

To all our customers

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Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

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# HD74HCT125/HD74HCT126

Quad. Bus Buffer Gates (with 3-state outputs)



ADE-205-545 (Z)  
1st. Edition  
Sep. 2000

## Description

The HD74HCT125, HD74HCT126 require the 3-state control input C to be taken high to put the output into the high impedance condition, whereas the HD74HCT125, HD74HCT126 requires the control input to be low to put the output into high impedance.

## Features

- LSTTL Output Logic Level Compatibility as well as CMOS Output Compatibility
- High Speed Operation:  $t_{pd}$  (A to Y) = 12 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  $\mu$ A max
- Low Quiescent Supply Current:  $I_{CC}$  (static) = 4  $\mu$ A max ( $T_a$  = 25°C)

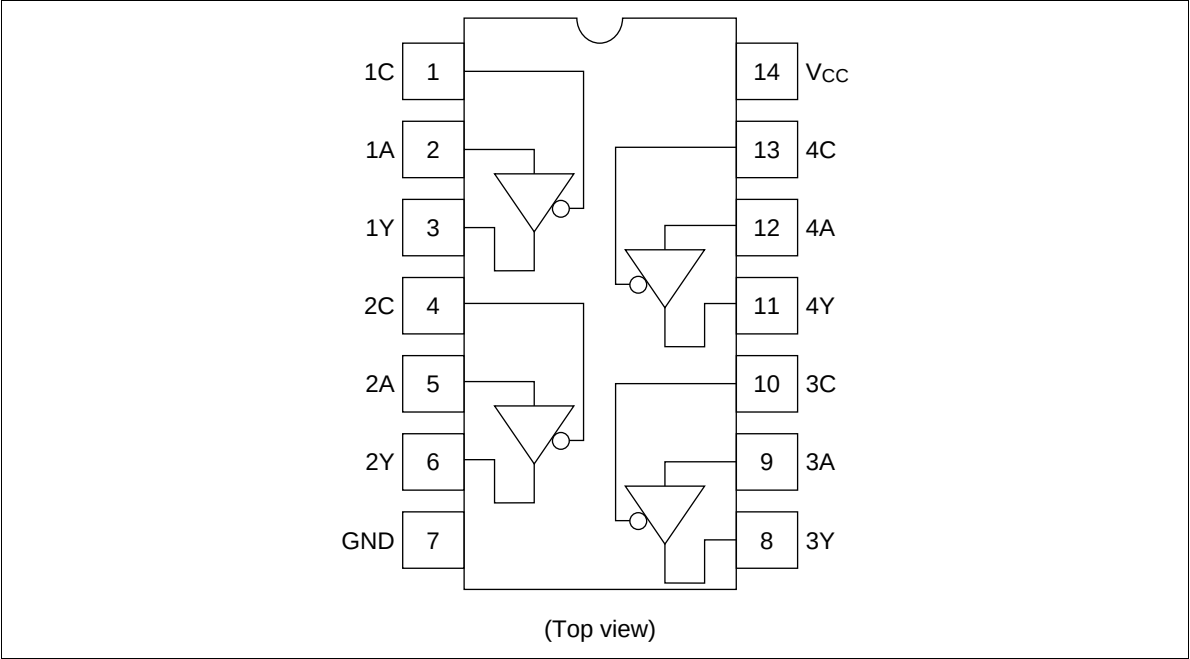
## Function Table

| Input  |        |   | Output Y   |            |
|--------|--------|---|------------|------------|
| C      |        |   |            |            |
| HCT125 | HCT126 | A | HD74HCT125 | HD74HCT126 |
| H      | L      | X | Z          | Z          |
| L      | H      | L | L          | L          |
| L      | H      | H | H          | H          |

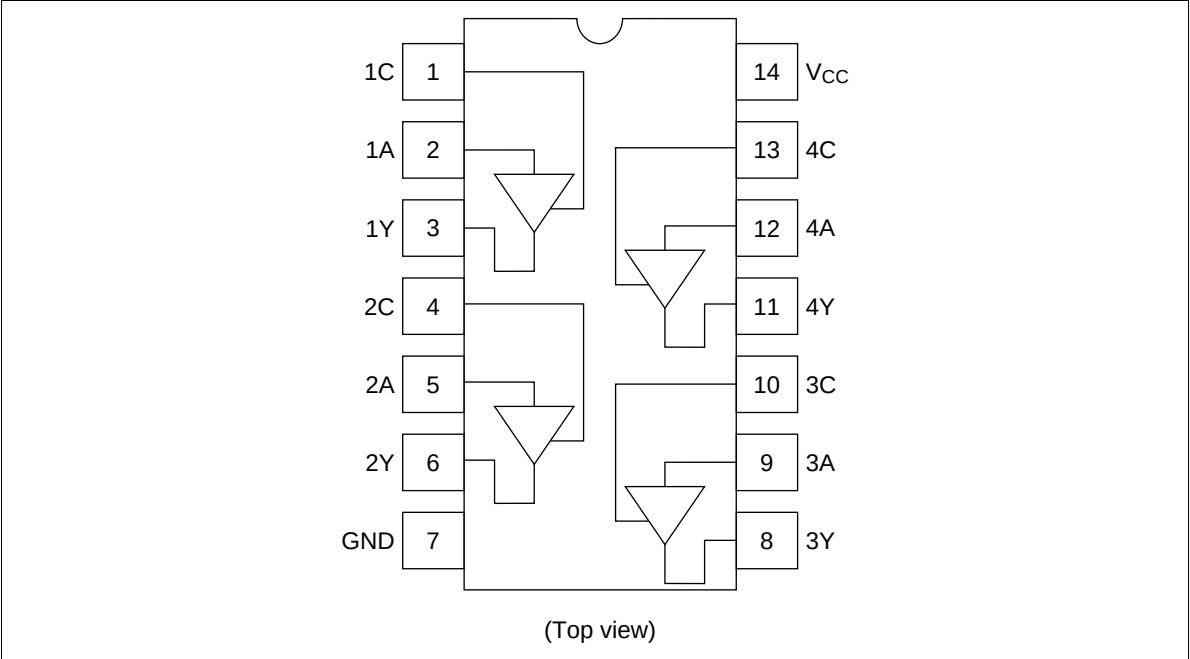
Notes: X: Irrelevant  
Z: Off (High-impedance) state of a 3-state output.

Pin Arrangement

HD74HCT125



HD74HCT126



## 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            | °C   |

## DC Characteristics

| Item                     | Symbol   | Ta = 25°C |     | Ta = −40 to +85°C |      | Unit | Test Conditions |                                                            |
|--------------------------|----------|-----------|-----|-------------------|------|------|-----------------|------------------------------------------------------------|
|                          |          | Min       | Typ | Max               | Min  |      | $V_{CC}$ (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 $V_{IL}$ $I_{OH} = -20 \mu A$        |
|                          |          | 4.18      | —   | —                 | 4.13 | —    |                 | 4.5 $I_{OH} = -6 mA$                                       |
|                          | $V_{OL}$ | —         | —   | 0.1               | —    | 0.1  | V               | 4.5 Vin = $V_{IH}$ or $V_{IL}$ $I_{OL} = 20 \mu A$         |
|                          |          | —         | —   | 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 $V_{IL}$ ,<br>Vout = $V_{CC}$ or GND |
| Input current            | $I_{in}$ | —         | —   | ±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                     |

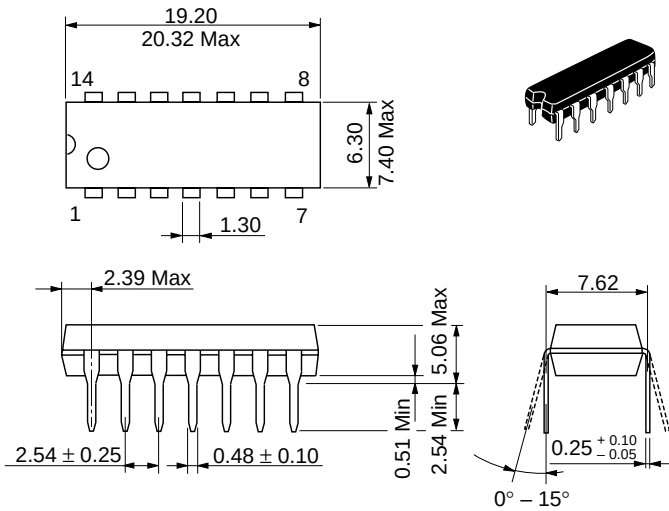
HD74HCT125/HD74HCT126

AC Characteristics (C<sub>L</sub> = 50 pF, Input t<sub>r</sub> = t<sub>f</sub> = 6 ns)

| Item              | Symbol           | Ta = −40 to |     |     |       |     |    | Unit | Test Conditions     |
|-------------------|------------------|-------------|-----|-----|-------|-----|----|------|---------------------|
|                   |                  | Ta = 25°C   |     |     | +85°C |     |    |      |                     |
|                   |                  | Min         | Typ | Max | Min   | Max |    |      | V <sub>CC</sub> (V) |
| Propagation delay | t <sub>PHL</sub> | —           | 12  | 20  | —     | 25  | ns | 4.5  |                     |
| time              | t <sub>PLH</sub> | —           | 12  | 20  | —     | 25  |    | 4.5  |                     |
| Output enable     | t <sub>ZL</sub>  | —           | 12  | 30  | —     | 38  | ns | 4.5  |                     |
| time              | t <sub>ZH</sub>  | —           | 12  | 30  | —     | 38  |    | 4.5  |                     |
| Output disable    | t <sub>LZ</sub>  | —           | 15  | 30  | —     | 38  | ns | 4.5  |                     |
| time              | t <sub>HZ</sub>  | —           | 15  | 30  | —     | 38  |    | 4.5  |                     |
| Output rise/fall  | t <sub>TLH</sub> | —           | 4   | 12  | —     | 15  | ns | 4.5  |                     |
| time              | t <sub>THL</sub> | —           | 4   | 12  | —     | 15  |    | 4.5  |                     |
| Input capacitance | C <sub>in</sub>  | —           | 5   | 10  | —     | 10  | pF | —    |                     |

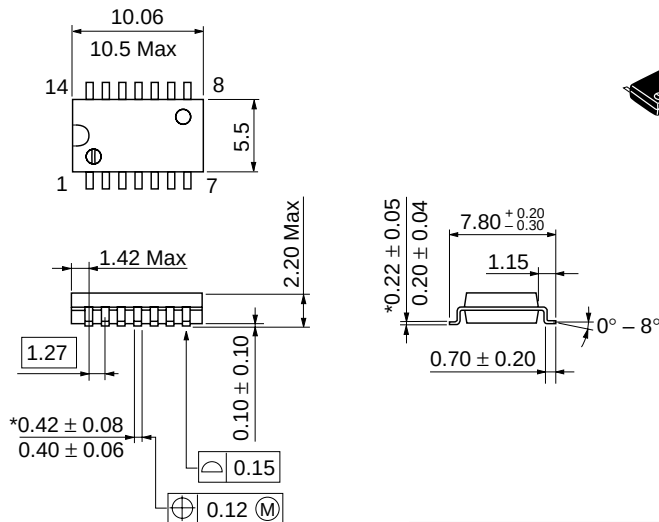
## Package Dimensions

Unit: mm



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

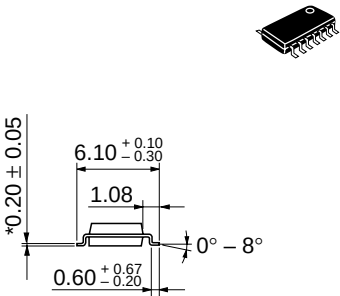
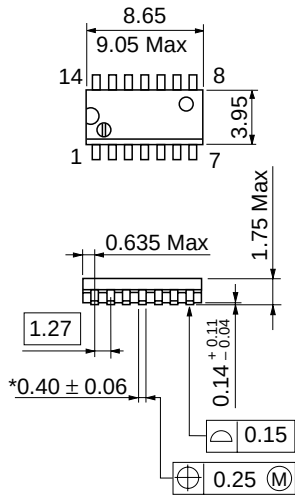
Unit: mm



\*Dimension including the plating thickness  
Base material dimension

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

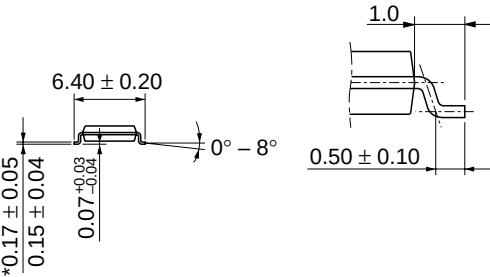
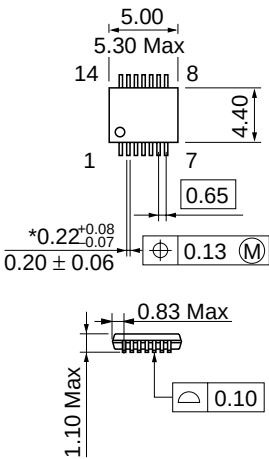
Unit: mm



\*Pd plating

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

Unit: mm



\*Dimension including the plating thickness  
Base material dimension

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



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