



Dual 4-5 Input "OR/NOR" Gate

**ELECTRICALLY TESTED PER:
MIL-M-38510/06006**

The 10509 is a dual 4-5 input **OR/NOR** gate.

- 25 mW Max/Gate (No Load)
- $t_{pd} = 2.0$ ns typ
- $t_r, t_f = 2.0$ ns typ (20% - 80%)

3

FUNCTION	PIN ASSIGNMENTS			BURN-IN (CONDITION C)
	DIL	FLATS	LCC	
VCC1	1	5	2	GND
AOUT	2	6	3	51 Ω to VTT
\overline{AOUT}	3	7	4	51 Ω to VTT
A1N	4	8	5	51 Ω to VTT
A1N	5	9	7	GND
A1N	6	10	8	OPEN
A1N	7	11	9	OPEN
VEE	8	12	10	VEE
B1N	9	13	12	OPEN
B1N	10	14	13	OPEN
B1N	11	15	14	OPEN
B1N	12	16	15	GND
B1N	13	1	17	51 Ω to VTT
\overline{BOUT}	14	2	18	51 Ω to VTT
BOUT	15	3	19	51 Ω to VTT
VCC2	16	4	20	GND

BURN - IN CONDITIONS:

VTT = - 2.0 V MAX / - 2.2 V MIN
VEE = - 5.7 V MAX / - 5.2 V MIN

Military 10509

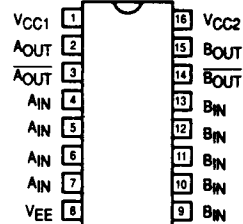


AVAILABLE AS

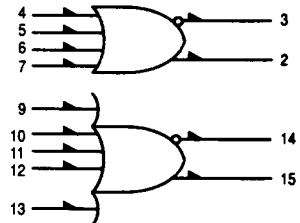
- 1) JAN: JM 38510/06006
 - 2) SMD: N/A
 - 3) 883: 10509/BXAJC
- X = CASE OUTLINE AS FOLLOWS:

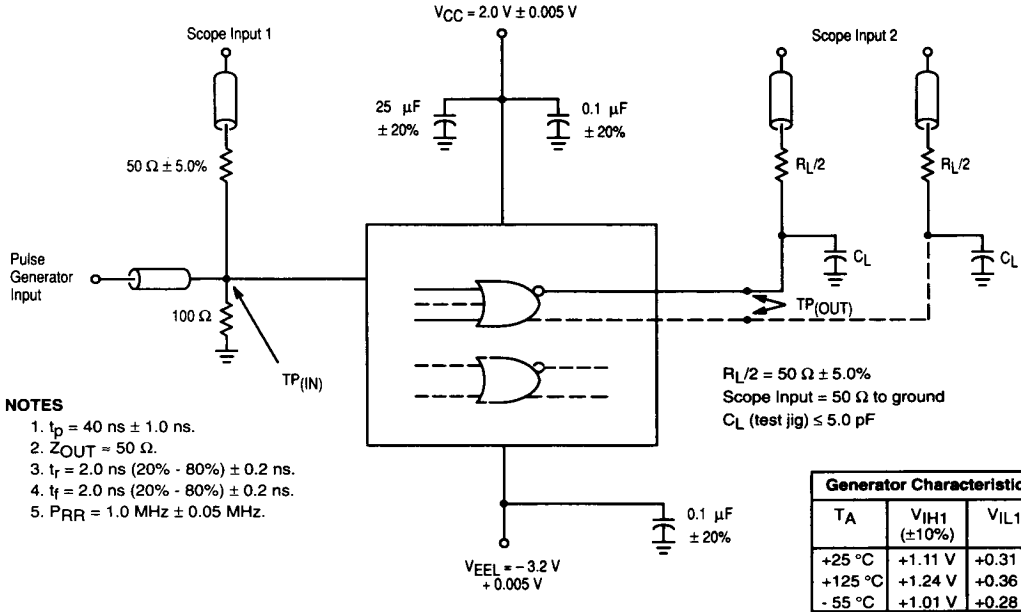
**PACKAGE: CERDIP: E
CERFLAT: F
LCC: 2**

The letter "M" appears before the slash on LCC.



LOGIC DIAGRAM





NOTES

1. $t_p = 40 \text{ ns} \pm 1.0 \text{ ns}$.
2. $Z_{OUT} \approx 50 \Omega$.
3. $t_r = 2.0 \text{ ns}$ (20% - 80%) $\pm 0.2 \text{ ns}$.
4. $t_f = 2.0 \text{ ns}$ (20% - 80%) $\pm 0.2 \text{ ns}$.
5. $P_{RR} = 1.0 \text{ MHz} \pm 0.05 \text{ MHz}$.

NOTES

1. Perform test in accordance with test table; each output is tested separately.
2. All input and output cables to the scope are equal lengths of 50 Ω coaxial cable. Wire length should be ≤ 0.250 (6.35 mm) from TP_{IN} to input pin and TP_{OUT} to output pin.
3. Outputs not under test should be connected to a 100 Ω resistor to ground.

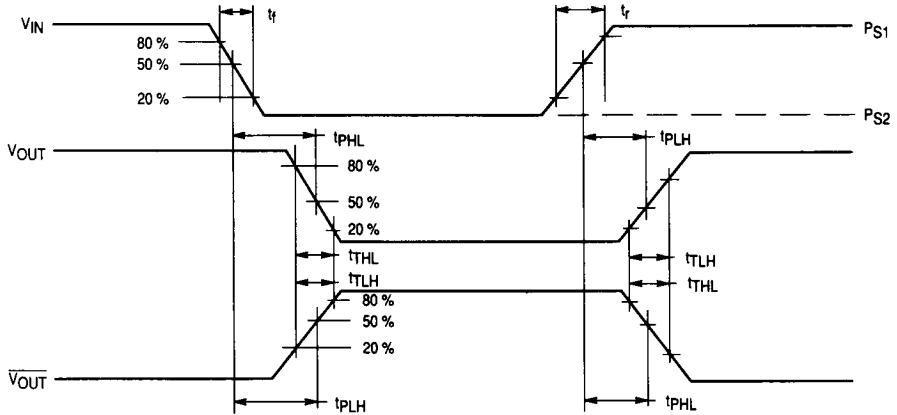


Figure 1. Switching Test Circuit and Waveforms

10509 QUIESCENT LIMIT TABLE *

* ELECTRICAL CHARACTERISTICS

Each MECL 10K series circuit has been designed to meet the dc specifications shown in the test table, after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse air flow greater than 500 linear fpm is maintained. Outputs are terminated through a 100 Ω resistor to -2.0 volts.

Test Temperature	Test Voltage Values (Volts)								
	V _{IH1}	V _{IL1}	V _{IH2}	V _{IL2}	V _{ITL}	V _{IH}	V _{ITL}	V _{VEE1}	
T _A = 25 °C	-0.78	-1.85	+1.11	+0.31	-1.475	-1.105		0	-5.2
T _A = 125 °C	-0.63	-1.82	+1.24	+0.36	-1.400	-1.000		0	-5.2
T _A = -55 °C	-0.88	-1.92	+1.01	+0.28	-1.510	-1.255		0	-5.2

Symbol	Parameter	Limits						Units	TEST VOLTAGE APPLIED TO PINS BELOW								
		+ 25 °C		+ 125 °C		-55 °C			Pinouts referenced are for DIL package, check Pin Assignments V _{CC} = 0 V, Output Load = 100 Ω to -2.0 V								
		Subgroup 1	Subgroup 2	Subgroup 2	Subgroup 3	Subgroup 3	Subgroup 3		V _{IH1}	V _{IL1}	V _{ITL}	V _{IH}	V _{CC}	V _{VEE1}	P. U. T.		
	Functional Parameters:	Min	Max	Min	Max	Min	Max										
V _{OH}	High Output Voltage	-0.93	-0.78	-0.825	-0.63	-1.06	-0.88	V	4 - 7, 9 - 13	4 - 7, 9 - 13			1, 16	8	2, 3, 14, 15		
V _{OL}	Low Output Voltage	-1.86	-1.62	-1.82	-1.545	-1.92	-1.655	V	4 - 7, 9 - 13	4 - 7, 9 - 13			1, 16	8	2, 3, 14, 15		
V _{OTH}	High Output Voltage	-0.96		-0.845		-1.1		V				4 - 7, 9 - 13	4 - 7, 9 - 13	1, 16	8	2, 3, 14, 15	
V _{OTL}	Low Output Voltage		-1.6		-1.525		-1.635	V				4 - 7, 9 - 13	4 - 7, 9 - 13	1, 16	8	2, 3, 14, 15	
I _{EE}	Power Supply Current	-14		-16		-16		mA						1, 16	8	8	
I _{IH}	Input Current High		265		450		450	μ A	4 - 7, 9 - 13					1, 16	8	4 - 7, 9 - 13	
I _{IL}	Input Current Low	0.5		0.3		0.5		μ A		4 - 7, 9 - 13				1, 16	8	4 - 7, 9 - 13	

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Test Temperature	Test Voltage Values (Volts)							
	V _{IH1}	V _{IH2}	V _{IL2}	V _{ITL}	V _{IH1}	V _{IL1}	V _{IH2}	V _{VEEL}
T _A = 25 °C	-0.78	+1.11	+0.31	-1.475	-1.105	-1.85	-1.475	+2.0
T _A = 125 °C	-0.63	+1.24	+0.36	-1.400	-1.000	-1.82	-1.400	+2.0
T _A = -55 °C	-0.88	+1.01	+0.28	-1.510	-1.255	-1.92	-1.510	+2.0

Symbol	Parameter	Limits						Units	TEST VOLTAGE APPLIED TO PINS BELOW:					
		+ 25° C		+ 125° C		- 55° C			Pinouts referenced are for DIL package, check Pin Assignments VCC = 2.0 V, Output Load = 100 Ω to GND					
		Subgroup 9	Subgroup 10	Subgroup 9	Subgroup 10	Subgroup 9	Subgroup 10		V _{IN}	V _{OUT}	VCC	V _{VEEL}	P. U. T.	
t _{PLH}	Rise Time	1.1	3.3	1.0	4.0	1.0	4.0	ns	6, 11	2, 3, 14	1, 16	8	2, 3, 14, 15	
t _{PHL}	Fall Time	1.1	3.3	1.0	4.0	1.0	4.0	ns	6, 11	2, 3, 14	1, 16	8	2, 3, 14, 15	
t _{PLH}	Propaganda Delay Low to High	1.0	2.9	1.0	3.7	1.0	3.7	ns	6, 11	2, 3, 14	1, 16	8	2, 3, 14, 15	
t _{PHL}	Propaganda Delay High to Low	1.0	2.9	1.0	3.7	1.0	3.7	ns	6, 11	2, 3, 14	1, 16	8	2, 3, 14, 15	