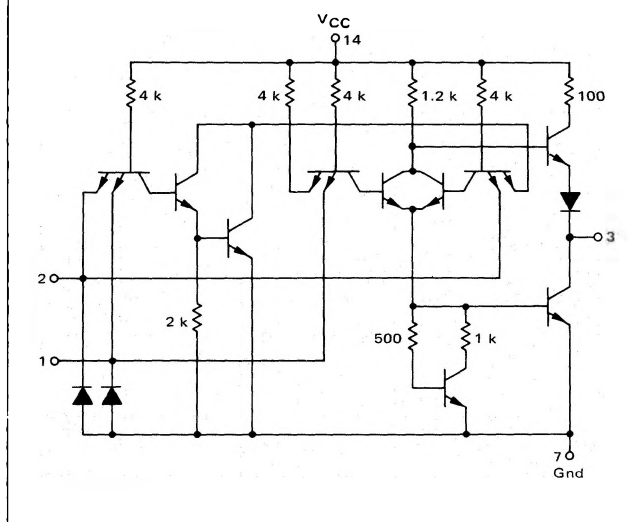


QUAD 2-INPUT
EXCLUSIVE "NOR" GATE

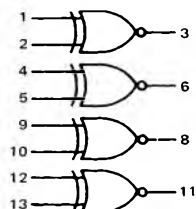
MC3100/MC3000 series

MC3122F • MC3022F
MC3122L • MC3022L,P

CIRCUIT SCHEMATIC
1/4 OF CIRCUIT SHOWN



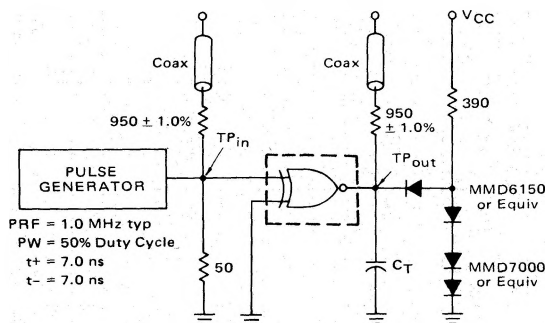
This device consists of four 2-input Exclusive NOR gates. They can be used to build parity checking/generating functions. Up/down counters can be built using these gates and J-K flip-flops.



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

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

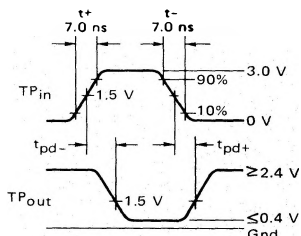
SWITCHING TIME TEST CIRCUIT AND WAVEFORMS



Ground inputs of gates not under test.

$C_T = 25 \text{ pF}$ = total parasitic capacitance, which includes probe, wiring, and load capacitances.

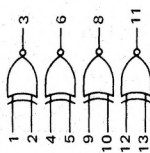
The coax delays from input to scope and output to scope must be matched. The scope must be terminated in 50-ohm impedance. The 950-ohm resistor and the scope termination impedance constitute a 20:1 attenuator probe. Coax shall be CT-070-50 or equivalent.



MC3122, MC3022 (continued)

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		Pin Under Test	MC3122 Test Limits										MC3022 Test Limits										TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW:															
			-55°C		+25°C		+125°C		0°C		+25°C		+75°C		-55°C		+25°C		+75°C		-55°C		+25°C		+75°C		-55°C		+25°C		+75°C		-55°C		+25°C		+75°C	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
			Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit	Symbol	Unit
Input	Forward Current	I _F	1	-	-3.0	-	-3.0	-	-3.0	mA	-	-3.0	-	-3.0	mA	-	-3.0	-	-3.0	mA	-	-3.0	mA	-	-3.0	mA	-	-3.0	mA	-	-3.0	mA	-	-3.0	mA	-	-3.0	mA
	Leakage Current	I _R	1	-	100	-	100	-	100	μA	-	100	-	100	μA	-	100	-	100	μA	-	100	μA	-	100	μA	-	100	μA	-	100	μA	-	100	μA	-	100	μA
	Breakdown Voltage	BV _{in}	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Output	Clamp Voltage	V _D	1	-	-	-	-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Output Voltage	V _{OL}	3	-	0.4	-	0.4	-	0.4	Vdc	-	0.4	-	0.4	Vdc	-	0.4	-	0.4	Vdc	-	0.4	Vdc	-	0.4	Vdc	-	0.4	Vdc	-	0.4	Vdc	-	0.4	Vdc	-	0.4	Vdc
	V _{OH}	3	2.4	-	2.4	-	2.4	-	2.5	-	2.5	-	2.5	-	2.5	Vdc	-	2.5	-	2.5	Vdc	-	2.5	Vdc	-	2.5	Vdc	-	2.5	Vdc	-	2.5	Vdc	-	2.5	Vdc		
Short-Circuit Current	I _{SC}	3	-20	-65	-20	-65	-20	-65	mA	-20	-65	-20	-65	mA	-20	-65	-20	-65	mA	-20	-65	-20	-65	mA	-20	-65	-20	-65	-20	-65	-20	-65	-20	-65	-20	-65	-20	-65
Power Requirements (Total Device)	Maximum Power Supply Current	I _{max}	14	-	-	-	24.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Power Supply Drain	I _{PDH}	14	-	34.4	-	34.4	-	34.4	mA	-	34.4	-	34.4	mA	-	34.4	-	34.4	mA	-	34.4	mA	-	34.4	mA	-	34.4	mA	-	34.4	mA	-	34.4	mA	-	34.4	mA
		I _{PDL}	14	-	17.8	-	17.8	-	17.8	mA	-	17.8	-	17.8	mA	-	17.8	-	17.8	mA	-	17.8	mA	-	17.8	mA	-	17.8	mA	-	17.8	mA	-	17.8	mA	-	17.8	mA
Switching Parameters	Turn-On Delay	t _{pd}	1,3	-	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Turn-Off Delay	t _{pd+}	1,3	-	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			

TEST CURRENT/VOLTAGE VALUES																						
mA										Volts												
I _{OL}	I _{OH}	I _{in}	I _b	V _{IL}	V _{IH}	V _F	V _R	V _{RH}	V _{CC}	V _{CCL}	V _{CCH}	V _{max}										
16	-1.6	-	-	1.1	2.0	0.4	2.4	4.0	5.0	4.5	5.5	-										
16	-1.6	2.0	-10	1.1	1.8	0.4	2.4	4.0	5.0	4.5	5.5	7.0										
16	-1.6	-	-	0.8	1.8	0.4	2.4	4.0	5.0	4.5	5.5	-										
16	-1.6	-	-	1.1	2.0	0.4	2.5	4.0	5.0	4.75	5.25	-										
16	-1.6	2.0	-10	1.1	1.8	0.4	2.5	4.0	5.0	4.75	5.25	7.0										
16	-1.6	-	-	0.9	1.8	0.4	2.5	4.0	5.0	4.75	5.25	-										

TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW:																						
I _{OL}	I _{OH}	I _{in}	I _b	V _{IL}	V _{IH}	V _F	V _R	V _{RH}	V _{CC}	V _{CCL}	V _{CCH}	V _{max}										
-	-	-	-	-	-	1	-	2	-	-	14	-						4.5, 7.9, 10, 12, 13				
-	-	-	-	-	-	-	1	-	-	-	14	-						2.4, 5.7, 9, 10, 12, 13				
-	-	1	-	-	-	-	-	-	-	-	14	-						2.4, 5.7, 9, 10, 12, 13				
-	-	-	1	-	-	-	-	-	-	-	14	-						4.5, 7.9, 10, 12, 13				
3	-	-	-	1	2	-	-	-	-	-	14	-						4.5, 7.9, 10, 12, 13				
3	-	-	-	2	1	-	-	-	-	-	14	-						4.5, 7.9, 10, 12, 13				
-	3	-	-	1,2	-	-	-	-	-	-	14	-						4.5, 7.9, 10, 12, 13				
-	3	-	-	-	1,2	-	-	-	-	-	14	-						4.5, 7.9, 10, 12, 13				
-	-	-	-	-	-	1,2	-	-	-	-	14	-						3.4, 5.7, 9, 10, 12, 13				
-	-	-	-	-	-	-	-	-	-	-	14	-										
-	-	-	-	-	-	-	-	-	-	-	-	-						7				
-	-	-	-	-	-	1.2, 4.5, 9, 10, 12, 13	-	-	-	-	-	14						7				
-	-	-	-	-	-	2.5, 10, 13	-	1, 4, 9, 12	-	-	-	-						7				
-	-	-	-	-	-	1.2, 4.5, 9, 10, 12, 13	-	-	-	-	-	-						7				
1	-	-	-	-	-	-	-	-	14	-	-	-						2.4, 5.7, 9, 10, 12, 13				
1	-	-	-	-	-	-	-	-	14	-	-	-						2.4, 5.7, 9, 10, 12, 13				

Pins not listed are left open.