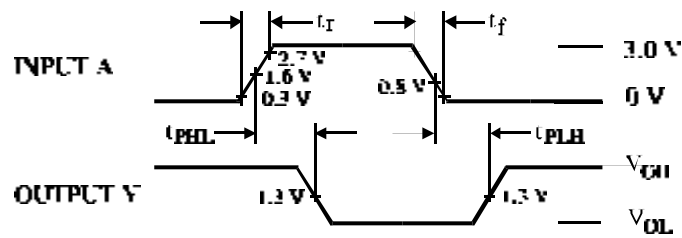
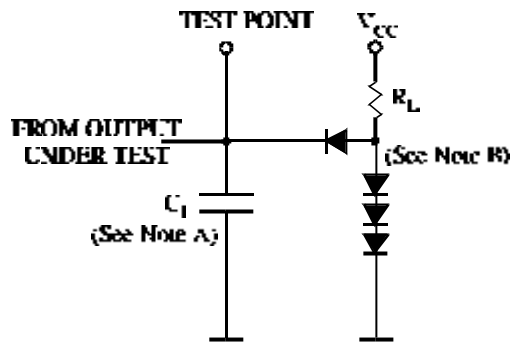


Figure 1. Switching Waveforms



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

Figure 2. Test Circuit