

HD74LVC04

Hex Inverters

REJ03D0343-0300Z
(Previous ADE-205-062B (Z))
Rev.3.00
Jul. 22, 2004

Description

The HD74LVC04 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

- $V_{CC} = 2.0\text{ V to }5.5\text{ V}$
- All inputs $V_{IH} (\text{Max.}) = 5.5\text{ V} (@V_{CC} = 0\text{ V to }5.5\text{ V})$
- Typical V_{OL} ground bounce $< 0.8\text{ V} (@V_{CC} = 3.3\text{ V, }T_a = 25^\circ\text{C})$
- Typical V_{OH} undershoot $> 2.0\text{ V} (@V_{CC} = 3.3\text{ V, }T_a = 25^\circ\text{C})$
- High output current $\pm 24\text{ mA} (@V_{CC} = 3.0\text{ V to }5.5\text{ V})$
- Ordering Information

| Part Name | Package Type | Package Code | Package Abbreviation | Taping Abbreviation (Quantity) |
|---------------|--------------------|--------------|----------------------|--------------------------------|
| HD74LVC04FPEL | SOP-14 pin (JEITA) | FP-14DAV | FP | EL (2,000 pcs/reel) |
| HD74LVC04TELL | TSSOP-14 pin | TTP-14DV | T | ELL (2,000 pcs/reel) |

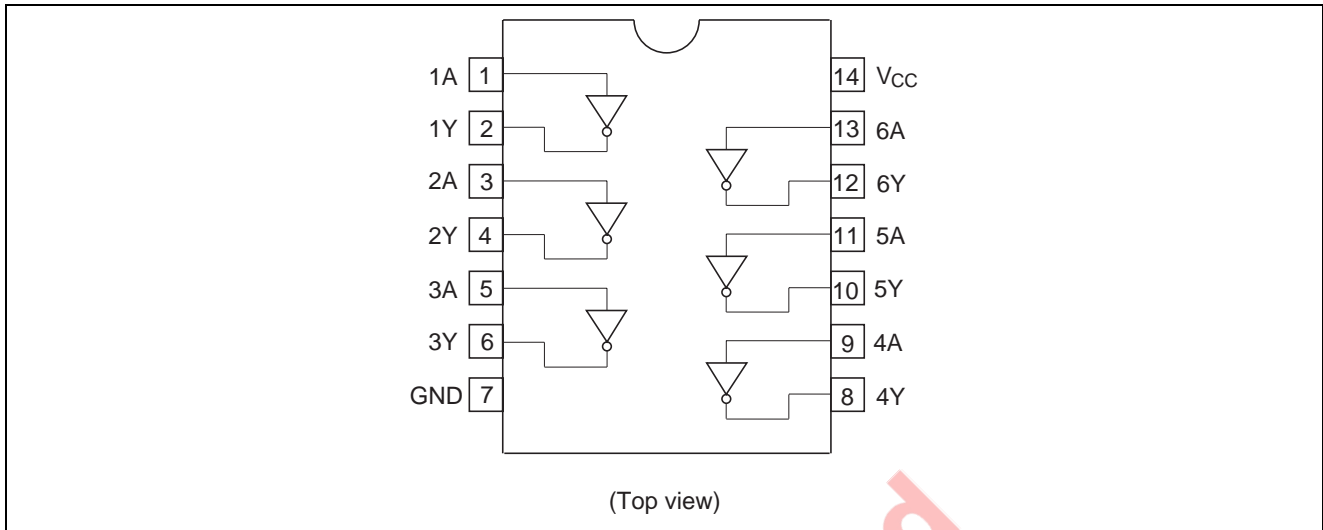
Note: Please consult the sales office for the above package availability.

Function Table

| Input A | Output Y |
|---------|----------|
| H | L |
| L | H |

H: High level
L: Low level

Pin Arrangement



Absolute Maximum Ratings

| Item | Symbol | Ratings | Unit | Conditions |
|------------------------------|-----------------------|------------------------|--------------------|--|
| Supply voltage range | V_{CC} | -0.5 to 6.0 | V | |
| Input diode current | I_{IK} | -50 | mA | $V_I = -0.5\text{ V}$ |
| Input voltage | V_I | -0.5 to 6.0 | V | |
| Output diode current | I_{OK} | -50 50 | mA | $V_O = -0.5\text{ V}$ $V_O = V_{CC} + 0.5\text{ V}$ |
| Output voltage | V_O | -0.5 to $V_{CC} + 0.5$ | V | |
| Output current | I_O | ± 50 | mA | |
| V_{CC} , GND current / pin | I_{CC} or I_{GND} | 100 | mA | |
| Storage temperature | T_{stg} | -65 to +150 | $^{\circ}\text{C}$ | |

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} | 1.5 to 5.5 2.0 to 5.5 | V | Data retention At operation |
| Input / Output voltage | V_I V_O | 0 to 5.5 0 to V_{CC} | V | A Y |
| Operating temperature | T_a | -40 to 85 | $^{\circ}\text{C}$ | |
| Output current | I_{OH} I_{OL} | -12 -24 ^{*2} 12 24 ^{*2} | mA | $V_{CC} = 2.7\text{ V}$ $V_{CC} = 3.0\text{ V to } 5.5\text{ V}$ $V_{CC} = 2.7\text{ V}$ $V_{CC} = 3.0\text{ V to } 5.5\text{ V}$ |
| Input rise / fall time ^{*1} | t_r, t_f | 10 | ns/V | |

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

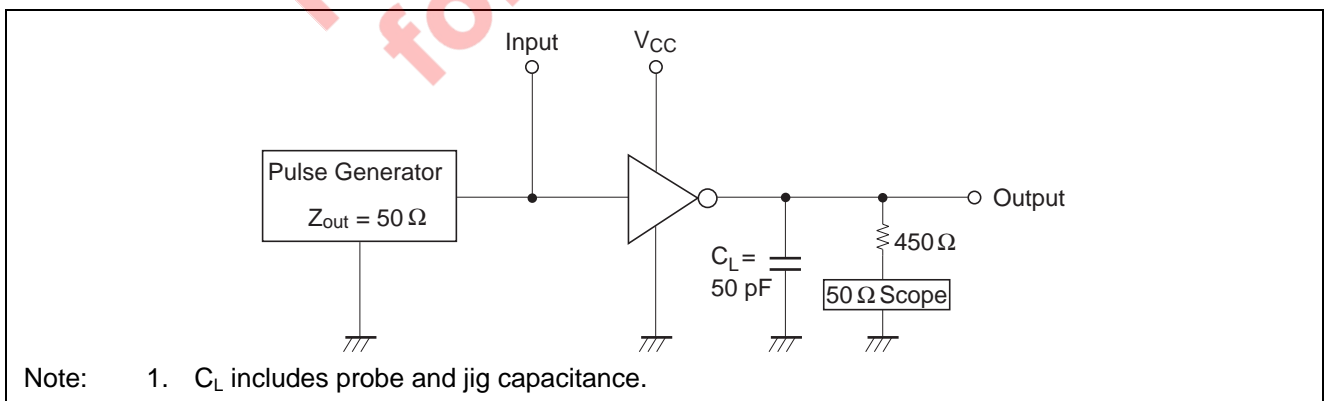
Electrical Characteristics

| Item | Symbol | V _{CC} (V) | Ta = -40 to 85°C | | Unit | Test Conditions |
|--------------------------|------------------|---------------------|----------------------|----------------------|------|--|
| | | | Min | Max | | |
| 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 _{OH} | 2.7 to 5.5 | V _{CC} -0.2 | — | V | I _{OH} = -100 μA |
| | | 2.7 | 2.2 | — | | I _{OH} = -12 mA |
| | | 3.0 | 2.4 | — | | I _{OH} = -12 mA |
| | | 3.0 | 2.0 | — | | I _{OH} = -24 mA |
| | | 4.5 | 3.8 | — | | I _{OH} = -24 mA |
| | V _{OL} | 2.7 to 5.5 | — | 0.2 | V | I _{OL} = 100 μA |
| | | 2.7 | — | 0.4 | | I _{OL} = 12 mA |
| | | 3.0 | — | 0.55 | | I _{OL} = 24 mA |
| | | 3.0 | — | 0.55 | | I _{OL} = 24 mA |
| | | 4.5 | — | 0.55 | | I _{OL} = 24 mA |
| Input current | I _{IN} | 0 to 5.5 | — | ±5.0 | 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 |

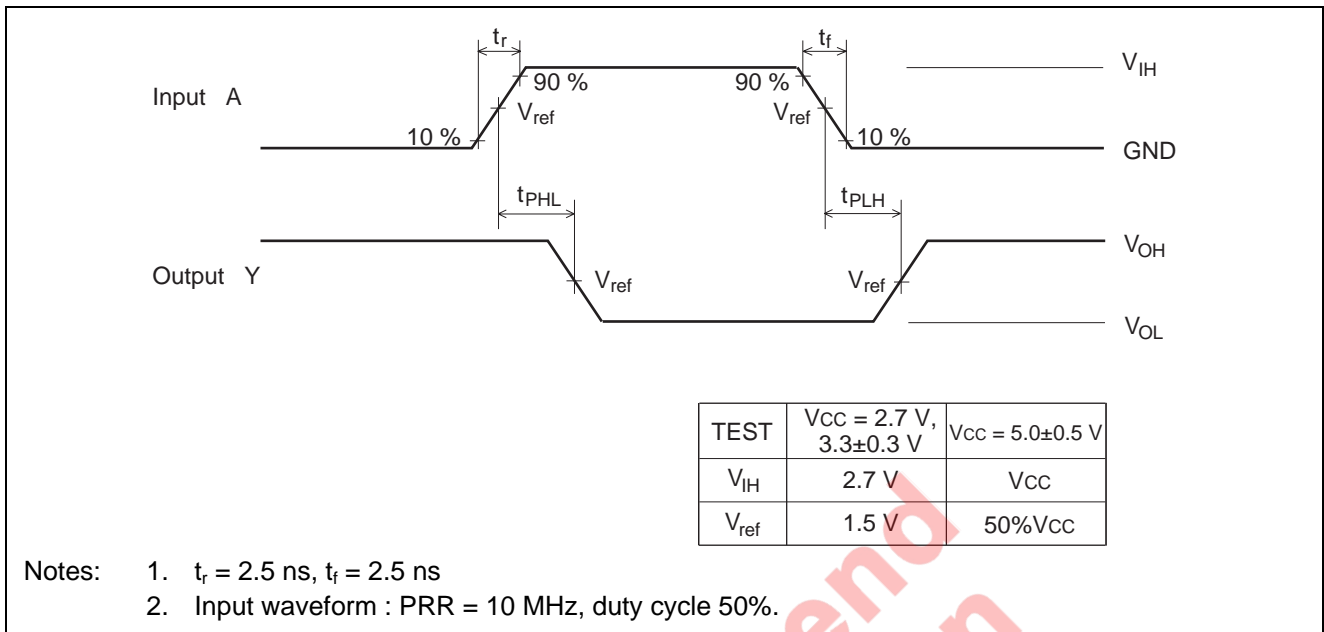
Switching Characteristics

| Item | Symbol | V _{CC} (V) | Ta = -40 to 85°C | | | Unit | From (Input) | To (Output) |
|------------------------|------------------|---------------------|------------------|------|-----|------|--------------|-------------|
| | | | Min | Typ | Max | | | |
| Propagation delay time | t _{PLH} | 2.7 | — | 4.5 | 7.0 | ns | A | Y |
| | t _{PHL} | 3.3±0.3 | 1.5 | 3.5 | 6.0 | | | |
| | | 5.0±0.5 | — | 2.5 | 5.0 | | | |
| Input capacitance | C _{IN} | 2.7 | — | 3.0 | — | pF | | |
| Output capacitance | C _O | 2.7 | — | 15.0 | — | pF | | |

Test Circuit



Waveforms



Not recommended for new design

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Renesas Technology Europe Limited.

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, United Kingdom
Tel: <44> (1628) 585 100, Fax: <44> (1628) 585 900

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Tel: <49> (89) 380 70 0, Fax: <49> (89) 929 30 11

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