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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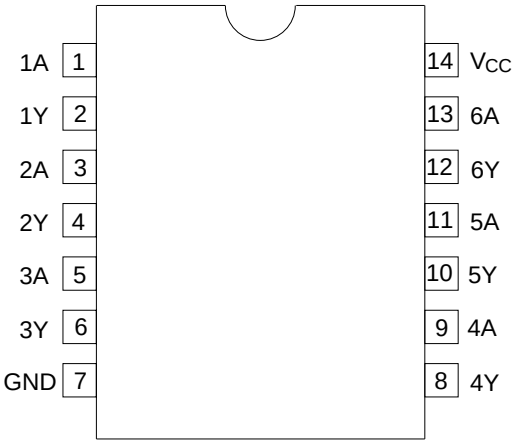
Pin Arrangement



(Top view)

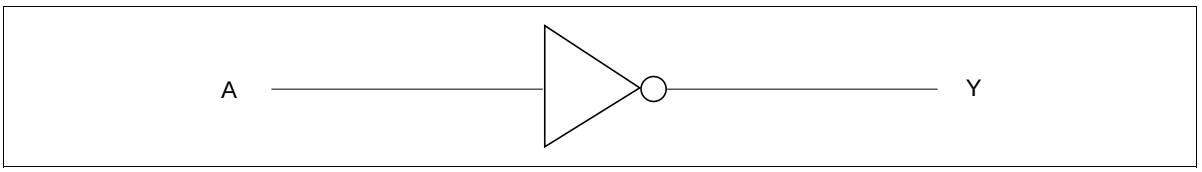
Absolute Maximum Ratings

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

Logic Diagram (1/4 Circuit)



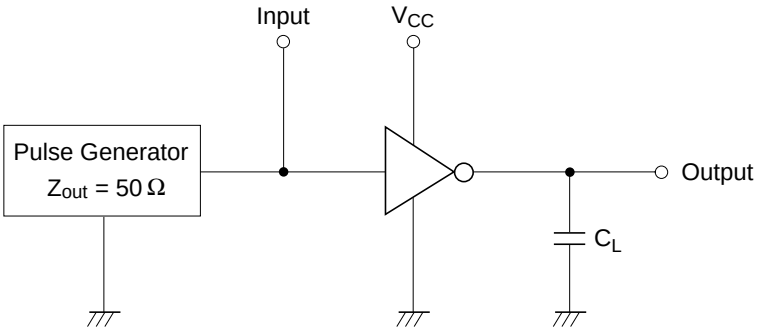
Electrical Characteristics

Item	Symbol	V_{CC} (V)	Ta = 25°C			Ta = –40 to 85°C		Unit	Test Conditions
			Min	Typ	Max	Min	Max		
Output voltage	V_{OH}	2.0	1.80	—	—	1.80	—	V	I_O = –20 µA
		4.5	4.00	—	—	4.00	—		
		6.0	5.50	—	—	5.50	—		
		4.5	3.86	—	—	3.76	—		I_O = –4 mA
		6.0	5.36	—	—	5.26	—		I_O = –5.2 mA
	V_{OL}	2.0	—	—	0.20	—	0.20		I_O = 20 µA
		4.5	—	—	0.50	—	0.50		
		6.0	—	—	0.50	—	0.50		
		4.5	—	—	0.32	—	0.37		I_O = 4 mA
		6.0	—	—	0.32	—	0.37		I_O = 5.2 mA
Input current	I_I	6.0	—	±0.1	±100	—	±1000	nA	$V_I = V_{CC}$ or GND
Quiescent supply voltage	I_{CC}	6.0	—	—	2.0	—	20	µA	$V_I = V_{CC}$ or GND, I_O = 0

Switching Characteristics (C_L = 50 pF)

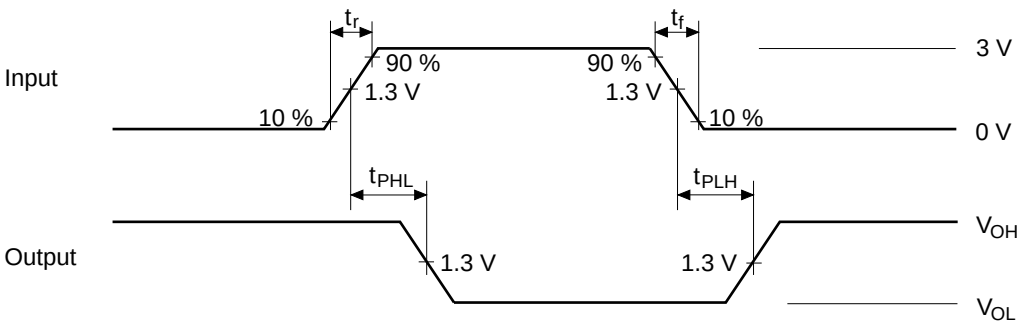
Item	Symbol	V_{cc} (V)	Ta = 25°C			Ta = –40 to 85°C		Unit	Input	Output
			Min	Typ	Max	Min	Max		FROM	TO
Propagation delay time	t_{PLH}	2.0	—	16	60	—	75	ns	A	Y
	t_{PHL}	4.5	—	7	12	—	15			
		6.0	—	6	10	—	13			
Output rise / fall time	t_r	2.0	—	21	75	—	95	ns		Each
	t_f	4.5	—	8	15	—	19			output
		6.0	—	7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

Test Circuit



Note: 1. C_L includes probe and jig capacitance.

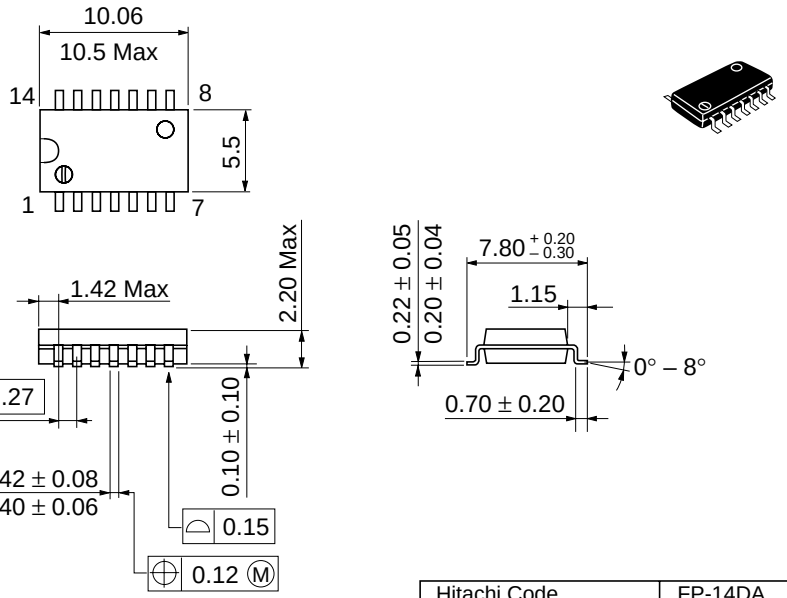
• **Waveform**



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

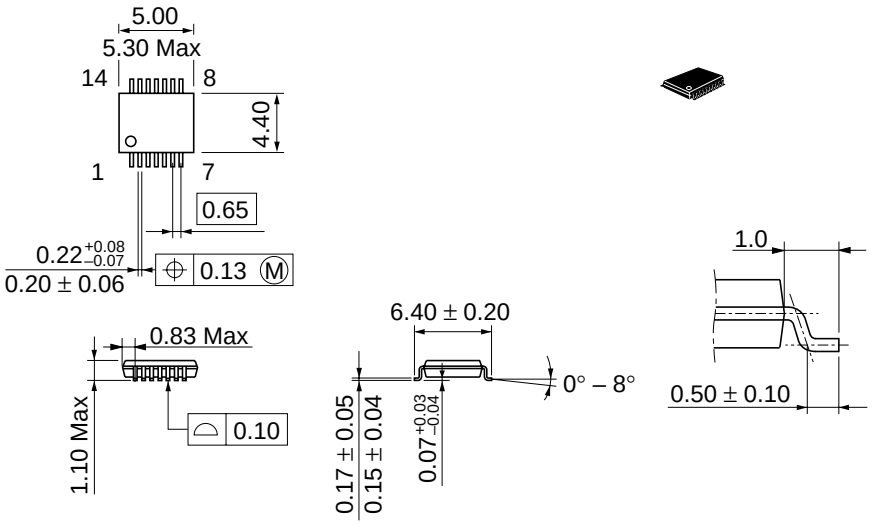
Package Dimensions

Unit : mm



Dimension including the plating thickness
Base material dimension

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



Dimension including the plating thickness
Base material dimension

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

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