

# HD74HC30

8-input NAND Gate

# HITACHI

ADE-205-416 (Z)

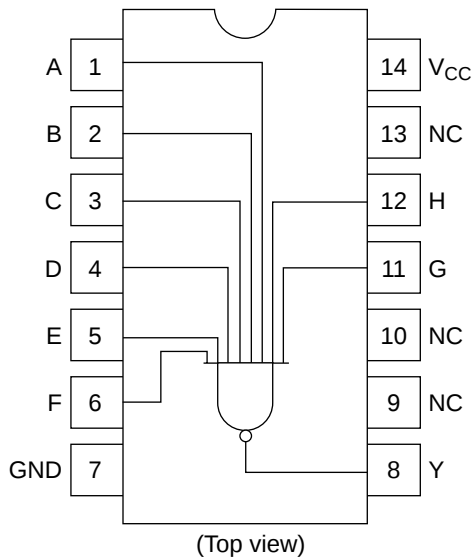
1st. Edition

Sep. 2000

## Features

- High Speed Operation:  $t_{pd} = 11 \text{ ns typ (} C_L = 50 \text{ pF)}$
- High Output Current: Fanout of 10 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:  $I_{CC} \text{ (static)} = 1 \mu\text{A max (} T_a = 25^\circ\text{C)}$

## Pin Arrangement



DC Characteristics

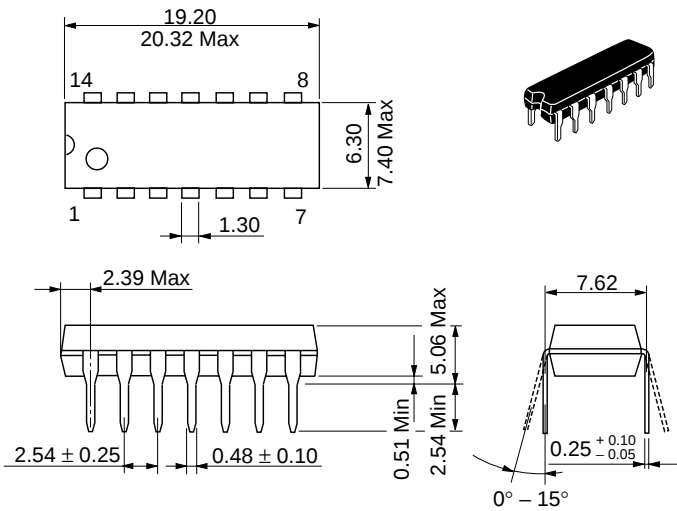
| Item                     | Symbol          | V <sub>CC</sub> (V) | Ta = 25°C |     |      | Ta = -40 to +85°C |      | Unit | Test Conditions                                                   |                           |
|--------------------------|-----------------|---------------------|-----------|-----|------|-------------------|------|------|-------------------------------------------------------------------|---------------------------|
|                          |                 |                     | 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                 | —         | —   | 0.5  | —                 | 0.5  | 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               | —    | V    | 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> = -4 mA   |
|                          |                 | 6.0                 | 5.68      | —   | —    | 5.63              | —    |      |                                                                   | I <sub>OH</sub> = -5.2 mA |
|                          | V <sub>OL</sub> | 2.0                 | —         | 0.0 | 0.1  | —                 | 0.1  | V    | 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> = 4 mA    |
|                          |                 | 6.0                 | —         | —   | 0.26 | —                 | 0.33 |      |                                                                   | I <sub>OL</sub> = 5.2 mA  |
| 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                 | —         | —   | 1.0  | —                 | 10   | μA   | Vin = V <sub>CC</sub> or GND, I <sub>out</sub> = 0 μA             |                           |

AC Characteristics ( $C_L = 50 \text{ pF}$ , Input  $t_r = t_f = 6 \text{ ns}$ )

| Item                      | Symbol           | V <sub>CC</sub> (V) | Ta = 25°C |     |     | Ta = −40 to +85°C |     | Unit | Test Conditions |
|---------------------------|------------------|---------------------|-----------|-----|-----|-------------------|-----|------|-----------------|
|                           |                  |                     | Min       | Typ | Max | Min               | Max |      |                 |
| Propagation delay<br>time | t <sub>PLH</sub> | 2.0                 | —         | —   | 130 | —                 | 165 | ns   |                 |
|                           |                  | 4.5                 | —         | 10  | 26  | —                 | 33  |      |                 |
|                           |                  | 6.0                 | —         | —   | 22  | —                 | 28  |      |                 |
|                           | t <sub>PHL</sub> | 2.0                 | —         | —   | 130 | —                 | 165 | ns   |                 |
|                           |                  | 4.5                 | —         | 12  | 26  | —                 | 33  |      |                 |
|                           |                  | 6.0                 | —         | —   | 22  | —                 | 28  |      |                 |
| Output rise time          | t <sub>TLH</sub> | 2.0                 | —         | —   | 75  | —                 | 95  | ns   |                 |
|                           |                  | 4.5                 | —         | 5   | 15  | —                 | 19  |      |                 |
|                           |                  | 6.0                 | —         | —   | 13  | —                 | 16  |      |                 |
| Output fall time          | t <sub>THL</sub> | 2.0                 | —         | —   | 75  | —                 | 95  | ns   |                 |
|                           |                  | 4.5                 | —         | 5   | 15  | —                 | 19  |      |                 |
|                           |                  | 6.0                 | —         | —   | 13  | —                 | 16  |      |                 |
| Input capacitance         | Cin              | —                   | —         | 5   | 10  | —                 | 10  | pF   |                 |

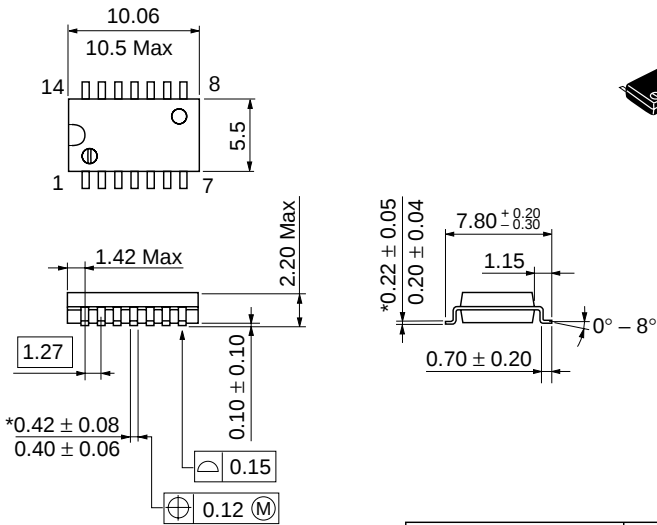
Package Dimensions

Unit: mm



|                        |          |
|------------------------|----------|
| Hitachi Code           | DP-14    |
| JEDEC                  | Conforms |
| EIAJ                   | Conforms |
| Mass (reference value) | 0.97 g   |

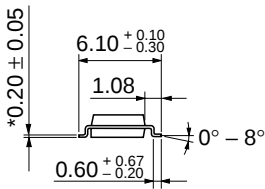
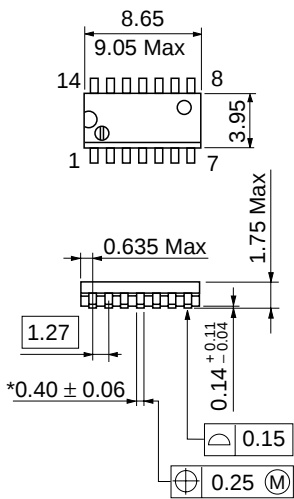
Unit: mm



\*Dimension including the plating thickness  
Base material dimension

|                        |          |
|------------------------|----------|
| Hitachi Code           | FP-14DA  |
| JEDEC                  | —        |
| EIAJ                   | Conforms |
| Mass (reference value) | 0.23 g   |

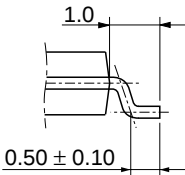
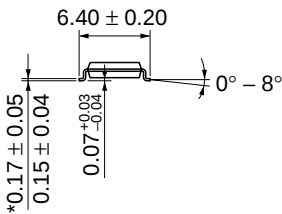
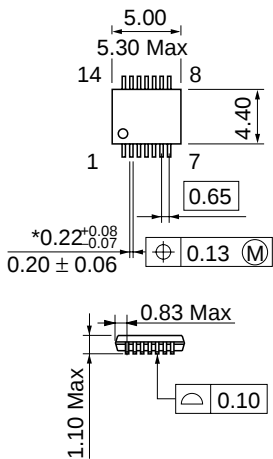
Unit: mm



|                        |          |
|------------------------|----------|
| Hitachi Code           | FP-14DN  |
| JEDEC                  | Conforms |
| EIAJ                   | Conforms |
| Mass (reference value) | 0.13 g   |

\*Pd plating

Unit: mm



|                        |         |
|------------------------|---------|
| Hitachi Code           | TTP-14D |
| JEDEC                  | —       |
| EIAJ                   | —       |
| Mass (reference value) | 0.05 g  |

\*Dimension including the plating thickness  
Base material dimension

Cautions

1. Hitachi neither warrants nor grants licenses of any rights of Hitachi's or any third party's patent, copyright, trademark, or other intellectual property rights for information contained in this document. Hitachi bears no responsibility for problems that may arise with third party's rights, including intellectual property rights, in connection with use of the information contained in this document.
  2. Products and product specifications may be subject to change without notice. Confirm that you have received the latest product standards or specifications before final design, purchase or use.
  3. Hitachi makes every attempt to ensure that its products are of high quality and reliability. However, contact Hitachi's sales office before using the product in an application that demands especially high quality and reliability or where its failure or malfunction may directly threaten human life or cause risk of bodily injury, such as aerospace, aeronautics, nuclear power, combustion control, transportation, traffic, safety equipment or medical equipment for life support.
  4. Design your application so that the product is used within the ranges guaranteed by Hitachi particularly for maximum rating, operating supply voltage range, heat radiation characteristics, installation conditions and other characteristics. Hitachi bears no responsibility for failure or damage when used beyond the guaranteed ranges. Even within the guaranteed ranges, consider normally foreseeable failure rates or failure modes in semiconductor devices and employ systemic measures such as fail-safes, so that the equipment incorporating Hitachi product does not cause bodily injury, fire or other consequential damage due to operation of the Hitachi product.
  5. This product is not designed to be radiation resistant.
  6. No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without written approval from Hitachi.
  7. Contact Hitachi's sales office for any questions regarding this document or Hitachi semiconductor products.

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 | : | <a href="http://semiconductor.hitachi.com/">http://semiconductor.hitachi.com/</a>           |
|     | Europe       | : | <a href="http://www.hitachi-eu.com/hel/ecg">http://www.hitachi-eu.com/hel/ecg</a>           |
|     | Asia         | : | <a href="http://sicapac.hitachi-asia.com">http://sicapac.hitachi-asia.com</a>               |
|     | Japan        | : | <a href="http://www.hitachi.co.jp/Sicd/indx.htm">http://www.hitachi.co.jp/Sicd/indx.htm</a> |

For further information write to:

|                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hitachi Semiconductor (America) Inc.<br>179 East Tasman Drive,<br>San Jose, CA 95134<br>Tel: <1> (408) 433-1990<br>Fax: <1> (408) 433-0223 | Hitachi Europe GmbH<br>Electronic Components Group<br>Dornacher Straße 3<br>D-85622 Feldkirchen, Munich<br>Germany<br>Tel: <49> (89) 9 9180-0<br>Fax: <49> (89) 9 29 30 00<br><br>Hitachi Europe Ltd.<br>Electronic Components Group.<br>Whitebrook Park<br>Lower Cookham Road<br>Maidenhead<br>Berkshire SL6 8YA, United Kingdom<br>Tel: <44> (1628) 585000<br>Fax: <44> (1628) 585160 | Hitachi Asia Ltd.<br>Hitachi Tower<br>16 Collyer Quay #20-00,<br>Singapore 049318<br>Tel: <65>-538-6533/538-8577<br>Fax: <65>-538-6933/538-3877<br>URL: <a href="http://www.hitachi.com.sg">http://www.hitachi.com.sg</a><br><br>Hitachi Asia Ltd.<br>(Taipei Branch Office)<br>4/F, No. 167, Tun Hwa North Road,<br>Hung-Kuo Building,<br>Taipei (105), Taiwan<br>Tel: <886>-(2)-2718-3666<br>Fax: <886>-(2)-2718-8180<br>Telex: 23222 HAS-TP<br>URL: <a href="http://www.hitachi.com.tw">http://www.hitachi.com.tw</a> | Hitachi Asia (Hong Kong) Ltd.<br>Group III (Electronic Components)<br>7/F., North Tower,<br>World Finance Centre,<br>Harbour City, Canton Road<br>Tsim Sha Tsui, Kowloon,<br>Hong Kong<br>Tel: <852>-(2)-735-9218<br>Fax: <852>-(2)-730-0281<br>URL: <a href="http://www.hitachi.com.hk">http://www.hitachi.com.hk</a> |
|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Copyright © Hitachi, Ltd., 2000. All rights reserved. Printed in Japan.  
Colophon 2.0