

# GD54/74S30

## 8-INPUT POSITIVE NAND GATE

### Description

This device contains a single 4-input NAND gate and performs the following Boolean functions in positive logic.

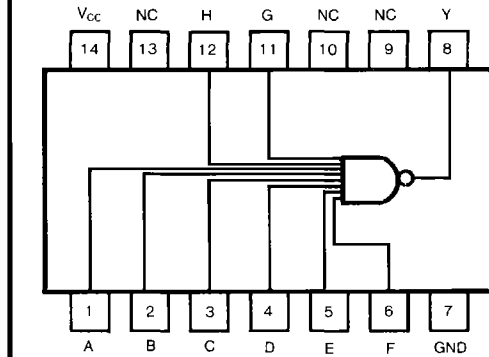
$$Y = \overline{A \cdot B \cdot C \cdot D \cdot E \cdot F \cdot G \cdot H} \text{ or}$$

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

### Function Table

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

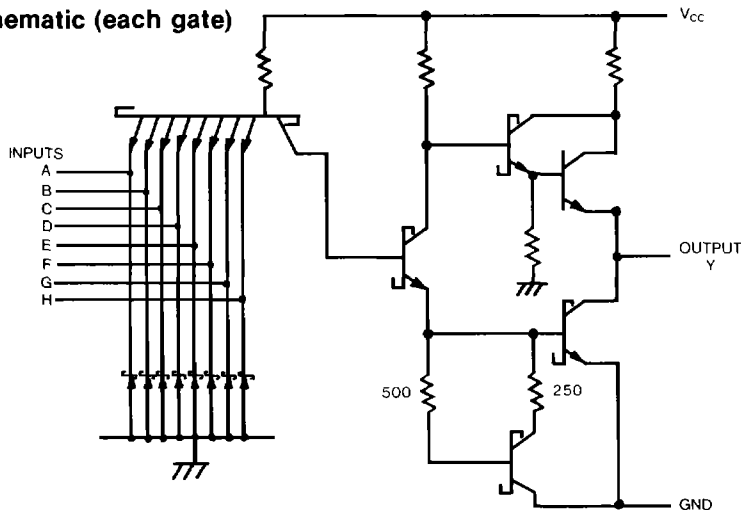
### Pin Configuration



NC No internal connection

Suffix-Blank. Plastic Dual In Line Package  
 Suffix-J : Ceramic Dual In Line Package

### Circuit Schematic (each gate)



### Absolute Maximum Ratings

- Supply voltage,  $V_{CC}$  ..... 7V
- Input voltage ..... 5.5V
- Operating free-air temperature range 54S .....  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$   
 74S .....  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$
- Storage temperature range .....  $-65^{\circ}\text{C}$  to  $150^{\circ}\text{C}$

**Recommended Operating Conditions**

SYMBOL	PARAMETER		MIN	NOM	MAX	UNIT
V <sub>CC</sub>	Supply voltage	54	4.5	5	5.5	V
		74	4.75	5	5.25	
I <sub>OH</sub>	High-level output current				-1	mA
I <sub>OL</sub>	Low-level output current				20	mA
T <sub>A</sub>	Operating free-air temperature	54	-55		125	°C
		74	0		70	

**Electrical Characteristics** over recommended operating free-air temperature range (unless otherwise noted)

SYMBOL	PARAMETER	TEST CONDITIONS	MIN	Typ (Note 1)	MAX	UNIT	
V <sub>IH</sub>	High-level input voltage		2			V	
V <sub>IL</sub>	Low-level input voltage	54			0.8	V	
		74			0.8		
V <sub>IK</sub>	Input clamp voltage	V <sub>CC</sub> =Min, I <sub>I</sub> =-18mA			-1.2	V	
V <sub>OH</sub>	High-level output voltage	V <sub>CC</sub> =Min, V <sub>IL</sub> =Max I <sub>OH</sub> =Max	54	2.5	3.4	V	
			74	2.7	3.4		
V <sub>OL</sub>	Low-level output voltage	V <sub>CC</sub> =Min, V <sub>IH</sub> =Min I <sub>OL</sub> =Max			0.5	V	
I <sub>I</sub>	Input current at maximum input voltage	V <sub>CC</sub> =Max, V <sub>I</sub> =5.5V			1	mA	
I <sub>IH</sub>	High-level input current	V <sub>CC</sub> =Max, V <sub>I</sub> =2.7V			50	μA	
I <sub>IL</sub>	Low-level input current	V <sub>CC</sub> =Max, V <sub>I</sub> =0.5V			-2	mA	
I <sub>OS</sub>	Short-circuit output current	V <sub>CC</sub> =Max (Note 2)	-40		-100	mA	
I <sub>CCH</sub>	Supply current	Total with outputs high	V <sub>CC</sub> =Max		3	5	mA
I <sub>CCL</sub>		Total with outputs low	V <sub>CC</sub> =Max		5.5	10	mA

Note 1. All typical values are at V<sub>CC</sub>=5V, T<sub>A</sub>=25°C

Note 2. Not more than one output should be shorted at a time, and the duration should not exceed one second.

**Switching Characteristics, V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C**

SYMBOL	PARAMETER	TEST CONDITION#	MIN	TYP	MAX	UNIT
t <sub>PLH</sub>	Propagation delay time, low-to-high-level output	C <sub>L</sub> =15pF, R <sub>L</sub> =280Ω		4	6	ns
t <sub>PHL</sub>	Propagation delay time, high-to-low-level output			4.5	7	

\*For load circuit and voltage waveforms, see page 3-12.