

To all our customers

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Renesas Technology Home Page: <http://www.renesas.com>

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.

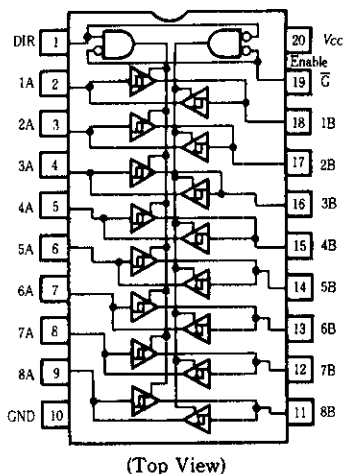
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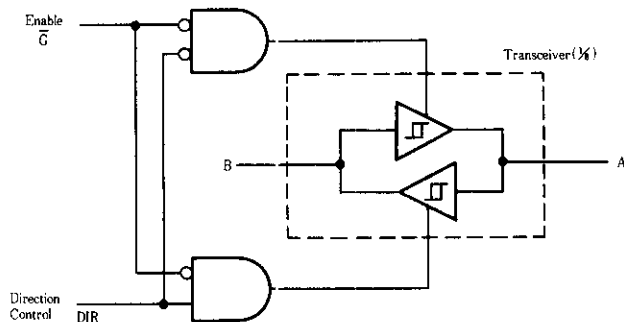
HD74LS641 ● Octal Bus Transceivers (non-inverted open-collector outputs)

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}	—	—	24	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

■ 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	μA	
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
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}	$V_{CC} = 5.25\text{V}$	$V_I = 5.5\text{V}$	—	—	0.1	mA
	$V_I = 7\text{V}$		—	—	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	

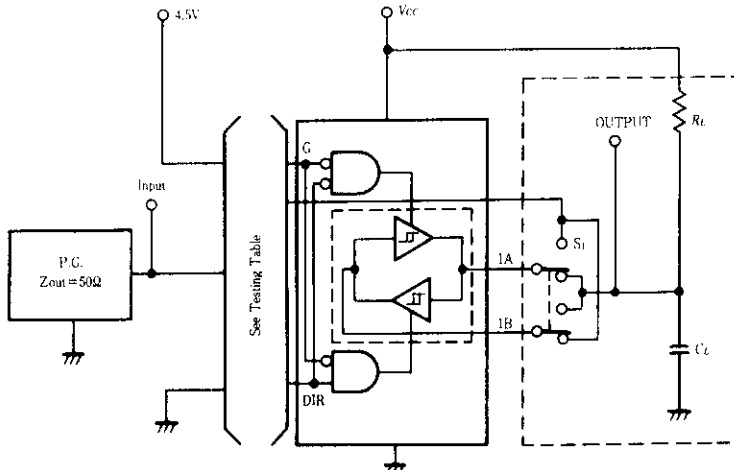
* $V_{CC} = 5\text{V}, T_a = 25^\circ\text{C}$

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

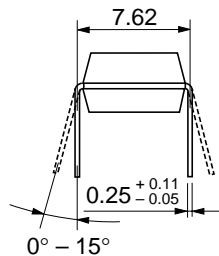
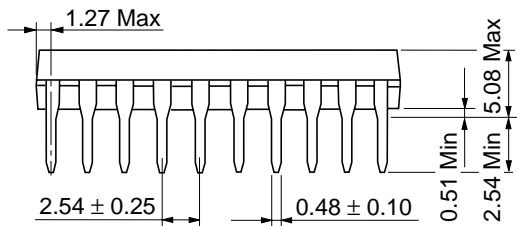
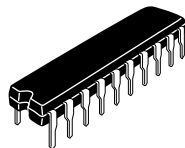
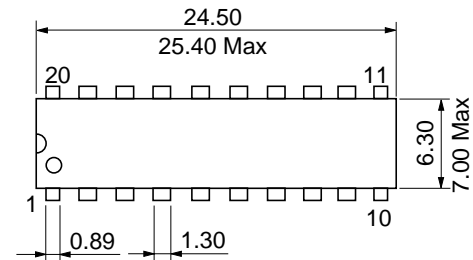
Item	Symbol	INPUT	OUTPUT	Test Conditions	min	typ	max	Unit
Propagation delay time	t_{PLH}	A	B	$C_L = 45\text{pF}, R_L = 667\ \Omega$	—	17	25	ns
		B	A		—	17	25	ns
	t_{PHL}	A	B		—	16	25	ns
		B	A		—	16	25	ns
Output enable time	t_{PLH}	\bar{G}	A		—	23	40	ns
		\bar{G}	B		—	25	40	ns
	t_{PHL}	\bar{G}	A		—	34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

■ TESTING METHOD

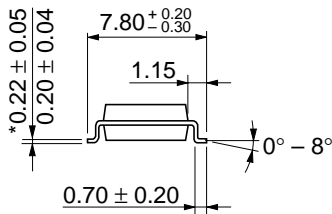
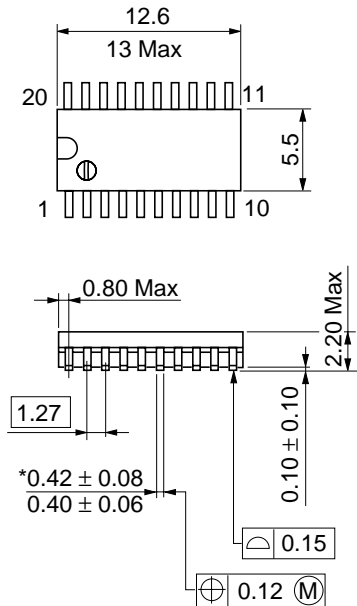
Test Circuit



- 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.

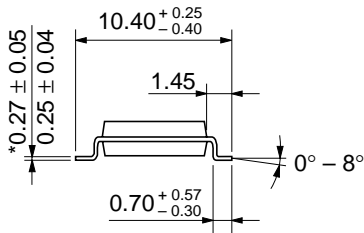
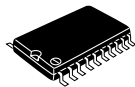
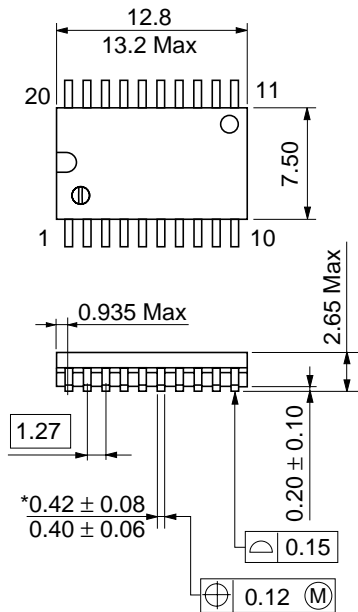


Hitachi Code	DP-20N
JEDEC	—
EIAJ	Conforms
Weight (reference value)	1.26 g



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-20DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.31 g



Hitachi Code	FP-20DB
JEDEC	Conforms
EIAJ	—
Weight (reference value)	0.52 g

*Dimension including the plating thickness
Base material dimension

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