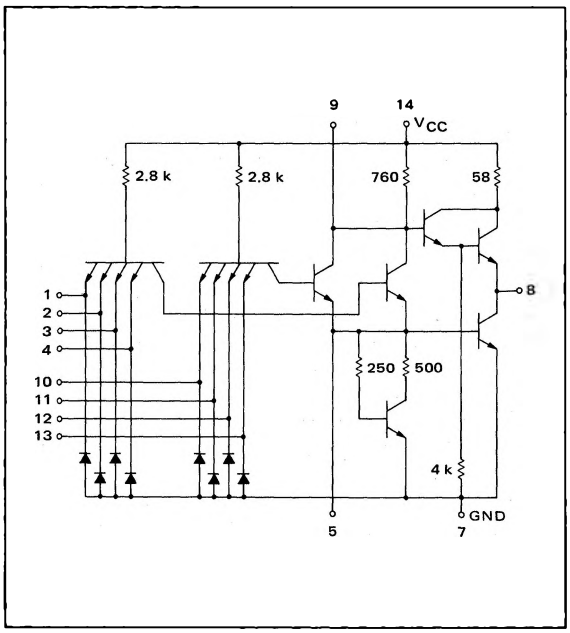
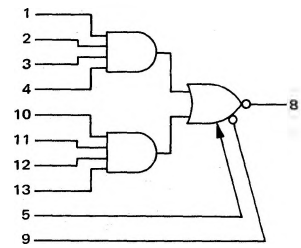
EXPANDABLE 2-WIDE 4-INPUT "AND-OR-INVERT" GATE

MC3134F • MC3034F
MC3134L • MC3034L, P

(54H55J) (74H55J, N)



This device consists of two 4-input AND gates ORed together and inverted. The emitter and collector nodes of the OR stage are brought out to provide expansion capability to a 6-wide AOI gate using the MC3130/3030 or MC3118/3018 expanders.



Positive Logic:

$$8 = \overline{(1 \bullet 2 \bullet 3 \bullet 4) + (10 \bullet 11 \bullet 12 \bullet 13) + (\text{Expanders})}$$

Negative Logic:

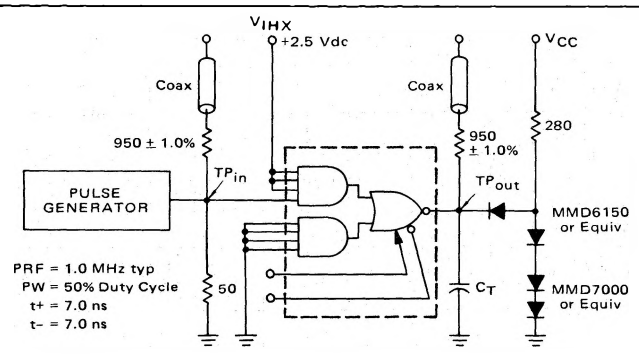
$$8 = \overline{(1 + 2 + 3 + 4) \bullet (10 + 11 + 12 + 13) \bullet (\text{Expanders})}$$

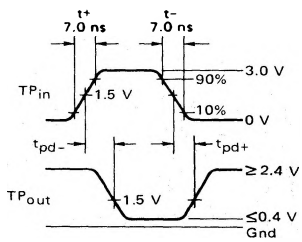
Input Loading Factor = 1
Output Loading Factor = 10
Total Power Dissipation = 30 mW typ/pkg
Propagation Delay Time = 7.0 ns typ

Pin numbers for the 54H55F/74H55F device are shown in the chart. These devices are available on special request.

DEVICE	PIN NUMBERS													
MC3134F,L/3034F,L,P	1	2	3	4	5	6	7	8	9	10	11	12	13	14
54H55F/74H55F	14	1	2	3	9	10	11	12	13	5	6	7	8	4

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS





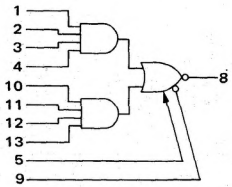
C_T = 25 pF = total parasitic capacitance, which includes probe, wiring, and load capacitances.

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 anu 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 input of the gate under test. To complete testing, sequence through remaining inputs.



	TEST CURRENT/VOLTAGE VALUES (All Temperatures)																		
	mA								Ohms	Volts									
	I_{OL}	I_{OH}	I_{in}	I_D	I_{X1}	I_{X2}	I_{X3}	I_{X4}	R_{EX} ③	V_{EX} ①	V_F	V_R	V_{RH}	V_{IH}	V_{IHX}	V_{IL}	V_{CC}	V_{CCL}	V_{CCH}
MC3134	20	-2.0	1.0	-10	0.7	0.32	-0.32	0.47	68	1.4	0.4	2.4	4.0	2.0	2.4	0.8	5.0	4.5	5.5
MC3034	20	-2.0	1.0	-10	1.1	0.57	-0.57	0.6	63	1.4	0.4	2.5	4.0	2.0	2.4	0.8	5.0	4.75	5.25

Characteristic	Symbol	Pin Under Test	MC3134 Test Limits −55 to +125°C Min	Max	Unit	MC3034 Test Limits 0 to +75°C Min	Max	Unit	TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW: I_{OL}	I_{OH}	I_{in}	I_D	I_{X1}	I_{X2}	I_{X3}	I_{X4}	R_{EX} ③	V_{EX} ①	V_F	V_R	V_{RH}	V_{IH}	V_{IHX}	V_{IL}	V_{CC}	V_{CCL}	V_{CCH}	Gnd
Input																											
Forward Current	I_F	1	-	-2.0	mAdc	-	-2.0	mAdc	-	-	-	-	-	-	-	-	-	1	-	2,3,4	-	-	-	-	-	14	7
Leakage Current	I_{RI}	1	-	50	μAdc	-	50	μAdc	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	14	2,3,4,7, 10,11,12,13
Breakdown Voltage	BV_{in}	1	5.5**	-	mVdc	5.5**	-	mVdc	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	2,3,4,7, 10,11,12,13
Clamp Voltage	V_D	1	-	-1.5**	Vdc	-	-1.5**	Vdc	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	14	-	7
Expander Input Current	I_{EX}	9 ①	-	-5.85	mAdc	-	-6.3	mAdc	-	-	-	-	-	-	-	-	-	5,9	-	-	-	-	-	-	-	14	-	1,2,3,4,7, 10,11,12,13
Base-Emitter Voltage	V_{BE}	5 ②	-	1.0	Vdc	-	1.0	Vdc	8	-	-	-	5,9	-	-	-	-	-	-	-	-	-	-	-	-	14	-	1,2,3,4,7, 10,11,12,13
Output																											
Output Voltage	V_{OL}	8	-	0.4	Vdc	-	0.4	Vdc	8	-	-	-	-	-	-	-	-	-	-	-	-	1,2, 3,4	-	-	-	14	-	7,10,11,12,13
		8 ③	-	0.4	Vdc	-	0.4	Vdc	8	-	-	-	-	-	-	5	9	-	-	-	-	1,2, 3,4	-	-	-	14	-	1,2,3,4,7, 10,11,12,13
	V_{OH}	8	2.4	-	Vdc	2.5	-	Vdc	-	8	-	-	-	-	-	-	-	-	-	-	2,3,4, 11,12,13	-	-	1,10	-	14	-	7
		8	2.4	-	Vdc	2.5	-	Vdc	-	8	-	-	-	5	9	-	-	-	-	-	-	-	-	-	-	14	-	1,2,3,4,7, 10,11,12,13
Short-Circuit Current	I_{SC}	8	-40	-100	mAdc	-40	-100	mAdc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	1,2,3,4,7, 10,11,12,13
Power Requirements																											
Power Supply Drain	I_{PDH}	14	-	12	mAdc	-	12	mAdc	-	-	-	-	-	-	-	-	-	-	-	1,2,3,4,10, 11,12,13	-	-	-	-	-	14	7
	I_{PDL}	14	-	6.4	mAdc	-	6.4	mAdc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	1,2,3,4,7, 10,11,12,13
Switching Parameters									Pulse In	Pulse Out																	
Turn-On Delay	t_{pd-}**	1,8	-	11**	ns	-	11**	ns	1	8	-	-	-	-	-	-	-	-	-	-	-	2,3,4	-	14	-	-	7,10,11,12,13
Turn-Off Delay	t_{pd+}**	1,8	-	11**	ns	-	11**	ns	1	8	-	-	-	-	-	-	-	-	-	-	-	2,3,4	-	14	-	-	7,10,11,12,13

**Tested only at 25°C

① See Figure 1.

② See Figure 2.

③ See Figure 3.