

SN5426, SN54LS26, SN7426, SN74LS26 QUADRUPLE 2-INPUT HIGH-VOLTAGE INTERFACE POSITIVE-NAND GATES

DECEMBER 1983—REVISED MARCH 1988

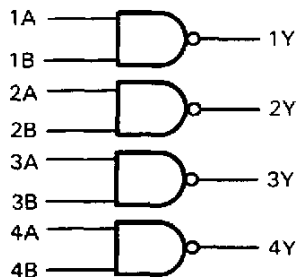
- For Driving Low-Threshold-Voltage MOS Inputs

description

These 2-input open-collector NAND gates feature high-output voltage ratings for interfacing with low-threshold-voltage MOS logic circuits or other 12-volt systems. Although the output is rated to withstand 15 volts, the V_{CC} terminal is connected to the standard 5-volt source.

The SN5426 and SN54LS26 are characterized for operation over the full military temperature range of -55°C to 125°C . The SN7426 and SN74LS26 are characterized for operation from 0°C to 70°C .

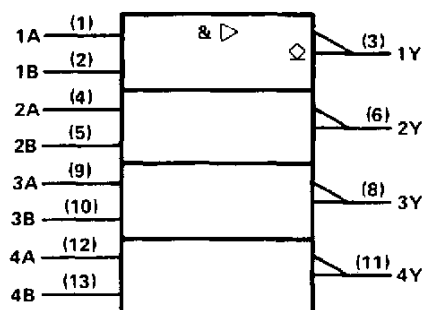
logic diagram



positive logic

$$Y = \overline{AB}$$

logic symbol†

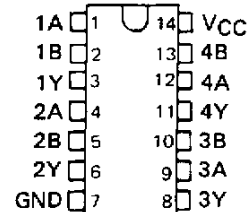


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

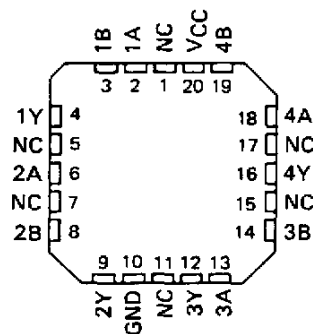
SN5426 . . . J PACKAGE
SN54LS26 . . . J OR W PACKAGE
SN7426 . . . N PACKAGE
SN74LS26 . . . D OR N PACKAGE

(TOP VIEW)



SN54LS26 . . . FK PACKAGE

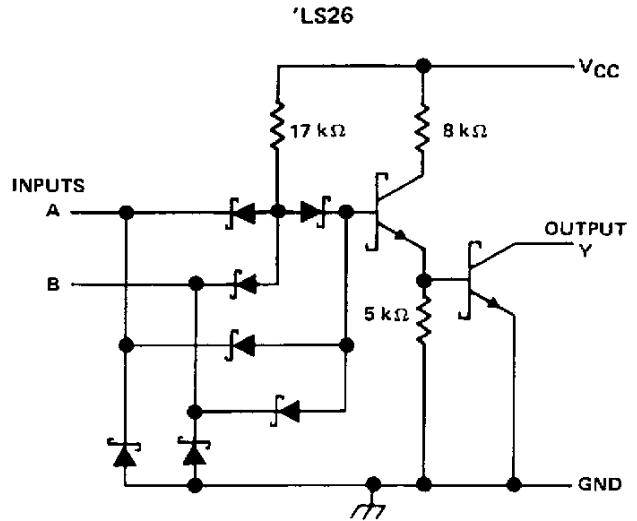
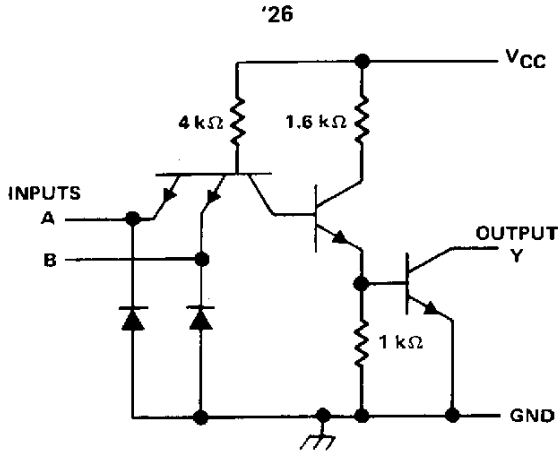
(TOP VIEW)



NC - No internal connection

SN5426, SN54LS26, SNSN7426, SN74LS26
QUADRUPLE 2-INPUT
HIGH-VOLTAGE INTERFACE POSITIVE-NAND GATES

schematics



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: '26 | 5.5 V |
| 'LS26 | 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.

SN54LS26, SN74LS26
QUADRUPLE 2-INPUT
HIGH-VOLTAGE INTERFACE POSITIVE-NAND GATES

recommended operating conditions

| | SN54LS26 | | | SN74LS26 | | | 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 |
| V _{OH} High-level output voltage | | | 15 | | | 15 | V |
| 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† | SN54LS26 | | | SN74LS26 | | | UNIT |
|-------------------|--|----------|------|-----|----------|------|-----|------|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| V _{IK} | V _{CC} = MIN, I _I = -18 mA | | -1.5 | | | -1.5 | V | |
| I _{OH} | V _{CC} = MIN, V _{IL} = MAX, V _{OH} = 12 V | | | 50 | | | μA | |
| | V _{CC} = MIN, V _{IL} = MAX, V _{OH} = 15 V | | | 1 | | | mA | |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 4 mA | 0.25 | 0.4 | | 0.25 | 0.4 | V | |
| | V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 8 mA | | | | 0.35 | 0.5 | | |
| I _I | V _{CC} = MAX, V _I = 7 V | | 0.1 | | | 0.1 | mA | |
| I _{IH} | V _{CC} = MAX, V _{IH} = 2.7 V | | 20 | | | 20 | μA | |
| I _{IL} | V _{CC} = MAX, V _{IL} = 0.4 V | | -0.4 | | | -0.4 | mA | |
| I _{CCCH} | V _{CC} = MAX, V _I = 0 | 0.8 | 1.6 | | 0.8 | 1.6 | mA | |
| I _{CCL} | V _{CC} = MAX, V _I = 4.5 V | 2.4 | 4.4 | | 2.4 | 4.4 | | |

† 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.

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} | A or B | Y | R _L = 2 kΩ, C _L = 15 pF | | 17 | 32 | ns |
| t _{PHL} | | | | | 15 | 28 | ns |

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

SN5426, SN7426
QUADRUPLE 2-INPUT
HIGH-VOLTAGE INTERFACE POSITIVE-NAND GATES

recommended operating conditions

| | SN5426 | | | SN7426 | | | 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 | | |
| V _{OH} High-level output voltage | 15 | | | 15 | | | V | | |
| 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† | SN5426 | | | SN7426 | | | UNIT | |
|------------------|--|--------|------|-----|--------|------|-----|------|----|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | | |
| V _{IK} | V _{CC} = MIN, I _I = -12 mA | -1.5 | | | -1.5 | | | V | |
| I _{OH} | V _{CC} = MIN, V _{IL} = 0.8 V, V _{OH} = 12 V | | | | 50 | | | μA | |
| | V _{CC} = MIN, V _{IL} = 0.7 V, V _{OH} = 12 V | | | | 50 | | | | |
| | V _{CC} = MIN, V _{IL} = 0.8 V, V _{OH} = 15 V | | | | 1 | | | mA | |
| | V _{CC} = MIN, V _{IL} = 0.7 V, V _{OH} = 15 V | | | | 1 | | | | |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 16 mA | 0.4 | | | 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 _{CCH} | V _{CC} = MAX, V _I = 0 | 4 | | | 4 | | | 8 | mA |
| I _{CCL} | V _{CC} = MAX, V _I = 4.5 V | 12 | | | 12 | | | 22 | 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.

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} | A or B | Y | R _L = 1 kΩ, C _L = 15 pF | 16 | | 24 | ns |
| t _{PHL} | | | | 11 | | 17 | ns |

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

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