

# GD54/74LS08

## QUADRUPLE 2-INPUT POSITIVE AND GATES

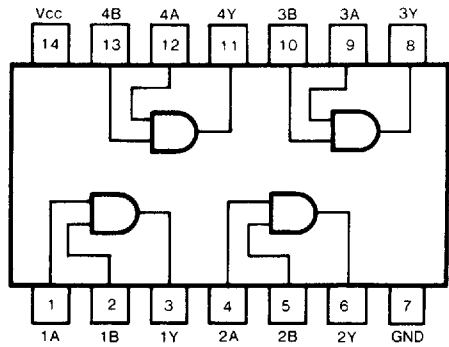
### Description

This device contains four independent 2-input AND gates. It performs the Boolean functions  $Y=A \cdot B$  or  $Y=\overline{A+B}$  in positive logic.

### Function Table (each gate)

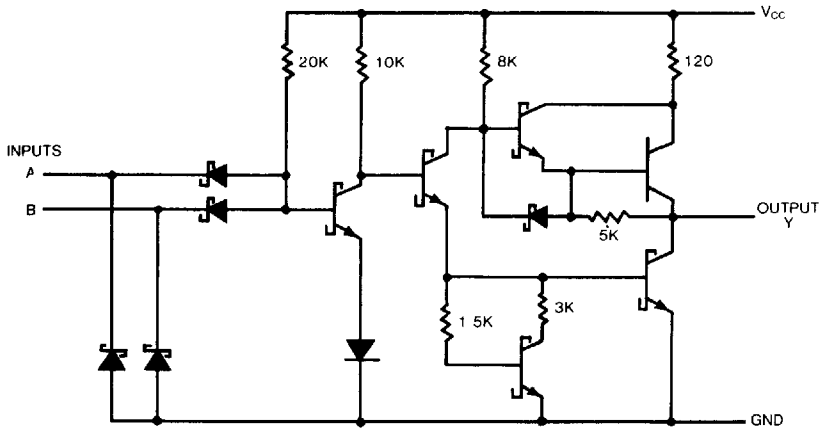
INPUTS		OUTPUT
A	B	Y
H	H	H
L	X	L
X	L	L

### Pin Configuration



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 ..... 7V
- Operating free-air temperature range 54LS .....  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$   
 74LS .....  $0^{\circ}\text{C}$  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	
$V_{CC}$	Supply voltage	54	4.5	5	5.5	V
		74	4.75	5	5.25	
$I_{OH}$	High-level output current	54, 74		-400	$\mu$ A	
$I_{OL}$	Low-level output current	54		4	mA	
		74		8		
$T_A$	Operating free-air temperature	54	-55	125	$^{\circ}$ 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		0.7	V
			74		0.8	
$V_{IK}$	Input clamp voltage	$V_{CC} = \text{Min}$ , $I_I = -18\text{mA}$			-1.5	V
$V_{OH}$	High-level output voltage	$V_{CC} = \text{Min}$ , $V_{IH} = \text{Min}$	54	2.5	3.4	V
		$I_{OH} = \text{Max}$	74	2.7	3.4	
$V_{OL}$	Low-level output voltage	$V_{CC} = \text{Min}$ , $I_{OL} = 4\text{mA}$	54, 74	0.25	0.4	V
		$V_{IL} = \text{Max}$ , $I_{OL} = 8\text{mA}$	74	0.35	0.5	
$I_I$	Input current at maximum input voltage	$V_{CC} = \text{Max}$ , $V_I = 7\text{V}$			0.1	mA
$I_{IH}$	High-level input current	$V_{CC} = \text{Max}$ , $V_I = 2.7\text{V}$			20	$\mu$ A
$I_{IL}$	Low-level input current	$V_{CC} = \text{Max}$ , $V_I = 0.4\text{V}$			-0.4	mA
$I_{OS}$	Short-circuit output current	$V_{CC} = \text{Max}$ (Note 2)	-20		-100	mA
$I_{CCH}$	Supply current	Total with outputs high	$V_{CC} = \text{Max}$	2.4	4.8	mA
		Total with outputs low	$V_{CC} = \text{Max}$	4.4	8.8	

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 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	$C_L = 15\text{pF}$ , $R_L = 2\text{k}\Omega$		8	15	ns
$t_{PHL}$	Propagation delay time, high-to-low-level output			10	20	

#For load circuit and voltage waveforms, see page 3-11