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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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Keep safety first in your circuit designs!

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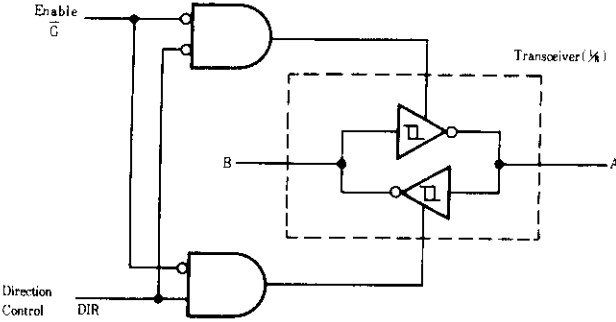
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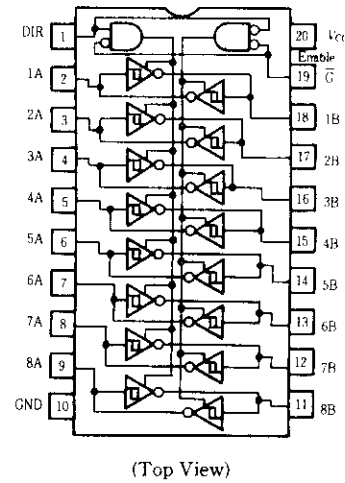
HD74LS640-1 ●Octal Bus Transceivers (inverted 3-state outputs)

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.

■BLOCK DIAGRAM



■PIN ARRANGEMENT



■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	μA	
	I_{OZL}		$V_O=0.4\text{V}$	—	—	-400	μA	
Input current	I_{IH}	$V_{CC}=5.25\text{V}, V_I=2.7\text{V}$		—	—	20	μA	
	I_{IL}	$V_{CC}=5.25\text{V}, V_I=0.4\text{V}$		—	—	-400	μA	
	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.

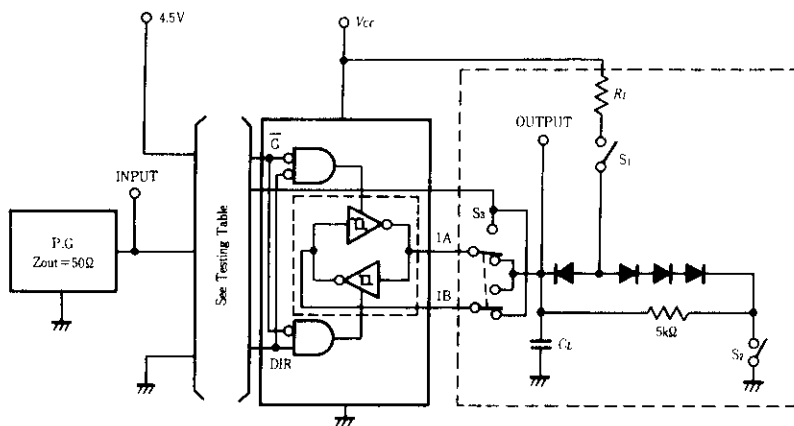
The duration of the short circuit shall not exceed one second.

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

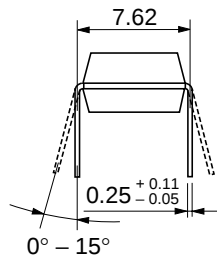
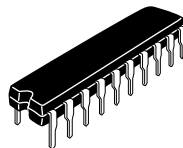
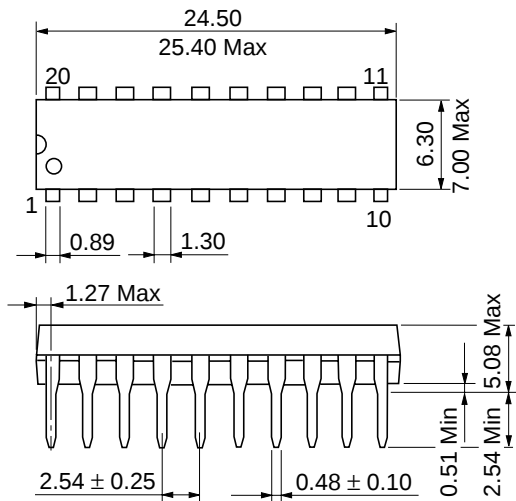
Item	Symbol	INPUT	OUTPUT	Test Conditions	min	typ	max	Unit
Propagation delay time	t_{PLH}	A	B	$C_L = 45\text{pF}, R_L = 667\ \Omega$	—	6	10	ns
		B	A		—	6	10	ns
	t_{PHL}	A	B		—	8	15	ns
		B	A		—	8	15	ns
Output enable time	t_{ZL}	$\bar{G}$	A		—	31	40	ns
		$\bar{G}$	B		—	31	40	ns
	t_{ZH}	$\bar{G}$	A		—	23	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 Ⓜ .
 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 a input-output switch.



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

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