

To all our customers

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

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Keep safety first in your circuit designs!

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Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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# HD74HC00

Quad. 2-input NAND Gates

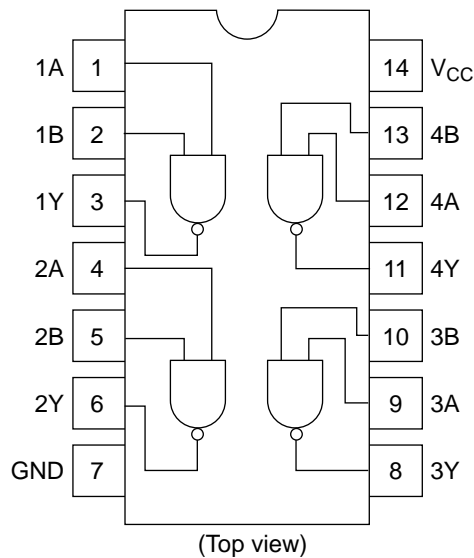
**RENESAS**

ADE-205-403 (Z)  
1st. Edition  
Sep. 2000

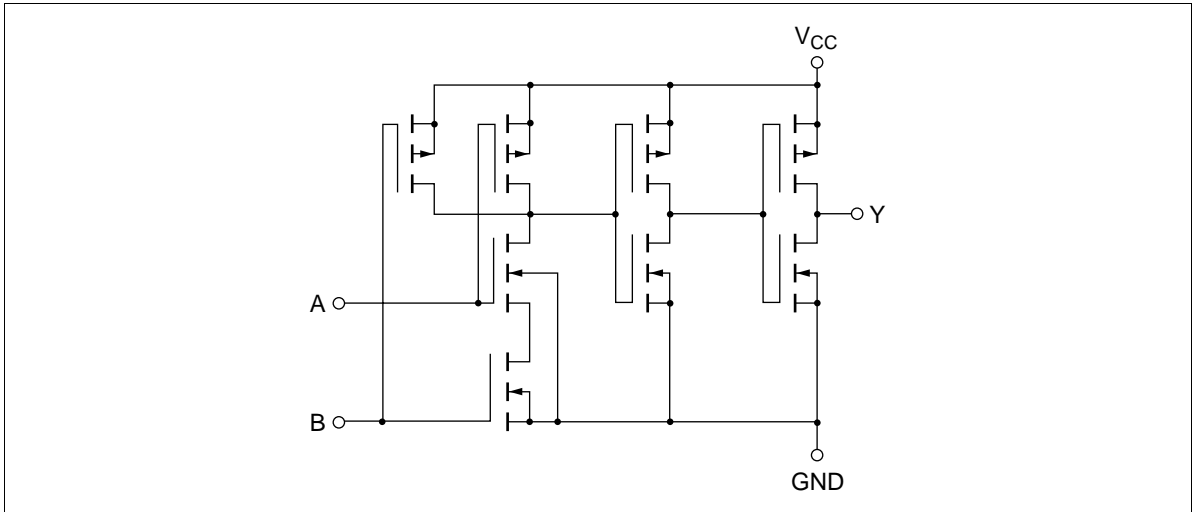
## Features

- High Speed Operation:  $t_{pd} = 8.5$  ns typ ( $C_L = 50$  pF)
- High Output Current: Fanout of 10 LSTTL Loads
- Wide Operating Voltage:  $V_{CC} = 2$  to 6 V
- Low Input Current: 1  $\mu$ A max
- Low Quiescent Supply Current:  $I_{CC}(\text{static}) = 1$   $\mu$ A max ( $T_a = 25^\circ\text{C}$ )

## Pin Arrangement



## Circuit Schematic (1/4)



## DC Characteristics

Item	Symbol	$V_{CC}$ (V)	$T_a = 25^\circ\text{C}$		$T_a = -40$ to $+85^\circ\text{C}$		Unit	Test Conditions	
			Min	Typ	Max	Min			Max
Input voltage	$V_{IH}$	2.0	1.5	—	—	1.5	—	V	
		4.5	3.15	—	—	3.15	—		
		6.0	4.2	—	—	4.2	—		
	$V_{IL}$	2.0	—	—	0.5	—	0.5		V
		4.5	—	—	1.35	—	1.35		
		6.0	—	—	1.8	—	1.8		
Output voltage	$V_{OH}$	2.0	1.9	2.0	—	1.9	—	$V_{in} = V_{IH}$ or $V_{IL}$ $I_{OH} = -20 \mu\text{A}$	
		4.5	4.4	4.5	—	4.4	—		
		6.0	5.9	6.0	—	5.9	—		
		4.5	4.18	—	—	4.13	—		$I_{OH} = -4 \text{ mA}$
		6.0	5.68	—	—	5.63	—		$I_{OH} = -5.2 \text{ mA}$
		$V_{OL}$	2.0	—	0.0	0.1	—		0.1
	4.5		—	0.0	0.1	—	0.1		
	6.0		—	0.0	0.1	—	0.1		
	4.5		—	—	0.26	—	0.33	$I_{OL} = 4 \text{ mA}$	
	6.0	—	—	0.26	—	0.33	$I_{OL} = 5.2 \text{ mA}$		

## DC Characteristics (cont)

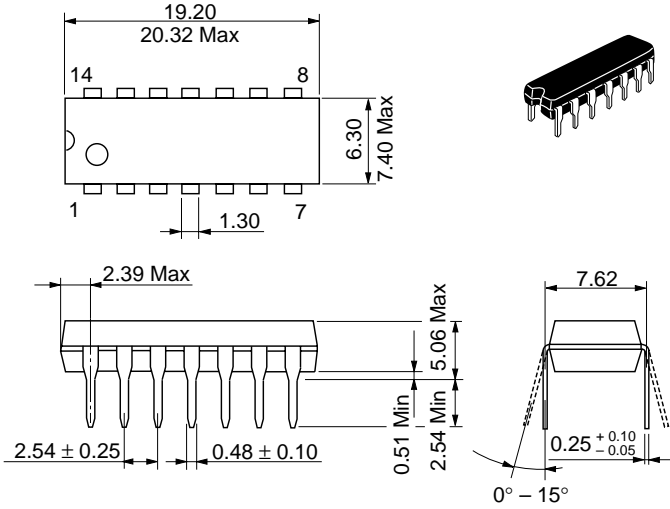
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40 to +85°C		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Input current	I <sub>in</sub>	6.0	—	—	±0.1	—	±1.0	μA	V <sub>in</sub> = V <sub>CC</sub> or GND
Quiescent supply current	I <sub>CC</sub>	6.0	—	—	1.0	—	10	μA	V <sub>in</sub> = V <sub>CC</sub> or GND, I <sub>out</sub> = 0 μA

AC Characteristics (C<sub>L</sub> = 50 pF, Input t<sub>r</sub> = t<sub>f</sub> = 6 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 time	t <sub>PLH</sub>	2.0	—	—	90	—	115	ns	
		4.5	—	9	18	—	23		
		6.0	—	—	15	—	20		
	t <sub>PHL</sub>	2.0	—	—	90	—	115	ns	
		4.5	—	8	18	—	23		
		6.0	—	—	15	—	20		
Output rise time	t <sub>TLH</sub>	2.0	—	—	75	—	95	ns	
		4.5	—	7	15	—	19		
		6.0	—	—	13	—	16		
Output fall time	t <sub>THL</sub>	2.0	—	—	75	—	95	ns	
		4.5	—	7	15	—	19		
		6.0	—	—	13	—	16		
Input capacitance	C <sub>in</sub>	—	—	5	10	—	10	pF	

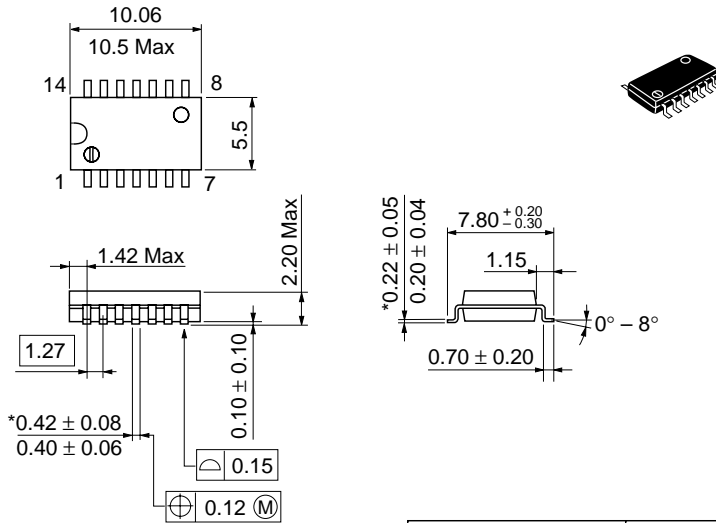
## Package Dimensions

Unit: mm



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

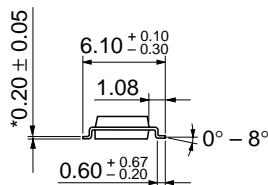
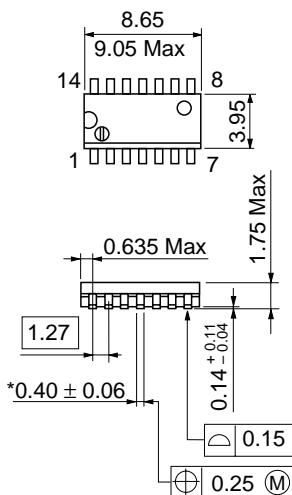
Unit: mm



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

\*Dimension including the plating thickness  
Base material dimension

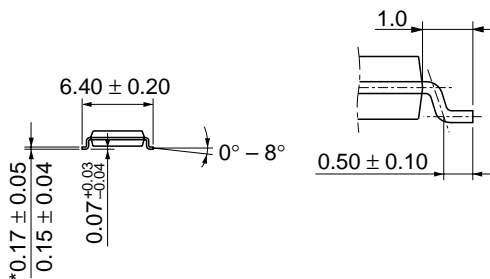
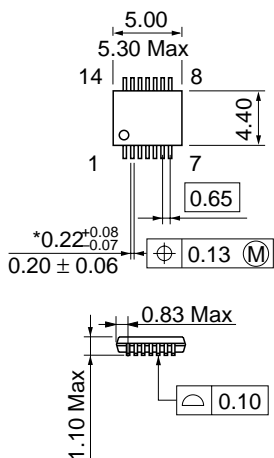
Unit: mm



\*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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