

SN54S134, SN74S134 12-INPUT POSITIVE-NAND GATES WITH 3-STATE OUTPUTS

SDLS203

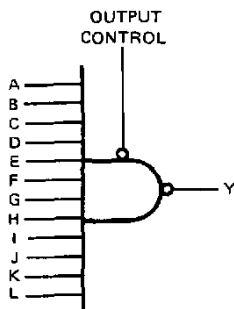
DECEMBER 1983 — REVISED MARCH 1988

- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers and Flat Packages, and Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

description

The 'S134 feature three-state outputs that, when enabled, have the low impedance characteristics of a TTL output with additional drive capability at high logic levels to permit driving heavily loaded lines without external pull-up resistors. When disabled, both output transistors are turned off presenting a high-impedance state to the bus so the output will act neither as a significant load nor as a driver. The 'S134 outputs are disabled when G is high.

logic diagram



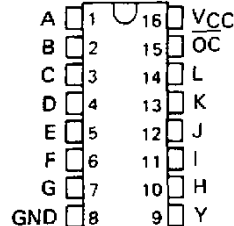
positive logic

$$Y = A \cdot B \cdot C \cdot D \cdot E \cdot F \cdot G \cdot H \cdot I \cdot J \cdot K \cdot L \text{ or}$$

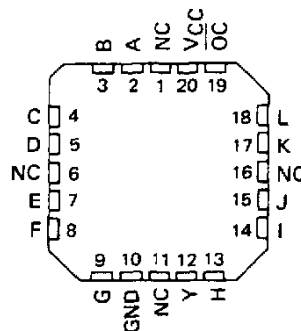
$$Y = \bar{A} + \bar{B} + \bar{C} + \bar{D} + \bar{E} + \bar{F} + \bar{G} + \bar{H} + \bar{I} + \bar{J} + \bar{K} + \bar{L}$$

Output is off (disabled) when output control is high.

SN54S134 . . . J OR W PACKAGE
SN74S134 . . . D OR N PACKAGE
(TOP VIEW)

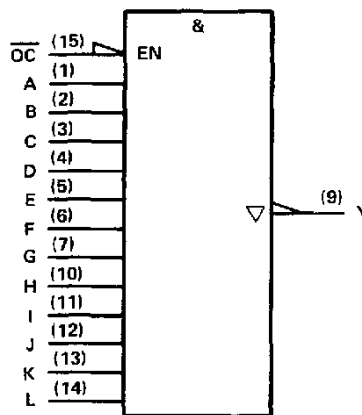


SN54S134 . . . FK PACKAGE
(TOP VIEW)



NC - No internal connection

logic symbol†



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

Pin numbers shown are for D, J, N, and W packages.

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TTL Devices

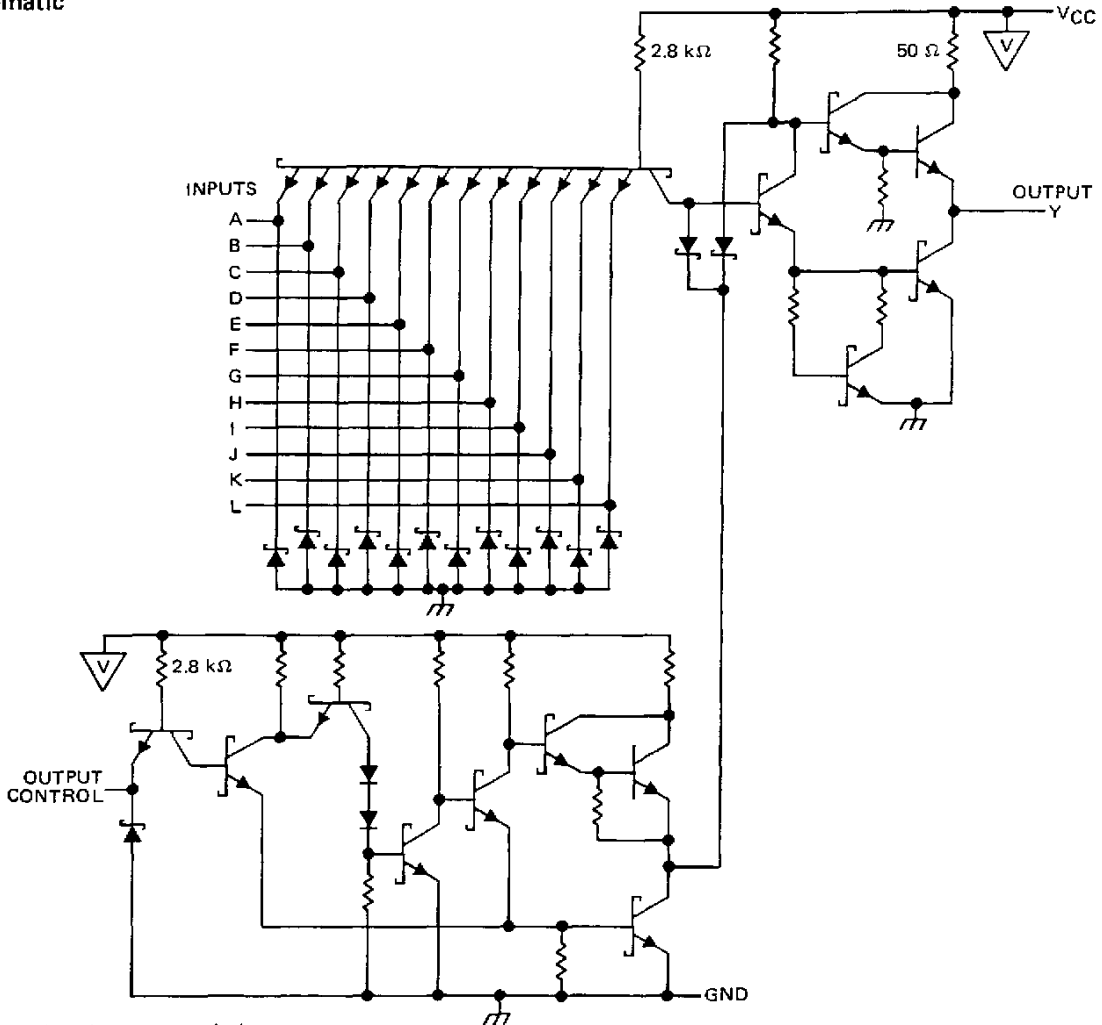
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SN54S134, SN74S134 12-INPUT POSITIVE-NAND GATES WITH 3-STATE OUTPUTS

schematic



Resistor values shown are nominal.

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

| | |
|--|----------------|
| Supply voltage, V_{CC} (see Note 1) | 7 V |
| Input voltage | 5.5 V |
| Voltage applied to a disabled 3-state output | 5.5 V |
| Operating free-air temperature range: SN54' | -55°C to 125°C |
| SN74' | 0°C to 70°C |
| Storage temperature range | -65°C to 150°C |

NOTE 1: Voltage values are with respect to network ground terminal.

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SN54S134, SN74S134

12-INPUT POSITIVE-NAND GATES WITH 3-STATE OUTPUTS

recommended operating conditions

| | SN54S134 | | | SN74S134 | | | UNIT |
|---|----------|-----|-----|----------|-----|------|------|
| | MIN | NOM | MAX | MIN | NOM | MAX | |
| V _{CC} Supply voltage | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| V _{IH} High-level input voltage | 2 | | | 2 | | | V |
| V _{IL} Low-level input voltage | | | 0.8 | | | 0.8 | V |
| I _{OH} High-level output current | | | -2 | | | -6.5 | mA |
| I _{OL} Low-level output current | | | 20 | | | 20 | mA |
| T _A Operating free-air temperature | -55 | | 125 | 0 | | 70 | °C |

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

| PARAMETER | TEST CONDITIONS† | SN54S134 | | SN74S134 | | UNIT | |
|-------------------|--|------------------|------|----------|-----|------|------|
| | | MIN | TYP‡ | MAX | MIN | | TYP‡ |
| V _{IK} | V _{CC} = MIN, I _I = -18 mA | | | -1.2 | | -1.2 | V |
| V _{OH} | V _{CC} = MIN, V _{IH} = 2 V V _{IL} = 0.8 V | 2.4 | 3.4 | | | | V |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 20 mA | | | 0.5 | | 0.5 | V |
| I _{OZ} | V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = 0.8 V | | | 50 | | 50 | μA |
| I _I | V _{CC} = MAX, V _I = 5.5 V | | | 1 | | 1 | mA |
| I _{IH} | V _{CC} = MAX, V _I = 2.7 V | | | 50 | | 50 | μA |
| I _{IL} | V _{CC} = MAX, V _I = 0.5 V | | | -2 | | -2 | mA |
| I _{OS} § | V _{CC} = MAX | -40 | | -100 | -40 | -100 | mA |
| I _{CC} | V _{CC} = MAX | Outputs high | 7 | 13 | 7 | 13 | mA |
| | | Outputs low | 9 | 16 | 9 | 16 | |
| | | Outputs disabled | 14 | 25 | 14 | 25 | |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

§ Not more than one output should be shorted at a time, and duration of the short circuit should not exceed one second.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 2)

| PARAMETER | TEST CONDITIONS | SN54S134 | | SN74S134 | | UNIT | | |
|------------------|--|----------|-----|----------|-----|------|------|-----|
| | | MIN | TYP | MAX | MIN | | TYP | MAX |
| t _{PLH} | R _L = 280 Ω, C _L = 15 pF | 4 | | 6 | 4 | | 6 | ns |
| t _{PLH} | R _L = 280 Ω, C _L = 50 pF | | 5.5 | | | 5.5 | | ns |
| t _{PHL} | R _L = 280 Ω, C _L = 15 pF | | 5 | 7.5 | | 5 | 7.5 | ns |
| t _{PHL} | R _L = 280 Ω, C _L = 50 pF | | 7 | | | 7 | | ns |
| t _{PZH} | R _L = 280 Ω, C _L = 50 pF | | 13 | 19.5 | | 13 | 19.5 | ns |
| t _{PZL} | | | 14 | 21 | | 14 | 21 | ns |
| t _{PHZ} | R _L = 280 Ω, C _L = 5 pF | | 5.5 | 8.5 | | 5.5 | 8.5 | ns |
| t _{PLZ} | | | 9 | 14 | | 9 | 14 | ns |

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.


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