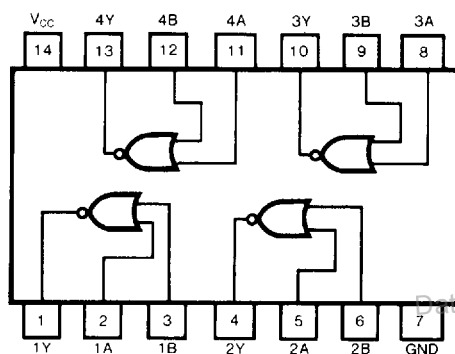


QUADRUPLE 2-INPUT POSITIVE-NOR GATES**Description**

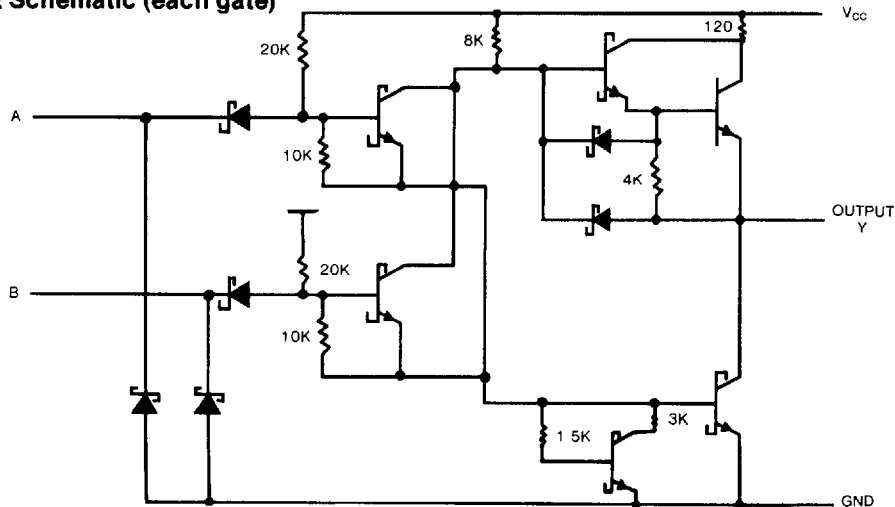
This device contains four independent 2-input NOR gates. It performs the Boolean functions $Y = \overline{A \cdot B}$ or $Y = \overline{A + B}$ in positive logic.

Function Table

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

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			μA
I _{OL}	Low-level output current	54	4			mA
		74	8			
T _A	Operating free-air temperature	54	−55			°C
		74	0			

Electrical Characteristics over recommended operating free air temperature (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} =Min, I _I =−18mA		−1.5				V		
V _{OH}	High-level output voltage		V _{CC} =Min, V _{IL} =Max I _{OH} =Max		54	2.5	3.4			V	
					74	2.7	3.4				
V _{OL}	Low-level output voltage		V _{CC} =Min V _{IH} =Min	I _{OL} =4mA	54,74	0.25	0.4			V	
				I _{OL} =8mA	74	0.35	0.5				
I _I	Input current at maximum input voltage		V _{CC} =Max, V _I =7V		0.1				mA		
I _{IH}	High-level input current		V _{CC} =Max, V _I =2.7V		20				μA		
I _{IL}	Low-level input current		V _{CC} =Max, V _I =0.4V		−0.4				mA		
I _{OS}	Short-circuit output current		V _{CC} =Max (Note 2)		−20		−100		mA		
I _{CCH}	Supply current	Total with outputs high	V _{CC} =Max		1.6		3.2		mA		
I _{CCL}		Total with outputs low	V _{CC} =Max		2.8		5.4		mA		

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

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

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

SYMBOL	PARAMETER	TEST CONDITION#	MIN	TYP	MAX	UNIT
t_{PLH}	Propagation delay time, low-to-high-level output	$C_L = 15\text{pF}, R_L = 2\text{k}\Omega$	10		15	ns
t_{PHL}	Propagation delay time, high-to-low-level output		10		15	ns

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