



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

NTE74LS640 Integrated Circuit TTL– Inverting Octal Bus Transceiver with 3–State Outputs

Description:

The NTE74LS640 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 (\bar{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
- Inverting 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}	$V_{CC} = \text{MIN}, I_I = -18\text{mA}$	-	-	-1.5	V	
Hysteresis	$V_{T+} - V_{T-}$	$V_{CC} = \text{MIN}, \text{A or B Input}$	0.2	0.4	-	V	
High Level Output Voltage	V_{OH}	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, V_{IL} = \text{MAX}$	$I_{OH} = -3\text{mA}$	2.4	3.4	-	V
			$I_{OH} = \text{MAX}$	2.0	-	-	V
Low Level Output Voltage	V_{OL}	$V_{CC} = \text{MIN}, V_{IH} = 2\text{V}, V_{IL} = \text{MAX}$	$I_{OL} = 12\text{mA}$	-	0.25	0.4	V
			$I_{OL} = \text{MAX}$	-	0.35	0.5	V
Off-State Output Current	I_{OZ}	$V_{CC} = \text{MAX}, \overline{G}$ at 2V	$V_O = 2.7\text{V}$	-	-	20	μA
			$V_O = 0.4\text{V}$	-	-	-0.4	mA
Input Current A or B DIR or \overline{G}	I_I	$V_{CC} = \text{MAX}$	$V_I = 5.5\text{V}$	-	-	0.1	mA
			$V_I = 7\text{V}$	-	-	0.1	mA
High Level Input Current	I_{IH}	$V_{CC} = \text{MAX}, V_I = 2.7\text{V}$	-	-	20	μA	
Low Level Input Current	I_{IL}	$V_{CC} = \text{MAX}, V_I = 0.4\text{V}$	-	-	-0.4	mA	
Short-Circuit Output Current	I_{OS}	$V_{CC} = \text{MAX}, \text{Note 4}$	-40	-	-225	mA	
Supply Current Outputs High Outputs Low Outputs at Hi-Z	I_{CC}	$V_{CC} = \text{MAX}, \text{Outputs Open}$		-	48	70	mA
				-	62	90	mA
				-	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 $V_{CC} = 5\text{V}, T_A = +25^\circ\text{C}$.

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: ($V_{CC} = 5\text{V}, T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time (From A Input to B Output) (From B Input to A Output)	t_{PLH}	$C_L = 45\text{pF}, R_L = 667\Omega$	-	6	10	ns
			-	6	10	ns
Propagation Delay Time (From A Input to B Output) (From B Input to A Output)	t_{PHL}		-	8	15	ns
			-	8	15	ns
Output Enable Time (From \overline{G} Input to A Output) (From \overline{G} Input to B Output)	t_{PZL}		-	31	40	ns
			-	31	40	ns
Output Enable Time (From \overline{G} Input to A Output) (From \overline{G} Input to B Output)	t_{PZH}		-	23	40	ns
			-	23	40	ns
Output Disable Time (From \overline{G} Input to A Output) (From \overline{G} Input to B Output)	t_{PLZ}	$C_L = 5\text{pF}, R_L = 667\Omega$	-	15	25	ns
			-	15	25	ns
Output Disable Time (From \overline{G} Input to A Output) (From \overline{G} Input to B Output)	t_{PHZ}		-	15	25	ns
			-	15	25	ns

Function Table:

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

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

Pin Connection Diagram

