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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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HD74HC640/HD74HC643

Octal Bus Transceivers (with 3-state outputs)



ADE-205-517 (Z)
1st. Edition
Sep. 2000

Description

Each device has an active enable \overline{G} and a direction control input, DIR. when DIR is high, data flows from the A inputs to the B outputs. When DIR is low, data flows from the B inputs to the A outputs. The HD74HC640 transfers inverted data from one bus to other and the HD74HC643 transfers inverted data from the A bus to the B bus and true data from the B bus to the A bus.

Features

- High Speed Operation: $t_{pd} = 12 \text{ ns typ (} C_L = 50 \text{ pF)}$
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage: $V_{CC} = 2 \text{ to } 6 \text{ V}$
- Low Input Current: $1 \mu\text{A max}$
- Low Quiescent Supply Current: $I_{CC} \text{ (static)} = 4 \mu\text{A max (} T_a = 25^\circ\text{C)}$

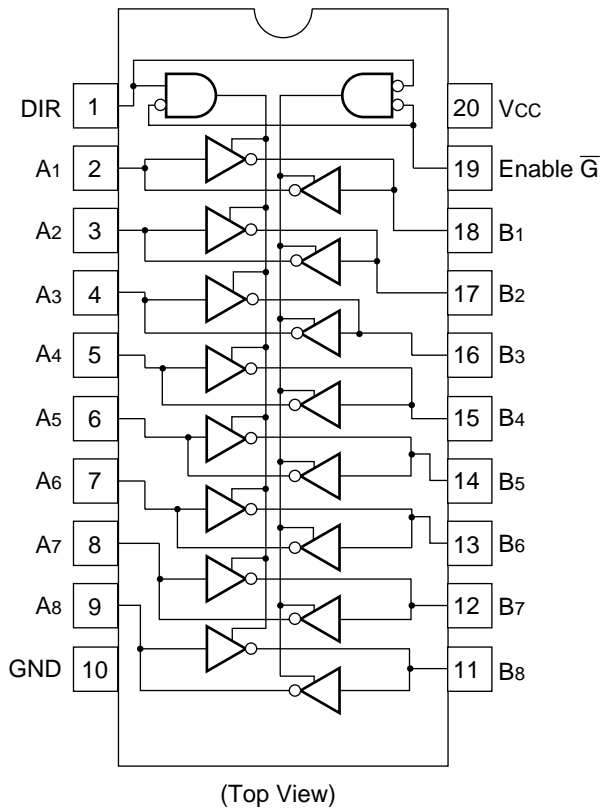
Function Table

Control Inputs		Operation	
\overline{G}	DIR	HD74HC640	HD74HC643
L	L	\overline{B} data to A bus	B data to A bus
L	H	\overline{A} data to B bus	\overline{A} data to B bus
H	X	Isolation	Isolation

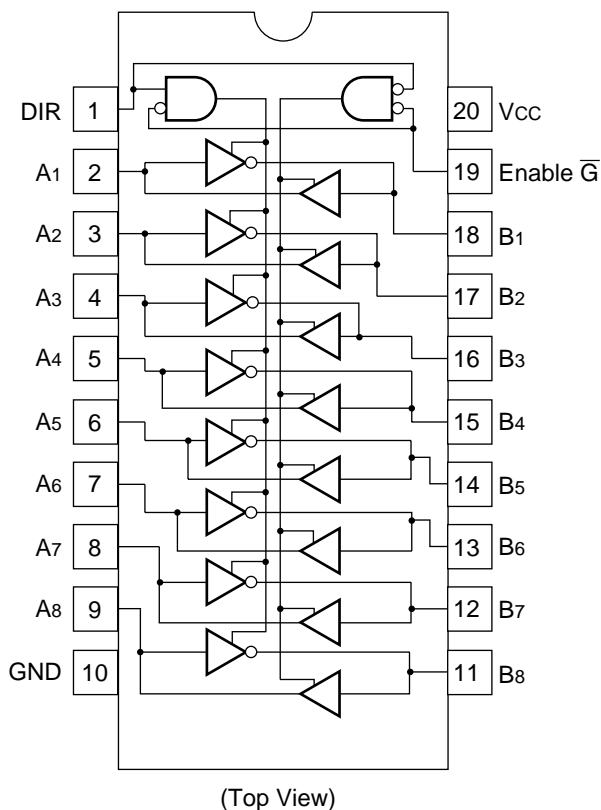
HD74HC640/HD74HC643

Pin Arrangement

HD74HC640



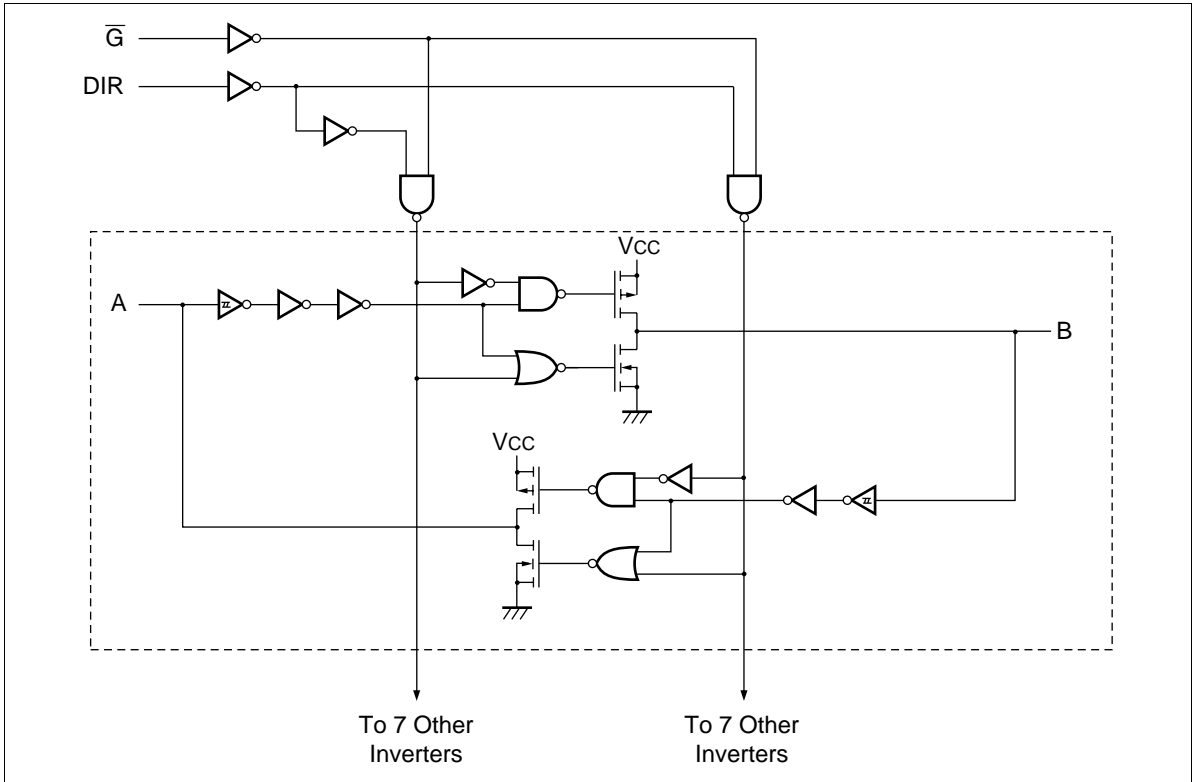
HD74HC643



Absolute Maximum Ratings

Item	Symbol	Rating	Unit
Supply voltage range	V_{CC}	-0.5 to +7.0	V
Input voltage	V_{IN}	-0.5 to $V_{CC} + 0.5$	V
Output voltage	V_{OUT}	-0.5 to $V_{CC} + 0.5$	V
Output current	I_{OUT}	± 35	mA
DC current drain per V_{CC} , GND	I_{CC} , I_{GND}	± 75	mA
DC input diode current	I_{IK}	± 20	mA
DC output diode current	I_{OK}	± 20	mA
Power Dissipation per package	P_T	500	mW
Storage temperature	T_{stg}	-65 to +150	$^{\circ}C$

HD74HC643



DC Characteristics

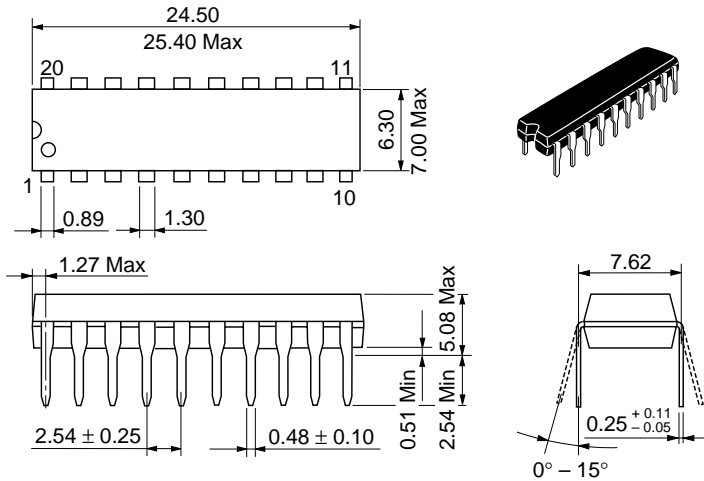
Item	Symbol	V _{CC} (V)	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions		
			Min	Typ	Max	Min			Max	
Input voltage	V _{IH}	2.0	1.5	—	—	1.5	—	V		
		4.5	3.15	—	—	3.15	—			
		6.0	4.2	—	—	4.2	—			
	V _{IL}	2.0	—	—	0.3	—	0.3	V		
		4.5	—	—	1.35	—	1.35			
		6.0	—	—	1.8	—	1.8			
Hysteresis voltage	V _H	2.0	—	0.1	—	—	—	V		
		4.5	—	0.4	—	—	—			
		6.0	—	0.4	—	—	—			
Output voltage	V _{OH}	2.0	1.9	2.0	—	1.9	—	V	Vin = V _{IH} or V _{IL} I _{OH} = -20 μA	
		4.5	4.4	4.5	—	4.4	—			
		6.0	5.9	6.0	—	5.9	—			
		4.5	4.18	—	—	4.13	—			I _{OH} = -6 mA
		6.0	5.68	—	—	5.63	—			I _{OH} = -7.8 mA
	V _{OL}	2.0	—	0.0	0.1	—	0.1	V	Vin = V _{IH} or V _{IL} I _{OL} = 20 μA	
		4.5	—	0.0	0.1	—	0.1			
		6.0	—	0.0	0.1	—	0.1			
		4.5	—	—	0.26	—	0.33			I _{OL} = 6 mA
		6.0	—	—	0.26	—	0.33			I _{OL} = 7.8 mA
Off-state output current	I _{OZ}	6.0	—	—	±0.5	—	±5.0	μA	Vin = V _{IH} or V _{IL} , Vout = V _{CC} or GND	
Input current	I _{in}	6.0	—	—	±0.1	—	±1.0	μA	Vin = V _{CC} or GND	
Quiescent supply current	I _{CC}	6.0	—	—	4.0	—	40	μA	Vin = V _{CC} or GND, Iout = 0 μA	

AC Characteristics ($C_L = 50$ pF, Input $t_r = t_f = 6$ ns)

Item	Symbol	V_{CC} (V)	Ta = 25°C		Ta = -40 to +85°C		Unit	Test Conditions
			Min	Typ	Max	Min		
Propagation delay time	t_{PLH}	2.0	—	—	90	—	115	ns
	t_{PHL}	4.5	—	12	18	—	23	
		6.0	—	—	15	—	20	
Output enable time	t_{ZH}	2.0	—	—	230	—	290	ns
	t_{ZL}	4.5	—	15	46	—	58	
		6.0	—	—	39	—	49	
Output disable time	t_{HZ}	2.0	—	—	215	—	270	ns
	t_{LZ}	4.5	—	17	43	—	54	
		6.0	—	—	37	—	46	
Output rise/fall time	t_{TLH}	2.0	—	—	60	—	75	ns
	t_{THL}	4.5	—	4	12	—	15	
		6.0	—	—	10	—	13	
Input capacitance	C_{in}	—	—	5	10	—	10	pF

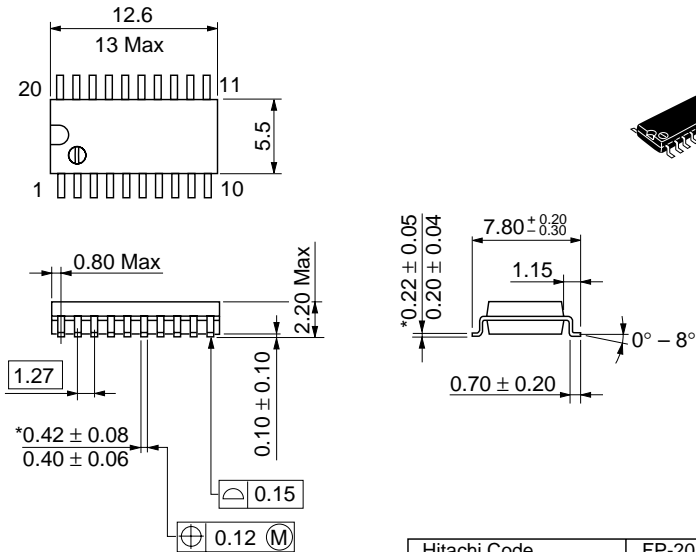
Package Dimensions

Unit: mm



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

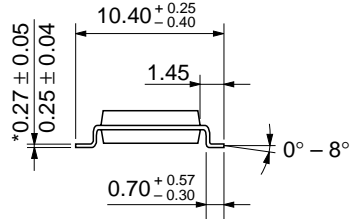
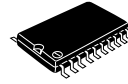
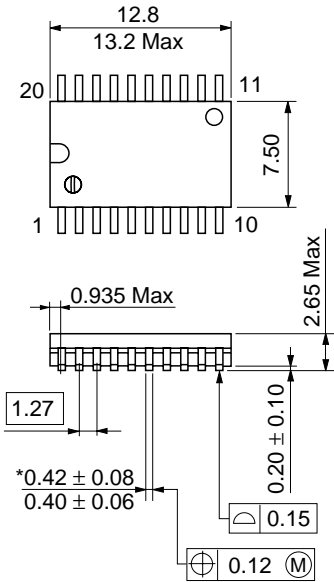
Unit: mm



*Dimension including the plating thickness
Base material dimension

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

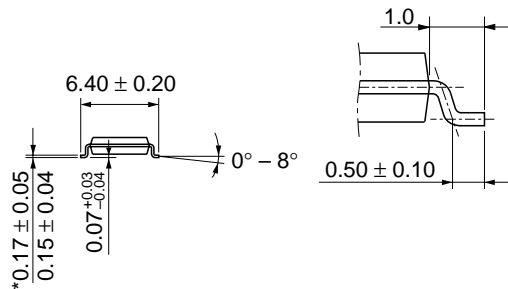
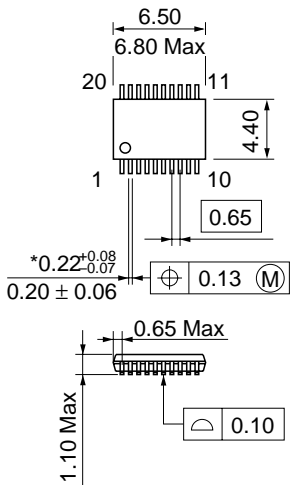
Unit: mm



*Dimension including the plating thickness
Base material dimension

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

Unit: mm



*Dimension including the plating thickness
Base material dimension

Hitachi Code	TTP-20DA
JEDEC	—
EIAJ	—
Mass (reference value)	0.07 g

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