

HD74HCU04A

Hex Inverters

HITACHI

ADE-205-288 (Z)

1st. Edition

June 1999

Description

The HD74HCU04A has six inverters in a 14 pin package. $Y = \overline{A}$

Features

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

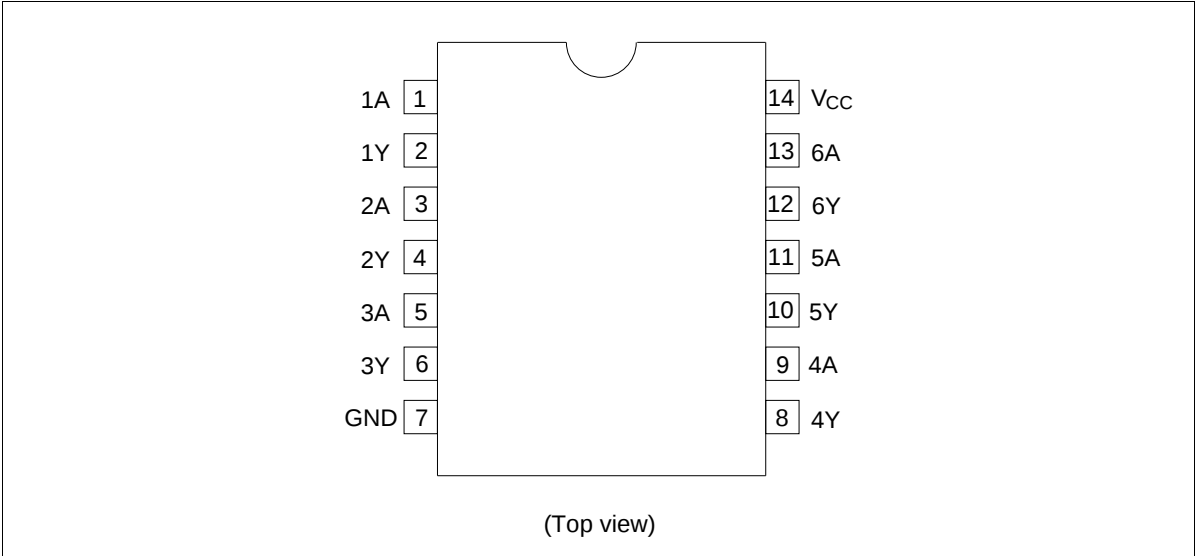
Function Table

Input A	Output Y
H	L
L	H

H : High level
L : Low level

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Pin Arrangement



Absolute Maximum Ratings

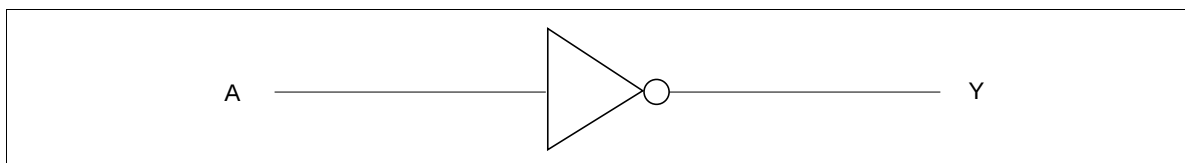
Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	-0.5 to 7.0	V
Input diode peak current	I_{IK}	± 20	mA
Output diode peak current	I_{OK}	± 20	mA
Output current	I_O	± 25	mA
V_{CC} , GND current / pin	I_{CC} or I_{GND}	± 50	mA
Storage temperature	Tstg	-65 to 150	°C

Recommended Operating Conditions

Item	Symbol	V _{CC} (V)	Min	Typ	Max	Unit
Supply voltage	V _{CC}		2.0	5.0	6.0	V
Input voltage	V _{IH}	2.0	1.7	—	—	V
		4.5	3.6	—	—	
		6.0	4.8	—	—	
	V _{IL}	2.0	0	—	0.3	
		4.5	0	—	0.8	
		6.0	0	—	1.1	
	V _I		0	—	V _{CC}	
Output voltage	V _O		0	—	V _{CC}	V
Output current	I _{OH}	4.5	—	−4.0	—	mA
		6.0	—	−5.2	—	
	I _{OL}	4.5	—	4.0	—	
		6.0	—	5.2	—	
Input rise / fall time	t _r , t _f	2.0	0	—	1000	ns
		4.5	0	—	500	
		6.0	0	—	400	
Operating temperature	Ta		−40	—	85	°C

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Logic Diagram (1/4 Circuit)



Electrical Characteristics

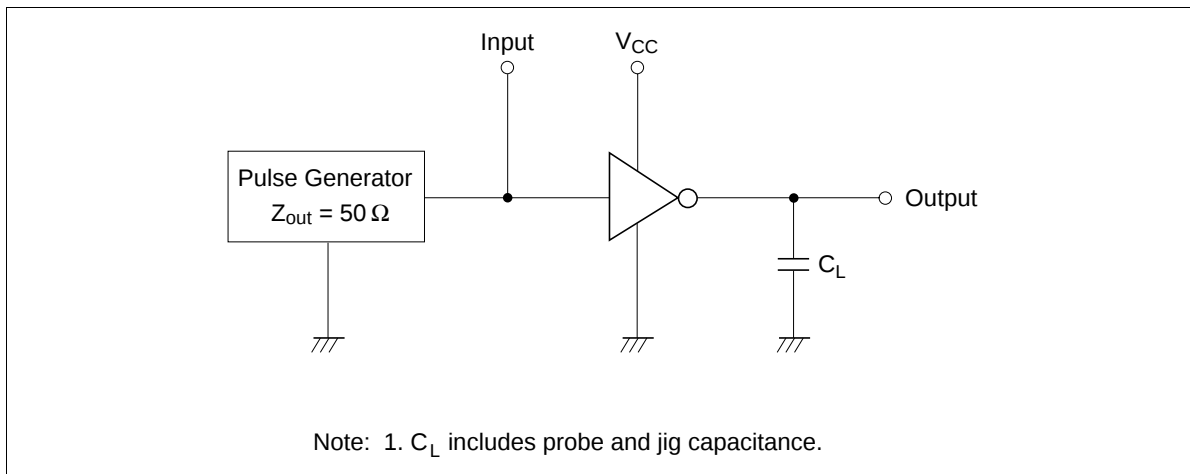
Item	Symbol	V_{CC} (V)	$T_a = 25^{\circ}\text{C}$			$T_a = -40 \text{ to } 85^{\circ}\text{C}$		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Output voltage	V_{OH}	2.0	1.80	—	—	1.80	—	V	$I_o = -20 \mu\text{A}$
		4.5	4.00	—	—	4.00	—		
		6.0	5.50	—	—	5.50	—		
		4.5	3.86	—	—	3.76	—		
		6.0	5.36	—	—	5.26	—		
	V_{OL}	2.0	—	—	0.20	—	0.20		$I_o = 20 \mu\text{A}$
		4.5	—	—	0.50	—	0.50		
		6.0	—	—	0.50	—	0.50		
		4.5	—	—	0.32	—	0.37		
		6.0	—	—	0.32	—	0.37		
Input current	I_I	6.0	—	± 0.1	± 100	—	± 1000	nA	$V_I = V_{CC} \text{ or GND}$
Quiescent supply voltage	I_{CC}	6.0	—	—	2.0	—	20	μA	$V_I = V_{CC} \text{ or GND}, I_o = 0$

Switching Characteristics ($C_L = 50 \text{ pF}$)

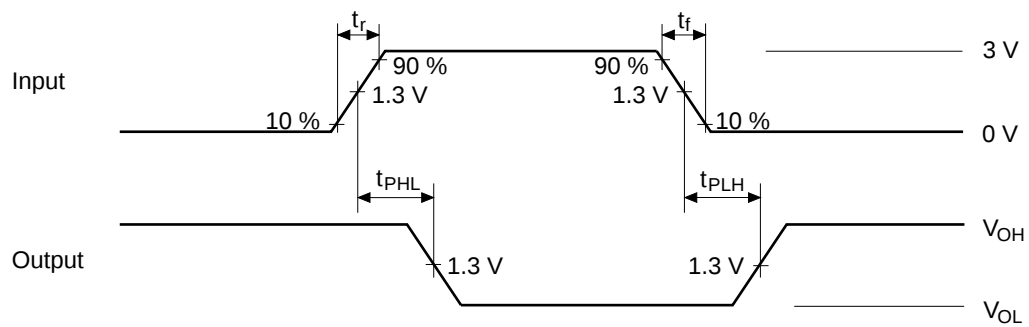
Item	Symbol	$V_{CC} \text{ (V)}$	$T_a = 25^\circ\text{C}$			$T_a = -40 \text{ to } 85^\circ\text{C}$		Unit	Input FROM	Output TO
			Min	Typ	Max	Min	Max			
Propagation delay time	t_{PLH}	2.0	—	16	60	—	75	ns	A	Y
	t_{PHL}	4.5	—	7	12	—	15			
		6.0	—	6	10	—	13			
Output rise / fall time	t_r	2.0	—	21	75	—	95	ns		Each output
	t_f	4.5	—	8	15	—	19			
		6.0	—	7	13	—	16			
Input capacitance	C_i	—	—	3	10	—	10	pF		
Power dissipation capacitance	C_{PD}	—	—	20	—	—	—	pF		

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Test Circuit



• Waveform

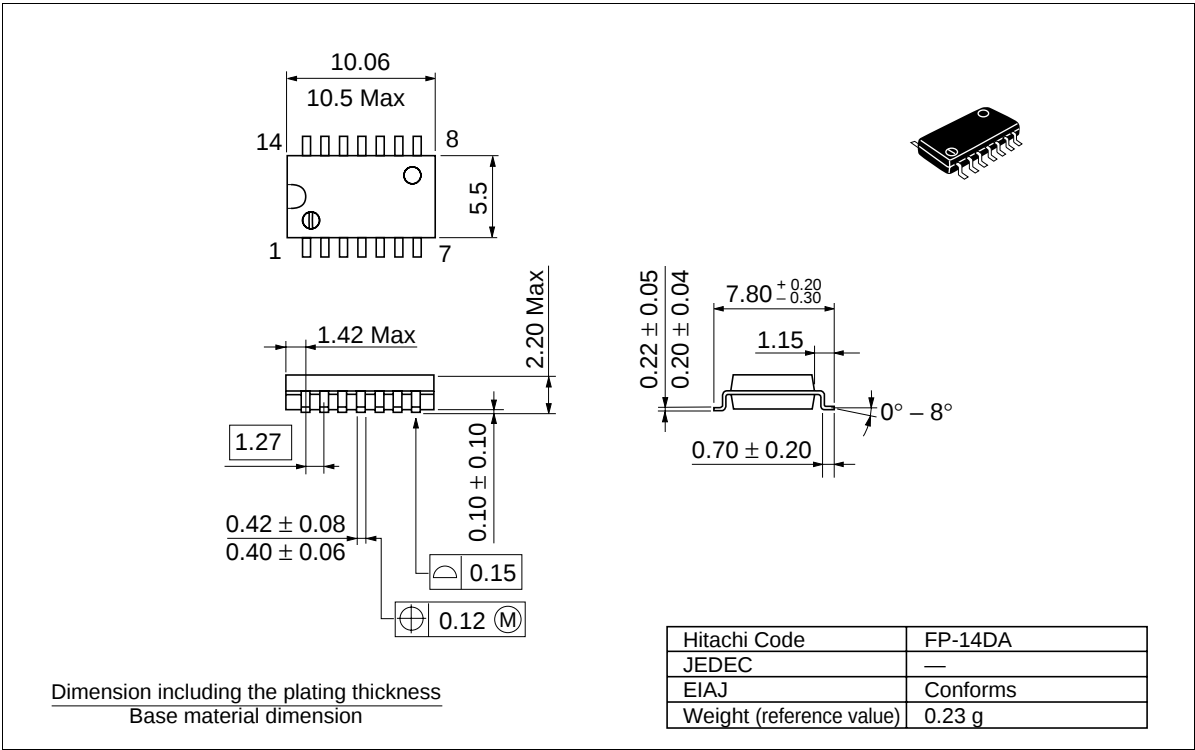


Note: 1. Input waveform : PRR = 1 MHz, duty cycle 50%, $t_r = 6\text{ ns}$, $t_f = 6\text{ ns}$

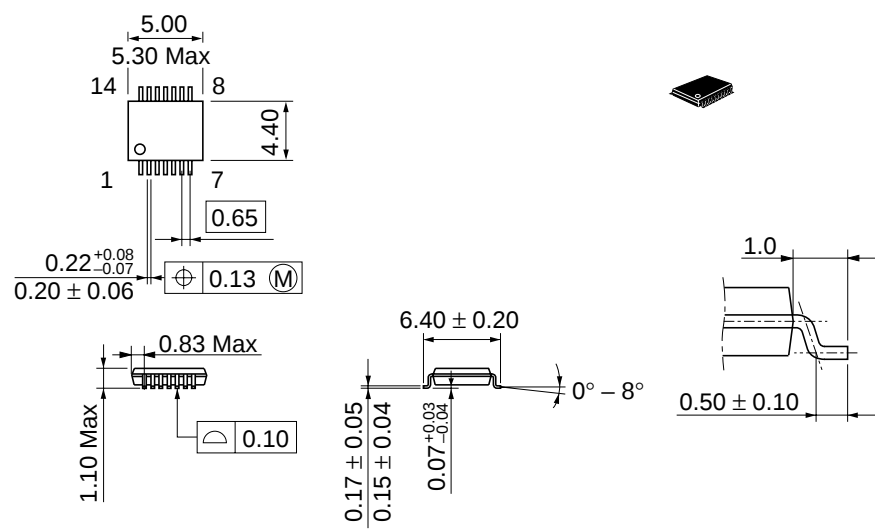
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Package Dimensions

Unit : mm



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Dimension including the plating thickness
Base material dimension

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

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