

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

DECEMBER 1983—REVISED MARCH 1988

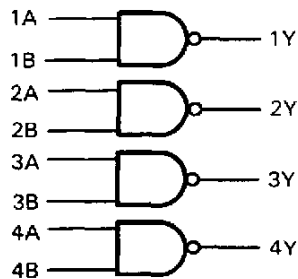
- For Driving Low-Threshold-Voltage MOS Inputs

## 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  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ . The SN7426 and SN74LS26 are characterized for operation from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .

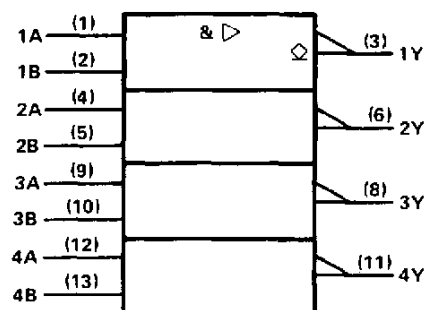
## logic diagram



## positive logic

$$Y = \overline{AB}$$

## logic symbol†

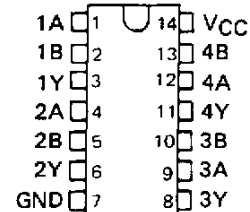


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

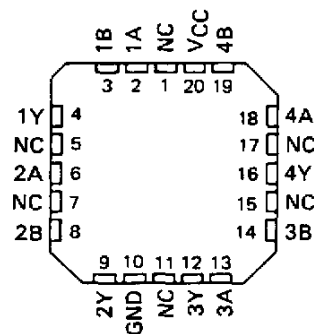
SN5426 . . . J PACKAGE  
SN54LS26 . . . J OR W PACKAGE  
SN7426 . . . N PACKAGE  
SN74LS26 . . . D OR N PACKAGE

(TOP VIEW)



SN54LS26 . . . FK PACKAGE

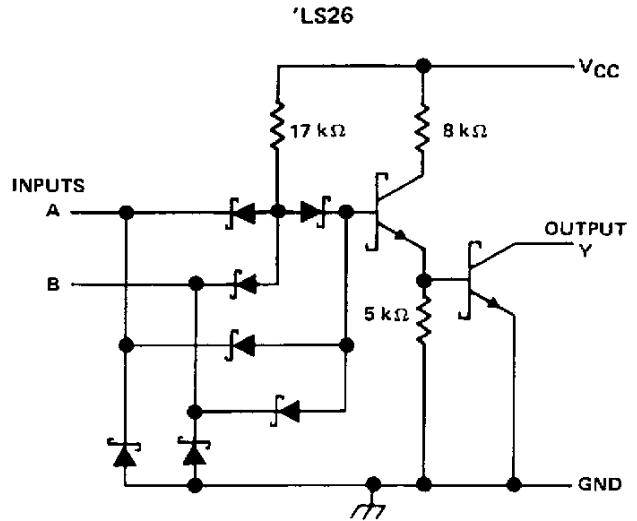
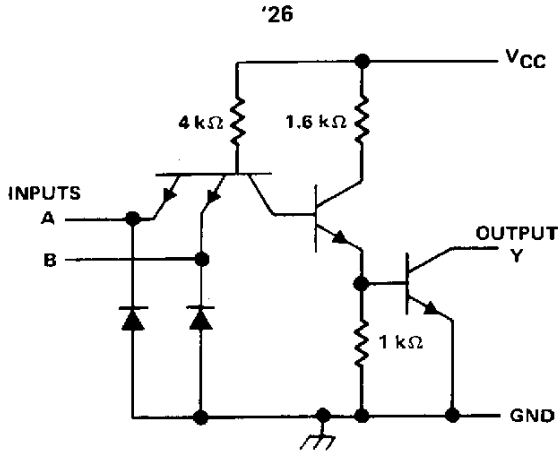
(TOP VIEW)



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 <sub>CC</sub> Supply voltage	4.5	5	5.5	4.75	5	5.25	V
V <sub>IH</sub> High-level input voltage	2			2			V
V <sub>IL</sub> Low-level input voltage			0.7			0.8	V
V <sub>OH</sub> High-level output voltage			15			15	V
I <sub>OL</sub> Low-level output current			4			8	mA
T <sub>A</sub> 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 <sub>IK</sub>	V <sub>CC</sub> = MIN, I <sub>I</sub> = -18 mA		-1.5			-1.5	V	
I <sub>OH</sub>	V <sub>CC</sub> = MIN, V <sub>IL</sub> = MAX, V <sub>OH</sub> = 12 V			50			μA	
	V <sub>CC</sub> = MIN, V <sub>IL</sub> = MAX, V <sub>OH</sub> = 15 V			1			mA	
V <sub>OL</sub>	V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, I <sub>OL</sub> = 4 mA	0.25	0.4		0.25	0.4	V	
	V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, I <sub>OL</sub> = 8 mA				0.35	0.5		
I <sub>I</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 7 V		0.1			0.1	mA	
I <sub>IH</sub>	V <sub>CC</sub> = MAX, V <sub>IH</sub> = 2.7 V		20			20	μA	
I <sub>IL</sub>	V <sub>CC</sub> = MAX, V <sub>IL</sub> = 0.4 V		-0.4			-0.4	mA	
I <sub>CCCH</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 0	0.8	1.6		0.8	1.6	mA	
I <sub>CCL</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 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<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

**switching characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C (see note 2)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t <sub>PLH</sub>	A or B	Y	R <sub>L</sub> = 2 kΩ, C <sub>L</sub> = 15 pF		17	32	ns
t <sub>PHL</sub>					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 <sub>CC</sub> Supply voltage	4.5	5	5.5	4.75	5	5.25	V		
V <sub>IH</sub> High-level input voltage	2			2			V		
V <sub>IL</sub> Low-level input voltage	0.8			0.8			V		
V <sub>OH</sub> High-level output voltage	15			15			V		
I <sub>OL</sub> Low-level output current	16			16			mA		
T <sub>A</sub> 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 <sub>IK</sub>	V <sub>CC</sub> = MIN, I <sub>I</sub> = -12 mA	-1.5			-1.5			V	
I <sub>OH</sub>	V <sub>CC</sub> = MIN, V <sub>IL</sub> = 0.8 V, V <sub>OH</sub> = 12 V				50			μA	
	V <sub>CC</sub> = MIN, V <sub>IL</sub> = 0.7 V, V <sub>OH</sub> = 12 V				50				
	V <sub>CC</sub> = MIN, V <sub>IL</sub> = 0.8 V, V <sub>OH</sub> = 15 V				1			mA	
	V <sub>CC</sub> = MIN, V <sub>IL</sub> = 0.7 V, V <sub>OH</sub> = 15 V				1				
V <sub>OL</sub>	V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, I <sub>OL</sub> = 16 mA	0.4			0.4			V	
I <sub>I</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 5.5 V	1			1			mA	
I <sub>IH</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.4 V	40			40			μA	
I <sub>IL</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.4 V	-1.6			-1.6			mA	
I <sub>CCH</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 0	4			4			8	mA
I <sub>CCL</sub>	V <sub>CC</sub> = MAX, V <sub>I</sub> = 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<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

**switching characteristics, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C (see note 2)**

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t <sub>PLH</sub>	A or B	Y	R <sub>L</sub> = 1 kΩ, C <sub>L</sub> = 15 pF	16		24	ns
t <sub>PHL</sub>				11		17	ns

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

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