M74LS30P

SINGLE 8-INPUT POSITIVE NAND GATE

DESCRIPTION

The M74LS30P is a semiconductor integrated circuit containing one 8-input positive-logic NAND gate, usable as a negative-logic NOR gate.

FEATURES

- High breakdown input voltage ($V_I \geqq 15V$)
- Low power dissipation (P_d = 2.4mW typical)
- High speed (t_{pd} = 11ns typical)
- Low output impedance
- Wide operating temperature range (T_a = −20 ~ +75°C)

APPLICATION

General purpose, for use in industrial and consumer equipment.

FUNCTIONAL DESCRIPTION

The use of Schottky TTL technology enables the achievement of input high breakdown voltage, high speed, low power dissipation and high fan-out.

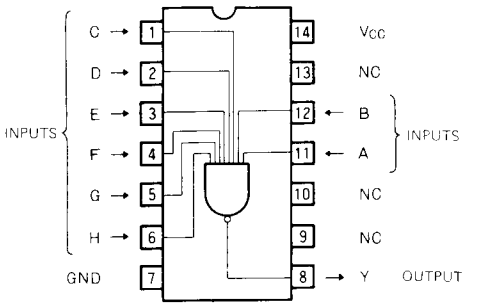
When inputs A, B, C, D, E, F and G are high, output Y is low and when one or more of the inputs is low, output Y is high.

FUNCTION TABLE

A	N	Y
L	L	H
H	L	H
L	H	H
H	H	L

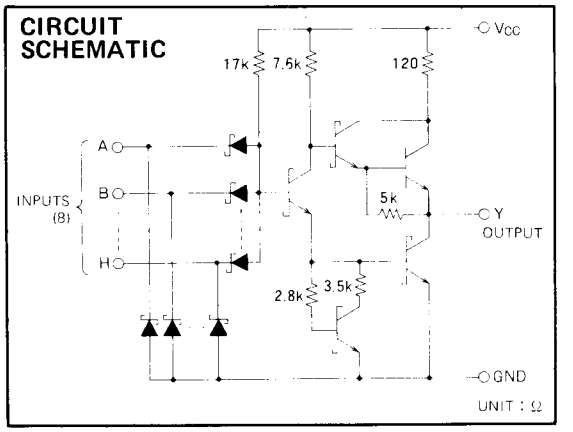
N = B・C・D・E・F・G・H

PIN CONFIGURATION (TOP VIEW)



Outline 14P4 NC: NO CONNECTION

CIRCUIT SCHEMATIC



ABSOLUTE MAXIMUM RATINGS (T_a = −20 ~ +75°C, unless otherwise noted)

Symbol	Parameter	Conditions	Limits	Unit
V_{CC}	Supply voltage		−0.5 ~ +7	V
V_I	Input voltage		−0.5 ~ +15	V
V_O	Output voltage	High-level state	−0.5 ~ + V_{CC}	V
Topr	Operating free-air ambinet temperature range		−20 ~ +75	°C
Tstg	Storage temperature range		−65 ~ +150	°C

SINGLE 8-INPUT POSITIVE NAND GATE

RECOMMENDED OPERATING CONDITIONS ($T_a = -20 \sim +75°C$, unless otherwise noted)

Symbol	Parameter		Limits			Unit
			Min	Typ	Max	
V_{CC}	Supply voltage		4.75	5	5.25	V
I_{OH}	High-level output current	$V_{OH} \geqq 2.7V$	0		−400	μA
I_{OL}	Low-level output current	$V_{OL} \leqq 0.4V$	0		4	mA
		$V_{OL} \leqq 0.5V$	0		8	mA

ELECTRICAL CHARACTERISTICS ($T_a = -20 \sim +75°C$, unless otherwise noted)

Symbol	Parameter	Test conditions		Limits			Unit
				Min	Typ *	Max	
V_{IH}	High-level input voltage			2			V
V_{IL}	Low-level input voltage					0.8	V
V_{IC}	Input clamp voltage	$V_{CC}=4.75V$, $I_{IC}=-18mA$				−1.5	V
V_{OH}	High-level output voltage	$V_{CC}=4.75V$, $V_I=0.8V$, $I_{OH}=-400\mu A$		2.7	3.4		V
V_{OL}	Low-level output voltage	$V_{CC}=4.75V$	$I_{OL}=4mA$		0.25	0.4	V
		$V_I=2V$	$I_{OL}=8mA$		0.35	0.5	V
I_{IH}	High-level input current	$V_{CC}=5.25V$, $V_I=2.7V$				20	μA
		$V_{CC}=5.25V$, $V_I=10V$				0.1	mA
I_{IL}	Low-level input current	$V_{CC}=5.25V$, $V_I=0.4V$				−0.4	mA
I_{OS}	Short-circuit output circuit (Note 1)	$V_{CC}=5.25V$, $V_O=0V$		−20		−100	mA
I_{CCH}	Supply current, all inputs high	$V_{CC}=5.25V$, $V_I=0V$			0.35	0.5	mA
I_{CCL}	Supply current, all inputs low	$V_{CC}=5.25V$, $V_I=4.5V$			0.6	1.1	mA

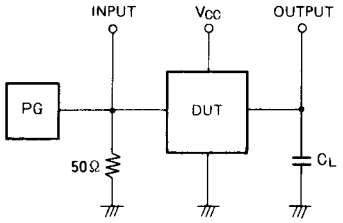
* : All typical values are at $V_{CC}=5V$, $T_a=25°C$

Note 1: All measurements should be done quickly.

SWITCHING CHARACTERISTICS ($V_{CC}=5V$, $T_a=25°C$, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
t_{PLH}	Low-to-high-level/high-to-low-level output propagation time	$C_L=15pF$ (Note 2)		6	15	ns
t_{PHL}				16	20	ns

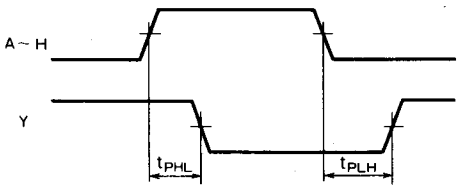
Note 2: Measurement circuit



(1) The pulse generator (PG) has the following characterisitcs:
PRR = 1MHz, t_r = 6ns, t_f = 6ns, t_W = 500ns;
$V_P = 3V_{P-P}$, $Z_O = 50\Omega$.

(2) C_L includes probe and jig capacitance

TIMING DIAGRAM (Reference level = 1.3V)

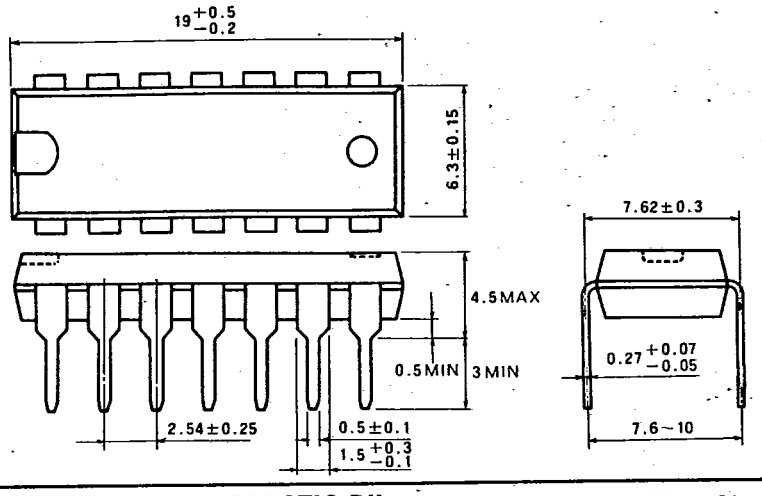


PRECAUTION FOR USE

Connect pins not being used to the V_{CC} supply voltage.

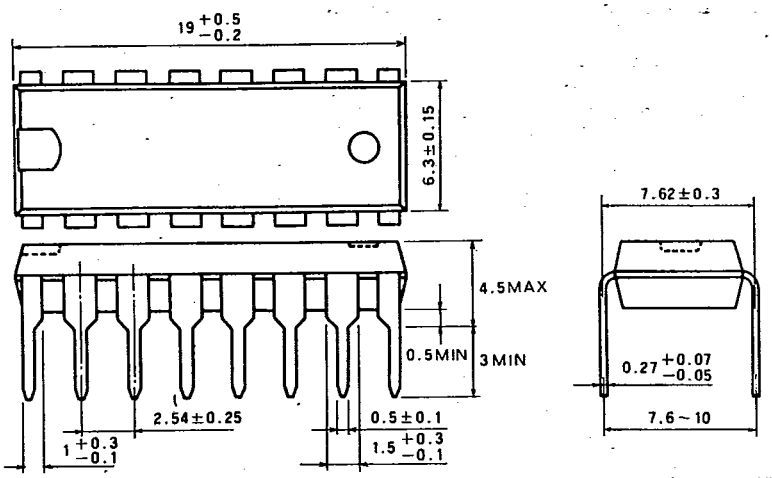
TYPE 14P4 14-PIN MOLDED PLASTIC DIL

Dimension in mm



TYPE 16P4 16-PIN MOLDED PLASTIC DIL

Dimension in mm



TYPE 20P4 20-PIN MOLDED PLASTIC DIL

Dimension in mm