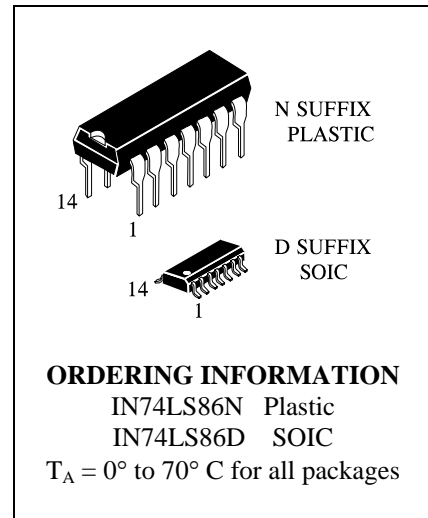


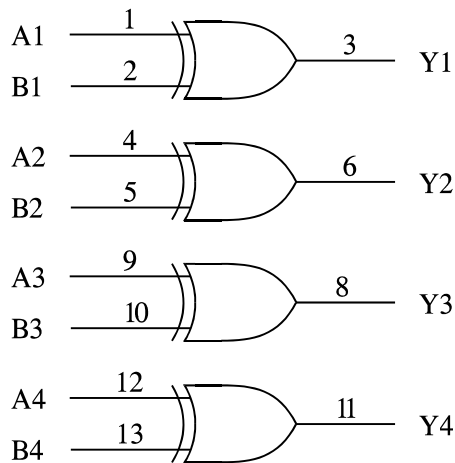
IN74LS86

Quad 2-Input Exclusive OR Gate

This device contains four independent 2-input Exclusive-OR gates. It performs the Boolean functions $Y=A \oplus B=AB+AB$ in positive logic.

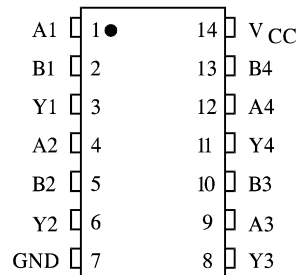


LOGIC DIAGRAM



PIN 14 = V_{CC}
 PIN 7 = GND

PIN ASSIGNMENT



FUNCTION TABLE

Inputs		Output
A	B	Y
L	L	L
L	H	H
H	L	H
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
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
V _{IH}	High Level Input Voltage	2.0		V
V _{IL}	Low Level Input Voltage		0.8	V
I _{OH}	High Level Output Current		-0.4	mA
I _{OL}	Low Level Output Current		8.0	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 _{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	2.7		V
V _{OL}	Low Level Output Voltage	V _{CC} = min, I _{OL} = 4 mA		0.4	V
		V _{CC} = min, I _{OL} = 8 mA		0.5	
I _{IH}	High Level Input Current	V _{CC} = max, V _{IN} = 2.7 V		40	μA
		V _{CC} = max, V _{IN} = 7.0 V		0.2	mA
I _{IL}	Low Level Input Current	V _{CC} = max, V _{IN} = 0.4 V		-0.8	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		10	mA
			Total with outputs low		

Note 1: Not more than one output should be shorted at a time, and 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 or B to Output Y (Other input low)		23	ns
t_{PHL}	Propagation Delay, Input A or B to Output Y (Other input low)		17	ns
t_{PLH}	Propagation Delay, Input A or B to Output Y (Other input high)		30	ns
t_{PHL}	Propagation Delay, Input A or B to Output Y (Other input high)		22	ns

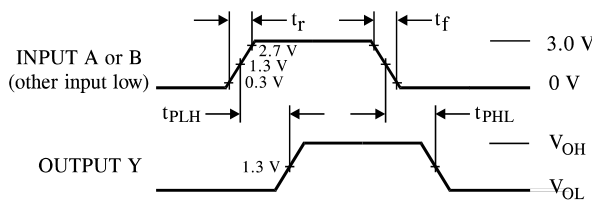


Figure 1. Switching Waveforms

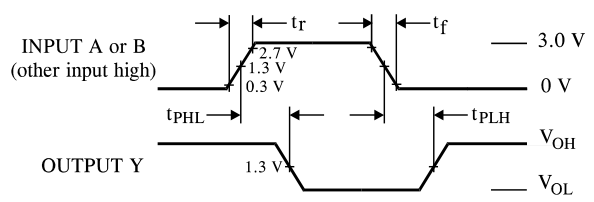
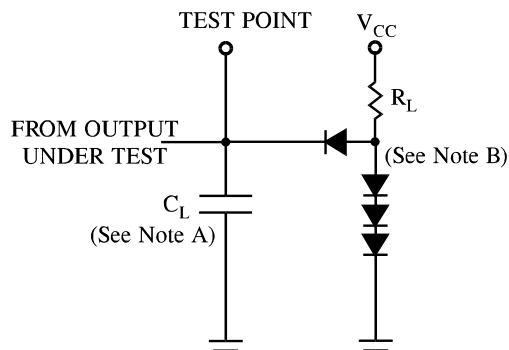


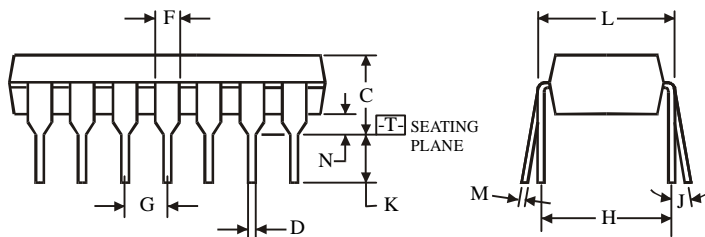
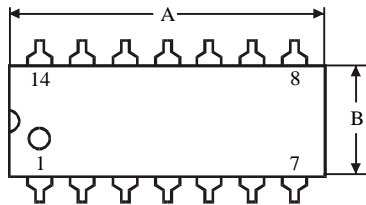
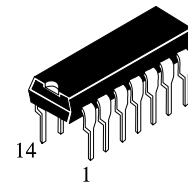
Figure 2. Switching Waveforms



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

Figure 3. Test Circuit

**N SUFFIX PLASTIC DIP
(MS - 001AA)**



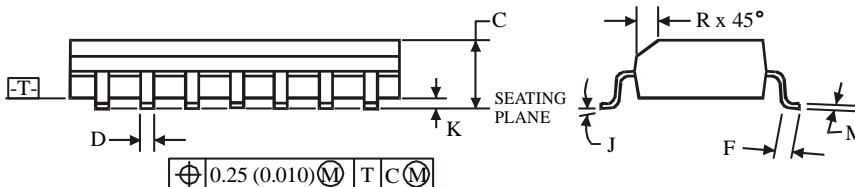
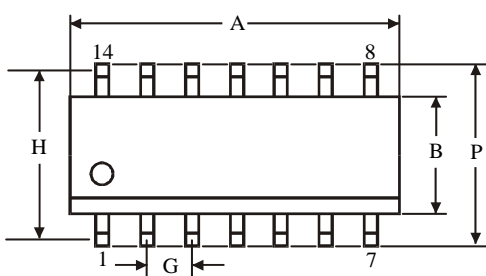
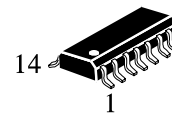
$\oplus 0.25 (0.010) \text{ (M) T}$

NOTES:

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

Symbol	Dimension, mm	
	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)**



$\oplus 0.25 (0.010) \text{ (M) T C (M)}$

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.

Symbol	Dimension, mm	
	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