SN54LS386A, SN74LS386A
QUADRUPLE 2-INPUT EXCLUSIVE-OR GATES

SDLS171 MARCH 1974 – REVISED MARCH 1988

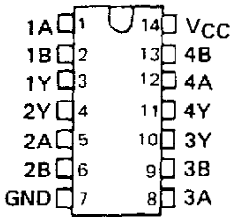
- Electrically Identical to SN54LS86A/SN74LS86A
- Mechanically Identical to SN54L86/SN74L86
- Total Average Propagation Delay Times . . . 10 ns
- Typical Total Power Dissipation . . . 30.5 mW

FUNCTION TABLE
(EACH GATE)

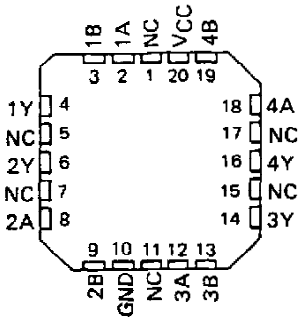
INPUTS		OUTPUT
A	B	
L	L	L
L	H	H
H	L	H
H	H	L

H = high level
L = low level

SN54LS386A . . . J OR W PACKAGE
SN74LS386A . . . D OR N PACKAGE
(TOP VIEW)

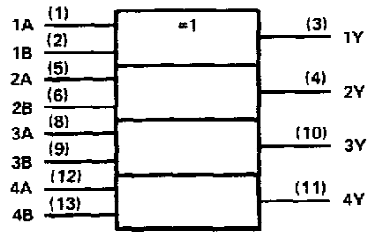


SN54LS386A . . . FK PACKAGE
(TOP VIEW)



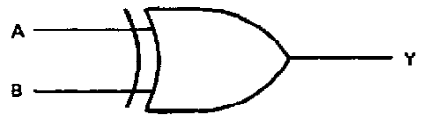
NC – No internal connection

logic symbol†



†This symbol is in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, N, and W packages.

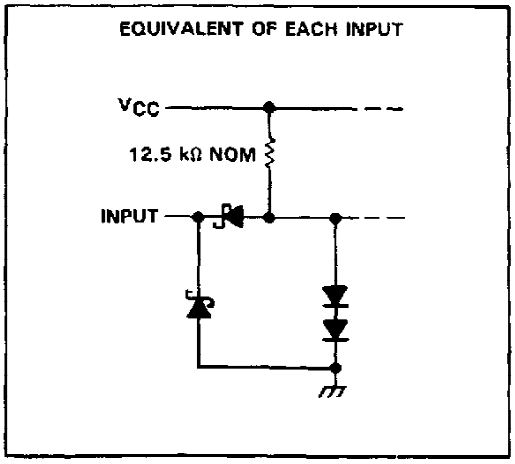
logic diagram (each gate)

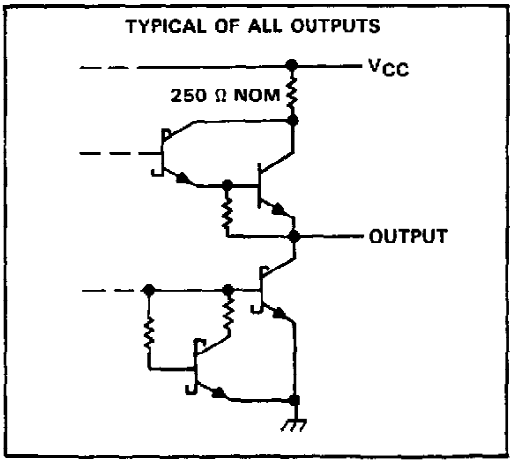


positive logic

$$Y = A \oplus B = \overline{A}B + A\overline{B}$$

schematics of inputs and outputs





absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC} (see Note 1) . . . . . 7 V
Input voltage . . . . . 7 V
Operating free-air temperature range: SN54LS386A . . . . . −55°C to 125°C
SN74LS386A . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

NOTE 1: Voltage values are with respect to network ground terminal.

recommended operating conditions

	SN54LS386A			SN74LS386A			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC}	4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}			−400			−400	μA
Low-level output current, I_{OL}			4			8	mA
Operating free-air temperature, T_A	−55		125	0		70	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS†		SN54LS386A			SN74LS386A			UNIT
				MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IH}	High-level input voltage			2			2			V
V_{IL}	Low-level input voltage					0.7			0.8	V
V_{IK}	Input clamp voltage	V_{CC} = MIN,	I_I = −18 mA			−1.5			−1.5	V
V_{OH}	High-level output voltage	V_{CC} = MIN, V_{IL} = V_{IL} max,	V_{IH} = 2 V, I_{OH} = −400 μA	2.5	3.4		2.7	3.4		V
V_{OL}	Low-level output voltage	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = V_{IL} max	I_{OL} = 4 mA		0.25	0.4		0.25	0.4	V
			I_{OL} = 8 mA					0.35	0.5	
I_I	Input current at maximum input voltage	V_{CC} = MAX,	V_I = 7 V			0.2			0.2	mA
I_{IH}	High-level input current	V_{CC} = MAX,	V_I = 2.7 V			40			40	μA
I_{IL}	Low-level input current	V_{CC} = MAX,	V_I = 0.4 V			−0.8			−0.8	mA
I_{OS}	Short-circuit output current§	V_{CC} = MAX		−20		−100	−20		−100	mA
I_{CC}	Supply current	V_{CC} = MAX,	See Note 2		6.1	10		6.1	10	mA

†For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
‡All typical values are at V_{CC} = 5 V, T_A = 25°C.
§Not more than one output should be shorted at a time.
NOTE 2: I_{CC} is measured with the inputs grounded and the outputs open.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

PARAMETER	FROM (INPUT)	TEST CONDITIONS		MIN	TYP	MAX	UNIT
t_{PLH}	A or B	Other input low	C_L = 15 pF, R_L = 2 kΩ, See Note 3		12	23	ns
t_{PHL}					10	17	
t_{PLH}	A or B	Other input high			20	30	ns
t_{PHL}					13	22	

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

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