

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.

TYPES SN5450, SN54H50, SN7450, SN74H50 DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATES (ONE GATE EXPANDABLE)

REVISED DECEMBER 1983

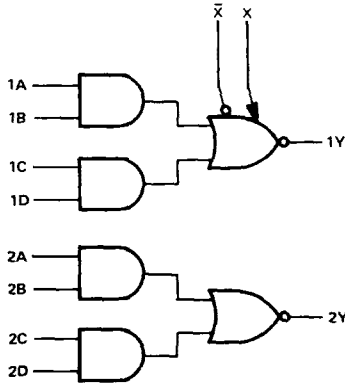
- Package Options Include Plastic and Ceramic DIPs
- Dependable Texas Instruments Quality and Reliability

description

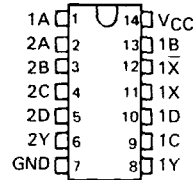
These devices contain two independent 2-wide 2-input AND-OR-INVERT gates with one gate expandable. They perform the Boolean function $Y = \overline{AB + CD + X}$ with X = output of SN5460/SN7460 for the SN5450/SN7450 and X = output of SN54H60/SN74H60 or SN54H62/SH74H62 for the SN54H50/SH74H50.

The SN5450 and SN54H50 are characterized for operation over the full military temperature range of -55°C to 125°C . The SN7450 and SN74H50 are characterized for operation from 0°C to 70°C .

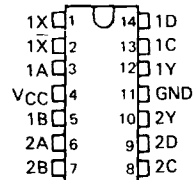
logic diagram



SN5450, SN54H50 . . . J PACKAGE
SN7450, SN74H50 . . . J OR N PACKAGE
(TOP VIEW)



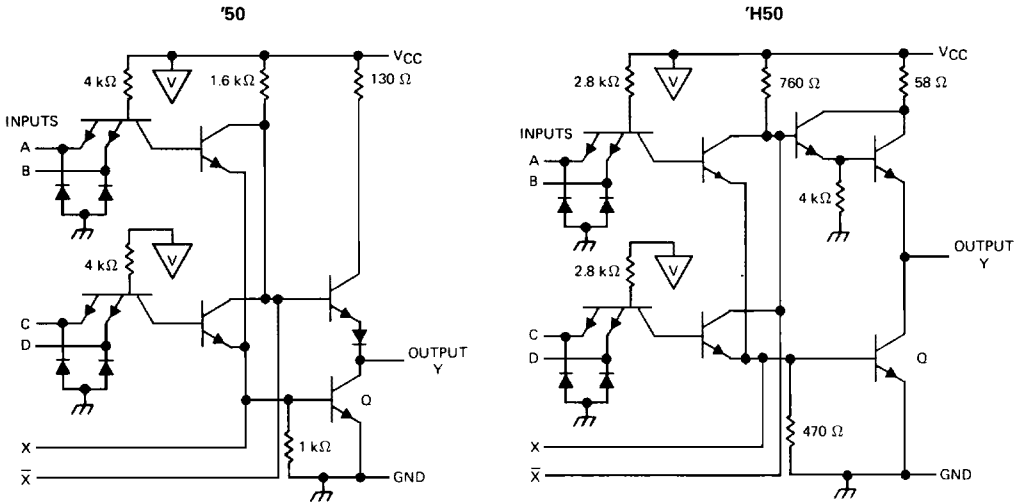
SN5450, SN54H50 . . . W PACKAGE
(TOP VIEW)



TYPES SN5450, SN54H50, SN7450, SN74H50

DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATES (ONE GATE EXPANDABLE)

schematic



Resistor values shown are nominal.
If expander is not used, leave X and \bar{X} open.

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 |
| 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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TTL DEVICES

TYPES SN5450, SN7450

DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATES (ONE GATE EXPANDABLE)

recommended operating conditions

| | | SN5450 | | | SN7450 | | | 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 | | | V | |
| I_{OH} | High-level output current | | | | -0.4 | | | mA | |
| I_{OL} | Low-level output current | | | | 16 | | | mA | |
| T_A | Operating free-air temperature | -55 | | | 125 | | | 0 | °C |

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

| PARAMETER | TEST CONDITIONS† | SN5450 | | | SN7450 | | | UNIT |
|-----------------|---|---------|------|-----|---------|------|-----|------|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| V_{IK} | $V_{CC} = \text{MIN}, I_I = -12 \text{ mA}$ | -1.5 | | | -1.5 | | | V |
| V_{OH} | $V_{CC} = \text{MIN}, V_{IL} = 0.8 \text{ V}, I_{OH} = -0.4 \text{ mA}$ | 2.4 | 3.4 | | 2.4 | 3.4 | | V |
| V_{OL} | $V_{CC} = \text{MIN}, V_{IH} = 2 \text{ V}, I_{OL} = 16 \text{ mA}$ | 0.2 0.4 | | | 0.2 0.4 | | | V |
| I_I | $V_{CC} = \text{MAX}, V_I = 5.5 \text{ V}$ | 1 | | | 1 | | | mA |
| I_{IH} | $V_{CC} = \text{MAX}, V_{IH} = 2.4 \text{ V}$ | 40 | | | 40 | | | μA |
| I_{IL} | $V_{CC} = \text{MAX}, V_{IL} = 0.4 \text{ V}$ | -1.6 | | | -1.6 | | | mA |
| $I_{OS}§$ | $V_{CC} = \text{MAX}$ | -20 | | -55 | -18 | | -55 | mA |
| I_{CCH} | $V_{CC} = \text{MAX}, V_I = 0 \text{ V}$ | 4 8 | | | 4 8 | | | mA |
| I_{CCL} | $V_{CC} = \text{MAX}, \text{See Note 2}$ | 7.4 14 | | | 7.4 14 | | | mA |
| $I_{\bar{X}}^▲$ | $V_{\bar{X}X} = 0.4 \text{ V}, I_{OL} = 16 \text{ mA}$ | -2.9 | | | -3.1 | | | mA |
| $V_{BE(Q)▲}$ | $I_X + I_{\bar{X}} = 0.41 \text{ mA}, R_{\bar{X}X} = 0, I_{OL} = 16 \text{ mA}$ $I_X + I_{\bar{X}} = 0.62 \text{ mA}, R_{\bar{X}X} = 0, I_{OL} = 16 \text{ mA}$ | 1.1 | | | 1 | | | V |
| $V_{OH}^▲$ | $I_X = 0.15 \text{ mA}, I_{\bar{X}} = -0.15 \text{ mA}, I_{OH} = -0.4 \text{ mA}$ $I_X = 0.27 \text{ mA}, I_{\bar{X}} = -0.27 \text{ mA}, I_{OH} = -0.4 \text{ mA}$ | 2.4 | 3.4 | | 2.4 | 3.4 | | V |
| $V_{OL}^▲$ | $I_X + I_{\bar{X}} = 0.3 \text{ mA}, R_{\bar{X}X} = 138 \Omega, I_{OL} = 16 \text{ mA}$ $I_X + I_{\bar{X}} = 0.43 \text{ mA}, R_{\bar{X}X} = 130 \Omega, I_{OL} = 16 \text{ mA}$ | 0.2 0.4 | | | 0.2 0.4 | | | V |

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

‡ All typical values are at $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$.

§ Not more than one output should be shorted at a time.

▲ Using expander inputs, $V_{CC} = \text{MIN}, T_A = \text{MIN}$, except typical values.

NOTE 2: All inputs of one AND gate at 4.5 V, all others at GND.

switching characteristics, $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$ (see note 3)

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

NOTE 3: See General Information Section for load circuits and voltage waveforms.

TYPES SN54H50, SN74H50

DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATES (ONE GATE EXPANDABLE)

recommended operating conditions

| | SN54H50 | | | SN74H50 | | | 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 | | | V |
| I _{OH} High-level output current | | | | -0.5 | | | mA |
| I _{OL} Low-level output current | | | | 20 | | | 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† | | | SN54H50 | | | SN74H50 | | | UNIT |
|-----------------------|---|--|--|---------|------|------|---------|------|------|------|
| | | | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| V _{IK} | V _{CC} = MIN, I _I = -8 mA | | | -1.5 | | | -1.5 | | | V |
| V _{OH} | V _{CC} = MIN, V _{IL} = 0.8 V, I _{OH} = -0.5 mA | | | 2.4 | 3.4 | | 2.4 | 3.4 | | V |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 20 mA | | | 0.2 | | | 0.2 | | | V |
| I _I | V _{CC} = MAX, V _I = 5.5 V | | | | | | 1 | | | mA |
| I _{IH} | V _{CC} = MAX, V _{IH} = 2.4 V | | | | | | 50 | | | μA |
| I _{IL} | V _{CC} = MAX, V _{IL} = 0.4 V | | | | | | -2 | | | mA |
| I _{OS} § | V _{CC} = MAX | | | -40 | | -100 | -40 | | -100 | mA |
| I _{CCH} | V _{CC} = MAX, V _I = 0 V | | | 8.2 | | | 12.8 | | | mA |
| I _{CCL} | V _{CC} = MAX, See Note 2 | | | 15.2 | | | 24 | | | mA |
| I _X ▲ | V _X = 1.4 V, I _X = 0, I _{OL} = 0 | | | -5.85 | | | -6.3 | | | mA |
| V _{BE(IQ)} ▲ | I _X + I _X = 0.7 mA, R _X X = 0, I _{OL} = 20 mA | | | | | | 1.1 | | | V |
| | I _X + I _X = 1.1 mA, R _X X = 0, I _{OL} = 20 mA | | | | | | 1 | | | V |
| V _{OH} ▲ | I _X = 0.32 mA, I _X = -0.32 mA, I _{OH} = -0.5 mA | | | 2.4 | 3.4 | | | | | V |
| | I _X = 0.57 mA, I _X = -0.57 mA, I _{OH} = -0.5 mA | | | | | | 2.4 | 3.4 | | V |
| V _{OL} ▲ | I _X + I _X = 0.47 mA, R _X X = 68 Ω, I _{OL} = 20 mA | | | 0.2 | | | 0.4 | | | V |
| | I _X + I _X = 0.6 mA, R _X X = 63 Ω, I _{OL} = 20 mA | | | | | | 0.2 | | | V |

† 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.

▲ Using expander inputs, V_{CC} = MIN, T_A = MIN, except typical values.

NOTE 2: All inputs of one AND gate at 4.5 V, all others at GND.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 3)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|------------------|--------------|-------------|---|-----------------------------------|-----|-----|------|
| t _{PLH} | Any | Y | R _L = 280 Ω, Expander pins open | C _L = 25 pF | 6.8 | 11 | ns |
| t _{PHL} | | | | | 6.2 | 11 | ns |
| t _{PLH} | | | R _L = 280 Ω, Ground to X | C _L = 25 pF, C = 15 pF | 11 | | ns |
| t _{PHL} | | | | | 7.4 | | ns |

NOTE 3: See General Information Section for load circuits and voltage waveforms.



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