Rochester Electronics

*Datasheet*

## Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

## Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
  - Class Q Military
  - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)

- Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

- **Package Options Include Both Plastic and Ceramic Chip Carriers in Addition to Plastic and Ceramic DIPs**
- **Dependable Texas Instruments Quality and Reliability**

## description

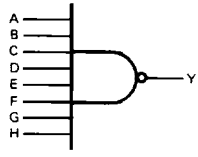
These devices contain a single 8-input NAND gate.

The SN5430, SN54H30, SN54L30, SN54LS30, and SN54S30 are characterized for operation over the full military range of −55°C to 125°C. The SN7430, SN74H30, SN74LS30, and SN74S30 are characterized for operation from 0°C to 70°C.

**FUNCTION TABLE**

| INPUTS A THRU H | OUTPUT Y |
|---|---|
| All inputs H | L |
| One or more inputs L | H |

## logic diagram

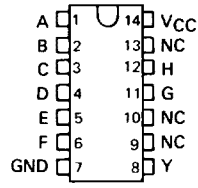



## positive logic

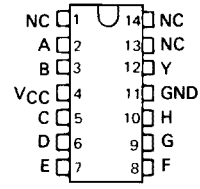
$$Y = \overline{A \cdot B \cdot C \cdot D \cdot E \cdot F \cdot G \cdot H} \quad \text{or}$$

$$Y = \overline{A} + \overline{B} + \overline{C} + \overline{D} + \overline{E} + \overline{F} + \overline{G} + \overline{H}$$

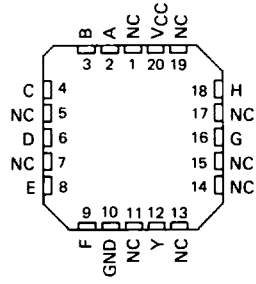
**SN5430, SN54H30, SN54L30 . . . J PACKAGE**
**SN54LS30, SN54S30 . . . J OR W PACKAGE**
**SN7430, SN74H30 . . . J OR N PACKAGE**
**SN74LS30, SN74S30 . . . D, J OR N PACKAGE**
**(TOP VIEW)**




**SN5430, SN54H30 . . . W PACKAGE**
**(TOP VIEW)**




**SN54LS30, SN54S30 . . . FK PACKAGE**
**SN74LS30, SN74S30 . . . FN PACKAGE**
**(TOP VIEW)**

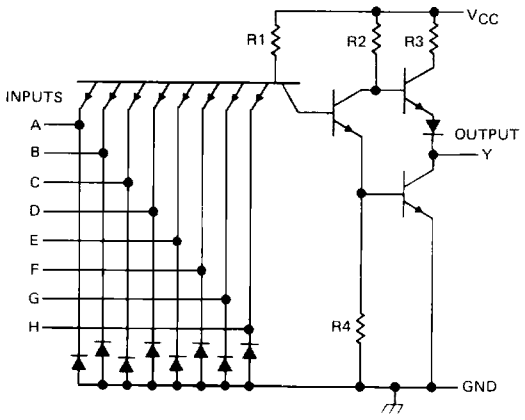



NC - No internal connection

3 TTL DEVICES

**schematics (each gate)**

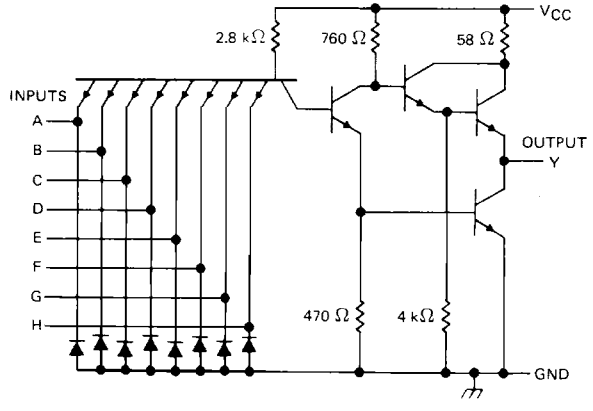
'30, 'L30




| CIRCUIT | R1 | R2 | R3 | R4 |
|---|---|---|---|---|
| '30 | 4 kΩ | 1.6 kΩ | 130 Ω | 1 kΩ |
| 'L30 | 40 kΩ | 20 kΩ | 500 Ω | 12 kΩ |

Input clamp diodes not on SN54L30 circuit.

'H30




Resistor values shown are nominal.





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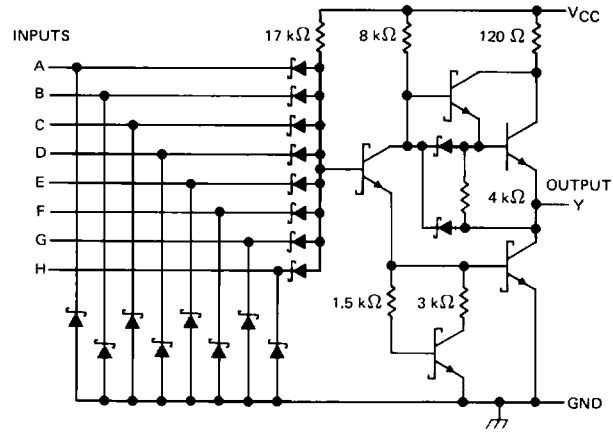
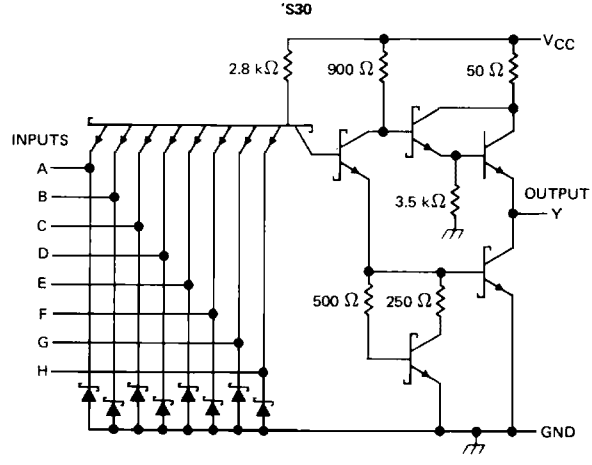
**schematics (each gate)**

'LS30




'S30




Resistor values shown are nominal.

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

Supply voltage, $V_{CC}$ (see Note 1): '30, 'H30, 'LS30, 'S30 . . . . . 7 V
'L30 . . . . . 8 V
Input voltage: '30, 'H30, 'L30, 'S30 . . . . . 5.5 V
'LS30 . . . . . 7 V
Operating free-air temperature: 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.

## recommended operating conditions

| | SN5430 | | | SN7430 | | | 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 | | | −0.4 | | | −0.4 | mA |
| $I_{OL}$ Low-level output current | | | 16 | | | 16 | 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 † | SN5430 | | | SN7430 | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| $V_{IK}$ | $V_{CC}$ = MIN, $I_I$ = −12 mA | | | −1.5 | | | −1.5 | V |
| $V_{OH}$ | $V_{CC}$ = MIN, $V_{IL}$ = 0.8 V, $I_{OH}$ = −0.4 mA | 2.4 | 3.4 | | 2.4 | 3.4 | | V |
| $V_{OL}$ | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $I_{OL}$ = 16 mA | | 0.2 | 0.4 | | 0.2 | 0.4 | V |
| $I_I$ | $V_{CC}$ = MAX, $V_I$ = 5.5 V | | | 1 | | | 1 | mA |
| $I_{IH}$ | $V_{CC}$ = MAX, $V_I$ = 2.4 V | | | 40 | | | 40 | μA |
| $I_{IL}$ | $V_{CC}$ = MAX, $V_I$ = 0.4 V | | | −1.6 | | | −1.6 | mA |
| $I_{OS}$§ | $V_{CC}$ = MAX | −20 | | −55 | −18 | | −55 | mA |
| $I_{CCH}$ | $V_{CC}$ = MAX, $V_I$ = 0 V | | 1 | 2 | | 1 | 2 | mA |
| $I_{CCL}$ | $V_{CC}$ = MAX, $V_I$ = 4.5 V | | 3 | 6 | | 3 | 6 | mA |

† 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.

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

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | Any | Y | $R_L$ = 400 Ω, $C_L$ = 15 pF | | 13 | 22 | ns |
| $t_{PHL}$ | | | | | 8 | 15 | ns |

NOTE 2: See General Information Section for load circuits and voltage waveforms.





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## recommended operating conditions

| | SN54H30 | | | SN74H30 | | | 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 | | | −0.5 | | | −0.5 | 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 † | MIN | TYP‡ | MAX | UNIT |
|---|---|---|---|---|---|
| $V_{IK}$ | $V_{CC}$ = MIN, $I_I$ = −8 mA | | | −1.5 | V |
| $V_{OH}$ | $V_{CC}$ = MIN, $V_{IL}$ = 0.8 V, $I_{OH}$ = −0.5 mA | 2.4 | 3.5 | | V |
| $V_{OL}$ | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $I_{OL}$ = 20 mA | | 0.2 | 0.4 | V |
| $I_I$ | $V_{CC}$ = MAX, $V_I$ = 5.5 V | | | 1 | mA |
| $I_{IH}$ | $V_{CC}$ = MAX, $V_I$ = 2.4 V | | | 50 | μA |
| $I_{IL}$ | $V_{CC}$ = MAX, $V_I$ = 0.4 V | | | −2 | mA |
| $I_{OS}$§ | $V_{CC}$ = MAX | −40 | | −100 | mA |
| $I_{CCH}$ | $V_{CC}$ = MAX, $V_I$ = 0 V | | 2.5 | 4.2 | mA |
| $I_{CCL}$ | $V_{CC}$ = MAX, $V_I$ = 4.5 V | | 6.5 | 10 | mA |

† 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 the duration of the short-circuit should not exceed one second.

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

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | Any | Y | $R_L$ = 280 Ω, $C_L$ = 25 pF | | 6.8 | 10 | ns |
| $t_{PHL}$ | | | | | 8.9 | 12 | ns |

NOTE 2: See General Information Section for load circuits and voltage waveforms.

## recommended operating conditions

| | | SN54L30 | | | UNIT |
|---|---|---|---|---|---|
| | | MIN | NOM | MAX | |
| $V_{CC}$ | Supply voltage | 4.5 | 5 | 5.5 | V |
| $V_{IH}$ | High-level input voltage | 2 | | | V |
| $V_{IL}$ | Low-level input voltage | | | 0.7 | V |
| $I_{OH}$ | High-level output current | | | −0.1 | mA |
| $I_{OL}$ | Low-level output current | | | 2 | mA |
| $T_A$ | Operating free-air temperature | −55 | | 125 | °C |

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

| PARAMETER | TEST CONDITIONS † | SN54L30 | | | UNIT |
|---|---|---|---|---|---|
| | | MIN | TYP‡ | MAX | |
| $V_{OH}$ | $V_{CC}$ = MIN, $V_{IL}$ = 0.7 V, $I_{OH}$ = −0.1 mA | 2.4 | 3.3 | | V |
| $V_{OL}$ | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $I_{OL}$ = 2 mA | | 0.15 | 0.3 | V |
| $I_I$ | $V_{CC}$ = MAX, $V_I$ = 5.5 V | | | 0.1 | mA |
| $I_{IH}$ | $V_{CC}$ = MAX, $V_I$ = 2.4 V | | | 10 | μA |
| $I_{IL}$ | $V_{CC}$ = MAX, $V_I$ = 0.3 V | | | −0.18 | mA |
| $I_{OS}$§ | $V_{CC}$ = MAX | −3 | | −15 | mA |
| $I_{CCH}$ | $V_{CC}$ = MAX, $V_I$ = 0 V | | 0.11 | 0.33 | mA |
| $I_{CCL}$ | $V_{CC}$ = MAX, $V_I$ = 4.5 V | | 0.29 | 0.51 | mA |

† 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.

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

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | Any | Y | $R_L$ = 4 kΩ, $C_L$ = 50 pF | | 35 | 60 | ns |
| $t_{PHL}$ | | | | | 70 | 100 | ns |

NOTE 2: See General Information Section for load circuits and voltage waveforms.





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## recommended operating conditions

| | SN54LS30 | | | SN74LS30 | | | 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 | | | 0.7 | | | 0.8 | V |
| $I_{OH}$ High-level output current | | | −0.4 | | | −0.4 | mA |
| $I_{OL}$ Low-level output current | | | 4 | | | 8 | 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 † | | | | SN54LS30 | | | SN74LS30 | | | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| $V_{IK}$ | $V_{CC}$ = MIN, | $I_I$ = −18 mA | | | | | −1.5 | | | −1.5 | V |
| $V_{OH}$ | $V_{CC}$ = MIN, | $V_{IL}$ = MAX, | $I_{OH}$ = −0.4 mA | | 2.5 | 3.4 | | 2.7 | 3.4 | | V |
| $V_{OL}$ | $V_{CC}$ = MIN, | $V_{IH}$ = 2 V, | $I_{OL}$ = 4 mA | | | 0.25 | 0.4 | | | 0.4 | V |
| | $V_{CC}$ = MIN, | $V_{IH}$ = 2 V, | $I_{OL}$ = 8 mA | | | | | | 0.25 | 0.5 | |
| $I_I$ | $V_{CC}$ = MAX, | $V_I$ = 7 V | | | | | 0.1 | | | 0.1 | mA |
| $I_{IH}$ | $V_{CC}$ = MAX, | $V_I$ = 2.7 V | | | | | 20 | | | 20 | μA |
| $I_{IL}$ | $V_{CC}$ = MAX, | $V_I$ = 0.4 V | | | | | −0.4 | | | −0.4 | mA |
| $I_{OS}$§ | $V_{CC}$ = MAX | | | | −20 | | −100 | −20 | | −100 | mA |
| $I_{CCH}$ | $V_{CC}$ = MAX, | $V_I$ = 0 V | | | | 0.35 | 0.5 | | 0.35 | 0.5 | mA |
| $I_{CCL}$ | $V_{CC}$ = MAX, | $V_I$ = 4.5 V | | | | 0.6 | 1.1 | | 0.6 | 1.1 | mA |

† 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 the duration of the short-circuit should not exceed one second.

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

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | Any | Y | $R_L$ = 2 kΩ, | $C_L$ = 15 pF | | 8 | 15 | ns |
| $t_{PHL}$ | | | | | | 13 | 20 | ns |

NOTE 2: See General Information Section for load circuits and voltage waveforms

## recommended operating conditions

| | SN54S30 | | | SN74S30 | | | 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 | | | −1 | | | −1 | 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 † | SN54S30 | | | SN74S30 | | | UNIT |
|---|---|---|---|---|---|---|---|---|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| $V_{IK}$ | $V_{CC}$ = MIN, $I_I$ = −18 mA | | | −1.2 | | | −1.2 | V |
| $V_{OH}$ | $V_{CC}$ = MIN, $V_{IL}$ = 0.8 V, $I_{OH}$ = −1 mA | 2.5 | 3.4 | | 2.7 | 3.4 | | V |
| $V_{OL}$ | $V_{CC}$ = MIN, $V_{IH}$ = 2 V, $I_{OL}$ = 20 mA | | | 0.5 | | | 0.5 | V |
| $I_I$ | $V_{CC}$ = 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 |
| $I_{CCH}$ | $V_{CC}$ = MAX, $V_I$ = 0 V | | 3 | 5 | | 3 | 5 | mA |
| $I_{CCL}$ | $V_{CC}$ = MAX, $V_I$ = 4.5 V | | 5.5 | 10 | | 5.5 | 10 | mA |

† 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 the duration of the short-circuit should not exceed one second.

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

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|---|
| $t_{PLH}$ | Any | Y | $R_L$ = 280 Ω, $C_L$ = 15 pF | | 4 | 6 | ns |
| $t_{PHL}$ | | | | | 4.5 | 7 | ns |
| $t_{PLH}$ | | | $R_L$ = 280 Ω, $C_L$ = 50 pF | | 5.5 | | ns |
| $t_{PHL}$ | | | | | 6.5 | | ns |

NOTE 2: See General Information Section for load circuits and voltage waveforms.





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