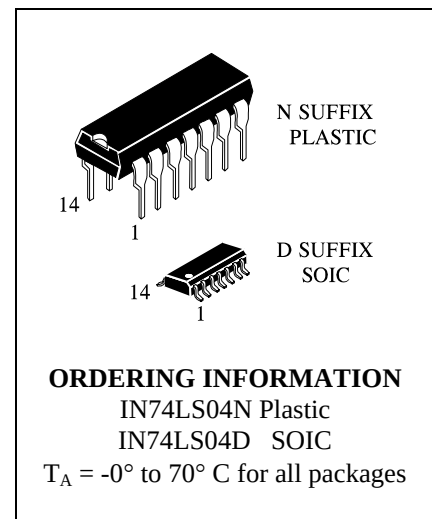


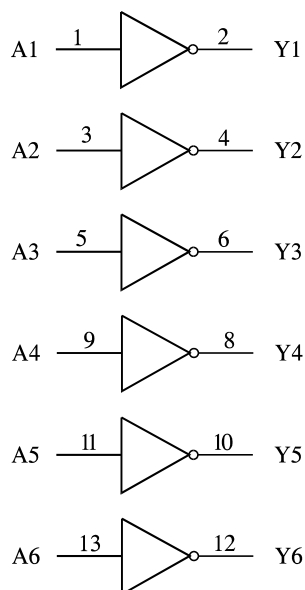
IN74LS04

Hex Inverters

This device contains six independent inverters. It performs the Boolean function $Y = \overline{A}$.



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
H	L
L	H

MAXIMUM RATINGS*

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	7.0	V
V_{IN}	Input Voltage	7.0	V
V_{OUT}	Output Voltage	7.0	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		-400	V
I_{OL}	Low Level Output Current		8.0	V
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_{IH}	High Level Input Voltage		2		V
V_{IL}	Low Level Input Voltage			0.8	V
V_{IK}	Input Clamp Voltage	$V_{CC} = \min, I_I = -18 \text{ mA}$		-1.5	V
V_{OH}	High Level Output Current	$V_{CC} = \min, V_{IL} = \max$ $I_{OH} = \max$	2.7		V
V_{OL}	Low Level Output Voltage	$V_{CC} = \min, V_{IH} = \min,$ $I_{OL} = 8 \text{ mA}$		0.5	V
I_I	Input Current at maximum input voltage	$V_{CC} = \max, V_I = -7 \text{ V}$		0.1	mA
I_{IH}	High Level Input Current	$V_{CC} = \max, V_{IN} = 2.7 \text{ V}$		20	μA
I_{IL}	Low Level Input Current	$V_{CC} = \max, V_{IN} = 0.4 \text{ V}$		-0.4	mA
I_{OS}	Short-circuit output current	$V_{CC} = \max$ (Note)	-20	-100	mA
I_{CC}	Supply Current	$V_{CC} = \max$	Total with outputs high	2.4	mA
			Total with outputs low	6.6	

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

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

Symbol	Parameter	Min	Max	Unit
t_{PLH}	Propagation Delay Time		15	ns
t_{PHL}	Propagation Delay Time		15	ns

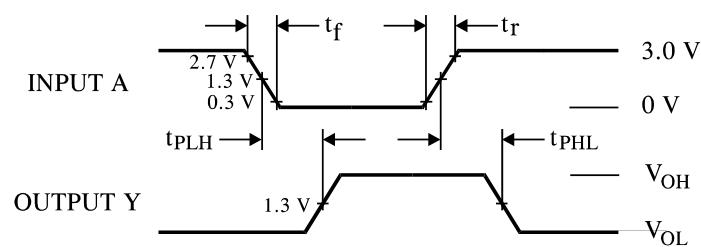
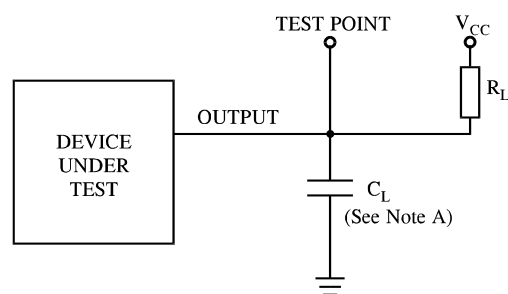


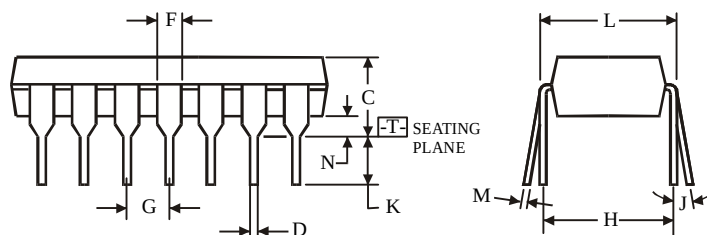
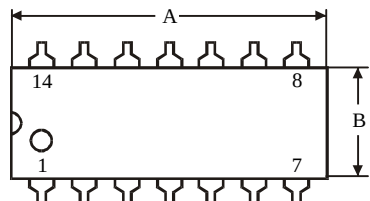
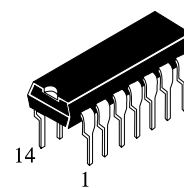
Figure 1. Switching Waveforms



NOTE A. C_L includes probe and jig capacitance.

Figure 2. Test Circuit

N SUFFIX PLASTIC DIP (MS - 001AA)



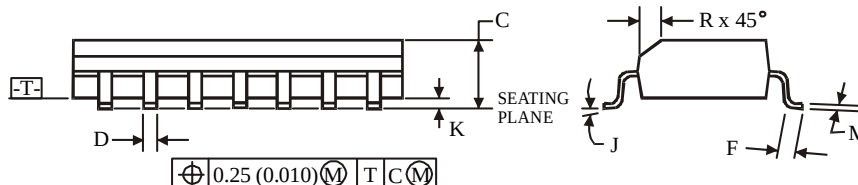
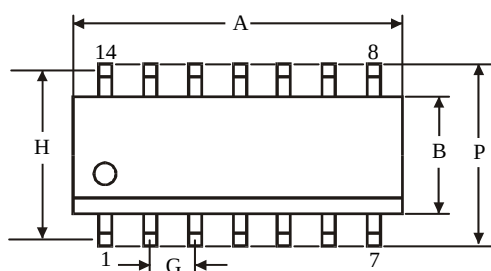
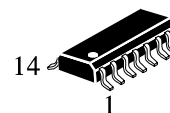
⌀ 0.25 (0.010) (M) T

NOTES:

- Dimensions "A", "B" do not include mold flash or protrusions.
Maximum mold flash or protrusions 0.25 mm (0.010) per side.

Dimension, mm		
Symbol	MIN	MAX
A	18.67	19.69
B	6.1	7.11
C		5.33
D	0.36	0.56
F	1.14	1.78
G	2.54	
H	7.62	
J	0°	10°
K	2.92	3.81
L	7.62	8.26
M	0.2	0.36
N	0.38	

D SUFFIX SOIC (MS - 012AB)



⌀ 0.25 (0.010) (M) T C (M)

NOTES:

- Dimensions A and B do not include mold flash or protrusion.
- Maximum mold flash or protrusion 0.15 mm (0.006) per side
for A; for B - 0.25 mm (0.010) per side.

Dimension, mm		
Symbol	MIN	MAX
A	8.55	8.75
B	3.8	4
C	1.35	1.75
D	0.33	0.51
F	0.4	1.27
G	1.27	
H	5.27	
J	0°	8°
K	0.1	0.25
M	0.19	0.25
P	5.8	6.2
R	0.25	0.5