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

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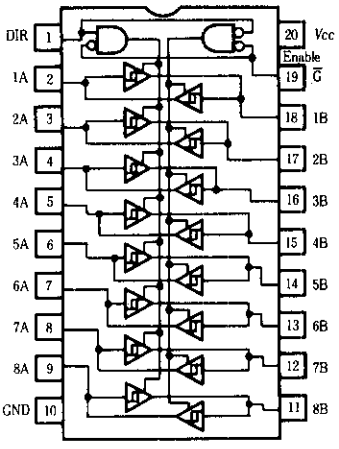
HD74LS645 ●Octal Bus Transceivers (non-inverted 3-state outputs)

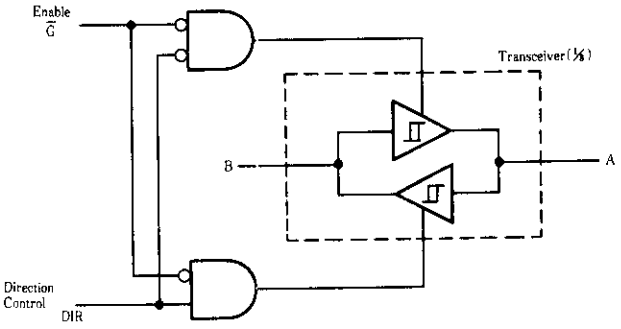
This octal bus transceiver is designed for asynchronous two-way communication between data buses. The devices transmit data from the A bus to the B bus or from the B bus to the A bus depending upon the level at the direction control (DIR) input. The enable input ($\overline{G}$) can be used to disable the device so that the buses are effectively isolated.

■PIN ARRANGEMENT



(Top View)

■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}	—	—	24	mA
Operating temperature range	T_{opr}	−20	25	75	℃

■FUNCTIONAL TABLE

Enable $\overline{G}$	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 (Ta= −20 ~ +75°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}=4.75V		0.2	—	—	V
Output voltage		V_{OH}	V_{CC}=4.75V, V_{IH}=2V, V_{IL}=0.8V	I_{OH}=−3mA	2.4	—	—	V
				I_{OH}=−15mA	2	—	—	
		V_{OL}	V_{CC}=4.75V, V_{IH}=2V, V_{IL}=0.8V	I_{OL}=12mA	—	—	0.4	V
				I_{OL}=24mA	—	—	0.5	
Output current		I_{OZH}	V_{CC}=5.25V, $\overline{G}$ input =2V	V_O=2.7V	—	—	20	μA
		I_{OZL}		V_O=0.4V	—	—	−400	
Input current		I_{IH}	V_{CC}=5.25V, V_I=2.7V		—	—	20	μA
		I_{IL}	V_{CC}=5.25V, V_I=0.4V		—	—	−400	μA
	A or B	I_I	V_{CC}=5.25V	V_I=5.5V	—	—	0.1	mA
	DIR or $\overline{G}$			V_I=7V	—	—	0.1	
Short-circuit output current		I_{OS}***	V_{CC}=5.25V		−40	—	−225	mA
Supply current**		I_{CCH}	V_{CC}=5.25V, OUTPUT OPEN		—	48	70	mA
		I_{CCL}			—	62	90	
		I_{CC2}			—	64	95	
Input clamp voltage		V_{IK}	V_{CC}=4.75V, I_{IN}=−18mA		—	—	−1.5	V

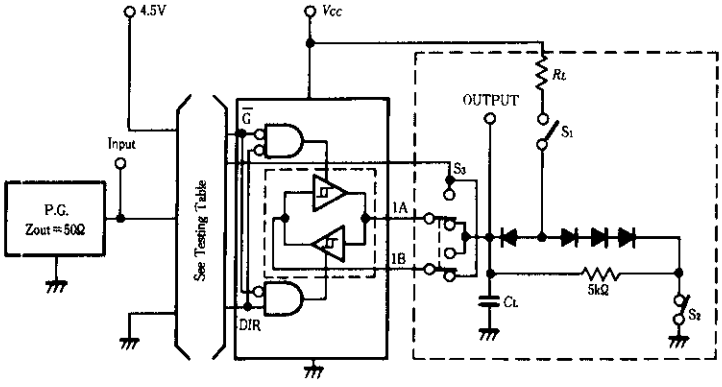
* V_{CC} = 5V, Ta = 25°C
** I_{CC} is measured with all outputs open.
*** Not more than one output should be shorted at a time, duration of short-circuit should not exceed one second.

■SWITCHING CHARACTERISTICS (V_{CC}=5V, Ta=25°C)

Item	Symbol	Input	Output	Test Condition	min	typ	max	Unit
Propagation delay time	t_{PLH}	A	B	C_L=45pF, R_L=667Ω	—	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}	$\overline{G}$	A		—	31	40	ns
		$\overline{G}$	B		—	31	40	ns
	t_{ZH}	$\overline{G}$	A		—	26	40	ns
		$\overline{G}$	B		—	26	40	ns
Output disable time	t_{LZ}	$\overline{G}$	A	C_L=5pF, R_L=667Ω	—	15	25	ns
		$\overline{G}$	B		—	15	25	ns
	t_{HZ}	$\overline{G}$	A		—	15	25	ns
		$\overline{G}$	B		—	15	25	ns

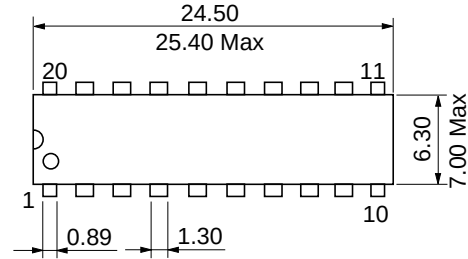
■TESTING METHOD

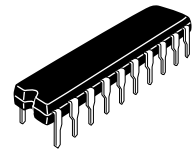
Test Circuit



Notes) 1. C_L includes probe and jig capacitance.
2. All diodes are 1S2074 (H).
3. 2A-2B, 3A-3B, 4A-4B, 5A-5B, 6A-6B, 7A-7B, 8A-8B are identical to above load circuit.
4. S_3 is a input-output switch.

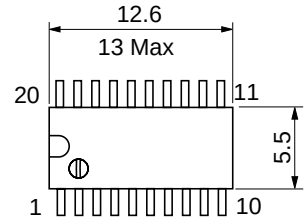
Unit: mm

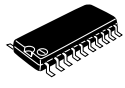


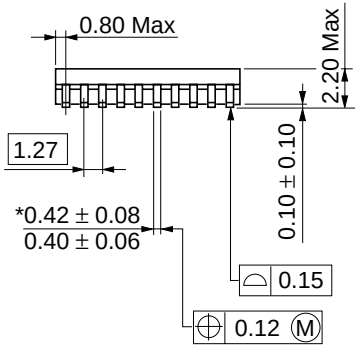


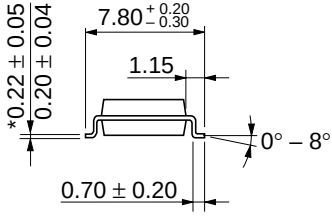
Hitachi Code	DP-20N
JEDEC	—
EIAJ	Conforms
Weight (reference value)	1.26 g

Unit: mm





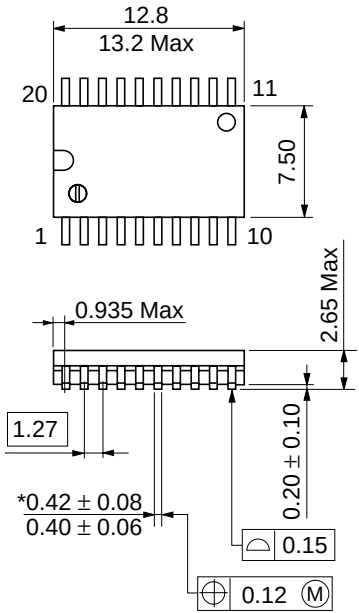


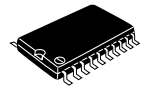


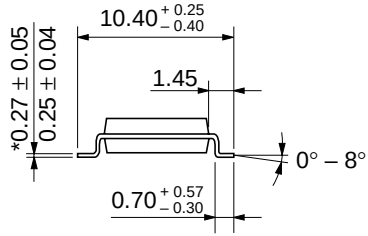
*Dimension including the plating thickness
Base material dimension

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

Unit: mm







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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