MOTOROLA

Triple 4-3-3 Input NOR Gate

Military 10H506

ELECTRICALLY TESTED PER:
5962-8756401

The 10H506 is a Triple 4-3-3 input **NOR** gate. This MECL 10H part is a functional/pinout duplication of the standard MECL 10K family part, with 100% improvement in propagation delay, and no increase in power-supply.

2

- Propagation Delay, 1.0 ns Typical
- Improved Noise Margin 150 mV (Over Operating Voltage and Temperature Range)
- Voltage Compensated
- MECL 10K-Compatible

PIN ASSIGNMENTS

FUNCTION	DIL	FLATS	LCC	BURN-IN (CONDITION C)
V_{CC1}	1	5	2	GND
B_{OUT}	2	6	3	51 Ω to V_{TT}
A_{OUT}	3	7	4	51 Ω to V_{TT}
A_{IN}	4	8	5	51 Ω to V_{TT}
A_{IN}	5	9	7	OPEN
A_{IN}	6	10	8	OPEN
A_{IN}	7	11	9	OPEN
V_{EE}	8	12	10	V_{EE}
B_{IN}	9	13	12	OPEN
B_{IN}	10	14	13	51 Ω to V_{TT}
B_{IN}	11	15	14	OPEN
C_{IN}	12	16	15	OPEN
C_{IN}	13	1	17	OPEN
C_{IN}	14	2	18	51 Ω to V_{TT}
C_{OUT}	15	3	19	51 Ω to V_{TT}
V_{CC2}	16	4	20	GND

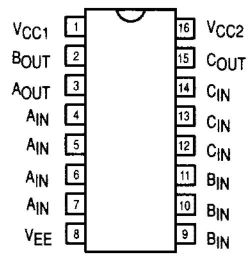
BURN - IN CONDITIONS:
V_{TT} = − 2.0 V MAX/ − 2.2 V MIN
V_{EE} = − 5.7 V MAX/ − 5.2 V MIN

AVAILABLE AS

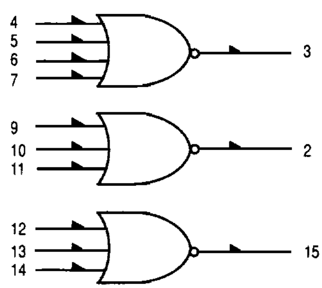
1) JAN: N/A
2) SMD: 5962-8756401
3) 883: 10H506/BXAJC
X = CASE OUTLINE AS FOLLOWS:

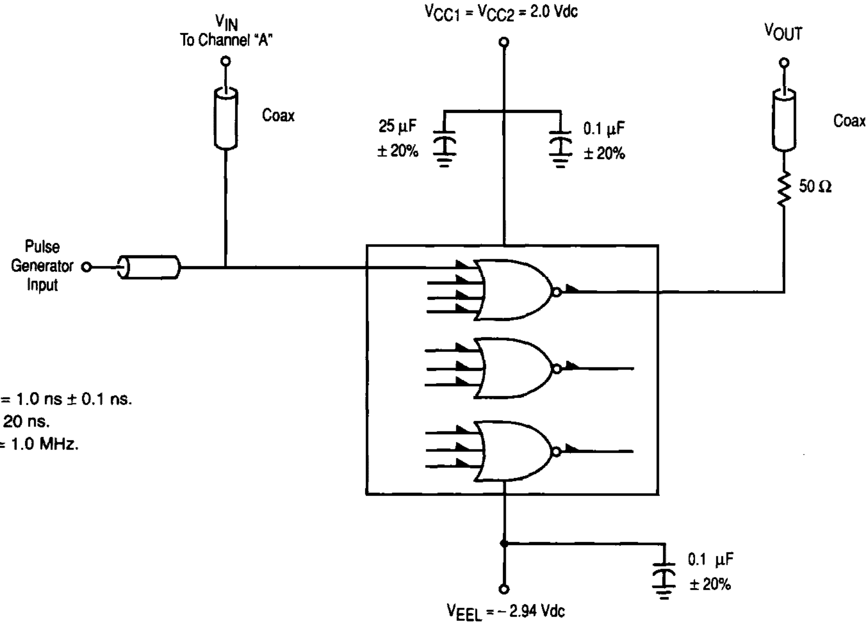
PACKAGE: CERDIP: E
CERFLAT: F
LCC: 2

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



LOGIC DIAGRAM





NOTES

1. $t_r = t_f = 1.0$ ns ± 0.1 ns.
2. $P_W \geq 20$ ns.
3. $P_{RF} = 1.0$ MHz.

NOTES

1. 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.
2. Outputs not under test should be connected to a 100 Ω resistor to ground.

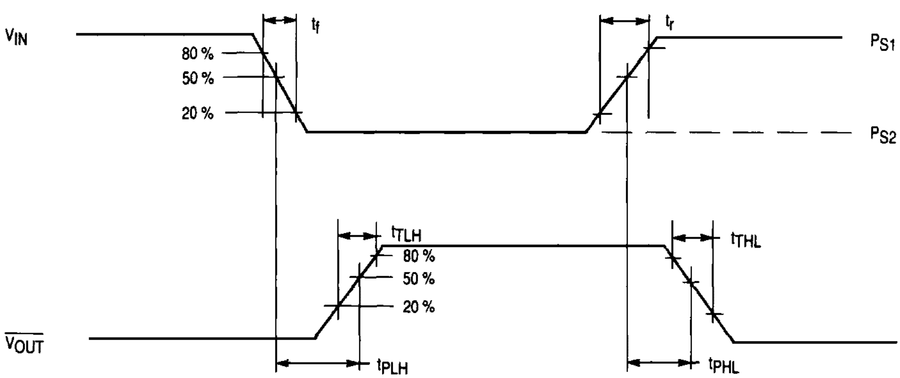


Figure 1. Switching Test Circuit and Waveforms

10H506
QUIESCENT LIMIT TABLE *

* ELECTRICAL CHARACTERISTICS

Each MECL 10H 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}	P_{S1}	P_{S2}	V_{EE1}	V_{EE2}	V_{EEL}
T_A = 25 °C	-0.78	-1.95	-1.11	-1.480	+1.11	+0.31	-5.46	-4.94	-2.94
T_A = 125 °C	-0.65	-1.95	-0.96	-1.465	+1.24	+0.36	-5.46	-4.94	-2.94
T_A = -55 °C	-0.84	-1.95	-1.16	-1.510	+1.01	+0.28	-5.46	-4.94	-2.94

Symbol	Parameter	Limits						Units	TEST VOLTAGE APPLIED TO PINS BELOW							
	Functional Parameters:	+ 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 3										
		Min	Max	Min	Max	Min	Max		V_{IH1}	V_{IL1}	V_{IH2}	V_{IL2}	V_{EE1}	V_{EE2}	V_{CC}	P.U.T.
V_{OH}	High Output Voltage	- 1.01	- 0.78	-0.86	- 0.65	- 1.06	- 0.84	V		4 - 7 9 - 14			8		1, 16	2, 3, 15
V_{OL}	Low Output Voltage	- 1.95	- 1.58	- 1.95	-1.363	- 1.95	- 1.61	V	4 - 7 9 - 14				8		1, 16	2, 3, 15
V_{OH1}	High Output Voltage	- 1.01	- 0.78	-0.86	- 0.65	- 1.06	- 0.84	V				4 - 7 9 - 14	8	8	1, 16	2, 3, 15
V_{OL1}	Low Output Voltage	- 1.95	- 1.58	- 1.95	-1.363	- 1.95	-1.61	V			4 - 7 9 - 14		8	8	1, 16	2, 3, 15
I_{EE}	Power Supply Current	- 21		- 23		- 23		mA					8		1, 16	8
I_{IH1}	Input Current High		310		500		500	µA	4 - 7 9 - 14				8		1, 16	4 - 7, 9 - 14
I_{IL}	Input Current Low	0.5		0.3		0.5		µA		4 - 7 9 - 14				8	1, 16	4 - 7, 9 - 14

10H506
QUIESCENT LIMIT TABLE *

*** ELECTRICAL CHARACTERISTICS**

Each MECL 10H 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}	P_{S1}	P_{S2}	V_{EE1}	V_{EE2}	V_{EEL}
T_A = 25 °C	-0.78	-1.95	-1.11	-1.480	+1.11	+0.31	-5.46	-4.94	-2.94
T_A = 125 °C	-0.65	-1.95	-0.96	-1.465	+1.24	+0.36	-5.46	-4.94	-2.94
T_A = -55 °C	-0.84	-1.95	-1.16	-1.510	+1.01	+0.28	-5.46	-4.94	-2.94

Symbol	Parameter	Limits						Units	TEST VOLTAGE APPLIED TO PINS BELOW				
	Functional Parameters:	+ 25 °C		+ 125 °C		- 55 °C			Pinouts referenced are for DIL package, check Pin Assignments V_{CC} = 2.0 V, Output Load = 100 Ω to GND				
		Subgroup 9		Subgroup 10		Subgroup 11							
		Min	Max	Min	Max	Min	Max		V_{IN}	V_{OUT}	V_{CC}	V_{EEL}	P.U.T.
t_{TLH}	Rise Time	0.6	1.8	0.55	1.9	0.5	1.7	ns	6	3	1, 16	8	2, 15
t_{THL}	Fall time	0.6	1.8	0.55	1.9	0.5	1.7	ns	10	2	1, 16	8	3, 15
t_{PHL}	Propagation Delay High to Low	0.5	1.75	0.55	1.8	0.5	1.7	ns	13	15	1, 16	8	2, 3
t_{PLH}	Propagation Delay Low to High	0.5	1.75	0.55	1.8	0.5	1.7	ns	13	15	1, 16	8	2, 3

2