

To all our customers

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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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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.

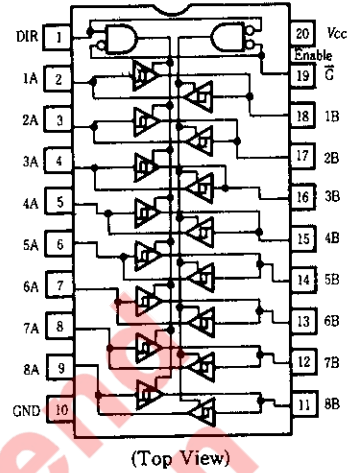
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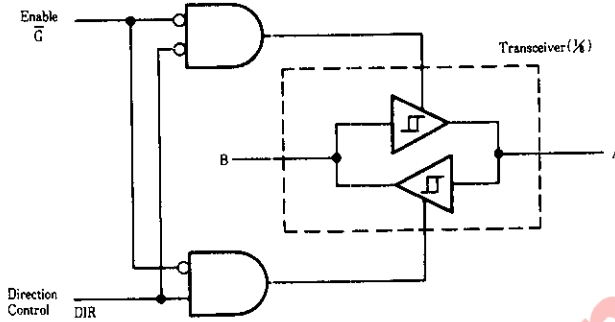
# HD74LS641-1 ● Octal Bus Transceivers (non-inverted open-collector outputs)

This octal bus transceivers 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 voltage	$V_{OH}$	—	—	5.5	V
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	Isolation

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

# HD74LS641-1

## ■ 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 current	$I_{OH}$	$V_{CC} = 4.75\text{V}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}, V_{OH} = 5.5\text{V}$	—	—	100	$\mu\text{A}$	
Output voltage	$V_{OL}$	$V_{CC} = 4.75\text{V}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}$	$I_{OL} = 12\text{mA}$	—	—	0.4	V
			$I_{OL} = 24\text{mA}$	—	—	0.5	V
			$I_{OL} = 48\text{mA}$	—	—	0.5	V
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	$V_{CC} = 5.25\text{V}$	$V_I = 5.5\text{V}$	—	—	0.1	mA
	DIR or $\bar{G}$		$V_I = 7\text{V}$	—	—	0.1	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	

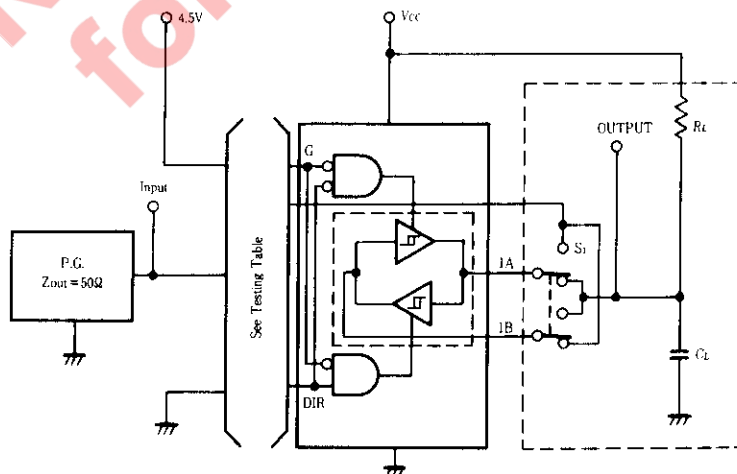
\*  $V_{CC} = 5\text{V}, T_a = 25^\circ\text{C}$

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

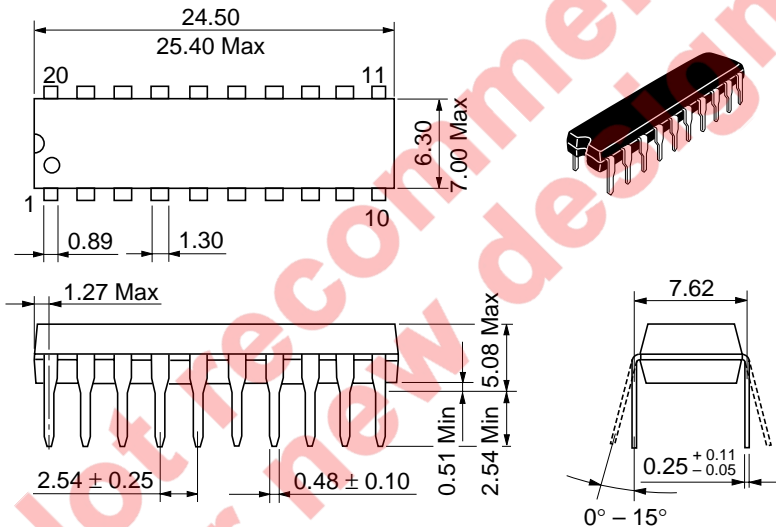
Item	Symbol	INPUT	OUTPUT	Test Conditions	min	typ	max	Unit
Propagation delay time	$t_{PLH}$	A	B	$C_L = 45\text{pF}, R_L = 667\ \Omega$	—	17	25	ns
		B	A		—	17	25	ns
	$t_{PHL}$	A	B		—	16	25	ns
		B	A		—	16	25	ns
Output enable time	$t_{PLH}$	$\bar{G}$	A		—	23	40	ns
		$\bar{G}$	B		—	25	40	ns
	$t_{PHL}$	$\bar{G}$	A		—	34	50	ns
		$\bar{G}$	B		—	37	50	ns

## ■ TESTING METHOD

### Test Circuit



- Notes) 1. 2A-2B, 3A-3B, 4A-4B, 5A-5B, 6A-6B, 7A-7B, 8A-8B, are identical to above load circuit.  
 2.  $C_L$  includes probe and jig capacitance.  
 3.  $S_1$  is a input-output switch.



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

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