

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

SDLS203

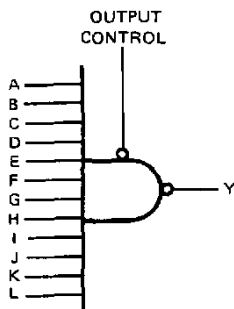
DECEMBER 1983 — REVISED MARCH 1988

- 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



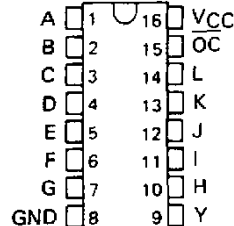
positive logic

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

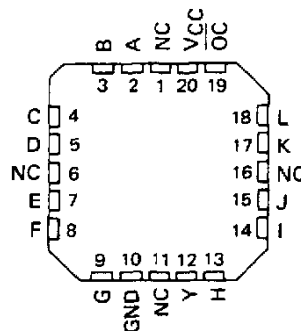
$$Y = \bar{A} + \bar{B} + \bar{C} + \bar{D} + \bar{E} + \bar{F} + \bar{G} + \bar{H} + \bar{I} + \bar{J} + \bar{K} + \bar{L}$$

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

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

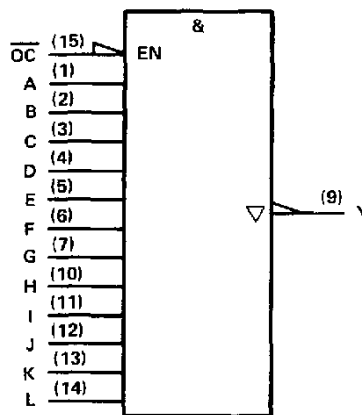


SN54S134 . . . FK PACKAGE
(TOP VIEW)



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.

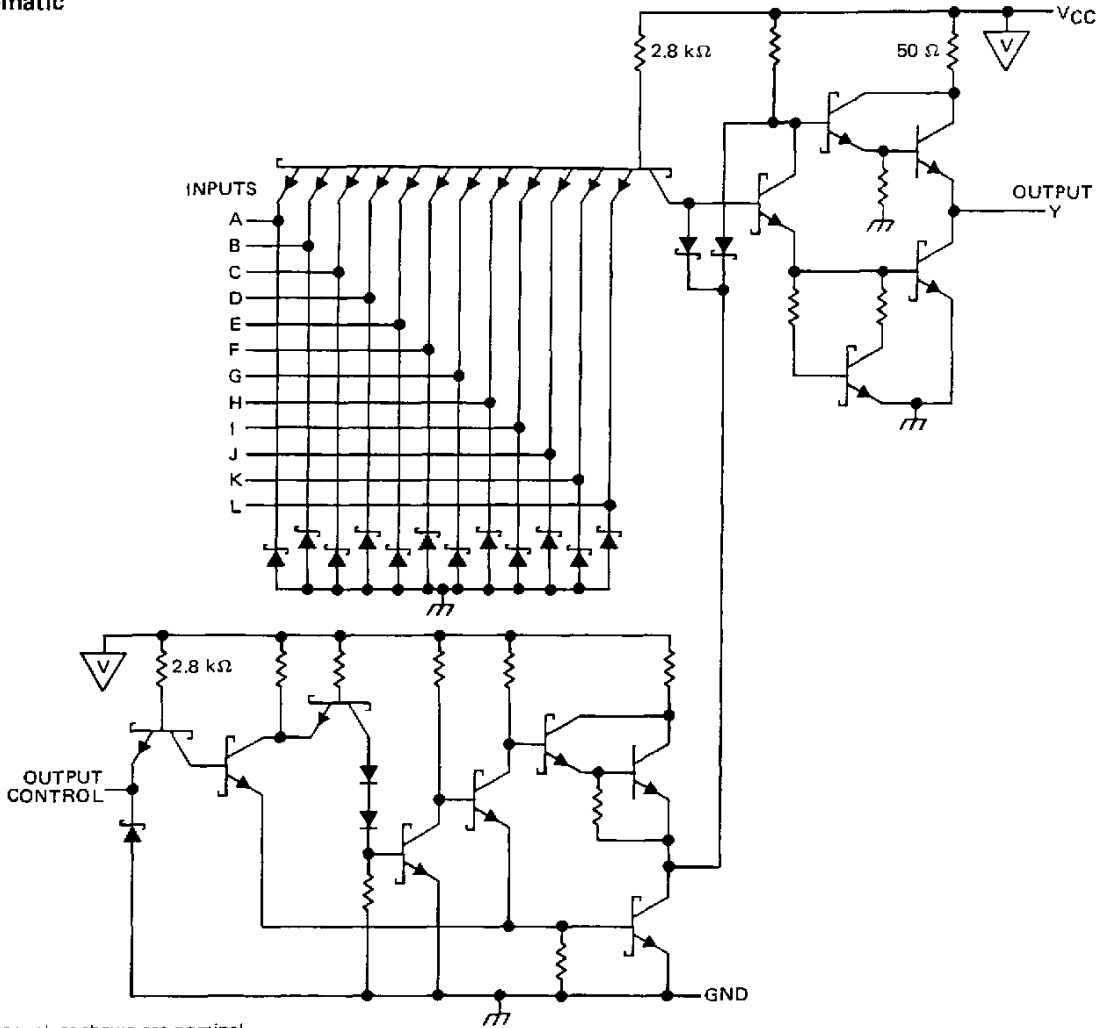
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SN54S134, SN74S134 12-INPUT POSITIVE-NAND GATES WITH 3-STATE OUTPUTS

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 |
| | | | | I _{OH} = -2 mA | | | |
| | | | | I _{OH} = -6.5 mA | | | |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 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 |
| | | | | -50 | | -50 | |
| 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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PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead finish/ Ball material (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|------------------|--------------------------------------|----------------------|--------------|-------------------------|---|
| SN54S134J | ACTIVE | CDIP | J | 16 | 1 | Non-RoHS & Green | SNPB | N / A for Pkg Type | -55 to 125 | SN54S134J |  |
| SNJ54S134J | ACTIVE | CDIP | J | 16 | 1 | Non-RoHS & Green | SNPB | N / A for Pkg Type | -55 to 125 | SNJ54S134J |  |
| SNJ54S134J | ACTIVE | CDIP | J | 16 | 1 | Non-RoHS & Green | SNPB | N / A for Pkg Type | -55 to 125 | SNJ54S134J |  |

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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J (R-GDIP-T**)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



| DIM \ PINS ** | 14 | 16 | 18 | 20 |
|---------------|------------------------|------------------------|------------------------|------------------------|
| A | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC |
| B MAX | 0.785 (19,94) | .840 (21,34) | 0.960 (24,38) | 1.060 (26,92) |
| B MIN | — | — | — | — |
| C MAX | 0.300 (7,62) | 0.300 (7,62) | 0.310 (7,87) | 0.300 (7,62) |
| C MIN | 0.245 (6,22) | 0.245 (6,22) | 0.220 (5,59) | 0.245 (6,22) |



4040083/F 03/03

- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. This package is hermetically sealed with a ceramic lid using glass frit.
 - D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
 - E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

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