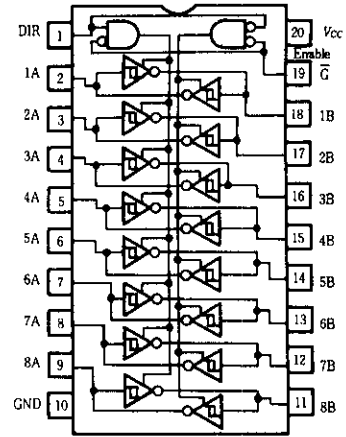


HD74LS640 ● Octal Bus Transceivers (inverted 3-state outputs)

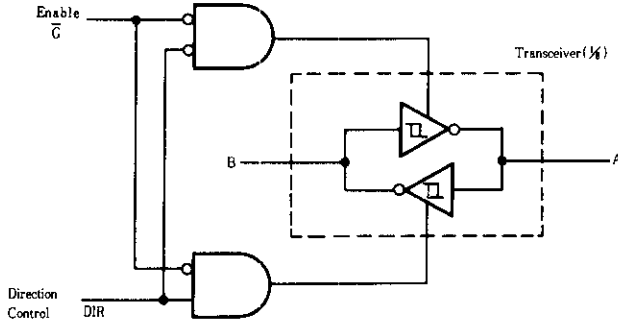
This octal bus transceivers is designed for asynchronous two-way communication between data buses. The device transmit data from the A bus to the B bus or from the B bus to the A bus depending upon the level at the direction control (DIR) input. The enable input (\bar{G}) can be used to disable the device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

■ 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	°C

■ FUNCTION TABLE

Enable	Direction Control	Operation
\bar{G}	DIR	
L	L	\bar{B} data to A bus
L	H	A data to B bus
H	X	Isolation

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
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
$V_i = 7\text{V}$				--		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.

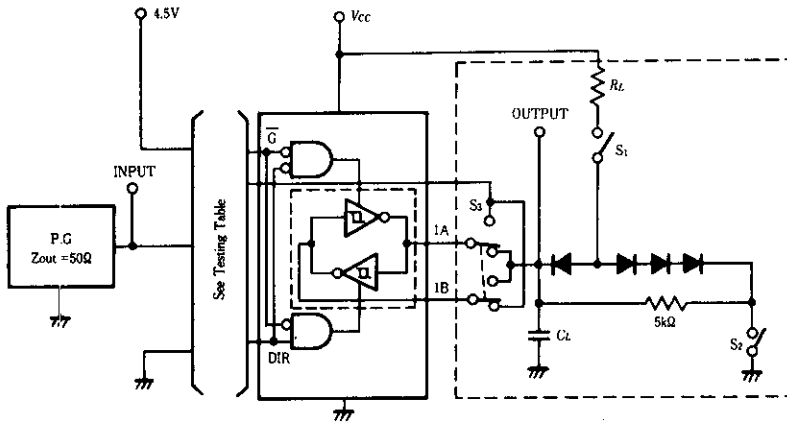
The duration of the short circuit shall not exceed one second.

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

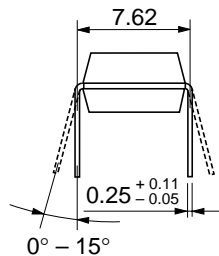
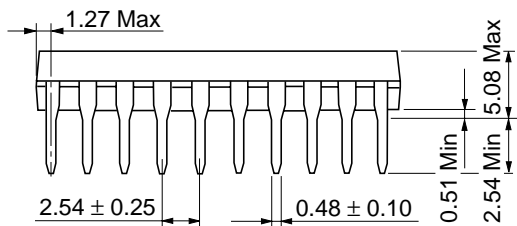
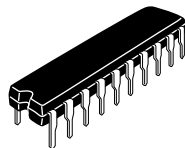
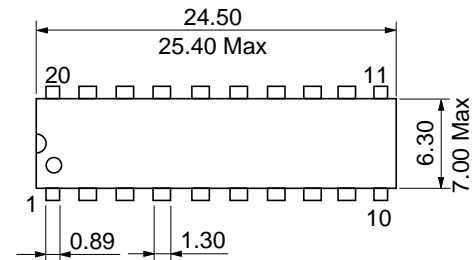
Item	Symbol	INPUT	OUTPUT	Test Conditions	min	typ	max	Unit
Propagation delay time	t_{PLH}	A	B	$C_L = 45\text{pF}, R_L = 667\ \Omega$	--	6	10	ns
		B	A		--	6	10	ns
	t_{PHL}	A	B		--	8	15	ns
		B	A		--	8	15	ns
Output enable time	t_{ZL}	\bar{G}	A		--	31	40	ns
		\bar{G}	B		--	31	40	ns
	t_{ZH}	\bar{G}	A		--	23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

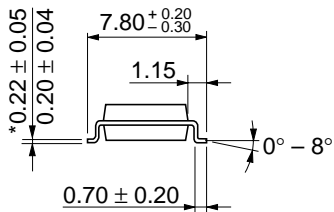
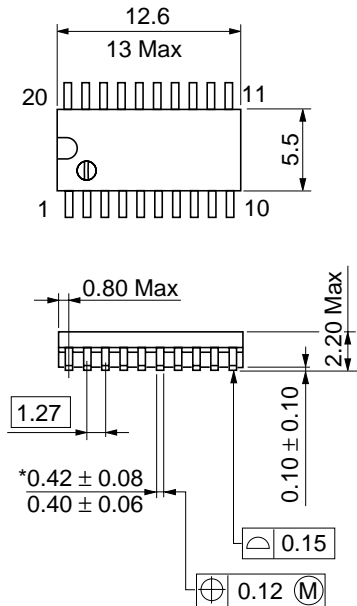
Test Circuit



- Notes)
1. C_L includes probe and jig capacitance.
 2. All diodes are 1S2074 $\text{\textcircled{C}}$.
 3. 2A-2B, 3A-3B, 4A-4B, 5A-5B, 6A-6B, 7A-7B, 8A-8B are identical to above load circuit.
 4. S_2 is a input-output switch.

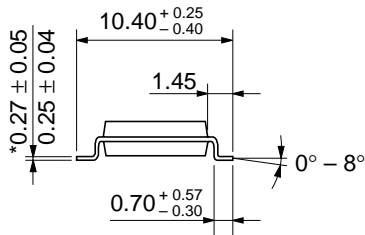
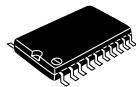
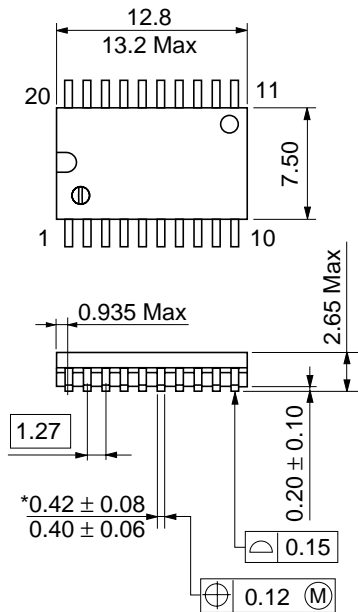


Hitachi Code	DP-20N
JEDEC	—
EIAJ	Conforms
Weight (reference value)	1.26 g



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

*Dimension including the plating thickness
Base material dimension



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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