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# HD74HCT00A

Quad. 2-input Positive NAND Gates

# HITACHI

ADE-205-286 (Z)  
1st. Edition  
June 1999

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## Description

The HD74HCT00A has four 2-input NAND gates in a 14 pin package.  $Y = \overline{A \cdot B}$  or  $Y = \overline{A} + \overline{B}$

## Features

- $V_{CC} = 4.5$  to  $5.5$  V operation
- Input terminal has protection diode

## Function Table

Inputs		Output Y
A	B	
H	H	L
L	X	H
X	L	H

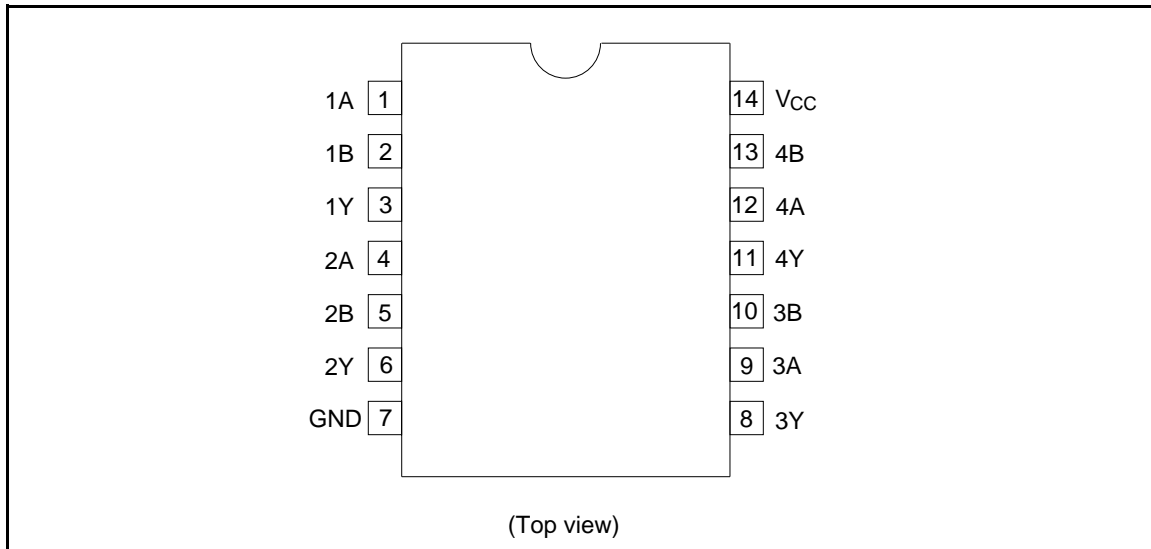
H : High level

L : Low level

X : Immaterial

# HD74HCT00A

## Pin Arrangement



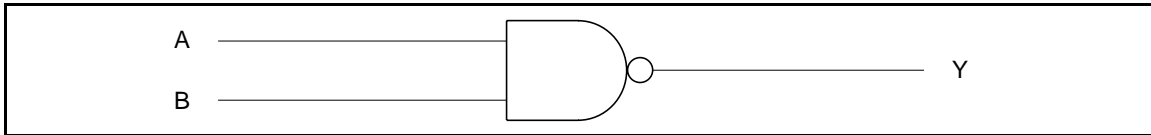
## Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	$V_{CC}$	-0.5 to 7.0	V
Input diode peak current	$I_{IK}$	$\pm 20$	mA
Output diode peak current	$I_{OK}$	$\pm 20$	mA
Output current	$I_O$	$\pm 25$	mA
$V_{CC}$ , GND current / pin	$I_{CC}$ or $I_{GND}$	$\pm 50$	mA
Storage temperature	$T_{stg}$	-65 to 150	$^{\circ}C$

## Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	$V_{CC}$	4.5	5.0	5.5	V
Input voltage	$V_{IH}$	2.0	—	—	V
	$V_{IL}$	0	—	0.8	V
	$V_I$	0	—	$V_{CC}$	V
Output voltage	$V_O$	0	—	$V_{CC}$	V
Output current	$I_{OH}$	—	-4	—	mA
	$I_{OL}$	—	4	—	mA
Input rise / fall time	$t_r, t_f$	—	—	500	ns
Operating temperature	$T_a$	-40	—	85	$^{\circ}C$

Logic Diagram (1/4 Circuit)



Electrical Characteristics

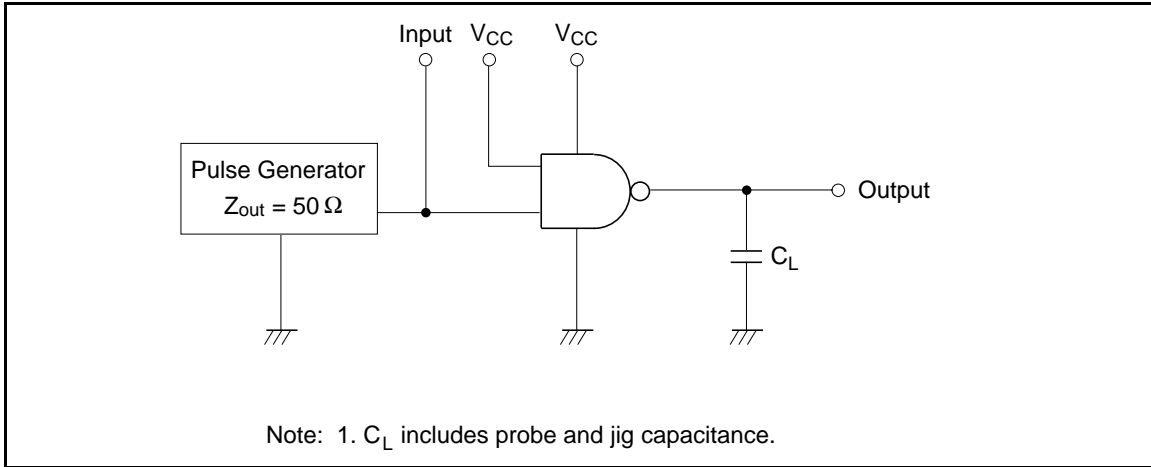
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40 to 85°C		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Output voltage	V <sub>OH</sub>	4.5	4.40	—	—	4.40	—	V	I <sub>O</sub> = -20 mA
		4.5	3.98	—	—	3.84	—		I <sub>O</sub> = -4 mA
	V <sub>OL</sub>	4.5	—	—	0.10	—	0.10		I <sub>O</sub> = 20 mA
		4.5	—	—	0.26	—	0.33		I <sub>O</sub> = 4 mA
Input current	I <sub>I</sub>	5.5	—	±0.1	±100	—	±1000	nA	V <sub>I</sub> = V <sub>CC</sub> or GND
Quiescent supply voltage	I <sub>CC</sub>	5.5	—	—	2.0	—	20	μA	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0

Switching Characteristics (C<sub>L</sub> = 50 pF)

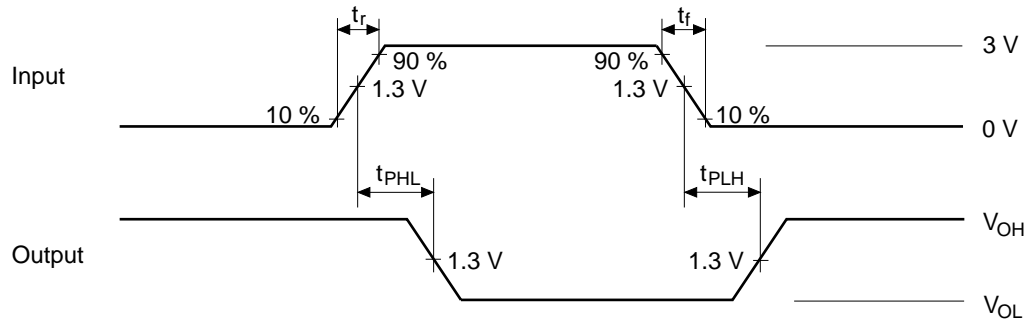
Item	Symbol	V <sub>CC</sub> (V)	Ta = 25°C			Ta = -40 to 85°C		Unit	Input	Output
			Min	Typ	Max	Min	Max			
Propagation delay time	t <sub>PLH</sub>	4.5	—	11	17	—	21	ns	A or B	Y
	t <sub>PHL</sub>	5.5	—	10	15	—	19			
Output rise / fall time	t <sub>r</sub>	4.5	—	7	15	—	19	ns		Y
	t <sub>f</sub>	5.5	—	6	13	—	16			
Input capacitance	C <sub>I</sub>	—	—	3	10	—	10	pF		
Power dissipation capacitance	C <sub>PD</sub>	—	—	20	—	—	—	pF		

# HD74HCT00A

## Test Circuit



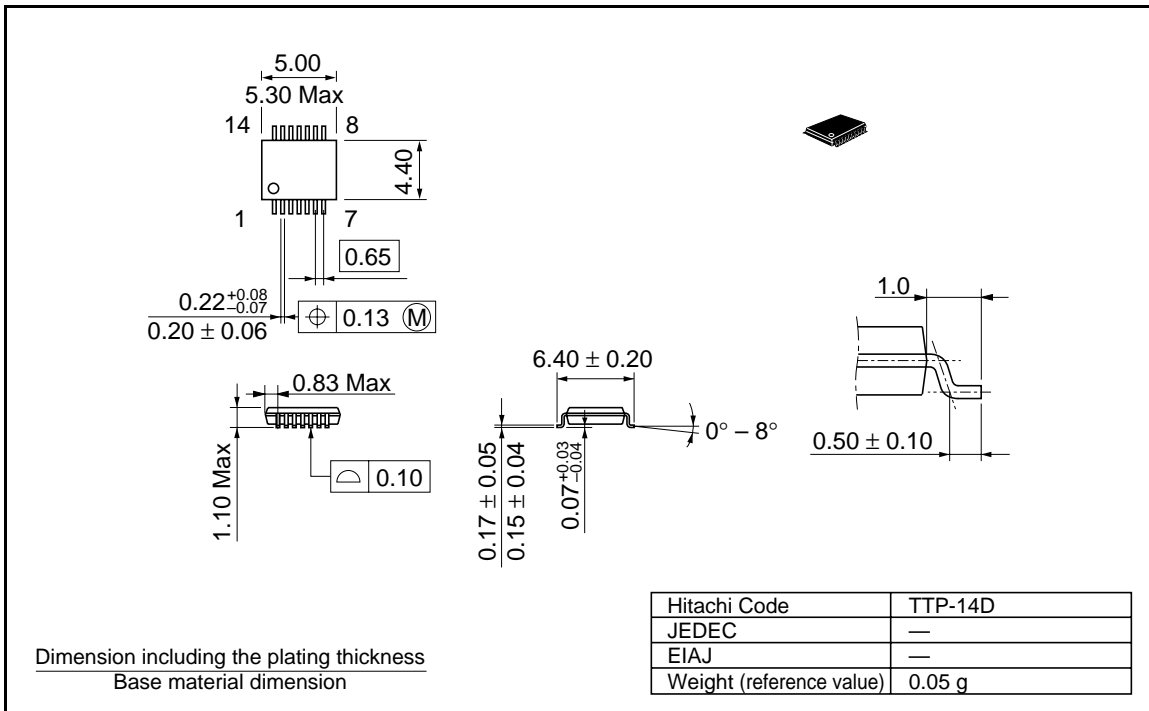
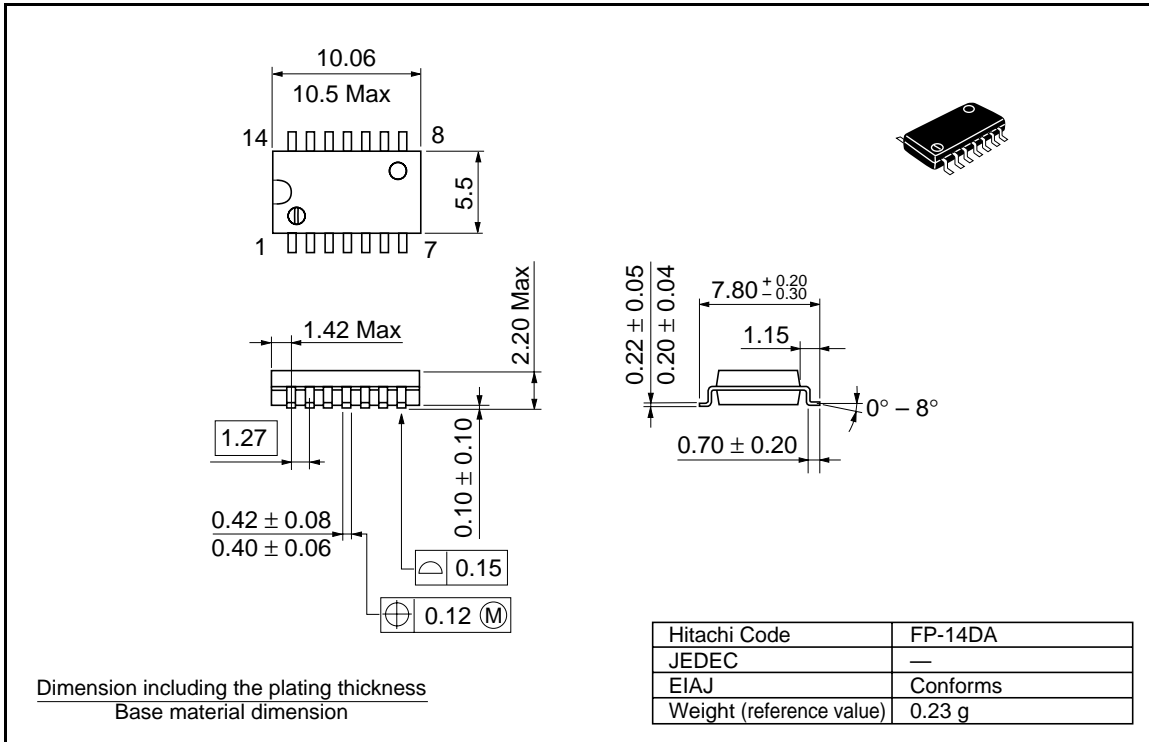
### • Waveform



Note: 1. Input waveform : PRR = 1 MHz, duty cycle 50%,  $t_r = 6$  ns,  $t_f = 6$  ns

Package Dimensions

Unit : mm



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