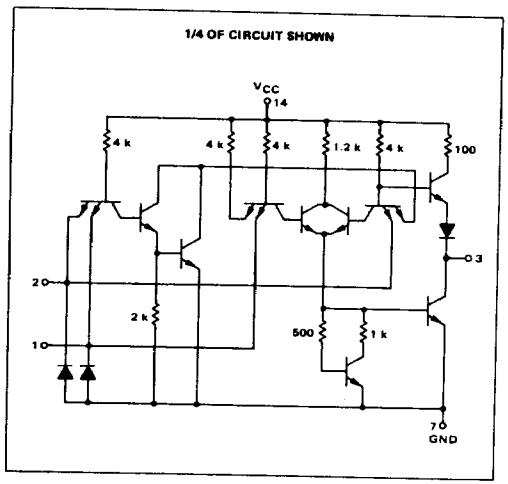
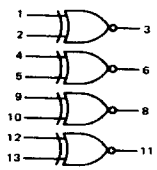
QUAD 2-INPUT
EXCLUSIVE "NOR" GATE

MTTL III MC3100/3000 series

MC3122F • MC3022F
MC3122L • MC3022L,P



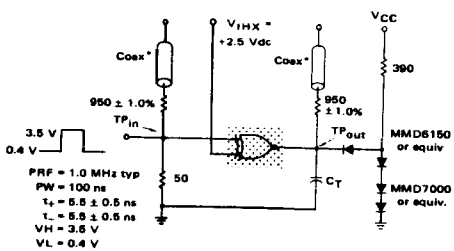
This device consists of four 2-input Exclusive NOR gates. They can be used to build parity checking/generating functions. Up/down counters can be built using these gates and J-K flip-flops.



Positive Logic: $3 = \overline{1} \cdot \overline{2} + 1 \cdot 2$

Input Loading Factor = 1.6
Output Loading Factor = 8
Total Power Dissipation = 85 mW typ/pkg
Propagation Delay Time = 14 ns typ

SWITCHING TIME TEST CIRCUIT

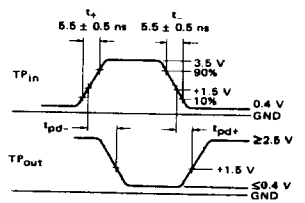


*The coax delays from input to scope and output to scope must be matched. The scope must be terminated in 50-ohm impedance. The 950-ohm resistor and the scope termination impedance constitute a 20:1 attenuator probe. Coax shall be CT-070-50 or equivalent.

C_T = 25 pF = total parasitic capacitance, which includes probe, wiring, and load capacitances.

Ground inputs of gates not under test.

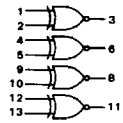
VOLTAGE WAVEFORMS AND DEFINITIONS



See General Information section for packaging.

ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one gate. The other gate is tested in the same manner. Further, test procedures are shown for only one input of the gate under test. To complete testing, sequence through remaining inputs.



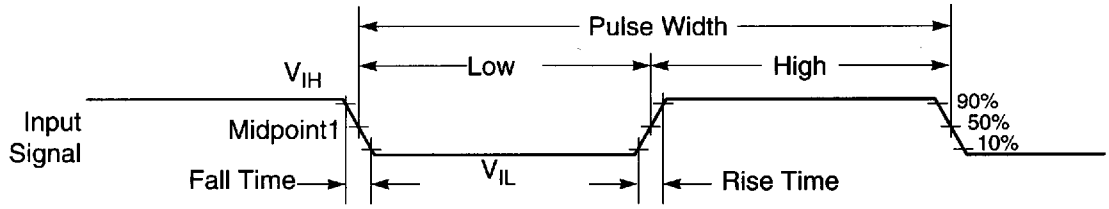
Characteristic	Symbol	Pin Under Test	MC3122 Test Limits −55°C Min	−55°C Max	+25°C Min	+25°C Max	+125°C Min	+125°C Max	Unit	MC3022 Test Limits 0°C Min	0°C Max	+25°C Min	+25°C Max	+75°C Min	+75°C Max	Unit	TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW: I_{OL}	I_{OH}	I_{in}	I_D	V_{IL}	V_{IH}	V_F	V_R	V_{BR}	V_{CC}	V_{CCL}	V_{CCH}	V_{mm}	Gnd
Input																													
Forward Current	I_F	1	-	-3.0	-	-3.0	-	-3.0	mAdc	-	-3.0	-	-3.0	-	-3.0	mAdc	-	-	-	-	-	-	1	-	-	-	-	14	-	4,5,7,9,10,12,13
Leakage Current	I_R	1	-	100	-	100	-	100	μAdc	-	100	-	100	-	100	μAdc	-	-	-	-	-	-	-	1	-	-	-	14	-	2,4,5,7,9,10,12,13
Breakdown Voltage	BV_{in}	1	-	-	5.5	-	-	-	Vdc	-	-	5.5	-	-	-	Vdc	-	-	1	-	-	-	-	-	-	-	-	14	-	2,4,5,7,9,10,12,13
Clamp Voltage	V_D	1	-	-	-	-1.5	-	-	Vdc	-	-	-	-1.5	-	-	Vdc	-	-	-	1	-	-	-	-	-	-	14	-	-	4,5,7,9,10,12,13
Output																													
Output Voltage	V_{OL}	3 3	- -	0.4 0.4	- -	0.4 0.4	- -	0.4 0.4	Vdc Vdc	- -	0.4 0.4	- -	0.4 0.4	- -	0.4 0.4	Vdc Vdc	3 3	- -	- -	- -	1 2	2 1	- -	- -	- -	- -	14 14	- -	- -	4,5,7,9,10,12,13 4,5,7,9,10,12,13
	V_{OH}	3 3	2.4 2.4	- -	2.4 2.4	- -	2.4 2.4	- -	Vdc Vdc	2.5 2.5	- -	2.5 2.5	- -	2.5 2.5	- -	Vdc Vdc	- -	3 3	- -	- -	1,3 -	- 1,3	- -	- -	- -	- -	14 14	- -	- -	4,5,7,9,10,12,13 4,5,7,9,10,12,13
Short-Circuit Current	I_{SC}	3	-20	-65	-20	-65	-20	-65	mAdc	-20	-65	-20	-65	-20	-65	mAdc	-	-	-	-	-	-	1,2	-	-	-	14	-	-	2,4,5,7,9,10,12,13
Power Requirements (Total Device)																													
Maximum Power Supply Current	I_{max}	14	-	-	-	34.8	-	-	mAdc	-	-	-	34.8	-	-	mAdc	-	-	-	-	-	-	1,2,4,5,9,10,12,13	-	-	-	-	-	14	7
Power Supply Drain	I_{PDH}	14	-	32.4	-	32.4	-	32.4	mAdc	-	32.4	-	32.4	-	32.4	mAdc	-	-	-	-	-	-	2,5,10,13	-	1,4,9,12,	14	-	-	-	7
	I_{PDL}	14	-	16.8	-	16.8	-	16.8	mAdc	-	16.8	-	16.8	-	16.8	mAdc	-	-	-	-	-	-	1,2,4,5,9,10,12,13	-	-	14	-	-	-	7
Switching Parameters																													
Turn-On Delay	t_{pd-}	1,3	-	-	-	22	-	-	ns	-	-	-	22	-	-	ns	1	-	-	-	-	-	-	-	-	14	-	-	-	2,4,5,7,9,10,12,13
Turn-Off Delay	t_{pd+}	1,3	-	-	-	22	-	-	ns	-	-	-	22	-	-	ns	1	-	-	-	-	-	-	-	-	14	-	-	-	2,4,5,7,9,10,12,13

Pins not listed are left open.

@ Test Temperature	TEST CURRENT/VOLTAGE VALUES mA I_{OL}	I_{OH}	I_{in}	I_D	Volts V_{IL}	V_{IH}	V_F	V_R	V_{BR}	V_{CC}	V_{CCL}	V_{CCH}	V_{mm}
MC3122 −55°C	16	-1.6	-	-	1.1	2.0	0.4	3.4	4.0	5.0	4.5	5.5	-
MC3122 +25°C	16	-1.6	2.0	-10	1.1	1.8	0.4	3.4	4.0	5.0	4.5	5.5	7.0
MC3122 +125°C	16	-1.6	-	-	0.8	1.8	0.4	3.4	4.0	5.0	4.5	5.5	-
MC3022 0°C	16	-1.6	-	-	1.1	2.0	0.4	3.5	4.0	5.0	4.75	5.25	-
MC3022 +25°C	16	-1.6	2.0	-10	1.1	1.8	0.4	3.5	4.0	5.0	4.75	5.25	7.0
MC3022 +75°C	16	-1.6	-	-	0.9	1.8	0.4	3.5	4.0	5.0	4.75	5.25	-

AC ELECTRICAL CHARACTERISTICS

The timing waveforms in the AC Electrical Characteristics are tested with a V_{IL} maximum of 0.5 V and a V_{IH} minimum of 2.4 V for all pins, except EXTAL, $\overline{\text{RESET}}$, MODA, MODB, and MODC. These pins are tested using the input levels set forth in the DC Electrical Characteristics. AC timing specifications that are referenced to a device input signal are measured in production with respect to the 50% point of the respective input signal's transition. DSP56002 output levels are measured with the production test machine V_{OL} and V_{OH} reference levels set at 0.8 V and 2.0 V, respectively.



Note: The midpoint is $V_{IL} + (V_{IH} - V_{IL})/2$.

AA0179

Figure 2-1 Signal Measurement Reference