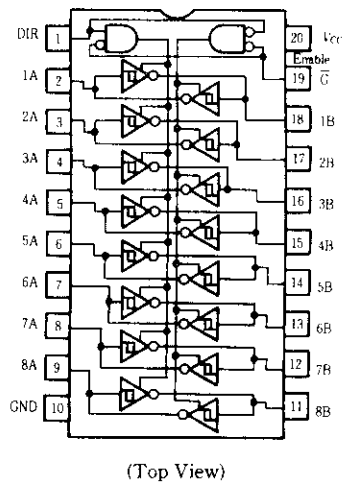


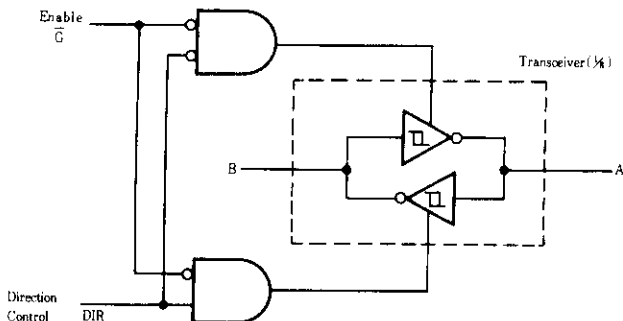
# HD74LS640-1 ● Octal Bus Transceivers (inverted 3-state outputs)

This octal bus transceivers is designed for asynchronous two-way communication between data buses. The device transmit 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 input ( $\bar{G}$ ) can be used to disable the device so that the buses are effectively isolated.

## ■ PIN ARRANGEMENT



## ■ BLOCK DIAGRAM



## ■ RECOMMENDED OPERATING CONDITIONS

Item	Symbol	min	typ	max	Unit
Supply voltage	$V_{CC}$	4.75	5.00	5.25	V
Output Current	$I_{OH}$	—	—	-15	mA
Output Current	$I_{OL}$	—	—	48	mA
Operating temperature range	$T_{opr}$	-20	25	75	°C

## ■ FUNCTION TABLE

Enable	Direction Control	Operation
$\bar{G}$	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isclation

Notes) H; high level, L; low level, X; irrelevant

## ■ ELECTRICAL CHARACTERISTICS ( $T_a = -20 \sim +75^\circ\text{C}$ )

Item	Symbol	Test Conditions	min	typ*	max	Unit		
Input voltage	$V_{IH}$		2.0	—	—	V		
	$V_{IL}$		—	—	0.8	V		
Hysteresis	$V_T^+ - V_T^-$	$V_{CC} = 4.75\text{V}$	0.2	—	—	V		
Output voltage	$V_{OH}$	$V_{CC} = 4.75\text{V}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}$	$I_{OH} = -3\text{mA}$	2.4	—	—	V	
			$I_{OH} = -15\text{mA}$	2	—	—	V	
	$V_{OL}$	$V_{CC} = 4.75\text{V}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}$	$I_{OL} = 12\text{mA}$	—	—	0.4	V	
			$I_{OL} = 24\text{mA}$	—	—	0.5	V	
			$I_{OL} = 48\text{mA}$	—	—	0.5	V	
Output current	$I_{OZH}$	$V_{CC} = 5.25\text{V}, \bar{G} \text{ INPUT} = 2\text{V}$	$V_O = 2.7\text{V}$	—	—	20	$\mu\text{A}$	
	$I_{OZL}$		$V_O = 0.4\text{V}$	—	—	-400	$\mu\text{A}$	
Input current	$I_{IH}$	$V_{CC} = 5.25\text{V}, V_I = 2.7\text{V}$		—	—	20	$\mu\text{A}$	
	$I_{IL}$	$V_{CC} = 5.25\text{V}, V_I = 0.4\text{V}$		—	—	-400	$\mu\text{A}$	
	A or B DIR or $\bar{G}$	$I_I$	$V_{CC} = 5.25\text{V}$	$V_I = 5.5\text{V}$	—	—	0.1	mA
				$V_I = 7\text{V}$	—	—	0.1	mA
Short-circuit output current	$I_{OS**}$	$V_{CC} = 5.25\text{V}$	-40	—	-225	mA		
Supply current	$I_{CCH}$	$V_{CC} = 5.25\text{V}, \text{OUTPUT OPEN}$	—	48	70	mA		
	$I_{CCL}$		—	62	90	mA		
	$I_{CCZ}$		—	64	95	mA		
Input clamp voltage	$V_{IK}$	$V_{CC} = 4.75\text{V}, I_{IN} = -18\text{mA}$	—	—	-1.5	V		

\*  $V_{CC} = 5\text{V}, T_a = 25^\circ\text{C}$

\*\* Not more than one output shall be shorted at a time.

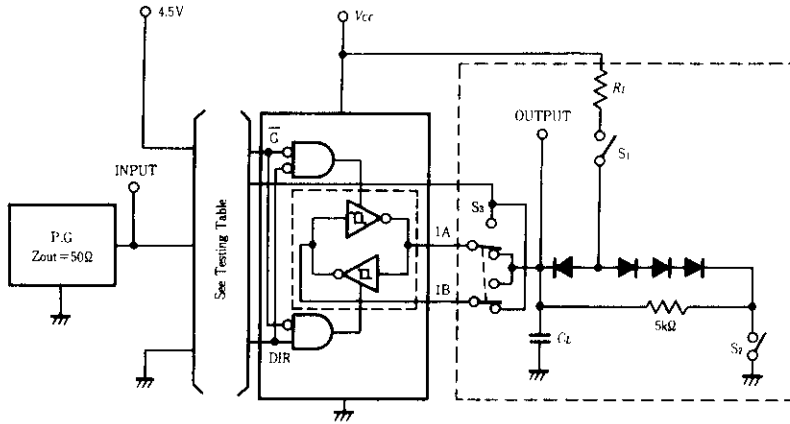
The duration of the short circuit shall not exceed one second.

## ■ SWITCHING CHARACTERISTICS ( $V_{CC} = 5\text{V}, T_a = 25^\circ\text{C}$ )

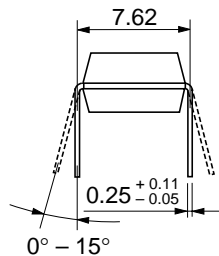
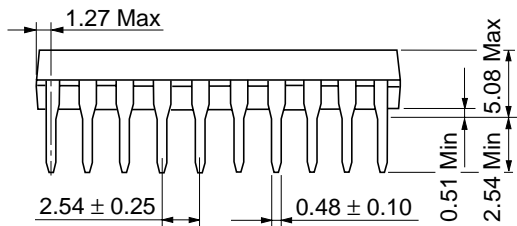
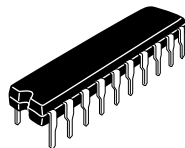
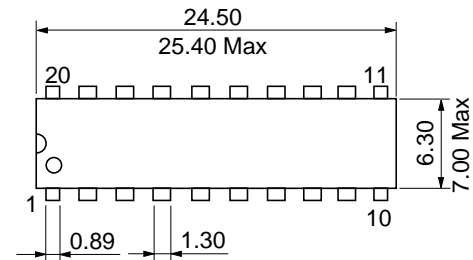
Item	Symbol	INPUT	OUTPUT	Test Conditions	min	typ	max	Unit
Propagation delay time	$t_{PLH}$	A	B	$C_L = 45\text{pF}, R_L = 667\ \Omega$	—	6	10	ns
		B	A		—	6	10	ns
	$t_{PHL}$	A	B		—	8	15	ns
		B	A		—	8	15	ns
Output enable time	$t_{ZL}$	$\bar{G}$	A		—	31	40	ns
		$\bar{G}$	B		—	31	40	ns
	$t_{ZH}$	$\bar{G}$	A		—	23	40	ns
		$\bar{G}$	B		—	23	40	ns
Output disable time	$t_{LZ}$	$\bar{G}$	A	$C_L = 5\text{pF}, R_L = 667\ \Omega$	—	15	25	ns
		$\bar{G}$	B		—	15	25	ns
	$t_{HZ}$	$\bar{G}$	A		—	15	25	ns
		$\bar{G}$	B		—	15	25	ns

## TESTING METHOD

### Test Circuit



- Notes)
1.  $C_L$  includes probe and jig capacitance.
  2. All diodes are 1S2074  $\text{\textcircled{H}}$ .
  3. 2A-2B, 3A-3B, 4A-4B, 5A-5B, 6A-6B, 7A-7B, 8A-8B are identical to above load circuit.
  4.  $S_2$  is an input-output switch.



Hitachi Code	DP-20N
JEDEC	—
EIAJ	Conforms
Weight (reference value)	1.26 g

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