

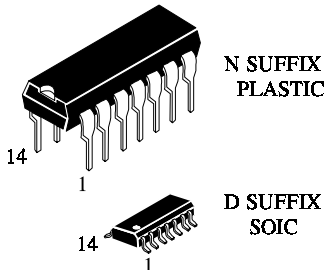
**IN74ALS04**

**Hex Inverter**

**Advanced Low Power Schottky TTL**

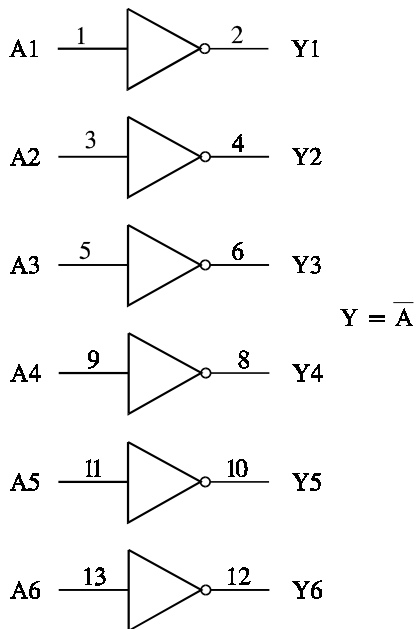
This device contains six independent gates, each of which performs the logic INVERT function.

- Operating Voltage Range: 4.5 V to 5.5 V
- Guarantee DC and AC specification over full temperature and  $V_{CC}$  range
- Switching response specified into 500Ω/50 pF
- Output Current: High Level: -0.4 mA  
Low Level : 8 mA



**ORDERING INFORMATION**  
 IN74ALS04N Plastic  
 IN74ALS04D SOIC  
 $T_A = -10^\circ$  to  $70^\circ$  C  
 for all packages

**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

## 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	4.5	5.5	V
V <sub>IH</sub>	High Level Input Voltage	2.0		V
V <sub>IL</sub>	Low Level Input Voltage		0.8	V
I <sub>OH</sub>	High Level Output Current		-0.4	mA
I <sub>OL</sub>	Low Level Output Current		8.0	mA
T <sub>A</sub>	Ambient Temperature Range	-10	+70	°C

## DC ELECTRICAL CHARACTERISTICS over full operating conditions

Symbol	Parameter	Test Conditions	Guaranteed Limit		Unit	
			Min	Max		
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	2.5		V	
V <sub>OL</sub>	Low Level Output Voltage	V <sub>CC</sub> = min, I <sub>OL</sub> = 4 mA		0.4	V	
		V <sub>CC</sub> = min, I <sub>OL</sub> = 8 mA		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		-0.1	mA	
I <sub>OS</sub>	Output Short Circuit Current	V <sub>CC</sub> = max, V <sub>O</sub> = 2.25 V	-15	-70	mA	
I <sub>CC</sub>	Supply Current	V <sub>CC</sub> = max	Outputs High		1.1	mA
			Outputs Low		4.2	

**AC ELECTRICAL CHARACTERISTICS** over full operating conditions ( $V_{CC} = 5.0\text{ V} \pm 10\%$ ,  $C_L = 50\text{ pF}$ ,  $R_L = 500\ \Omega$ , Input  $t_r = t_f = 2.0\text{ ns}$ )

Symbol	Parameter	Guaranteed Limit		Unit
		Min	Max	
$t_{PLH}$	Propagation Delay, Input A to Output Y (Figures 1,2)		11	ns
$t_{PHL}$	Propagation Delay, Input A to Output Y (Figures 1,2)		8	ns

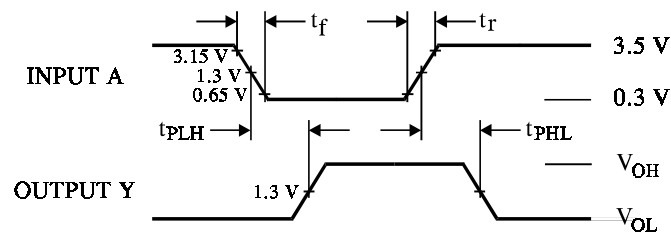
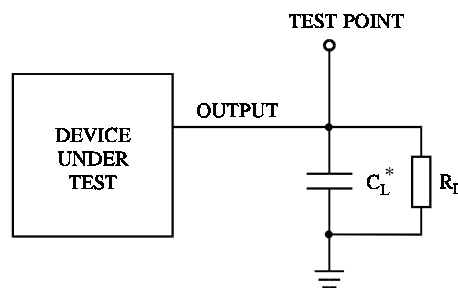


Figure 1. Switching Waveforms



\* Includes all probe and jig capacitance

Figure 2. Test Circuit