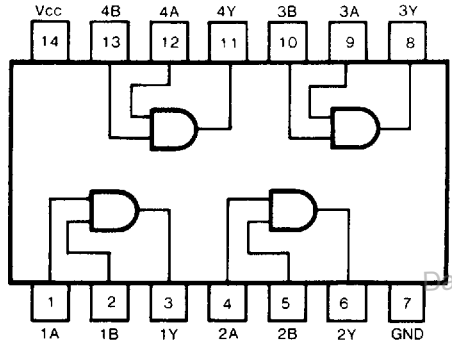


QUADRUPLE 2-INPUT POSITIVE AND GATES**Description**

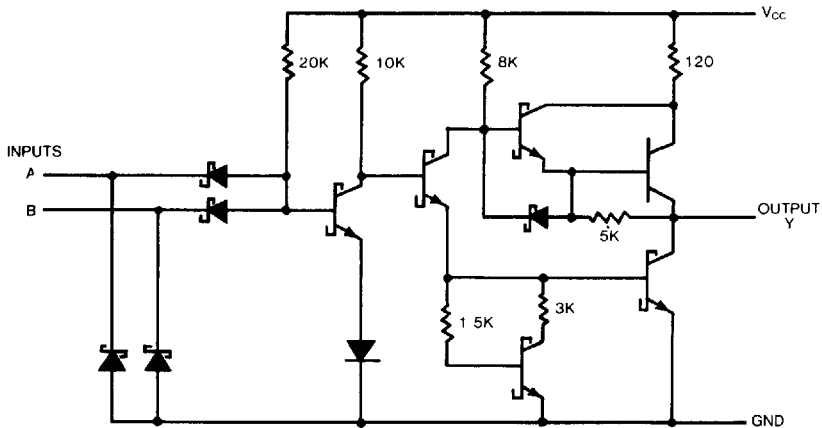
This device contains four independent 2-input AND gates. It performs the Boolean functions $Y=A \cdot B$ or $Y=\overline{A+B}$ in positive logic.

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°C to 125°C
74LS 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	54 74			-400	μ 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	$V_{CC} = \text{Min}, I_{OH} = \text{Max}$	54	2.5 3.4		V	
			74	2.7 3.4			
V_{OL}	Low-level output voltage	$V_{CC} = \text{Min}, I_{OL} = 4\text{mA}$	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	μ 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
I_{CCL}		Total with outputs low	$V_{CC} = \text{Max}$		4.4	8.8	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 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	ns

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