

HD74HCT640/HD74HCT643

Octal Bus Transceivers (with 3-state outputs)

HITACHI

ADE-205-562 (Z)
1st. Edition
Sep. 2000

Description

Both the HD74HCT640 and the HD74HCT643 have one active low enable input (\overline{G}), and a direction control (DIR). When the DIR input is high, data flows from the A inputs to the B outputs. When DIR is low, data flows from B to A.

The HD74HCT640 transfers inverted data from one bus to the other. The HD74HCT643 transfers inverted data from the A bus to the B bus and non-inverted data from the B bus to the A bus.

Features

- LSTTL Output Logic Level Compatibility as well as CMOS Output Compatibility
- High Speed Operation: t_{pd} (A to B) = 14.5 ns typ ($C_L = 50$ pF)
- High Output Current: Fanout of 15 LSTTL Loads
- Wide Operating Voltage: $V_{CC} = 4.5$ to 5.5 V
- Low Input Current: 1 μ A max
- Low Quiescent Supply Current: I_{CC} (static) = 4 μ A max ($T_a = 25^\circ\text{C}$)

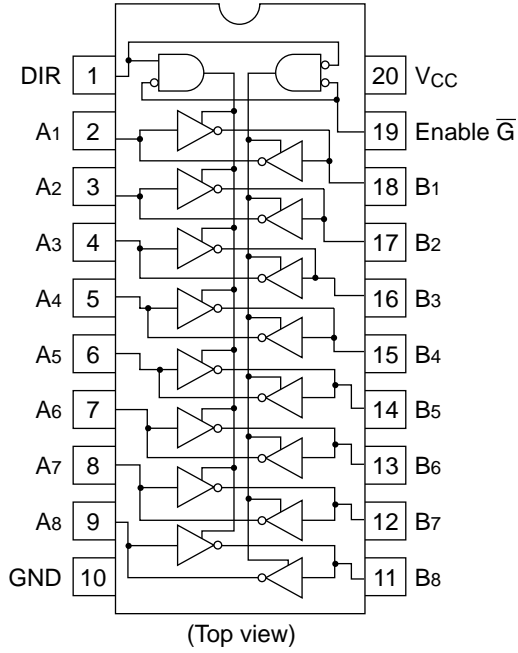
Function Table

| Control Input | | Operation | |
|----------------|-----|------------------------------|------------------------------|
| \overline{G} | DIR | HD74HCT640 | HD74HCT643 |
| 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 |

HD74HCT640/HD74HCT643

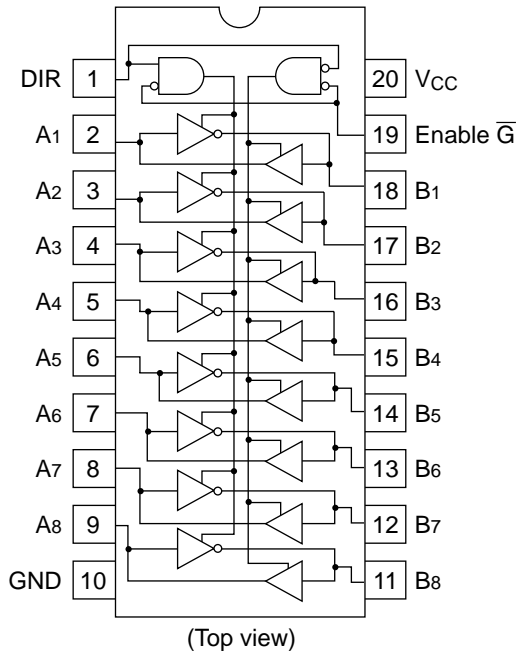
Pin Arrangement

HD74HCT640



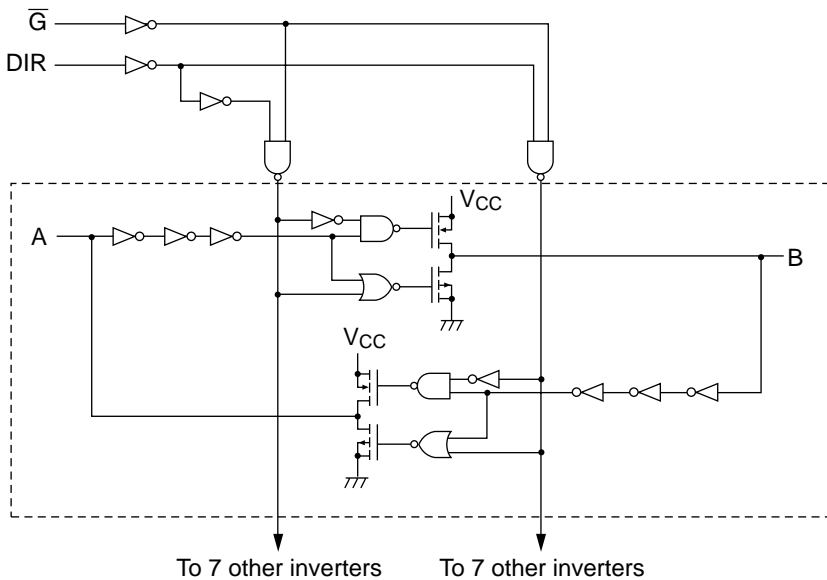
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HD74HCT643



Block Diagram

HD74HCT640



DC Characteristics

| Item | Symbol | Ta = 25°C | | Ta = -40 to +85°C | | Unit | Test Conditions | | |
|--------------------------|-----------------|-----------|-----|-------------------|------|------|-----------------|---------------------|---|
| | | Min | Typ | Max | Min | | Max | V _{CC} (V) | |
| Input voltage | V _{IH} | 2.0 | — | — | 2.0 | — | V | 4.5 to 5.5 | |
| | V _{IL} | — | — | 0.8 | — | 0.8 | V | 4.5 to 5.5 | |
| Output voltage | V _{OH} | 4.4 | — | — | 4.4 | — | V | 4.5 | Vin = V _{IH} or V _{IL} I _{OH} = -20 μA |
| | | 4.18 | — | — | 4.13 | — | | 4.5 | |
| | V _{OL} | — | — | 0.1 | — | 0.1 | V | 4.5 | Vin = V _{IH} or V _{IL} I _{OL} = 20 μA |
| | | — | — | 0.26 | — | 0.33 | | 4.5 | |
| Off-state output current | I _{OZ} | — | — | ±0.5 | — | ±5.0 | μA | 5.5 | Vin = V _{IH} or V _{IL} , Vout = V _{CC} or GND |
| Input current | I _{in} | — | — | ±0.1 | — | ±1.0 | μA | 5.5 | Vin = V _{CC} or GND |
| Quiescent current | I _{CC} | — | — | 4.0 | — | 40 | μA | 5.5 | Vin = V _{CC} or GND, Iout = 0 μA |

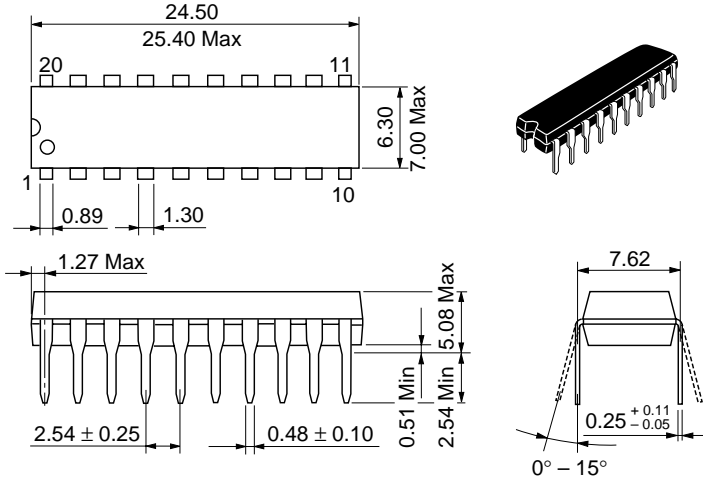
AC Characteristics (C_L = 50 pF, Input t_r = t_f = 6 ns)

| Item | Symbol | Ta = 25°C | | Ta = -40 to +85°C | | Unit | Test Conditions | |
|------------------------|------------------|-----------|-----|-------------------|-----|------|-----------------|---------------------|
| | | Min | Typ | Max | Min | | Max | V _{CC} (V) |
| Propagation delay time | t _{PLH} | — | 13 | 18 | — | 23 | ns | 4.5 |
| | t _{PHL} | — | 16 | 18 | — | 23 | | 4.5 |
| Output enable time | t _{ZH} | — | 16 | 46 | — | 58 | ns | 4.5 |
| | t _{ZL} | — | 16 | 46 | — | 58 | | 4.5 |
| Output disable time | t _{HZ} | — | 17 | 43 | — | 54 | ns | 4.5 |
| | t _{LZ} | — | 21 | 43 | — | 54 | | 4.5 |
| Output rise/fall time | t _{TLH} | — | 4 | 12 | — | 15 | ns | 4.5 |
| | t _{THL} | — | — | — | — | — | | — |
| Input capacitance | C _{in} | — | 5 | 10 | — | 10 | pF | — |

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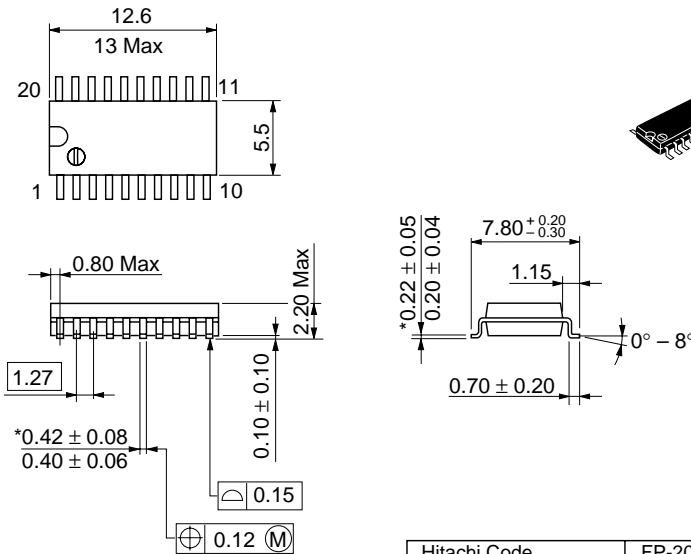
Package Dimensions

Unit: mm



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

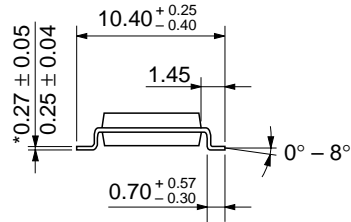
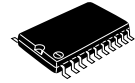
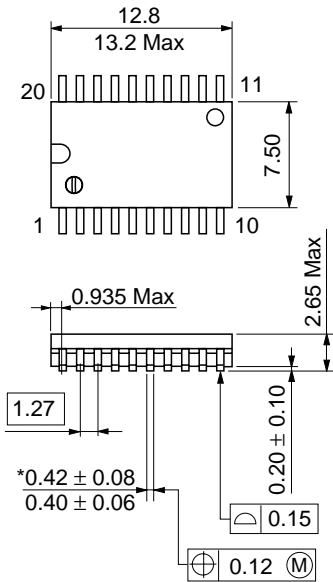
Unit: mm



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

*Dimension including the plating thickness
Base material dimension

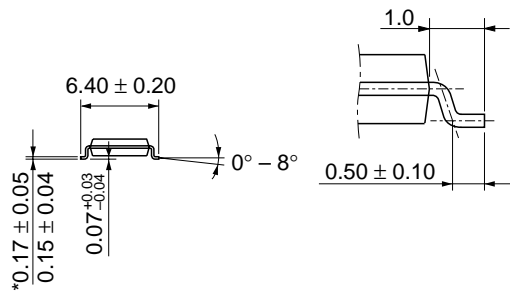
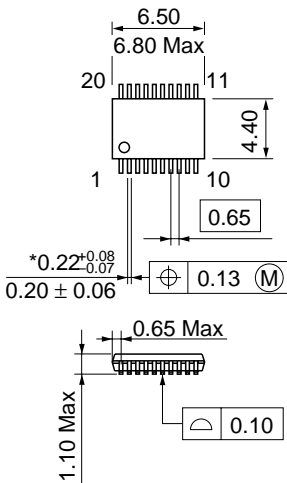
Unit: mm



*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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HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL North America : <http://semiconductor.hitachi.com/>
 Europe : <http://www.hitachi-eu.com/hel/ecg>
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For further information write to:

Hitachi Semiconductor
(America) Inc.
179 East Tasman Drive,
San Jose, CA 95134
Tel: <1> (408) 433-1990
Fax: <1> (408) 433-0223

Hitachi Europe GmbH
Electronic Components Group
Dornacher Straße 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 585160

Hitachi Asia Ltd.
Hitachi Tower
16 Collyer Quay #20-00,
Singapore 049318
Tel: <65>-538-6533/538-8577
Fax : <65>-538-6933/538-3877
URL : <http://www.hitachi.com.sg>

Hitachi Asia Ltd.
(Taipei Branch Office)
4/F, No. 167, Tun Hwa North Road,
Hung-Kuo Building,
Taipei (105), Taiwan
Tel: <886>-(2)-2718-3666
Fax : <886>-(2)-2718-8180
Telex : 23222 HAS-TP
URL : <http://www.hitachi.com.tw>

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower,
World Finance Centre,
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon,
Hong Kong
Tel : <852>-(2)-735-9218
Fax : <852>-(2)-730-0281
URL : <http://www.hitachi.com.hk>

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