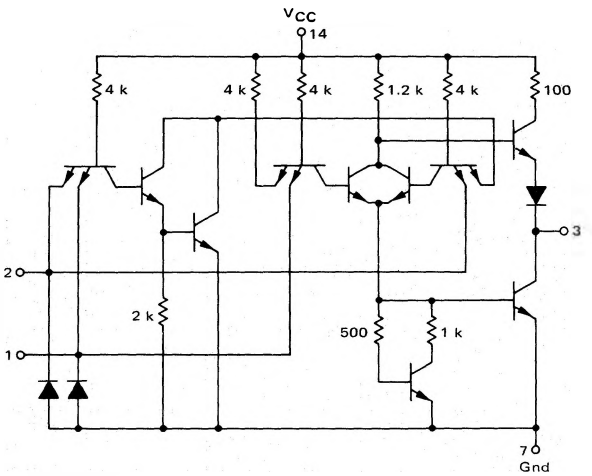
QUAD 2-INPUT
EXCLUSIVE "NOR" GATE

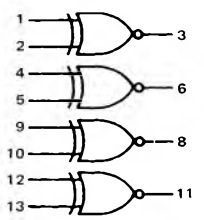
MC3100/MC3000 series

MC3122F • MC3022F
MC3122L • MC3022L,P

CIRCUIT SCHEMATIC
1/4 OF CIRCUIT SHOWN



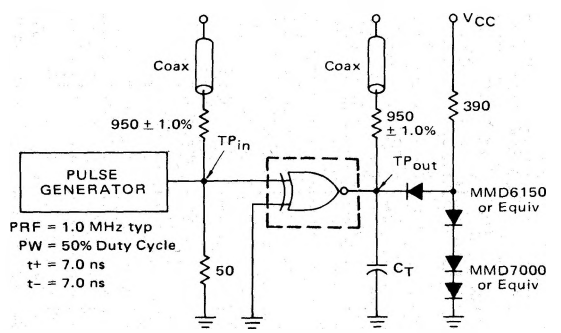
This device consists of four 2-input Exclusive NOR gates. They can be used to build parity checking/generating functions. Up/down counters can be built using these gates and J-K flip-flops.

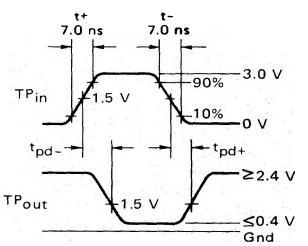


Positive Logic: $3 = \overline{1} \bullet \overline{2} + 1 \bullet 2$

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 AND WAVEFORMS





Ground inputs of gates not under test.

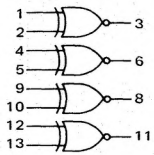
C_T = 25 pF = total parasitic capacitance, which includes probe, wiring, and load capacitances.

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.

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.



@ Test Temperature	TEST CURRENT/VOLTAGE VALUES												
	mA				Volts								
	I_{OL}	I_{OH}	I_{in}	I_D	V_{IL}	V_{IH}	V_F	V_R	V_{RH}	V_{CC}	V_{CCL}	V_{CCH}	V_{max}
MC3122 −55°C	16	-1.6	-	-	1.1	2.0	0.4	2.4	4.0	5.0	4.5	5.5	-
MC3122 +25°C	16	-1.6	2.0	-10	1.1	1.8	0.4	2.4	4.0	5.0	4.5	5.5	7.0
MC3122 +125°C	16	-1.6	-	-	0.8	1.8	0.4	2.4	4.0	5.0	4.5	5.5	-
MC3022 0°C	16	-1.6	-	-	1.1	2.0	0.4	2.5	4.0	5.0	4.75	5.25	-
MC3022 +25°C	16	-1.6	2.0	-10	1.1	1.8	0.4	2.5	4.0	5.0	4.75	5.25	7.0
MC3022 +75°C	16	-1.6	-	-	0.9	1.8	0.4	2.5	4.0	5.0	4.75	5.25	-

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_{RH}	V_{CC}	V_{CCL}	V_{CCH}	V_{max}	Gnd
Input																													
Forward Current	I_F	1	-	-3.0	-	-3.0	-	-3.0	mAdc	-	-3.0	-	-3.0	-	-3.0	mAdc	-	-	-	-	-	-	1	-	2	-	-	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	-	0.4	-	0.4	-	0.4	Vdc	-	0.4	-	0.4	-	0.4	Vdc	3	-	-	-	1	2	-	-	-	-	14	-	-	4,5,7,9,10,12,13
		3	-	0.4	-	0.4	-	0.4	Vdc	-	0.4	-	0.4	-	0.4	Vdc	3	-	-	-	2	1	-	-	-	-	14	-	-	4,5,7,9,10,12,13
	V_{OH}	3	2.4	-	2.4	-	2.4	-	Vdc	2.5	-	2.5	-	2.5	-	Vdc	-	3	-	-	1,2	-	-	-	-	-	14	-	-	4,5,7,9,10,12,13
		3	2.4	-	2.4	-	2.4	-	Vdc	2.5	-	2.5	-	2.5	-	Vdc	-	3	-	-	-	1,2	-	-	-	-	14	-	-	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	-	3,4,5,7,9,10,12,13
Power Requirements (Total Device) Maximum Power Supply Current	I_{max}	14	-	-	-	24.8	-	-	mAdc	-	-	-	24.8	-	-	mAdc	-	-	-	-	-	-	1,2,4,5,9, 10,12,13	-	-	-	-	-	14	7
Power Supply Drain	I_{PDH}	14	-	34.4	-	34.4	-	34.4	mAdc	-	34.4	-	34.4	-	34.4	mAdc	-	-	-	-	-	-	2,5,10,13	-	1,4,9,12,	-	-	14	-	7
	I_{PDL}	14	-	17.8	-	17.8	-	17.8	mAdc	-	17.8	-	17.8	-	17.8	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.