

# SN54ALS30A, SN54AS30, SN74ALS30A, SN74AS30 8-INPUT POSITIVE-NAND GATES

SDAS010C – MARCH 1984 – REVISED NOVEMBER 2000

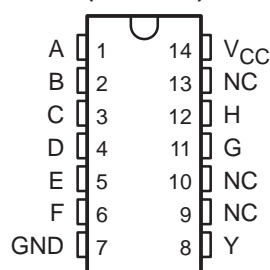
## description

These devices contain an 8-input positive-NAND gate and perform the following Boolean functions in positive logic:

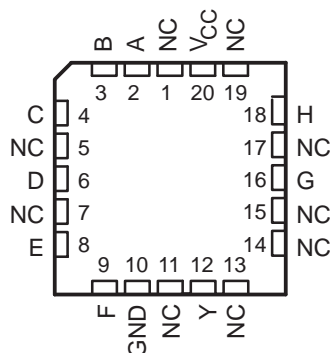
$$Y = \overline{A \cdot B \cdot C \cdot D \cdot E \cdot F \cdot G \cdot H} \text{ or}$$

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

SN54ALS30A, SN54AS30 . . . J PACKAGE  
SN74ALS30A, SN74AS30 . . . D OR N PACKAGE  
SN74AS30 . . . DB PACKAGE  
(TOP VIEW)



SN54ALS30A, SN54AS30 . . . FK PACKAGE  
(TOP VIEW)



NC – No internal connection

## ORDERING INFORMATION

TA	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING	
0°C to 70°C	PDIP – N	Tube	SN74ALS30AN	SN74ALS30AN	
			SN74AS30N	SN74AS30N	
	SOIC – D	Tube	SN74ALS30AD	ALS30A	
			Tape and reel		SN74ALS30AD
			Tube	SN74AS30D	AS30
				Tape and reel	
SSOP – DB	Tape and reel	SN74AS30DBR	AS30		
–55°C to 125°C	CDIP – J	Tube	SNJ54ALS30AJ	SNJ54ALS30AJ	
			SNJ54AS30J	SNJ54AS30J	
	LCCC – FK	Tube	SNJ54ALS30AFK	SNJ54ALS30AFK	
			SNJ54AS30FK	SNJ54AS30FK	

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at [www.ti.com/sc/package](http://www.ti.com/sc/package).



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PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

 **TEXAS  
INSTRUMENTS**

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# SN54ALS30A, SN54AS30, SN74ALS30A, SN74AS30

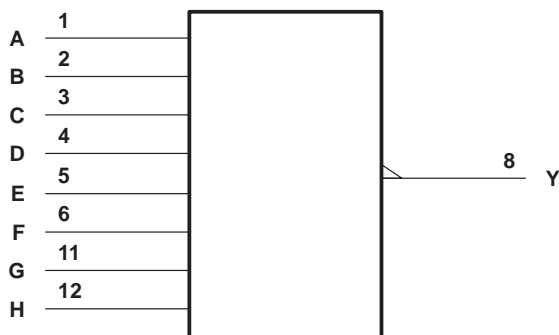
## 8-INPUT POSITIVE-NAND GATES

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FUNCTION TABLE

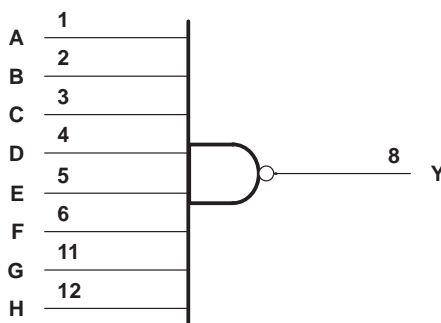
INPUTS A–H	OUTPUT Y
All inputs H	L
One or more inputs L	H

### logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12. Pin numbers shown are for the D, DB, J, and N packages.

### logic diagram (positive logic)



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

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

Supply voltage range, $V_{CC}$ .....	–0.5 V to 7 V
Input voltage range, $V_I$ .....	–0.5 V to 7 V
Package thermal impedance, $\theta_{JA}$ (see Note 1): D package .....	86°C/W
DB package .....	96°C/W
N package .....	80°C/W
Storage temperature range, $T_{stg}$ .....	–65°C to 150°C

‡ Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: The package thermal impedance is calculated in accordance with JESD 51-7.

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## recommended operating conditions

		MIN	NOM	MAX	UNIT
V <sub>CC</sub>	Supply voltage	4.5	5	5.5	V
V <sub>IH</sub>	High-level input voltage	2			V
V <sub>IL</sub>	Low-level input voltage			0.8 <sup>†</sup>	V
				0.7 <sup>‡</sup>	
I <sub>OH</sub>	High-level output current	'ALS30A		-0.4	mA
		'AS30		-2	
I <sub>OL</sub>	Low-level output current	SN54ALS30A		4	mA
		SN74ALS30A		8	
		'AS30		20	
T <sub>A</sub>	Operating free-air temperature	SN54ALS30A	-55	125	°C
		SN54AS30	-55	125	
		SN74ALS30A	0	70	
		SN74AS30	0	70	

<sup>†</sup> Applies to the 'AS30 and SN74ALS30A across the full operating temperature range, and SN54ALS30A over the temperature range of -55°C to 70°C.

<sup>‡</sup> Applies to the SN54ALS30A over the temperature range of 70°C to 125°C.

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

PARAMETER	TEST CONDITIONS		MIN	TYP <sup>§</sup>	MAX	UNIT
V <sub>IK</sub>	V <sub>CC</sub> = 4.5 V,	I <sub>I</sub> = -18 mA	'ALS30A		-1.5	V
			'AS30		-1.2	
V <sub>OH</sub>	V <sub>CC</sub> = 4.5 V to 5.5 V	I <sub>OH</sub> = -0.4 mA	'ALS30A	V <sub>CC</sub> -2		V
		I <sub>OH</sub> = -2 mA	'AS30	V <sub>CC</sub> -2		
V <sub>OL</sub>	V <sub>CC</sub> = 4.5 V	I <sub>OL</sub> = 4 mA	'ALS30A	0.25	0.4	V
		I <sub>OL</sub> = 8 mA	SN74ALS30A	0.35	0.5	
		I <sub>OL</sub> = 20 mA	'AS30	0.35	0.5	
I <sub>I</sub>	V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 7 V			0.1	mA
I <sub>IH</sub>	V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 2.7 V			20	μA
I <sub>IL</sub>	V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 0.4 V	'ALS30A		-0.1	mA
			'AS30		-0.5	
I <sub>O<sup>¶</sup></sub>	V <sub>CC</sub> = 5.5 V,	V <sub>O</sub> = 2.25 V	SN54ALS30A	-20	-112	mA
			SN74ALS30A	-30	-112	
			'AS30	-30	-112	
I <sub>CCH</sub>	V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 0	'ALS30A	0.22	0.36	mA
			'AS30	0.9	1.5	
I <sub>CCL</sub>	V <sub>CC</sub> = 5.5 V,	V <sub>I</sub> = 4.5 V	'ALS30A	0.54	0.9	mA
			'AS30	3	4.9	

<sup>§</sup> All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C.

<sup>¶</sup> The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I<sub>OS</sub>.



# SN54ALS30A, SN54AS30, SN74ALS30A, SN74AS30

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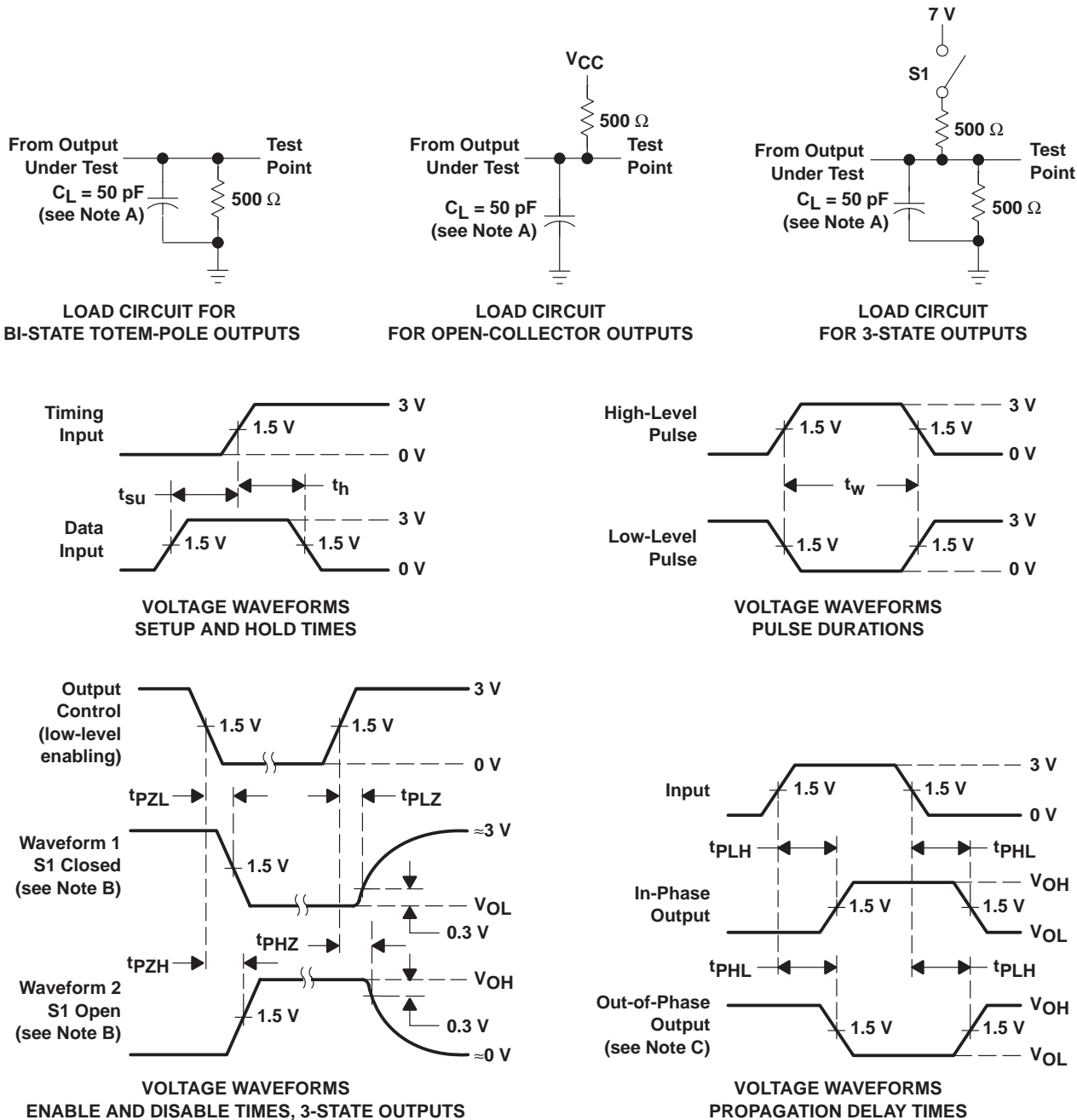
### switching characteristics over recommended operating free-air temperature range (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)		MIN	MAX	UNIT
t <sub>PLH</sub>	A, B, C, D, E, F, G, or H	Y	SN54ALS30A	3	15	ns
			SN74ALS30A	3	10	
			SN54AS30	1	5.5	
			SN74AS30	1	5	
t <sub>PHL</sub>	A, B, C, D, E, F, G, or H	Y	SN54ALS30A	3	15	ns
			SN74ALS30A	3	12	
			SN54AS30	1	5	
			SN74AS30	1	4.5	



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PARAMETER MEASUREMENT INFORMATION  
SERIES 54ALS/74ALS AND 54AS/74AS DEVICES



- NOTES: A.  $C_L$  includes probe and jig capacitance.  
 B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.  
 C. When measuring propagation delay items of 3-state outputs, switch S1 is open.  
 D. All input pulses have the following characteristics:  $PRR \leq 1$  MHz,  $t_r = t_f = 2$  ns, duty cycle = 50%.  
 E. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuits and Voltage Waveforms

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