ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089
http://www.nteinc.com

NTE74S20
Integrated Circuit
TTL – Dual 4–Input Positive NAND Gate

Description:

The NTE74S20 contains two independent 4–Input NAND gates in a 14–Lead plastic DIP type package.

Absolute Maximum Ratings: (Note 1)

Supply Voltage, V_{CC} 7V
DC Input Voltage, V_{IN} 5.5V
Operating Temperature Range, T_A . . . . . 0°C to +70°C
Storage Temperature Range, T_{stg} . . . . . –65°C to +150°C

Note 1. Unless otherwise specified, all voltages are referenced to GND.

Recommended Operating Conditions:

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{CC}	4.75	5.0	5.25	V
High–Level Input Voltage	V_{IH}	2	–	–	V
Low–Level Input Voltage	V_{IL}	–	–	0.8	V
High–Level Output Current	I_{OH}	–	–	–1	mA
Low–Level Output Current	I_{OL}	–	–	20	mA
Operating Temperature Range	T_A	0	–	+70	°C

Electrical Characteristics: (Note 2, Note 3)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Clamp Voltage	V_{IK}	V_{CC} = MIN, I_I = –18mA	–	–	–1.2	V
High Level Output Voltage	V_{OH}	V_{CC} = MIN, V_{IL} = 0.8V, I_{OH} = –1mA	2.7	3.4	–	V
Low Level Output Voltage	V_{OL}	V_{CC} = MIN, V_{IH} = 2V, I_{OL} = 20mA	–	–	0.5	V
Input Current	I_I	V_{CC} = MAX, V_I = 5.5V	–	–	1	mA

Note 2. .For conditions shown as MIN or MAX, use the appropriate value specified under “Recommended Operation Conditions”.

Note 3. All typical values are at V_{CC} = 5V, T_A = +25°C.

Electrical Characteristics (Cont'd): (Note 2, Note 3)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
High Level Input Current	I_{IH}	V_{CC} = MAX, V_I = 2.7V	–	–	0	μA
Low Level Input Current	I_{IL}	V_{CC} = MAX, V_I = 0.5V	–	–	−2	mA
Short−Circuit Output Current	I_{OS}	V_{CC} = MAX, Note 4	−40	–	−100	mA
High Level Supply Current	I_{CCH}	V_{CC} = MAX, V_I = 0	–	5	8	mA
Low Level Supply Current	I_{CCL}	V_{CC} = MAX, V_I = 4.5V	–	10	18	mA

Note 2. .For conditions shown as MIN or MAX, use the appropriate value specified under "Recommended Operation Conditions".

Note 3. All typical values are at V_{CC} = 5V, T_A = +25°C.

Note 4. Not more than one output should be shorted at a time, and the duration of the short−circuit should not exceed one second.

Switching Characteristics: (V_{CC} = 5V, T_A = +25°C unless otherwise specified)

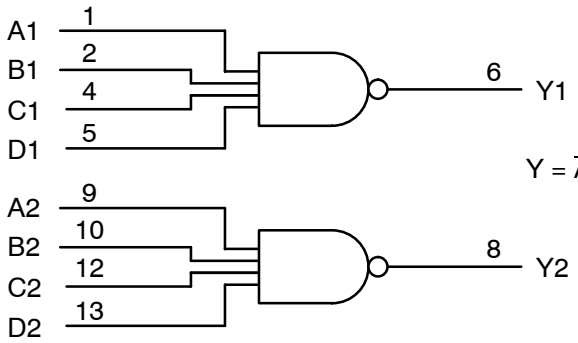
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time From Any Input to Y Output)	t_{PLH}	R_L = 280Ω, C_L = 15pF	–	3.0	4.5	ns
	t_{PHL}		–	3.0	5.0	ns
Propagation Delay Time From Any Input to Y Output)	t_{PLH}	R_L = 280Ω, C_L = 50pF	–	4.5	–	ns
	t_{PHL}		–	5.0	–	ns

Function Table (Each Gate):

Inputs				Output
A	B	C	D	Y
H	H	H	H	L
L	X	X	X	H
X	L	X	X	H
X	X	L	X	H
X	X	X	L	H

H = HIGH Voltage Level
L = LOW Voltage Level
X = Don't Care

Logic Diagram



$Y = \overline{A \bullet B \bullet C \bullet D}$ or $Y = \overline{A} + \overline{B} + \overline{C} + \overline{D}$

Pin14 = V_{CC}
Pin7 = GND

Pin Connection Diagram