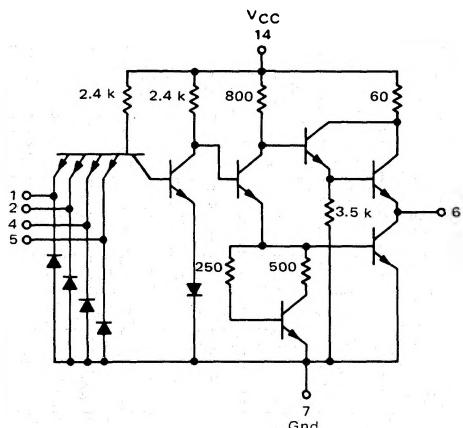


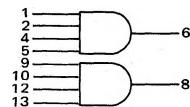
## DUAL 4-INPUT "AND" GATE

## MC3100/MC3000 series

**MC3111F • MC3011F**  
**MC3111L • MC3011L,P**  
 (54H21J) (74H21J,N)

 CIRCUIT SCHEMATIC  
 1/2 OF CIRCUIT SHOWN


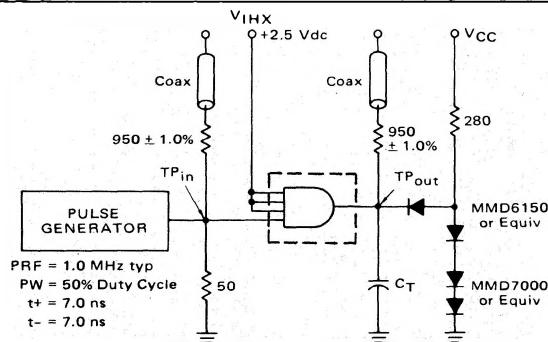
This device consists of two 4-input AND gates. This non-inverting function is useful for optimizing logic design, or for direct implementation of standard logic equations.



Positive Logic:  $6 = 1 \cdot 2 \cdot 4 \cdot 5$   
 Negative Logic:  $6 = 1 + 2 + 4 + 5$

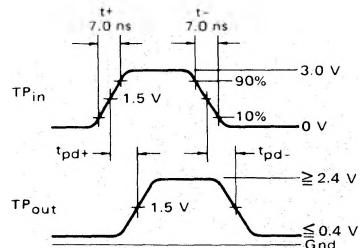
Input Loading Factor = 1  
 Output Loading Factor = 10  
 Total Power Dissipation = 56 mW typ/pkg  
 Propagation Delay Time = 9.0 ns typ

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS



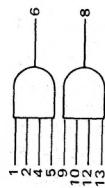
$C_T = 25 \text{ pF}$  = total parasitic capacitance, which includes probe, wiring, and load capacitances.

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.



## 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.



## MC3111, MC3011 (continued)

TEST CURRENT/VOLTAGE VALUES															
		mA			Volts										
		I <sub>OL</sub>	I <sub>OH</sub>	I <sub>in</sub>	I <sub>b</sub>	V <sub>IL</sub>	V <sub>IH</sub>	V <sub>f</sub>	V <sub>R</sub>	V <sub>max</sub>	V <sub>CC</sub>	V <sub>CC1</sub>	V <sub>CCH</sub>	V <sub>HX</sub>	
MC3111	@ Test Temperature	-5°C	-2.0	-	-	1.1	2.0	0.4	2.4	4.0	-	5.0	4.5	5.5	-
	+25°C	2.0	-2.0	1.0	-10	1.1	1.8	0.4	2.4	4.0	7.0	5.0	4.5	5.5	2.5
	+125°C	2.0	-2.0	-	-	0.8	1.8	0.4	2.4	4.0	-	5.0	4.5	5.5	-
	0°C	2.0	-2.0	-	-	1.1	2.0	0.4	2.5	4.0	-	5.0	4.75	5.25	-
MC3011	+25°C	2.0	-2.0	1.0	-10	1.1	1.8	0.4	2.5	4.0	7.0	5.0	4.75	5.25	2.5
	+75°C	2.0	-2.0	-	-	0.9	1.8	0.4	2.5	4.0	-	5.0	4.75	5.25	-
TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW:															
Characteristic	Symbol	Pin	MC3111 Test Limits				MC3011 Test Limits				MC3111 Test Limits				
			Under Test	-55°C	+25°C	+125°C	0°C	+25°C	+75°C	Min	Max	Min	Max	Unit	
Input	I <sub>F</sub>	1	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	mAdc	
	I <sub>R</sub>	1	-	50	-	50	-	50	-	50	-	50	-	μAdc	
	BV <sub>in</sub>	1	-	5.5	-	-	-	5.5	-	-	-	Vdc	-	Vdc	
	V <sub>D</sub>	1	-	-	-1.5	-	-	-1.5	-	-1.5	-	Vdc	-	Vdc	
Output	V <sub>OL</sub>	6	-	0.4	-	0.4	-	0.4	-	0.4	-	Vdc	6	-	
	V <sub>OH</sub>	6	2.4	-	2.4	-	2.4	-	2.5	-	2.5	-	Vdc	6	-
Short-Circuit Current	I <sub>SC</sub>	6	-40	-100	-40	-100	-40	-100	-40	-100	-40	mAdc	-	-	
Power Requirements (Total Device)	I <sub>max</sub>	14	-	-	18	-	-	-	18	-	-	mAdc	-	-	
Maximum Power Supply Current	I <sub>PDH</sub>	14	-	13.2	-	13.2	-	13.2	-	13.2	-	mAdc	-	-	
Power Supply Drain	I <sub>PDL</sub>	14	-	26	-	26	-	26	-	26	-	mAdc	-	-	
Switching Parameters	Turn-On Delay	1,6	-	-	15	-	-	-	15	-	-	Pulse In	Pulse Out	-	
	Turn-Off Delay	1,6	-	-	12	-	-	-	12	-	-	ns	1	6	

\*Since this is a non-inverting gate, power drain is minimized by tying the inputs to gates not under test to V<sub>TH</sub>