HD74LV05

Hex Inverters with Open Drain Outputs

Description

The HD74LV05 has six inverters with open drain outputs in a 14 pin package. Low voltage and high impedance 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

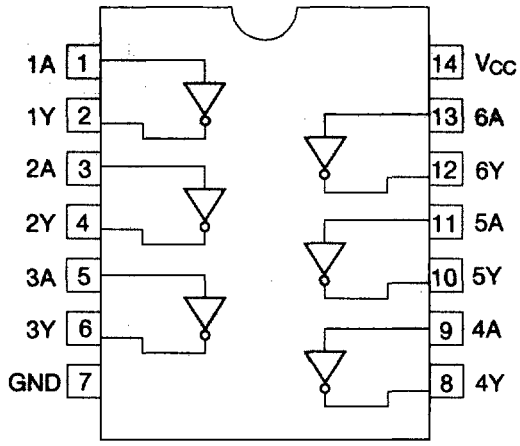
- V_{CC} = 2.0 V to 5.5 V
- All inputs V_{IH} (Max) = 5.5 V (@V_{CC} = 0 V to 5.5 V)
- Typical V_{OL} ground bounce < 0.8 V (@V_{CC} = 3.3 V, Ta = 25°C)
- Typical V_{OH} undershoot > 2.0 V (@V_{CC} = 3.3 V, Ta = 25°C)
- Output current
  ±6 mA (@V_{CC} = 3.0 V to 3.6 V)
  ±12 mA (@V_{CC} = 4.5 V to 5.5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

Function Table

Input A	Output Y
H	L
L	Z

H : High level
L : Low level
Z : High impedance

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		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	

Note: 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}		Y
Operating temperature	Ta	–40 to 85	°C	
Output current	I_{OL}	6	mA	V_{CC} = 3.0 to 3.6 V
		12 *2		V_{CC} = 4.5 to 5.5 V
Input rise / fall time *1	tr, tf	50	ns / V	V_{CC} = 5.5 V
		100		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%

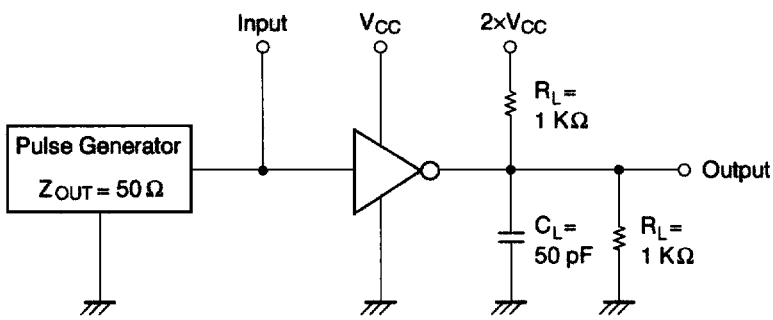
Electrical Characteristics (Ta = –40 to 85°C)

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_{IL}	2.7 to 3.6	—	0.8		
		4.5 to 5.5	—	V_{CC}×0.3		
Output voltage	V_{OL}	2.7 to 5.5	—	0.2	V	I_{OL} = 100 µA
		3.0	—	0.4		I_{OL} = 6 mA
		4.5	—	0.5		I_{OL} = 12 mA
Input current	I_{IN}	0 to 5.5	—	±1.0	µA	V_{IN} = 5.5 V or GND
Off state output current	I_{OZ}	5.5	—	±5.0	µA	V_{IN} = V_{CC}, GND V_{OUT} = V_{CC} 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		V_{IN} = one input at (V_{CC}–0.6) V, other inputs at V_{CC} or GND

Switching Characteristics

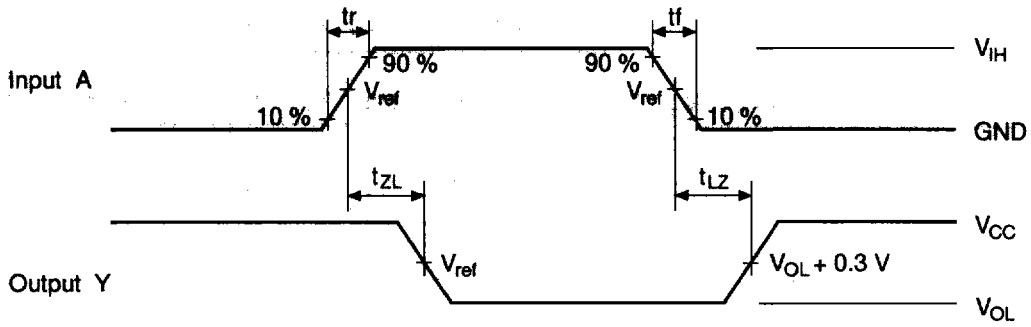
Item	Symbol	V_{CC} (V)	Ta = 25°C Min	Typ	Max	Ta = −40 to 85°C Min	Typ	Max	Unit	From (Input)	To (Output)
Propagation delay time	t_{LZ}	2.7	—	12.0	30.0	1.0	—	40.0	ns	A	Y
		3.3±0.3	—	11.5	25.0	1.0	—	30.0			
		5.0±0.5	—	10.0	18.0	1.0	—	23.0			
	t_{ZL}	2.7	—	8.5	13.5	1.0	—	14.5			
		3.3±0.3	—	7.0	11.5	1.0	—	12.5			
		5.0±0.5	—	5.5	9.0	1.0	—	10.0			
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. tr = 2.5 ns, tf = 2.5 ns
2. Input waveform : PRR = 10 MHz, duty cycle 50%