

To all our customers

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

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# HD74HC11

Triple 3-input AND Gates

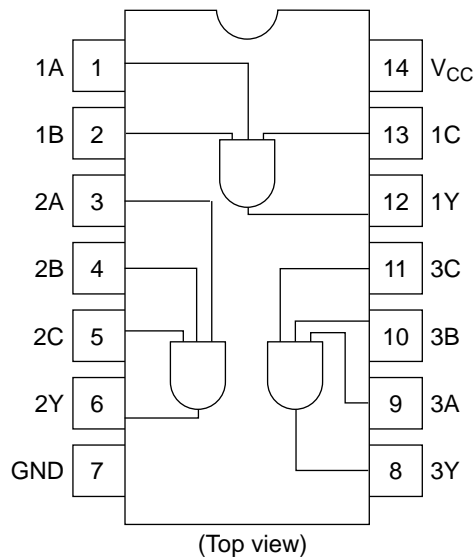
**RENESAS**

ADE-205-411 (Z)  
1st. Edition  
Sep. 2000

## Features

- High Speed Operation:  $t_{pd} = 9 \text{ ns typ}$  ( $C_L = 50 \text{ pF}$ )
- 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

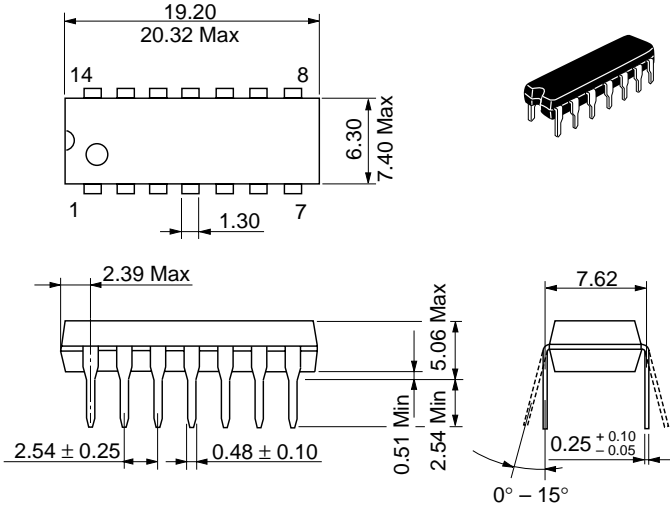
| Item                     | Symbol          | V <sub>CC</sub> (V) | Ta = 25°C |     | Ta = -40 to +85°C |      | Unit | Test Conditions |  |   |
|--------------------------|-----------------|---------------------|-----------|-----|-------------------|------|------|-----------------|--|---|
|                          |                 |                     | 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 ( $C_L = 50$  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          | —         | —   | 100               | —   | 125  | ns              |
|                        |           | 4.5          | —         | 9   | 20                | —   | 25   |                 |
|                        |           | 6.0          | —         | —   | 17                | —   | 21   |                 |
|                        | $t_{PHL}$ | 2.0          | —         | —   | 100               | —   | 125  | ns              |
|                        |           | 4.5          | —         | 9   | 20                | —   | 25   |                 |
|                        |           | 6.0          | —         | —   | 17                | —   | 21   |                 |
| Output rise time       | $t_{TLH}$ | 2.0          | —         | —   | 75                | —   | 95   | ns              |
|                        |           | 4.5          | —         | 5   | 15                | —   | 19   |                 |
|                        |           | 6.0          | —         | —   | 13                | —   | 16   |                 |
| Output fall time       | $t_{THL}$ | 2.0          | —         | —   | 75                | —   | 95   | ns              |
|                        |           | 4.5          | —         | 5   | 15                | —   | 19   |                 |
|                        |           | 6.0          | —         | —   | 13                | —   | 16   |                 |
| Input capacitance      | $C_{in}$  | —            | —         | 5   | 10                | —   | 10   | pF              |

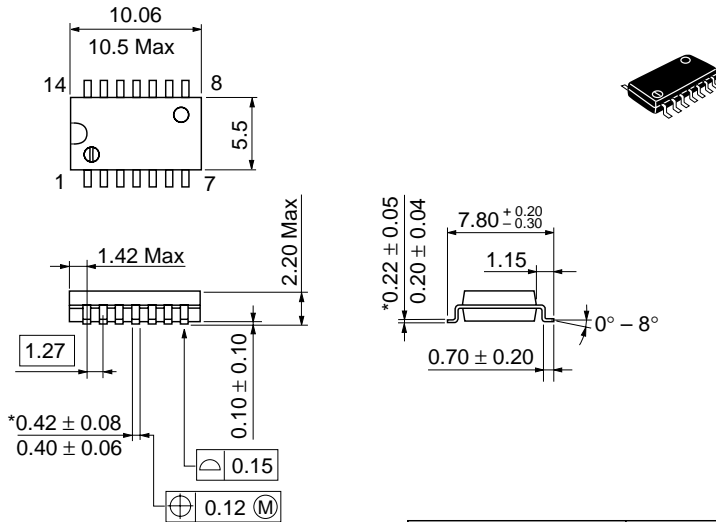
## Package Dimensions

Unit: mm



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

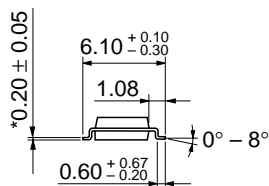
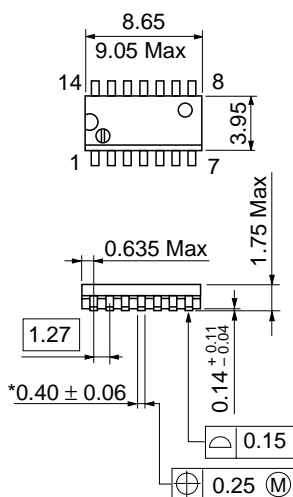
Unit: mm



\*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   |

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