HD74LV04

Hex Inverters

Description

The HD74LV04 has six inverters in a 14 pin package. Low voltage and high speed operation is suitable at the battery drive product (note type personal computer) and low power consumption extends the life of a battery for long time operation.

Features

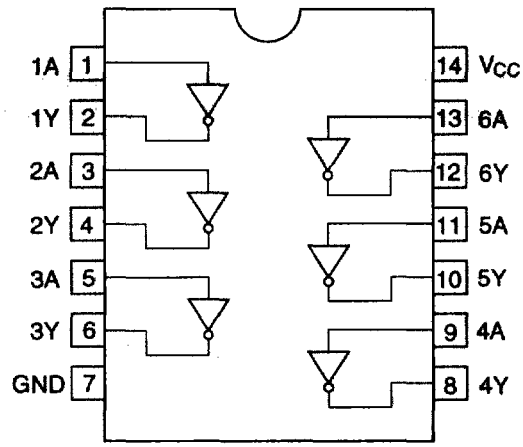
- V_{CC} = 2.0 V to 5.5 V
- All inputs V_{IH} (Max.) = 5.5 V (@V_{CC} = 0 V to 5.5 V)
- Typical V_{OL} ground bounce < 0.8 V (@V_{CC} = 3.3 V, Ta = 25°C)
- Typical V_{OH} undershoot > 2.0 V (@V_{CC} = 3.3 V, Ta = 25°C)
- Output current ±6 mA (@V_{CC} = 3.0 V to 3.6 V)
  ±12 mA (@V_{CC} = 4.5 V to 5.5 V)

Function Table

Input A	Output Y
H	L
L	H

H : High level
L : Low level

Pin Arrangement



(Top view)

Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Conditions
Supply voltage	V_{CC}	–0.5 to 7.0	V	
Input diode current	I_{IK}	–20	mA	V_I = –0.5 V
Input voltage	V_I	–0.5 to 7.0	V	
Output diode current	I_{OK}	–50	mA	V_O = –0.5 V
		50	mA	V_O = V_{CC}+0.5 V
Output voltage	V_O	–0.5 to V_{CC} +0.5	V	
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	

Notes: The absolute maximum ratings are values which must not individually be exceeded, and furthermore, no two of which may be realized at the same time.

Recommended Operating Conditions

Item	Symbol	Ratings	Unit	Conditions
Supply voltage	V_{CC}	2.0 to 5.5	V	
Input / output voltage	V_I	0 to 5.5	V	A
	V_O	0 to V_{CC}	V	Y
Operating temperature	Ta	–40 to 85	°C	
Output current	I_{OH}	–6	mA	V_{CC} = 3.0 V to 3.6 V
		–12 *2	mA	V_{CC} = 4.5 V to 5.5 V
	I_{OL}	6	mA	V_{CC} = 3.0 V to 3.6 V
		12 *2	mA	V_{CC} = 4.5 V to 5.5 V
Input rise / fall time *1	t_r, t_f	50	ns/V	V_{CC} = 5.5 V
		100	ns/V	V_{CC} = 3.6 V

Notes: 1. This item guarantees maximum limit when one input switches.
Waveform : Refer to test circuit of switching characteristics.
2. duty cycle ≤ 50%

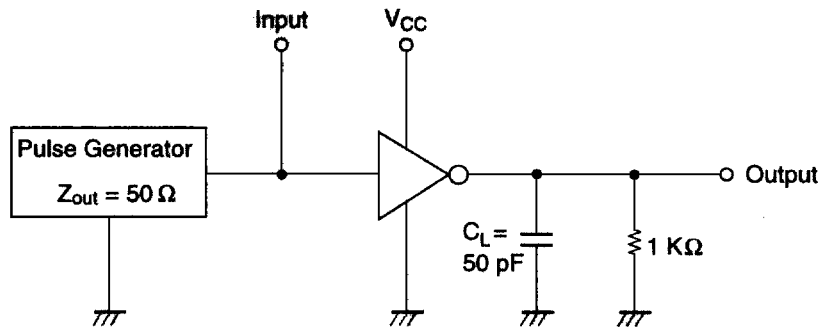
Electrical Characteristics

			Ta = –40 to 85°C			
Item	Symbol	V_{CC}(V)	Min	Max	Unit	Test Conditions
Input voltage	V_{IH}	2.7 to 3.6	2.0	—	V	
		4.5 to 5.5	V_{CC}×0.7	—	V	
	V_{IL}	2.7 to 3.6	—	0.8	V	
		4.5 to 5.5	—	V_{CC}×0.3	V	
Output voltage	V_{OH}	2.7 to 5.5	V_{CC}–0.2	—	V	I_{OH} = –100 µA
		3.0	2.4	—	V	I_{OH} = –6 mA
		4.5	3.6	—	V	I_{OH} = –12 mA
	V_{OL}	2.7 to 5.5	—	0.2	V	I_{OL} = 100 µA
		3.0	—	0.4	V	I_{OL} = 6 mA
		4.5	—	0.5	V	I_{OL} = 12 mA
Input current	I_{IN}	0 to 5.5	—	±1.0	µA	V_{IN} = 5.5 V or GND
Quiescent supply current	I_{CC}	5.5	—	20	µA	V_{IN} = V_{CC} or GND
	ΔI_{CC}	3.0 to 3.6	—	500	µA	V_{IN} = one input at(V_{CC}–0.6) V, other inputs at V_{CC} or GND

Switching Characteristics

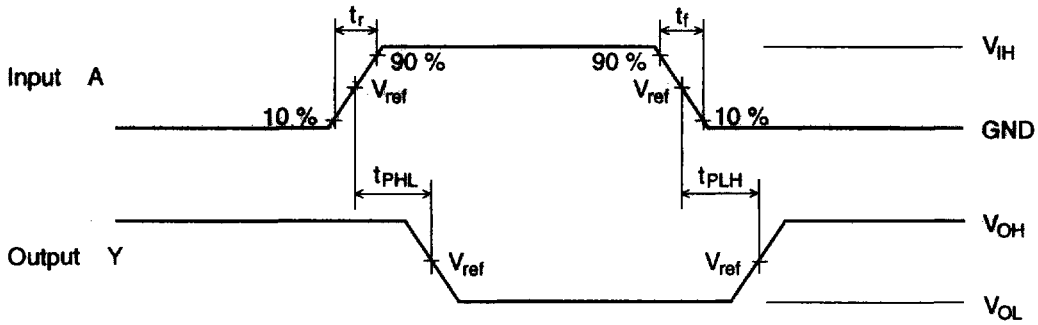
Item	Symbol	V_{CC}(V)	Ta = 25°C			Ta = –40 to 85°C			Unit	From (Input)	To (Output)
			Min	Typ	Max	Min	Typ	Max			
Propagation delay time	t_{PLH}	2.7	—	8.5	13.5	1.0	—	14.5	ns	A	Y
	t_{PHL}	3.3±0.3	—	7.0	11.5	1.0	—	12.5	ns		
		5.0±0.5	—	5.5	9.0	1.0	—	10.0	ns		
Input capacitance	C_{IN}	3.3±0.3	—	—	—	—	2.5	—	pF		

Test Circuit



Note: 1. C_L includes probe and jig capacitance.

Waveforms



Symbol	Vcc = 2.7 V, 3.3±0.3 V	Vcc = 5.0±0.5 V
V_{IH}	2.7 V	Vcc
V_{ref}	1.5 V	50%Vcc

Notes: 1. t_r = 2.5 ns, t_f = 2.5 ns
2. Input waveform : PRR = 10 MHz, duty cycle 50%