

To all our customers

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

Cautions

Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

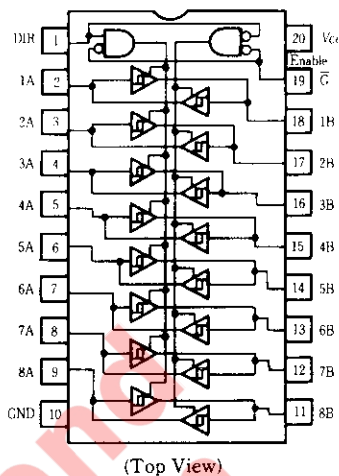
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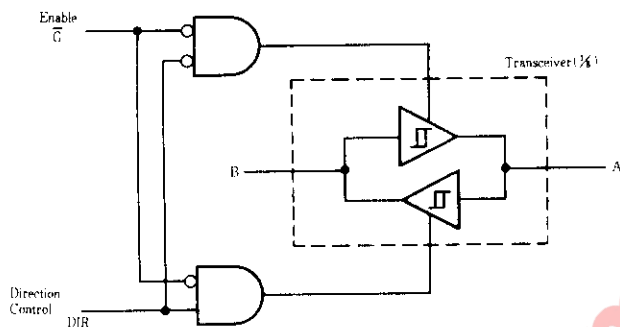
HD74LS645-1 ● Octal Bus Transceivers (non-inverted 3-state outputs)

This octal bus transceiver is designed for asynchronous two-way communication between data buses. The devices 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

■ FUNCTIONAL TABLE

Enable \bar{G}	Direction Control DIR	Operation
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

■ 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		
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_{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	
$I_{OL} = 48\text{mA}$			—	—	0.5		
Output current	I_{OZH}	$V_{CC} = 5.25\text{V}$			20	μA	
	I_{OZL}	\bar{G} input = 2V			-400		
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	$V_{CC} = 5.25\text{V}$	$V_I = 5.5\text{V}$	—	0.1	mA	
	DIR or \bar{G}		$V_I = 7\text{V}$	—	0.1		
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		
	I_{CCZ}			64	95		
Input clamp voltage	V_{IK}	$V_{CC} = 4.75\text{V}, I_{IH} = -18\text{mA}$	—	—	-1.5	V	

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

** I_{CC} is measured with all outputs open.

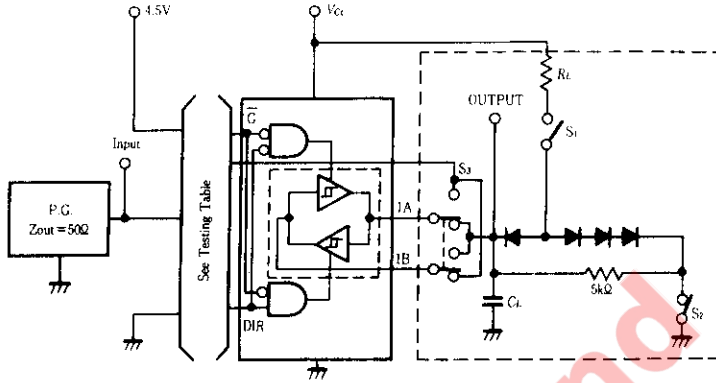
*** Not more than one output should be shorted at a time, duration of short-circuit should not exceed one second.

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

Item	Symbol	Input	Output	Test Condition	min	typ	max	Unit
Propagation delay time	t_{PLH}	A	B	$C_L = 45\text{pF}, R_L = 667\ \Omega$	—	8	15	ns
		B	A		—	8	15	ns
	t_{PHL}	A	B		—	11	15	ns
		B	A		—	11	15	ns
Output enable time	t_{ZL}	\bar{G}	A		—	31	40	ns
		\bar{G}	B		—	31	40	ns
	t_{ZH}	\bar{G}	A		—	26	40	ns
		\bar{G}	B		—	26	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

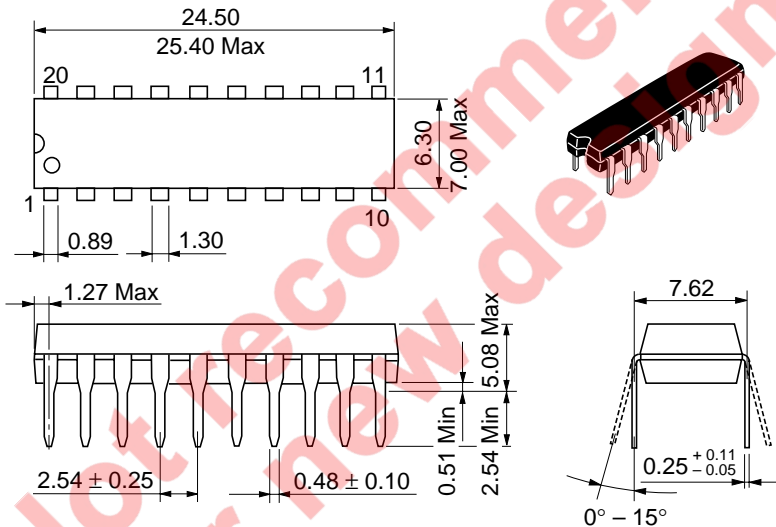
TESTING METHOD

Test Circuit



- Notes)
1. C_L includes probe and jig capacitance.
 2. All diodes are 1S2074 $\text{\textcircled{C}}$.
 3. 2A-2B, 3A-3B, 4A-4B, 5A-5B, 6A-6B, 7A-7B, 8A-8B are identical to above load circuit.
 4. S_1 is a input-output switch.

Not recommended for new design



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

Cautions

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