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.

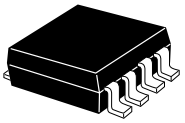
Features

- 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)

Hitachi semiconductor

Outline and Article Indication

• HD74LV2GU04A



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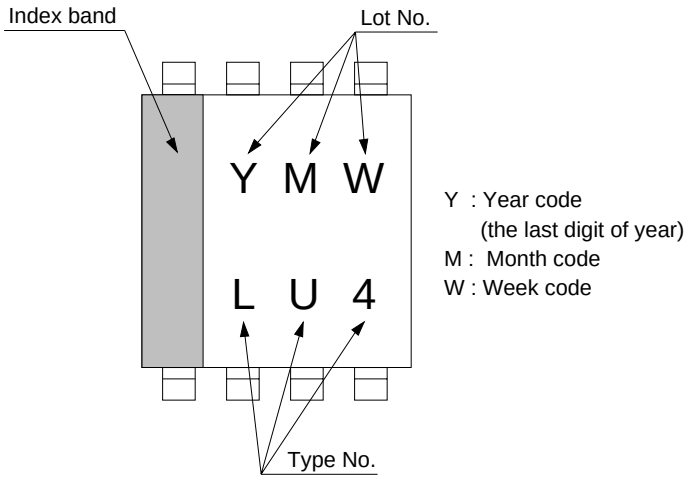


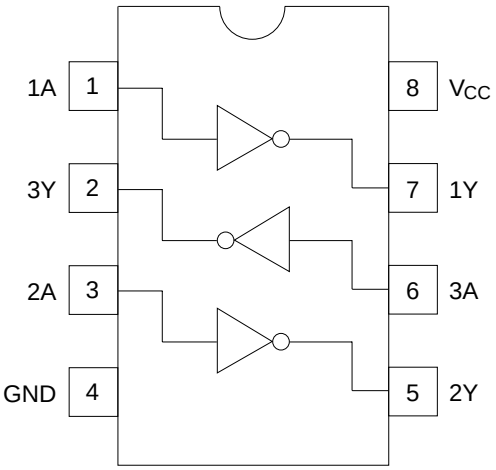
Function Table

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

H : High level

L : Low level

Pin Arrangement



(Top view)

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	Tstg	–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

- **Ta = –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}×0.85	—	—	V	
		2.3 to 2.7	V_{CC}×0.8	—	—		
		3.0 to 3.6	V_{CC}×0.8	—	—		
		4.5 to 5.5	V_{CC}×0.8	—	—		
	V_{IL}	1.65 to 1.95	—	—	V_{CC}×0.15		
		2.3 to 2.7	—	—	V_{CC}×0.2		
		3.0 to 3.6	—	—	V_{CC}×0.2		
		4.5 to 5.5	—	—	V_{CC}×0.2		
Output voltage	V_{OH}	Min to Max	V_{CC}–0.1	—	—	V	I_{OH} = –50 µA, V_{IN} = V_{IL}
		1.65	1.4	—	—		I_{OH} = –1 mA, V_{IN} = GND
		2.3	2.0	—	—		I_{OH} = –2 mA, V_{IN} = GND
		3.0	2.48	—	—		I_{OH} = –6 mA, V_{IN} = GND
		4.5	3.8	—	—		I_{OH} = –12 mA, V_{IN} = GND
	V_{OL}	Min to Max	—	—	0.1		I_{OL} = 50 µA, V_{IN} = V_{IH}
		1.65	—	—	0.3		I_{OL} = 1 mA, V_{IN} = V_{CC}
		2.3	—	—	0.4		I_{OL} = 2 mA, V_{IN} = V_{CC}
		3.0	—	—	0.44		I_{OL} = 6 mA, V_{IN} = V_{CC}
		4.5	—	—	0.55		I_{OL} = 12 mA, V_{IN} = V_{CC}
Input current	I_{IN}	0 to 5.5	—	—	±1	µA	V_{IN} = 5.5 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 ± 0.15 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	t_{PLH}	—	8.0	15.0	1.0	18.0	ns	C_L = 15 pF	A	$\overline{Y}$
delay time	t_{PHL}	—	15.2	24.0	1.0	27.0		C_L = 50 pF		

- V_{CC} = 2.5 ± 0.2 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	t_{PLH}	—	6.0	10.9	1.0	14.0	ns	C_L = 15 pF	A	$\overline{Y}$
delay time	t_{PHL}	—	9.5	13.4	1.0	16.0		C_L = 50 pF		

- V_{CC} = 3.3 ± 0.3 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	t_{PLH}	—	5.0	8.9	1.0	10.5	ns	C_L = 15 pF	A	$\overline{Y}$
delay time	t_{PHL}	—	7.5	11.4	1.0	13.0		C_L = 50 pF		

- V_{CC} = 5.0 ± 0.5 V

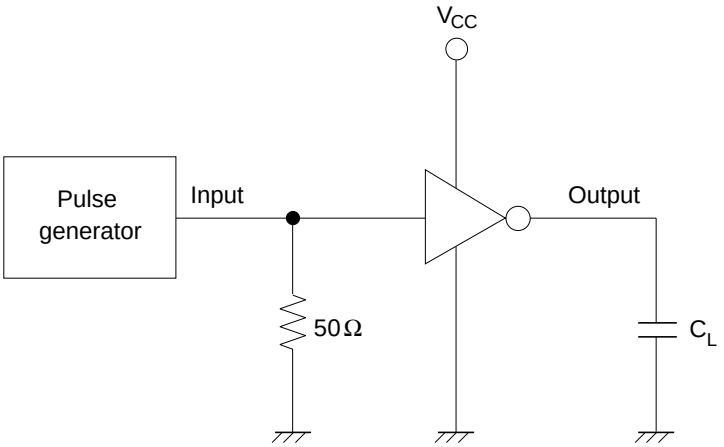
Item	Symbol	T_a = 25°C			T_a = –40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max	Min	Max				
Propagation	t_{PLH}	—	3.5	5.5	1.0	6.5	ns	C_L = 15 pF	A	$\overline{Y}$
delay time	t_{PHL}	—	5.0	7.0	1.0	8.0		C_L = 50 pF		

Operating Characteristics

- C_L = 50 pF

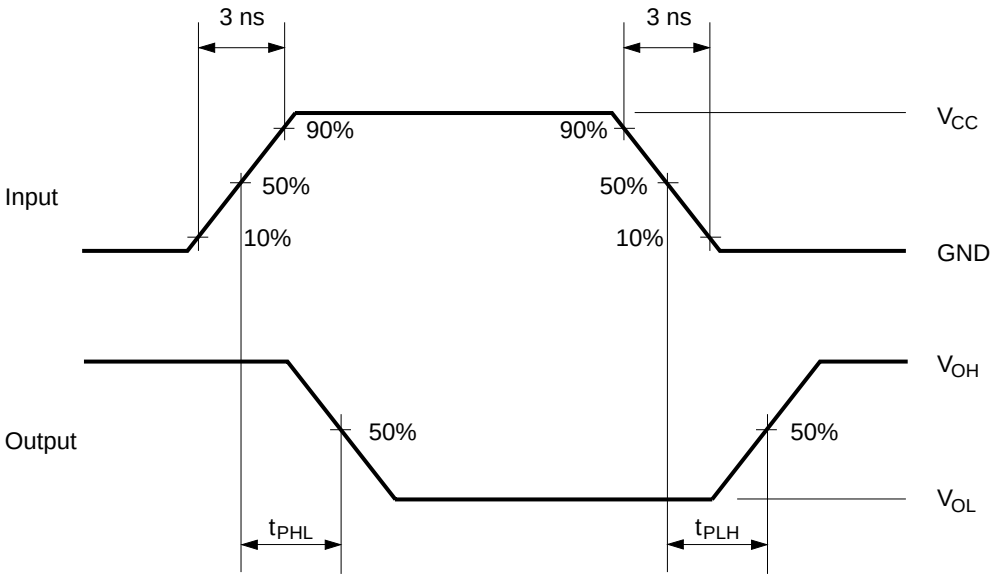
Item	Symbol	V_{CC} (V)	T_a = 25°C			Unit	Test Conditions
			Min	Typ	Max		
Power dissipation capacitance	C_{PD}	3.3	—	4.0	—	pF	f = 10 MHz
		5.0	—	5.0	—		

Test Circuit



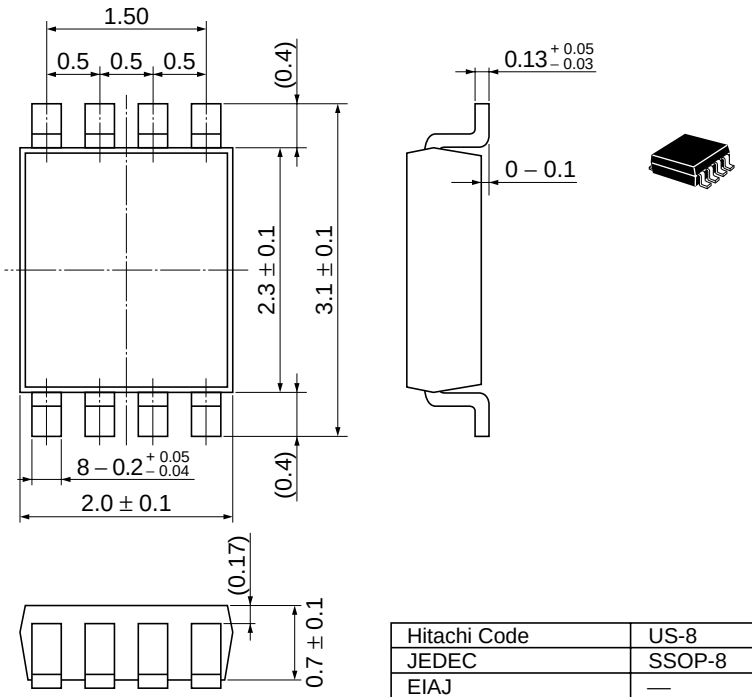
Note: Operating current test time, output is open.

• **Waveforms**



Package Dimensions

Unit : mm



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

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