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NTE74LS645
Integrated Circuit
TTL– Non–Inverting Octal Bus Transceiver with 3–State Outputs

Description:

The NTE74LS645 is an octal bus transceiver in a 20–Lead DIP type package designed for asynchronous two–way communication between data buses. This device transmits data from the A bus to the B bus or from the B bus to the A bus depending upon the level at the direction control (DIR) input. The enable pin ($\overline{G}$) can be used to disable the device so the buses are effectively isolated.

Features:

- Bi–Directional Bus Transceiver
- Hysteresis at Bus Inputs Improves Noise Margins
- Non–Inverting (True) Logic
- 3–State Outputs

Absolute Maximum Ratings: (Note 1)

Supply Voltage, V_{CC} 7V

Input Voltage

All Inputs 7V

I/O Ports 5.5V

Operating Temperature Range, T_A . . . . . 0°C to +70°C

Storage Temperature Range, T_{stg} . . . . . –65°C to +150°C

Note 1. Voltage values are with respect to network ground terminal.

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}	–	–	0.6	V
High–Level Output Current	I_{OH}	–	–	–15	mA
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
Hysteresis	$V_{T+} - V_{T-}$	V_{CC} = MIN, A or B Input		0.2	0.4	–	V
High Level Output Voltage	V_{OH}	V_{CC} = MIN, V_{IH} = 2V, V_{IL} = MAX	I_{OH} = −3mA	2.4	3.4	–	V
			I_{OH} = MAX	2.0	–	–	V
Low Level Output Voltage	V_{OL}	V_{CC} = MIN, V_{IH} = 2V, V_{IL} = MAX	I_{OL} = 12mA	–	0.25	0.4	V
			I_{OL} = MAX	–	0.35	0.5	V
Off−State Output Current	I_{OZ}	V_{CC} = MAX, $\overline{G}$ at 2V	V_O = 2.7V	–	–	20	μA
			V_O = 0.4V	–	–	−0.4	mA
Input Current A or B	I_I	V_{CC} = MAX	V_I = 5.5V	–	–	0.1	mA
DIR or $\overline{G}$			V_I = 7V	–	–	0.1	mA
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
Short−Circuit Output Current	I_{OS}	V_{CC} = MAX, Note 4		−40	–	−225	mA
Supply Current Outputs High	I_{CC}	V_{CC} = MAX, Outputs Open		–	48	70	mA
Outputs Low				–	62	90	mA
Outputs at Hi−Z				–	64	95	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.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time (From A Input to B Output)	t_{PLH}	C_L = 45pF, R_L = 667Ω	–	8	15	ns
(From B Input to A Output)			–	8	15	ns
Propagation Delay Time (From A Input to B Output)	t_{PHL}		–	11	15	ns
(From B Input to A Output)			–	11	15	ns
Output Enable Time (From $\overline{G}$ Input to A Output)	t_{PZL}		–	31	40	ns
(From $\overline{G}$ Input to B Output)			–	31	40	ns
Output Enable Time (From $\overline{G}$ Input to A Output)	t_{PZH}		–	26	40	ns
(From $\overline{G}$ Input to B Output)			–	26	40	ns
Output Disable Time (From $\overline{G}$ Input to A Output)	t_{PLZ}	C_L = 5pF, R_L = 667Ω	–	15	25	ns
(From $\overline{G}$ Input to B Output)			–	15	25	ns
Output Disable Time (From $\overline{G}$ Input to A Output)	t_{PHZ}		–	15	25	ns
(From $\overline{G}$ Input to B Output)			–	15	25	ns

Function Table:

Control Inputs		Operation
$\overline{G}$	DIR	
L	L	B Data to A Bus
L	H	A Data to B Bus
H	X	Isolation

H = HIGH Level, L = LOW Level, X = Irrelevant

Pin Connection Diagram