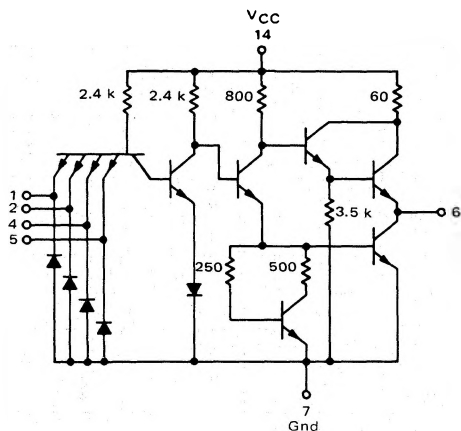


DUAL 4-INPUT "AND" GATE

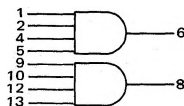
MC3100/MC3000 series

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

CIRCUIT SCHEMATIC
 1/2 OF CIRCUIT SHOWN



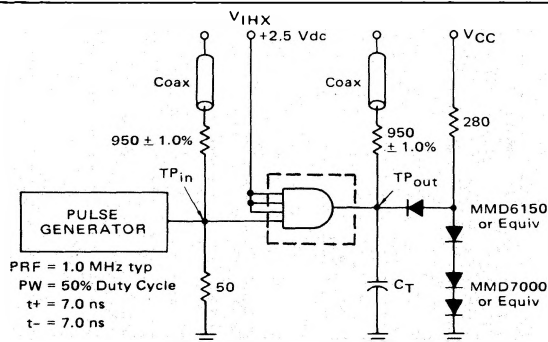
This device consists of two 4-input AND gates. This non-inverting function is useful for optimizing logic design, or for direct implementation of standard logic equations.



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

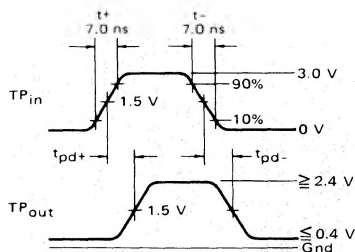
Input Loading Factor = 1
 Output Loading Factor = 10
 Total Power Dissipation = 56 mW typ/pkg
 Propagation Delay Time = 9.0 ns typ

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS



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

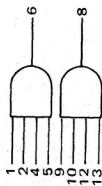
The coax delays from input to scope and output to scope must be matched. The scope must be terminated in 50-ohm impedance. The 950-ohm resistor and the scope termination impedance constitute a 20:1 attenuator probe. Coax shall be CT-070-50 or equivalent.



MC3111, MC3011 (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		Symbol	Pin Under Test	MC3111 Test Limits						MC3011 Test Limits						TEST CURRENT / VOLTAGE VALUES																			
				-55°C		+25°C		+125°C		0°C		+25°C		+75°C		TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW:																			
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW:																			
				Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	Unit	TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW:																			
Input				mA																Volts															
				I _F	I _R	B _V _{in}	V _D	V _{OL}	V _{OH}	I _{SC}	I _{max}	I _{PDH}	I _{PDL}	Pulse In	Pulse Out	I _{OH}	I _{in}	I _b	V _{IL}	V _{IH}	V _F	V _R	V _{BH}	V _{max}	V _{CC}	V _{CLL}	V _{CCH}	V _{HX}	Unit						
Forward Current	I _F	1	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	-2.0	mAdc	-	-	-	-	1	-	-	2.4, 5*	-	-	-	-	14	-	7			
Leakage Current	I _R	1	-	50	-	50	-	50	-	50	-	50	-	50	-	50	μAdc	-	-	-	-	-	1	*	-	-	-	-	14	-	2.4, 5, 7				
Breakdown Voltage	B _V _{in}	1	-	-	-	5.5	-	-	-	5.5	-	-	-	-	-	-	Vdc	-	-	-	-	-	-	*	-	-	-	14	-	2.4, 5, 7					
Clamp Voltage	V _D	1	-	-	-	-1.5	-	-	-	-	-	-1.5	-	-	-	-	Vdc	-	-	-	-	-	-	*	-	-	-	14	-	7					
Output Voltage	V _{OL}	6	-	0.4	-	0.4	-	0.4	-	0.4	-	0.4	-	0.4	-	0.4	Vdc	6	-	-	1	-	-	-	2.4, 5*	-	-	14	-	-	7				
	V _{OH}	6	2.4	-	2.4	-	2.4	-	2.4	-	2.4	-	2.4	-	2.4	-	Vdc	-	6	-	-	1	-	-	2.4, 5*	-	-	14	-	-	7				
Short-Circuit Current	I _{SC}	6	-40	-100	-40	-100	-40	-100	-40	-100	-40	-100	-40	-100	-40	-100	mAdc	-	-	-	-	-	-	-	2.4, 5*	-	-	14	-	-	7				
Power Requirements (Total Device)																																			
Maximum Power Supply Current	I _{max}	14	-	-	-	18	-	-	-	18	-	-	-	18	-	-	mAdc	-	-	-	-	-	-	-	1.2, 4.5, 9.10, 12, 13	-	-	-	-	-	7				
Power Supply Drain	I _{PDH}	14	-	13.2	-	13.2	-	13.2	-	13.2	-	13.2	-	13.2	-	13.2	mAdc	-	-	-	-	-	-	-	1.2, 4.5, 9.10, 12, 13	-	-	14	-	-	7				
	I _{PDL}	14	-	26	-	26	-	26	-	26	-	26	-	26	-	26	mAdc	-	-	-	-	-	-	-	-	-	-	14	-	-	1.2, 4.5, 7, 9.10, 12, 13				
Switching Parameters																																			
Turn-On Delay	t _{pd+}	1, 6	-	-	-	15	-	-	-	15	-	-	-	15	-	-	ns	1	6	-	-	-	-	*	-	14	-	-	2.4, 5	7					
Turn-Off Delay	t _{pd+}	1, 6	-	-	-	12	-	-	-	12	-	-	-	12	-	-	ns	1	6	-	-	-	*	-	14	-	-	2.4, 5	7						