



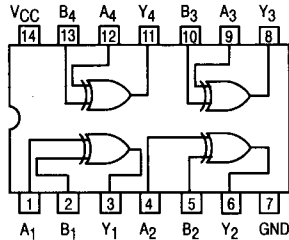
# Quad 2-Input Exclusive OR Gate

ELECTRICALLY TESTED PER:  
MIL-M-38510/30502

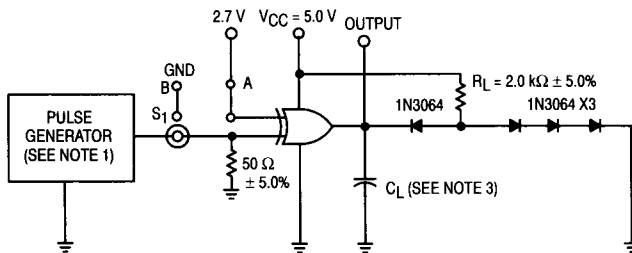
## Military 54LS86



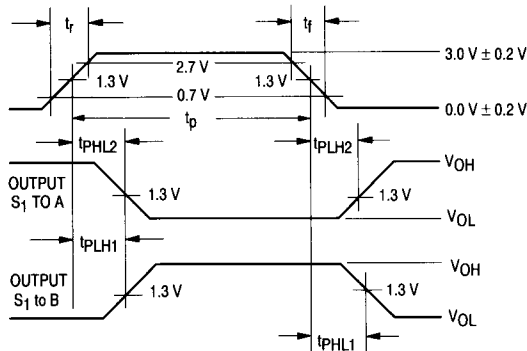
LOGIC DIAGRAM



AC TEST CIRCUIT



WAVEFORMS



AVAILABLE AS:

- 1) JAN: JM38510/30502BXA
- 2) SMD: N/A
- 3) 883: 54LS86/BXAJC

X = CASE OUTLINE AS FOLLOWS:  
PACKAGE: CERDIP: C  
CERFLAT: D  
LCC: 2

THE LETTER "M" APPEARS  
BEFORE THE / ON LCC.

PIN ASSIGNMENTS

FUNCT.	DIL 632-08	FLATS 717-04	LCC 756A-02	BURN-IN (COND. A)
A1	1	1	2	VCC
B1	2	2	3	GND
Y1	3	3	4	VCC
A2	4	4	6	VCC
B2	5	5	8	GND
Y2	6	6	9	VCC
GND	7	7	10	GND
Y3	8	8	12	VCC
A3	9	9	13	VCC
B3	10	10	14	GND
Y4	11	11	16	VCC
A4	12	12	18	VCC
B4	13	13	19	GND
VCC	14	14	20	VCC

BURN-IN CONDITIONS:

VCC = 5.0 V MIN/6.0 V MAX

NOTES:

1. Pulse generator has the following characteristics:  $V_{gen} = 3.0 \pm 0.2$  V,  $t_f \leq 6.0$  ns,  $t_r \leq 15$  ns. PRR  $\leq 1.0$  MHz,  $t_p = 0.5$   $\mu$ s, and  $Z_{OUT} \approx 50\Omega$ .
2. Each gate tested separately.
3.  $C_L = 50$  pF  $\pm 10\%$ , including scope probe, wiring and stray capacitance.
4. Voltage measurements are to be made with respect to network ground terminal.
5.  $R_L = 2.0$  k $\Omega$   $\pm 5.0\%$ .

## 54LS86

Symbol	Parameter	Limits						Unit	Test Condition (Unless Otherwise Specified)
		+ 25°C		+ 125°C		- 55°C			
		Subgroup 1		Subgroup 2		Subgroup 3			
		Min	Max	Min	Max	Min	Max		
V <sub>OH</sub>	Logical "1" Output Voltage	2.5		2.5		2.5		V	V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = - 400 μA, V <sub>IL</sub> = 0.7 V, V <sub>IN</sub> = 2.0 V on other input.
V <sub>OL</sub>	Logical "0" Output Voltage		0.4		0.4		0.4	V	V <sub>CC</sub> = 4.5 V, I <sub>OL</sub> = 4.0 mA, V <sub>IL</sub> = 0.7 V on both inputs.
V <sub>IC</sub>	Input Clamping Voltage		- 1.5					V	V <sub>CC</sub> = 4.5 V, I <sub>IN</sub> = - 18 mA, other input is open.
I <sub>IH</sub>	Logical "1" Input Current		40		40		40	μA	V <sub>CC</sub> = 5.5 V, V <sub>IH</sub> = 2.7 V, other input = 0 V.
I <sub>IHH</sub>	Logical "1" Input Current		200		200		200	μA	V <sub>CC</sub> = 5.5 V, V <sub>IHH</sub> = 5.5 V, other input = 0 V.
I <sub>IL</sub>	Logical "0" Input Current	- 225	- 705	- 225	- 705	- 225	- 705	μA	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 0.4 V, other input = 5.5 V.
I <sub>OS</sub>	Output Short Circuit Current	- 15	- 100	- 15	- 100	- 15	- 100	mA	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 5.5 V, other input = 0 V, V <sub>OUT</sub> = 0 V.
I <sub>CC</sub>	Power Supply Current		10		10		10	mA	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 0 V (all inputs).
V <sub>IH</sub>	Logical "1" Input Voltage	2.0		2.0		2.0		V	V <sub>CC</sub> = 4.5 V.
V <sub>IL</sub>	Logical "0" Input Voltage		0.7		0.7		0.7	V	V <sub>CC</sub> = 4.5 V.
	Functional Tests	Subgroup 7		Subgroup 8A		Subgroup 8B			per Truth Table with V <sub>CC</sub> = 5.0 V, V <sub>INL</sub> = 0.4 V, and V <sub>INH</sub> = 2.5 V.

Symbol	Parameter	Limits						Unit	Test Condition (Unless Otherwise Specified)
		+ 25°C		+ 125°C		- 55°C			
		Subgroup 9		Subgroup 10		Subgroup 11			
		Min	Max	Min	Max	Min	Max		
t <sub>PHL1</sub> t <sub>PHL1</sub>	Propagation Delay /Data-Output Output High-Low	2.0 —	22 17	2.0 —	29 24	2.0 —	29 24	ns	V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 50 pF, R <sub>L</sub> = 2.0 kΩ. V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 15 pF, R <sub>L</sub> = 2.0 kΩ.
t <sub>PLH1</sub> t <sub>PLH1</sub>	Propagation Delay /Data-Output Output Low-High	2.0 —	28 23	2.0 —	37 32	2.0 —	37 32	ns	V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 50 pF, R <sub>L</sub> = 2.0 kΩ. V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 15 pF, R <sub>L</sub> = 2.0 kΩ.
t <sub>PHL2</sub> t <sub>PHL2</sub>	Propagation Delay /Data-Output Output High-Low	2.0 —	27 23	2.0 —	35 30	2.0 —	35 30	ns	V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 50 pF, R <sub>L</sub> = 2.0 kΩ. V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 15 pF, R <sub>L</sub> = 2.0 kΩ.
t <sub>PLH2</sub> t <sub>PLH2</sub>	Propagation Delay /Data-Output Output Low-High	2.0 —	32 30	2.0 —	40 38	2.0 —	40 38	ns	V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 50 pF, R <sub>L</sub> = 2.0 kΩ. V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 15 pF, R <sub>L</sub> = 2.0 kΩ.

## NOTE:

- The limits specified for C<sub>L</sub> = 15 pF are guaranteed but not tested.