

54ACT11034, 74ACT11034 HEX NONINVERTERS

SCAS035A – D2957, FEBRUARY 1988 – REVISED APRIL 1993

- Inputs Are TTL-Voltage Compatible
- Flow-Through Architecture Optimizes PCB Layout
- Center-Pin V_{CC} and GND Configurations Minimize High-Speed Switching Noise
- EPIC™ (Enhanced-Performance Implanted CMOS) 1- μ m Process
- 500-mA Typical Latch-Up Immunity at 125°C
- Package Options Include Plastic Small-Outline Packages, Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs

description

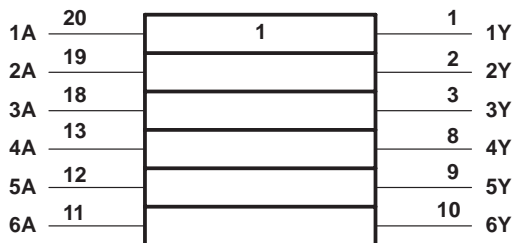
These devices contain six independent noninverters. They perform the Boolean function $Y = A$.

The 54ACT11034 is characterized for operation over the full military temperature range of -55°C to 125°C . The 74ACT11034 is characterized for operation from -40°C to 85°C .

FUNCTION TABLE
(each buffer)

| INPUT A | OUTPUT Y |
|------------|-------------|
| H | H |
| L | L |

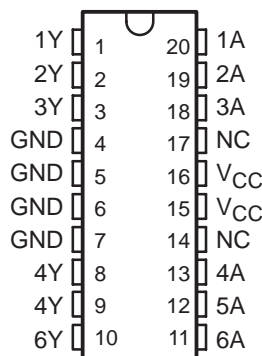
logic symbol†



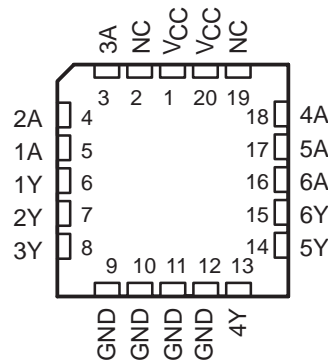
† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

Pin numbers shown are for the DW, J, and N packages.

54ACT11034 . . . J PACKAGE
74ACT11034 . . . DW OR N PACKAGE
(TOP VIEW)

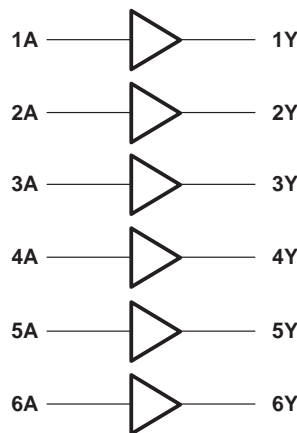


54ACT11034 . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

logic diagram (positive)



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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

TEXAS
INSTRUMENTS

POST OFFICE BOX 655303 • DALLAS, TEXAS 75265
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77001

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54ACT11034, 74ACT11034 HEX NONINVERTERS

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absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

| | |
|--|----------------------------|
| Supply voltage range, V_{CC} | –0.5 V to 7 V |
| Input voltage range, V_I (see Note 1) | –0.5 V to $V_{CC} + 0.5$ V |
| Output voltage range, V_O (see Note 1) | –0.5 V to $V_{CC} + 0.5$ V |
| Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$) | ± 20 mA |
| Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$) | ± 50 mA |
| Continuous output current, I_O ($V_O = 0$ to V_{CC}) | ± 50 mA |
| Continuous current through V_{CC} or GND | ± 150 mA |
| Storage temperature range | – 65°C to 150°C |

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

recommended operating conditions

| | | 54ACT11034 | | 74ACT11034 | | UNIT |
|---------------------|------------------------------------|------------|----------|------------|----------|------|
| | | MIN | MAX | MIN | MAX | |
| V_{CC} | Supply voltage | 4.5 | 5.5 | 4.5 | 5.5 | V |
| V_{IH} | High-level input voltage | 2 | | 2 | | V |
| V_{IL} | Low-level input voltage | | 0.8 | | 0.8 | V |
| V_I | Input voltage | 0 | V_{CC} | 0 | V_{CC} | V |
| V_O | Output voltage | 0 | V_{CC} | 0 | V_{CC} | V |
| I_{OH} | High-level output current | | –24 | | –24 | mA |
| I_{OL} | Low-level output current | | 24 | | 24 | mA |
| $\Delta t/\Delta v$ | Input transition rise or fall rate | 0 | 10 | 0 | 10 | ns/V |
| T_A | Operating free-air temperature | –55 | 125 | –40 | 85 | °C |

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER | TEST CONDITIONS | V_{CC} | $T_A = 25^\circ\text{C}$ | | | 54ACT11034 | | 74ACT11034 | | UNIT |
|------------------------------------|--|----------|--------------------------|-------|------|------------|------|------------|-----|------|
| | | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| V_{OH} | $I_{OH} = -50 \mu\text{A}$ | 4.5 V | 4.4 | | 4.4 | | 4.4 | | V | |
| | | 5.5 V | 5.4 | | 5.4 | | 5.4 | | | |
| | $I_{OH} = -24 \text{ mA}$ | 4.5 V | 3.94 | | 3.7 | | 3.8 | | | |
| | | 5.5 V | 4.94 | | 4.7 | | 4.8 | | | |
| | $I_{OH} = -50 \text{ mA}^\ddagger$ | 5.5 V | | | 3.85 | | | | | |
| $I_{OH} = -75 \text{ mA}^\ddagger$ | 5.5 V | | | | | 3.85 | | | | |
| V_{OL} | $I_{OL} = 50 \mu\text{A}$ | 4.5 V | | 0.1 | 0.1 | | 0.1 | | V | |
| | | 5.5 V | | 0.1 | 0.1 | | 0.1 | | | |
| | $I_{OL} = 24 \text{ mA}$ | 4.5 V | | 0.36 | 0.5 | | 0.44 | | | |
| | | 5.5 V | | 0.36 | 0.5 | | 0.44 | | | |
| | $I_{OL} = 50 \text{ mA}^\ddagger$ | 5.5 V | | | 1.65 | | | | | |
| $I_{OL} = 75 \text{ mA}^\ddagger$ | 5.5 V | | | | | 1.65 | | | | |
| I_I | $V_I = V_{CC}$ or GND | 5.5 V | | ± 0.1 | ± 1 | | ± 1 | μA | | |
| I_{CC} | $V_I = V_{CC}$ or GND, $I_O = 0$ | 5.5 V | | 4 | 80 | | 40 | μA | | |
| ΔI_{CC}^\S | One input at 3.4 V, Other inputs at GND or V_{CC} | 5.5 V | | 0.9 | 1 | | 1 | mA | | |
| C_i | $V_I = V_{CC}$ or GND | 5 V | | 3.5 | | | | pF | | |

† Not more than one output should be tested at a time, and the duration of the test should not exceed 10 ms.

§ This is the increase in supply current for each input that is at one of the specified TTL voltage levels rather than 0 V or V_{CC} .



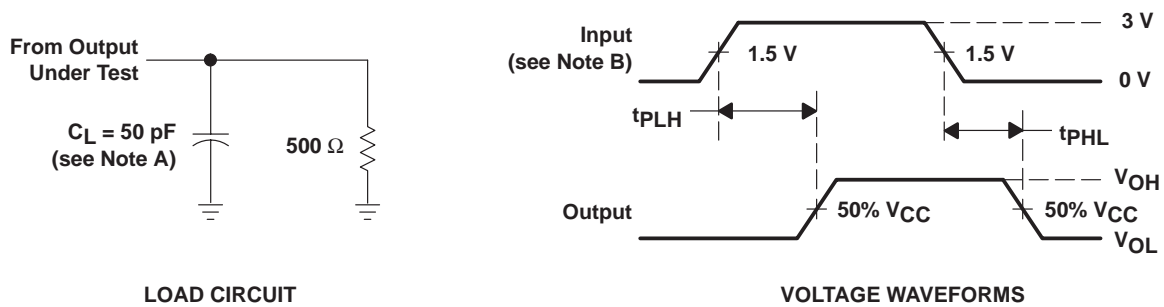
switching characteristics over recommended ranges of supply voltage and free-air temperature (unless otherwise noted) (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | $T_A = 25^\circ\text{C}$ | | | 54ACT11034 | | 74ACT11034 | | UNIT |
|-----------|--------------|-------------|--------------------------|-----|-----|------------|------|------------|-----|------|
| | | | MIN | TYP | MAX | MIN | MAX | MIN | MAX | |
| t_{PLH} | Any | Y | 1.5 | 6.1 | 8.9 | 1.5 | 10.5 | 1.5 | 9.9 | ns |
| t_{PHL} | | | 1.5 | 5.2 | 8 | 1.5 | 9.6 | 1.5 | 8.9 | |

operating characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$

| PARAMETER | TEST CONDITIONS | TYP | UNIT |
|---|---|-----|------|
| C_{pd} Power dissipation capacitance per gate | $C_L = 50\text{ pF}$, $f = 1\text{ MHz}$ | 29 | pF |

PARAMETER MEASUREMENT INFORMATION



- NOTES: A. C_L includes probe and jig capacitance.
 B. Input pulses are supplied by generators having the following characteristics: $PRR \leq 10\text{ MHz}$, $Z_O = 50\ \Omega$, $t_r = 3\text{ ns}$, $t_f = 3\text{ ns}$.
 C. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
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