

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.

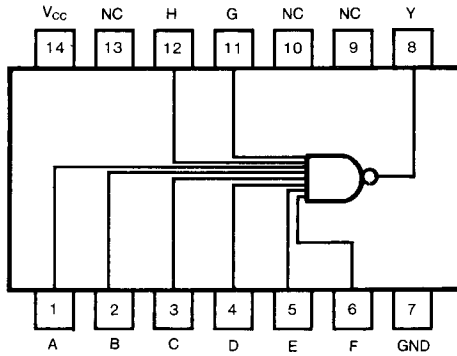
$$Y = \overline{A \cdot B \cdot C \cdot D \cdot E \cdot F \cdot G \cdot H} \text{ or}$$

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

Function Table

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

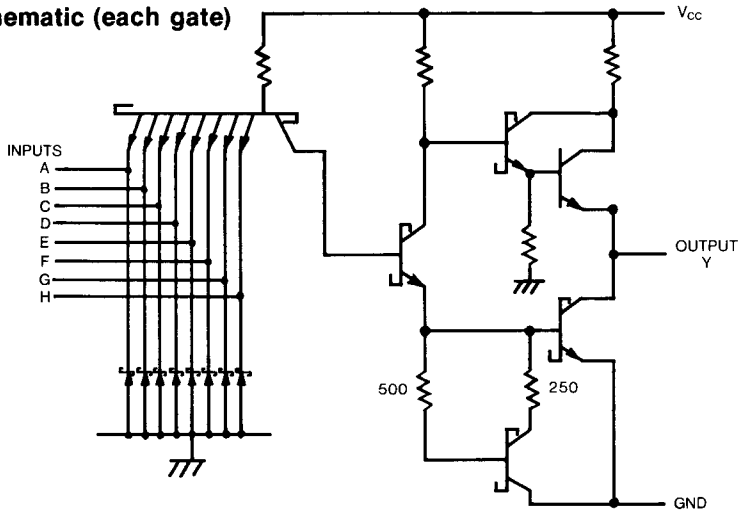
Pin Configuration



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°C to 125°C
 74S 0°C to 70°C
- Storage temperature range -65°C to 150°C

Recommended Operating Conditions

SYMBOL	PARAMETER		MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage	54	4.5	5	5.5	V
		74	4.75	5	5.25	
I_{OH}	High-level output current				-1	mA
I_{OL}	Low-level output current				20	mA
T_A	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_{IH}	High-level input voltage		2			V	
V_{IL}	Low-level input voltage		54		0.8	V	
			74		0.8		
V_{IK}	Input clamp voltage	$V_{CC} = \text{Min}, I_I = -18\text{mA}$			-1.2	V	
V_{OH}	High-level output voltage	$V_{CC} = \text{Min}, V_{IL} = \text{Max}$ $I_{OH} = \text{Max}$	54	2.5	3.4	V	
			74	2.7	3.4		
V_{OL}	Low-level output voltage	$V_{CC} = \text{Min}, V_{IH} = \text{Min}$ $I_{OL} = \text{Max}$			0.5	V	
I_I	Input current at maximum input voltage	$V_{CC} = \text{Max}, V_I = 5.5\text{V}$			1	mA	
I_{IH}	High-level input current	$V_{CC} = \text{Max}, V_I = 2.7\text{V}$			50	μA	
I_{IL}	Low-level input current	$V_{CC} = \text{Max}, V_I = 0.5\text{V}$			-2	mA	
I_{OS}	Short-circuit output current	$V_{CC} = \text{Max}$ (Note 2)	-40		-100	mA	
I_{CCH}	Supply current	Total with outputs high	$V_{CC} = \text{Max}$		3	5	mA
I_{CCL}		Total with outputs low	$V_{CC} = \text{Max}$		5.5	10	mA

Note 1: All typical values are at $V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$.

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

Switching Characteristics, $V_{CC} = 5\text{V}$, $T_A = 25^\circ\text{C}$

SYMBOL	PARAMETER	TEST CONDITION#	MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	$C_L = 15\text{pF}, R_L = 280\Omega$		4	6	ns
t_{PHL}	Propagation delay time, high-to-low-level output			4.5	7	

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