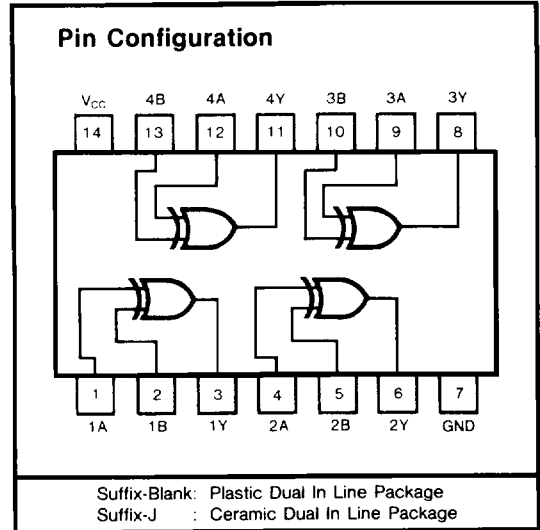


GD54/74LS86

QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES

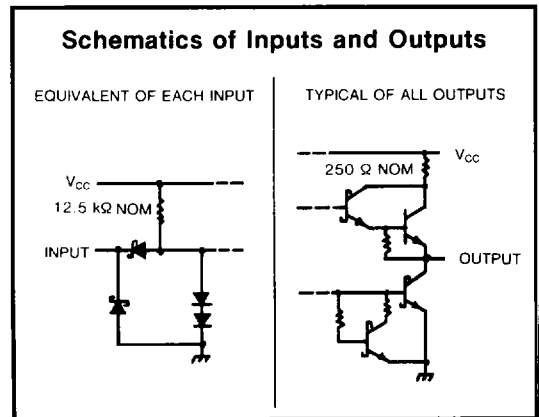
Description

This device contains four independent 2-input Exclusive-OR gates. It performs the Boolean functions $Y = A \oplus B = \bar{A}B + A\bar{B}$ in positive logic.



Function Table (each gate)

INPUT		OUTPUT
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L



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		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		0.7	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	54	2.5	3.4	V	
		I _{OH} =Max V _{IH} =Min	74	2.7	3.4		
V _{OL}	Low-level output voltage	V _{CC} =Min I _{OL} =4mA	54, 74	0.25	0.4	V	
		V _{IL} =Max V _{IH} =Min I _{OL} =8mA	74	0.35	0.5		
I _I	Input current at maximum input voltage	V _{CC} =Max, V _I =7V			0.2	mA	
I _{IH}	High-level input current	V _{CC} =Max, V _I =2.7V			40	μA	
I _{IL}	Low-level input current	V _{CC} =Max, V _I =0.4V			-0.8	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		6.1	10	mA
I _{CCL}		Total with outputs low	V _{CC} =Max		9	15	mA

Note 1: All typical values are at V_{CC}=5V, T_A=25°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} = 5V, T_A = 25°C

PARAMETER*	FROM (INPUT)	TEST CONDITION#	MIN	TYP	MAX	UNIT
t _{PLH}	A or B	Other input low	C _L = 15 pF R _L = 2KΩ	12	23	ns
t _{PHL}				10	17	
t _{PLH}	A or B	Other input high		20	30	ns
t _{PHL}				13	22	

* t_{PLH}=propagation delay time, low-to-high-level output

* t_{PHL}=propagation delay time, high-to-low-level output

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