# HD74HCT449

Quad. Bus Transceivers with Individual Direction Controls

HITACHI

## Description

The HD74HCT449 has 4 bus transceivers. The device has direction control inputs with individual. And this control inputs select data transmissible direction.

When $\overline{G}$BA is high, A outputs are disable, and when $\overline{G}$AB is high, B outputs are disable.

## Features

- LSTTL Output Logic Level Compatibility as well as CMOS Output Compatibility
- High Speed Operation: $t_{pd}$ (A to B) = 12.5 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 µA max
- Low Quiescent Supply Current: $I_{CC}$ (static) = 4 µA max (Ta = 25°C)

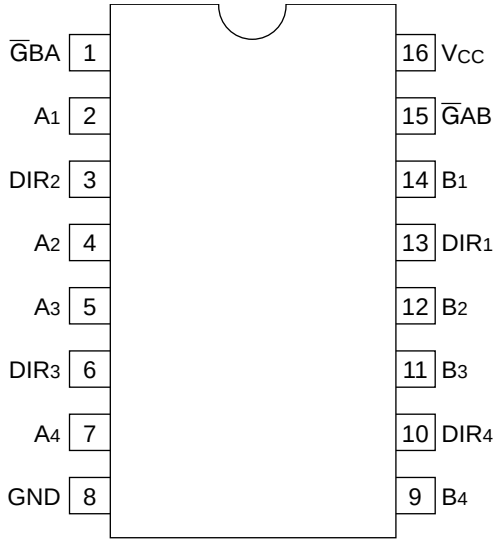
## Function Table

| Enable | | | |
|---|---|---|---|
| **$\overline{G}$BA** | **$\overline{G}$AB** | **Direction DIR** | **Operation** |
| H | H | X | Isolation |
| X | L | H | A data to B bus |
| L | X | L | B data to A bus |
| X | H | H | Isolation |
| H | X | L | Isolation |

H : High Level
L : Low Level
X : Irrelevant.

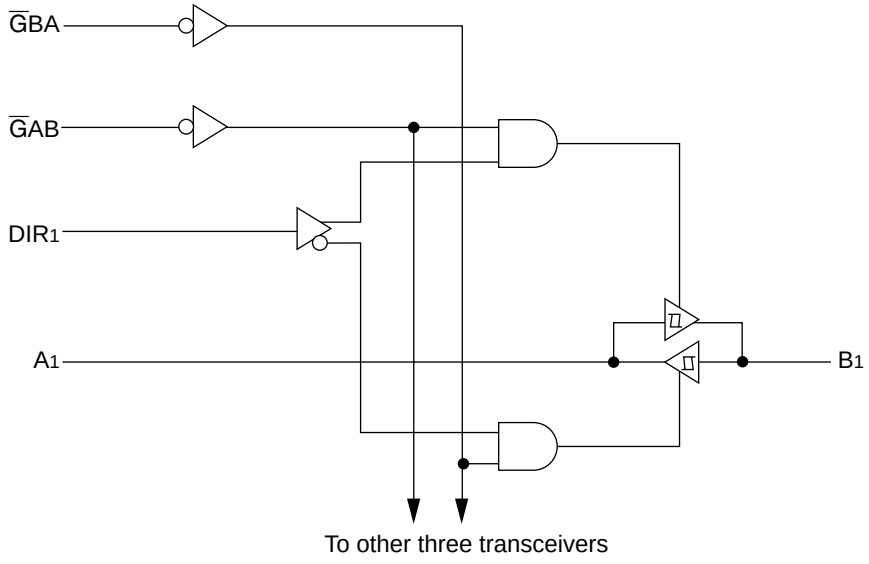
Hitachi semiconductor

## Pin Arrangement




(Top view)

## Logic Diagram



## 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 |
| DC current drain per pin | $I_{OUT}$ | ±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 | Tstg | –65 to +150 | °C |

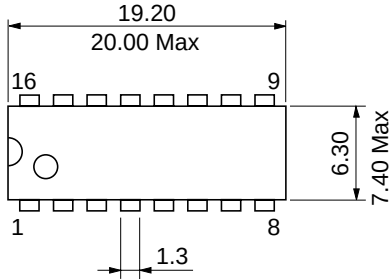
## DC Characteristics

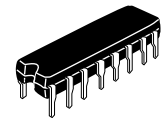
| | | Ta = 25°C | | | Ta = –40 to +85°C | | | Test Conditions | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Item | Symbol | Min | Typ | Max | Min | Max | Unit | $V_{cc}$ (V) | | |
| Input voltage | $V_{IH}$ | 2.0 | — | — | 2.0 | — | V | 4.5 to 5.5 | | |
| | $V_{IL}$ | — | — | 0.8 | — | 0.8 | 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 | | $I_{OH}$ = –6 mA |
| | $V_{OL}$ | — | — | 0.1 | — | 0.1 | V | 4.5 | Vin = $V_{IH}$ or $V_{IL}$ | $I_{OL}$ = 20 µA |
| | | — | — | 0.26 | — | 0.33 | | 4.5 | | $I_{OL}$ = 6 mA |
| 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 | Iin | — | — | ±0.1 | — | ±1.0 | µA | 5.5 | Vin = $V_{CC}$ or GND | |
| Quiescent supply current | $I_{CC}$ | — | — | 4.0 | — | 40 | µA | 5.5 | Vin = $V_{CC}$ or GND, Iout = 0 µA | |

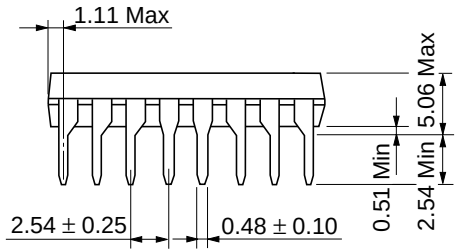
## AC Characteristics ($C_L$ = 50 pF, Input $t_r = t_f$ = 6 ns)

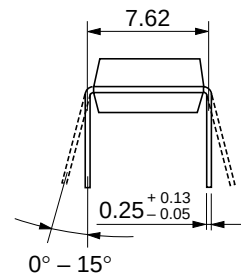
| | | Ta = 25°C | | | Ta = –40 to +85°C | | | Test Conditions |
|---|---|---|---|---|---|---|---|---|
| **Item** | **Symbol** | **Min** | **Typ** | **Max** | **Min** | **Max** | **Unit** | **$V_{cc}$ (V)** |
| Propagation delay | $t_{PHL}$ | — | 14 | 25 | — | 31 | ns | 4.5 |
| time | $t_{PLH}$ | — | 11 | 25 | — | 31 | | 4.5 |
| Output enable | $t_{ZL}$ | — | 18 | 30 | — | 39 | ns | 4.5 |
| time | $t_{ZH}$ | — | 14 | 30 | — | 39 | | 4.5 |
| Output disable | $t_{LZ}$ | — | 17 | 30 | — | 39 | ns | 4.5 |
| time | $t_{HZ}$ | — | 16 | 30 | — | 39 | | 4.5 |
| Output rise/fall | $t_{TLH}$ | — | 4 | 12 | — | 15 | ns | 4.5 |
| time | $t_{THL}$ | — | 4 | 12 | — | 15 | | 4.5 |
| Input capacitance | Cin | — | 5 | 10 | — | 10 | pF | — |

Unit: mm



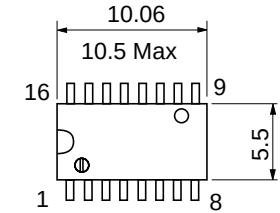



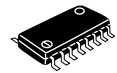


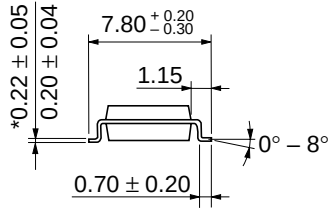



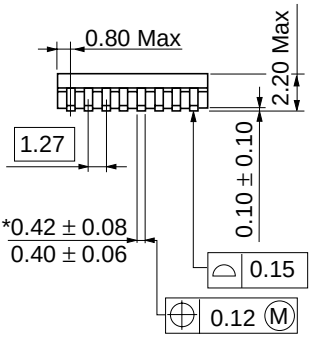

| | |
|---|---|
| Hitachi Code | DP-16 |
| JEDEC | Conforms |
| EIAJ | Conforms |
| Weight (reference value) | 1.07 g |

Unit: mm



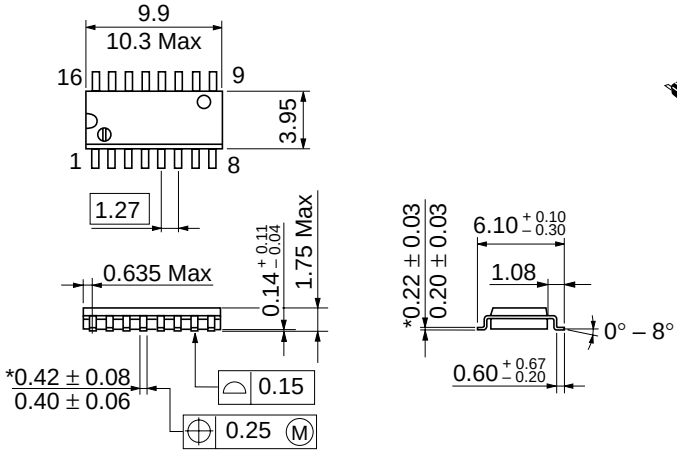


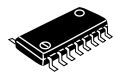




*Dimension including the plating thickness
Base material dimension

| | |
|---|---|
| Hitachi Code | FP-16DA |
| JEDEC | — |
| EIAJ | Conforms |
| Weight (reference value) | 0.24 g |

Unit: mm



| | |
|---|---|
| Hitachi Code | FP-16DN |
| JEDEC | Conforms |
| EIAJ | Conforms |
| Weight (reference value) | 0.15 g |

*Dimension including the plating thickness
Base material dimension

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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
NorthAmerica : http:semiconductor.hitachi.com/
Europe : http://www.hitachi-eu.com/hel/ecg
Asia (Singapore) : http://www.has.hitachi.com.sg/grp3/sicd/index.htm
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Asia (HongKong) : http://www.hitachi.com.hk/eng/bo/grp3/index.htm
Japan : http://www.hitachi.co.jp/Sicd/indx.htm

**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) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building. No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

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
Telex: 40815 HITEC HX