SDLS087

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

DECEMBER 1983—REVISED MARCH 1988

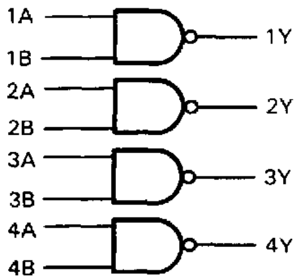
- **For Driving Low-Threshold-Voltage MOS Inputs**

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.

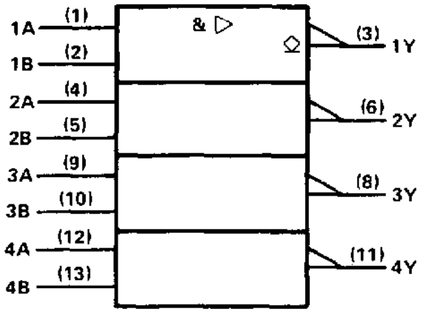
logic diagram



positive logic

$Y = \overline{AB}$

logic symbol†



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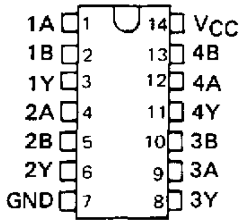
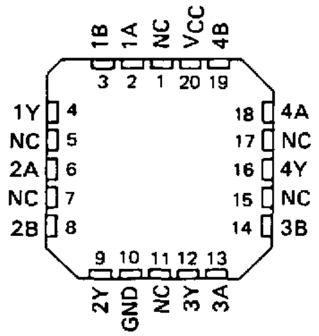
† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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)

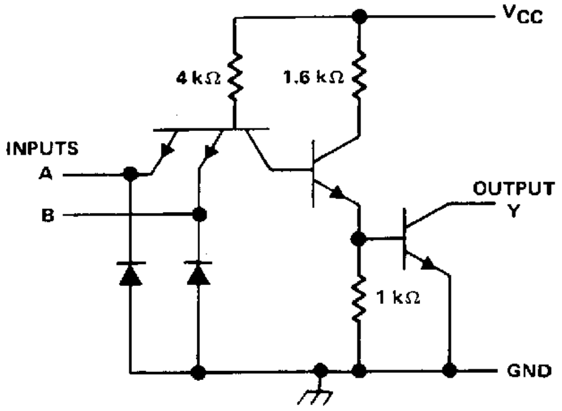


NC - No internal connection

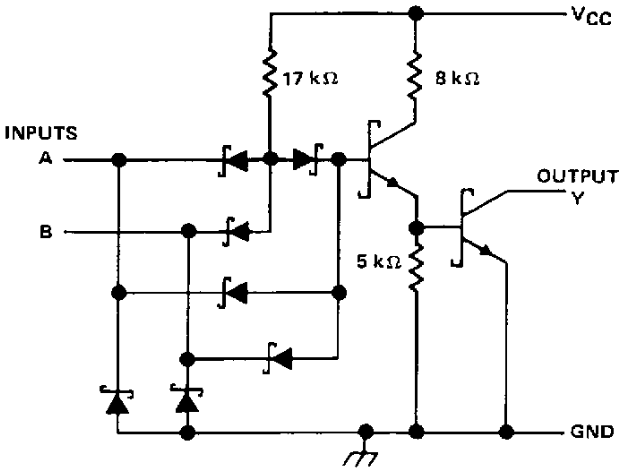
TEXAS INSTRUMENTS

schematics

'26



'LS26



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.

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			50	μA
	V_{CC} = MIN,	V_{IL} = MAX,	V_{OH} = 15 V			1			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_{CCH}	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.

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	8		4	8	mA
I_{CCL}	V_{CC} = MAX, V_I = 4.5 V		12	22		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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