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

NTE74LS33
Integrated Circuit
TTL – Quad 2–Input Positive NOR Buffer with Open–Collector Outputs

Description:

The NTE74LS33 contains four independent 2–Input NOR buffer gates with open–collector outputs in a 14–Lead plastic DIP type package. Open–collector outputs require resistive pull–up to perform logically but can deliver higher V_{OH} levels and are commonly used in wired–AND applications.

Absolute Maximum Ratings: (Note 1)

Supply Voltage, V_{CC} 7V
DC Input Voltage, V_{IN} 7V
Off–State Output Voltage 7V
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}	2.0	–	–	V
Low–Level Input Voltage	V_{IL}	–	–	0.8	V
High–Level Output Voltage	V_{OH}	–	–	5.5	V
Low–Level Output Current	I_{OL}	–	–	24	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	–	–	–1.5	V
High Level Output Current	I_{OH}	V_{CC} = MIN, V_{IH} = 2V, V_{OH} = 5.5V	–	–	0.25	mA
Low Level Output Voltage	V_{OL}	V_{CC} = MIN, V_{IL} = MAX, I_{OL} = 12mA	–	0.25	0.4	V
		V_{CC} = MIN, V_{IL} = MAX, I_{OL} = 24mA	–	0.35	0.5	V
Input Current	I_I	V_{CC} = MAX, V_I = 7V	–	–	0.1	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	–	–	20	μA
Low Level Input Current	I_{IL}	V_{CC} = MAX, V_I = 0.4V	–	–	–0.4	mA
High Level Supply Current	I_{CCH}	V_{CC} = MAX, V_I = 0	–	1.8	3.6	mA
Low Level Supply Current	I_{CCL}	V_{CC} = MAX, Note 4	–	6.9	13.8	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. One input at 4.5V, all others at GND.

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

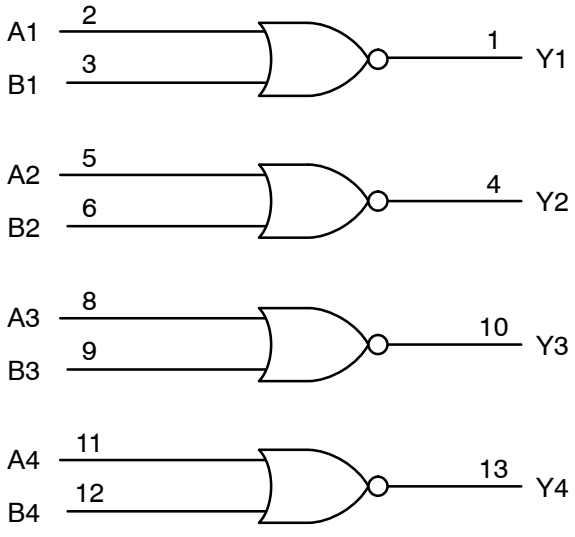
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time From A or B Input to Y Output)	t_{PLH}	R_L = 667Ω, C_L = 45pF	–	20	32	ns
	t_{PHL}		–	18	28	ns

Truth Table (Each Gate):

Inputs		Output
A	**B**	**Y**
H	X	L
X	H	L
L	L	H

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

Logic Diagram



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

Pin14 = V_{CC}
Pin7 = GND

Pin Connection Diagram