
HD74LV2GU04A

Triple Unbuffered Inverters

HITACHI

ADE-205-341 (Z)

1st. Edition

May 2000

Description

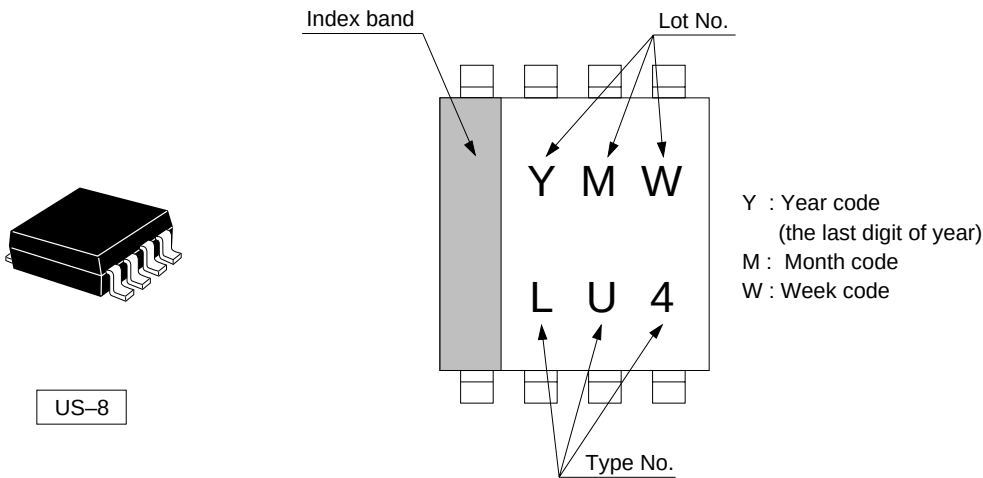
The HD74LV2GU04A has triple unbuffered inverters in a 8 pin package. Low voltage and high speed operation is suitable for the battery powered products (e.g., notebook computers), and the low power consumption extends the battery life.

Features

- The basic gate function is lined up as hitachi uni logic series.
- Supplied on emboss taping for high speed automatic mounting.
- Electrical characteristics equivalent to the HD74LVU04A
Supply voltage range : 1.65 to 5.5 V
Operating temperature range : -40 to +85°C
- All inputs V_{IH} (Max.) = 5.5 V (@ V_{CC} = 0 V to 5.5 V)
All outputs V_O (Max.) = 5.5 V (@ V_{CC} = 0 V)
- Output current ± 6 mA (@ V_{CC} = 3.0 V to 3.6 V), ± 12 mA (@ V_{CC} = 4.5 V to 5.5 V)

Outline and Article Indication

• HD74LV2GU04A

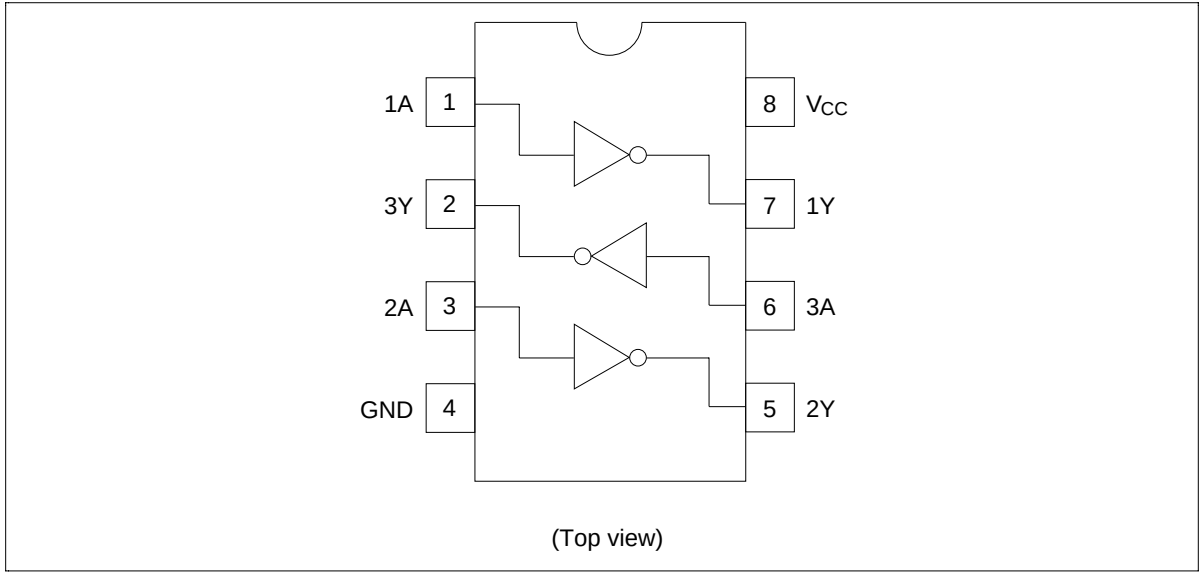


Function Table

Input A	Output $\bar{Y}$
H	L
L	H

H : High level
L : Low level

Pin Arrangement



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Test Conditions
Supply voltage	V _{CC}	−0.5 to 7.0	V	
Input voltage	V _{IN}	−0.5 to 7.0	V	
Output voltage	V _{OUT}	−0.5 to V _{CC} + 0.5	V	Output : H or L
Input diode current	I _{IK}	−20	mA	
Output diode current	I _{OK}	±50	mA	
Output current	I _{OUT}	±25	mA	
V _{CC} , GND current	I _{CC} or I _{GND}	±50	mA	
Power dissipation	P _T	200	mW	
Storage temperature	T _{stg}	−65 to 150	°C	

Recommended Operating Conditions

Item	Symbol	Ratings	Unit
Supply voltage	V _{CC}	1.65 to 5.5	V
Input voltage	V _{IN}	0 to 5.5	V
Output voltage	V _{OUT}	0 to V _{CC}	V
Operating temperature	T _{opr}	−40 to +85	°C

Electrical Characteristic

- $T_a = -40$ to 85°C

Item	Symbol	V_{CC} (V) *	Min	Typ	Max	Unit	Test condition
Input voltage	V_{IH}	1.65 to 1.95	$V_{CC} \times 0.85$	—	—	V	
		2.3 to 2.7	$V_{CC} \times 0.8$	—	—		
		3.0 to 3.6	$V_{CC} \times 0.8$	—	—		
		4.5 to 5.5	$V_{CC} \times 0.8$	—	—		
	V_{IL}	1.65 to 1.95	—	—	$V_{CC} \times 0.15$		
		2.3 to 2.7	—	—	$V_{CC} \times 0.2$		
		3.0 to 3.6	—	—	$V_{CC} \times 0.2$		
		4.5 to 5.5	—	—	$V_{CC} \times 0.2$		
Output voltage	V_{OH}	Min to Max	$V_{CC} - 0.1$	—	—	V	$I_{OH} = -50 \mu\text{A}$, $V_{IN} = V_{IL}$
		1.65	1.4	—	—		$I_{OH} = -1 \text{ mA}$, $V_{IN} = \text{GND}$
		2.3	2.0	—	—		$I_{OH} = -2 \text{ mA}$, $V_{IN} = \text{GND}$
		3.0	2.48	—	—		$I_{OH} = -6 \text{ mA}$, $V_{IN} = \text{GND}$
		4.5	3.8	—	—		$I_{OH} = -12 \text{ mA}$, $V_{IN} = \text{GND}$
	V_{OL}	Min to Max	—	—	0.1		$I_{OL} = 50 \mu\text{A}$, $V_{IN} = V_{IH}$
		1.65	—	—	0.3		$I_{OL} = 1 \text{ mA}$, $V_{IN} = V_{CC}$
		2.3	—	—	0.4		$I_{OL} = 2 \text{ mA}$, $V_{IN} = V_{CC}$
		3.0	—	—	0.44		$I_{OL} = 6 \text{ mA}$, $V_{IN} = V_{CC}$
		4.5	—	—	0.55		$I_{OL} = 12 \text{ mA}$, $V_{IN} = V_{CC}$
Input current	I_{IN}	0 to 5.5	—	—	± 1	μA	$V_{IN} = 5.5 \text{ V}$ or GND
Quiescent supply current	I_{CC}	5.5	—	—	10	μA	$V_{IN} = V_{CC}$ or GND , $I_O = 0$
Input capacitance	C_{IN}	3.3	—	4.0	—	pF	$V_{IN} = V_{CC}$ or GND

Note: For conditions shown as Min or Max, use the appropriate values under recommended operating conditions.

Switching Characteristics

• $V_{CC} = 1.8 \pm 0.15\text{ V}$

Item	Symbol	T _a = 25°C			T _a = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max	Min	Max				
Propagation delay time	t _{PLH} t _{PHL}	—	8.0 15.2	15.0 24.0	1.0 1.0	18.0 27.0	ns	C _L = 15 pF C _L = 50 pF	A	$\bar{Y}$

• $V_{CC} = 2.5 \pm 0.2\text{ V}$

Item	Symbol	T _a = 25°C			T _a = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max	Min	Max				
Propagation delay time	t _{PLH} t _{PHL}	—	6.0 9.5	10.9 13.4	1.0 1.0	14.0 16.0	ns	C _L = 15 pF C _L = 50 pF	A	$\bar{Y}$

• $V_{CC} = 3.3 \pm 0.3\text{ V}$

Item	Symbol	T _a = 25°C			T _a = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max	Min	Max				
Propagation delay time	t _{PLH} t _{PHL}	—	5.0 7.5	8.9 11.4	1.0 1.0	10.5 13.0	ns	C _L = 15 pF C _L = 50 pF	A	$\bar{Y}$

• $V_{CC} = 5.0 \pm 0.5\text{ V}$

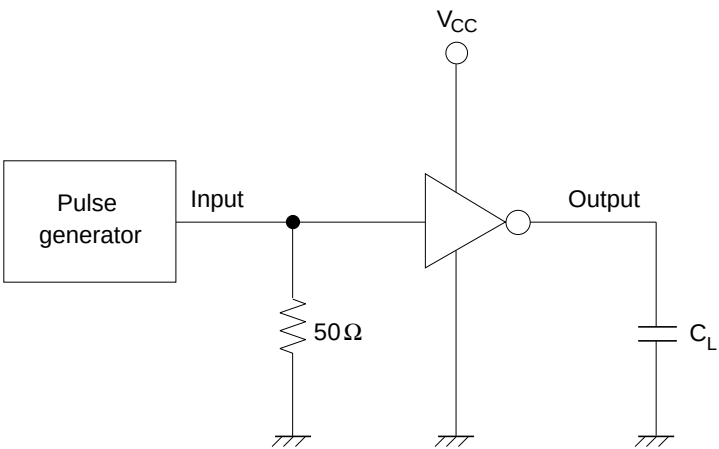
Item	Symbol	T _a = 25°C			T _a = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max	Min	Max				
Propagation delay time	t _{PLH} t _{PHL}	—	3.5 5.0	5.5 7.0	1.0 1.0	6.5 8.0	ns	C _L = 15 pF C _L = 50 pF	A	$\bar{Y}$

Operating Characteristics

- $C_L = 50\text{ pF}$

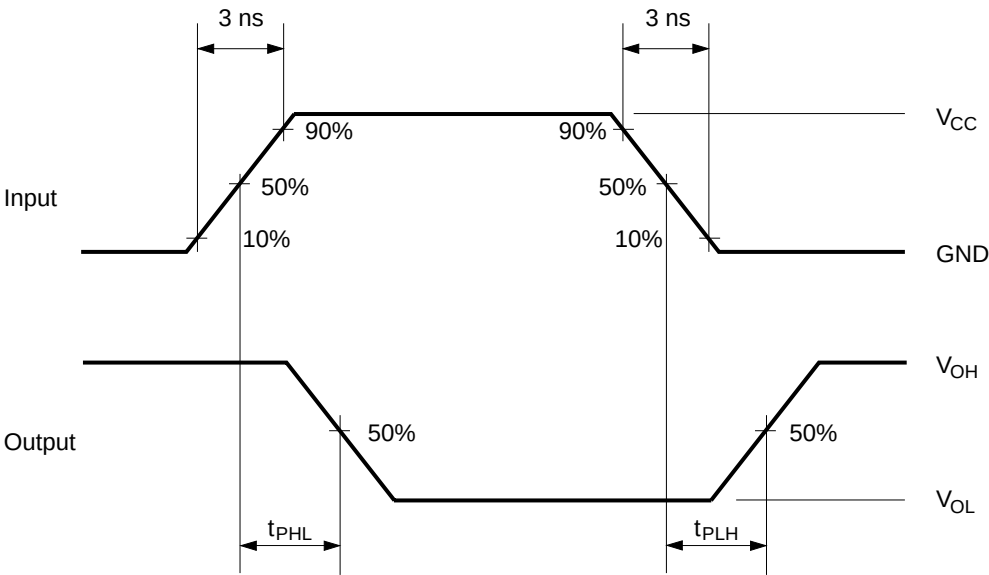
Item	Symbol	V_{CC} (V)	$T_a = 25^{\circ}\text{C}$			Unit	Test Conditions
			Min	Typ	Max		
Power dissipation capacitance	C_{PD}	3.3	—	4.0	—	pF	f = 10 MHz
		5.0	—	5.0	—		

Test Circuit



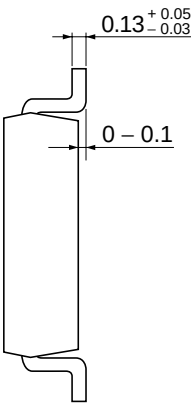
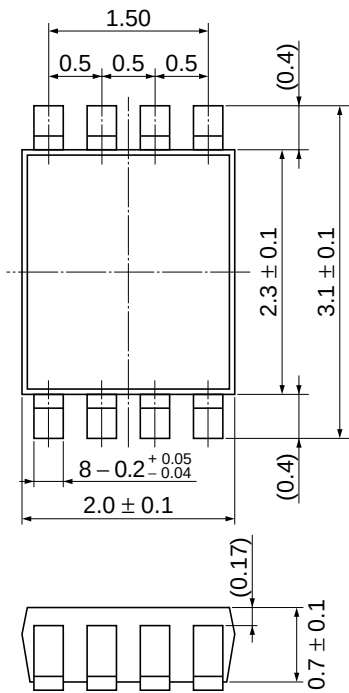
Note: Operating current test time, output is open.

• Waveforms



Package Dimensions

Unit : mm



Hitachi Code	US-8
JEDEC	SSOP-8
EIAJ	—
Mass (reference value)	—

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