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# HD74HC640/HD74HC643

Octal Bus Transceivers (with 3-state outputs)

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## 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:  $I_{CC} \text{ (static)} = 4 \mu\text{A max (} T_a = 25^\circ\text{C)}$

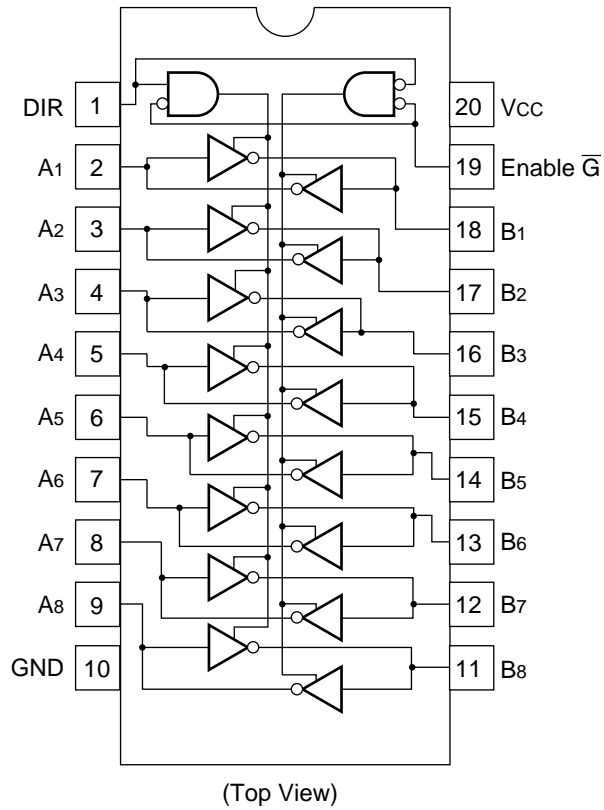
## Function Table

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

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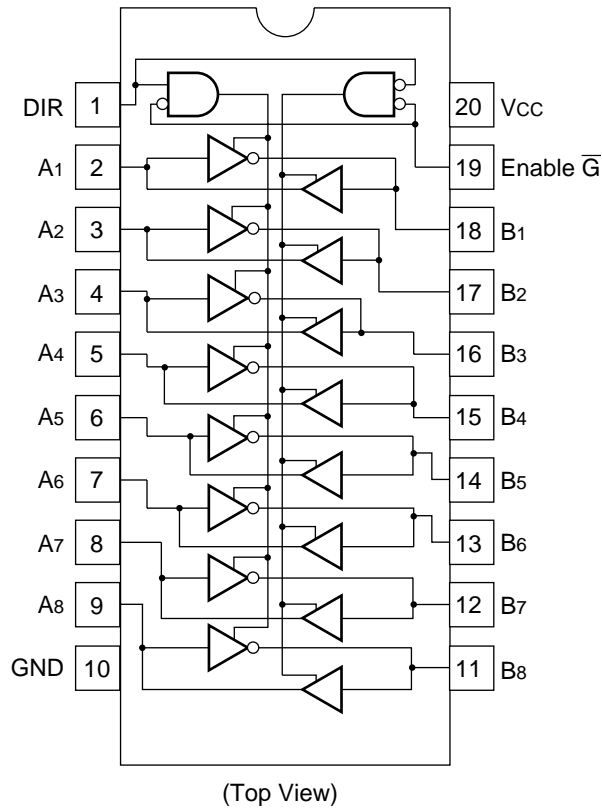
## Pin Arrangement

### HD74HC640



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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	$I_{OUT}$	$\pm 35$	mA
DC current drain per $V_{CC}$ , GND	$I_{CC}$ , $I_{GND}$	$\pm 75$	mA
DC input diode current	$I_{IK}$	$\pm 20$	mA
DC output diode current	$I_{OK}$	$\pm 20$	mA
Power Dissipation per package	$P_T$	500	mW
Storage temperature	Tstg	-65 to +150	$^{\circ}C$



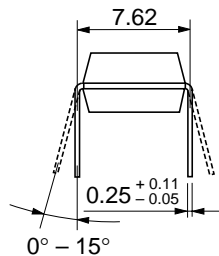
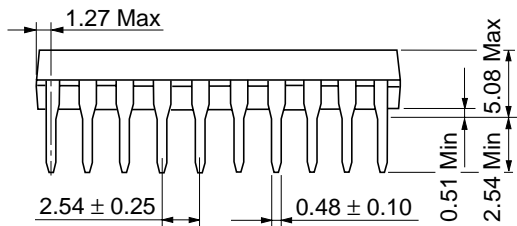
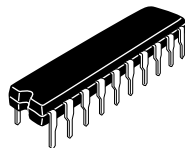
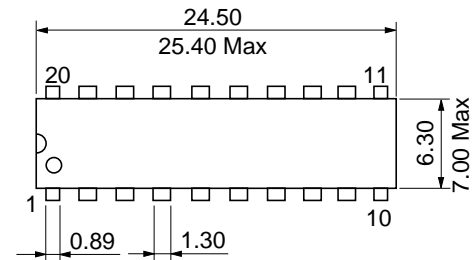


## DC Characteristics

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

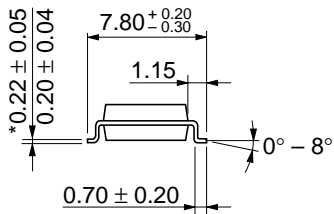
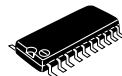
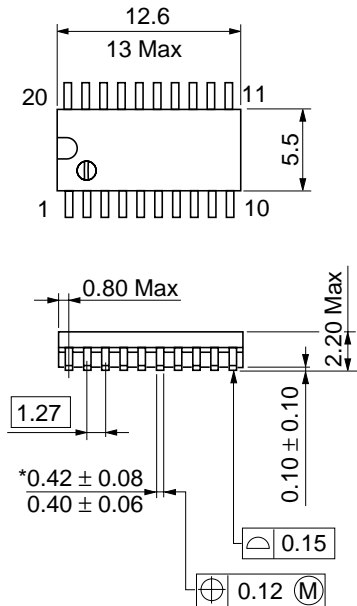
AC Characteristics ( $C_L = 50$  pF, Input  $t_r = t_f = 6$  ns)

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



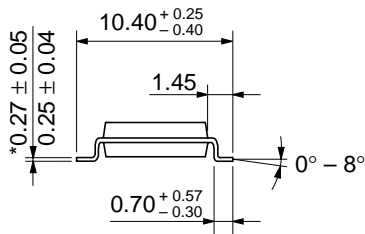
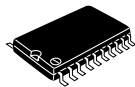
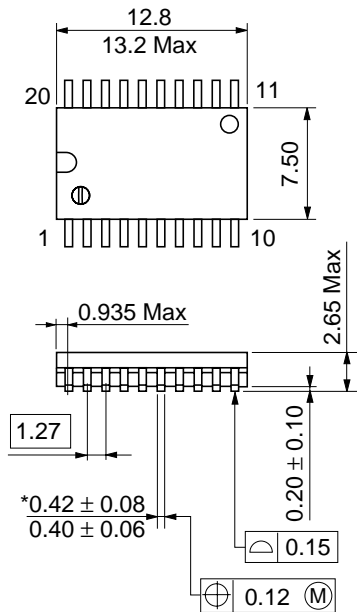
Hitachi Code	DP-20N
JEDEC	—
EIAJ	Conforms
Weight (reference value)	1.26 g





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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