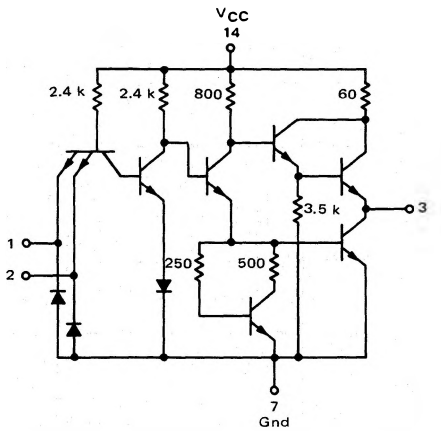
QUAD 2-INPUT "AND" GATE

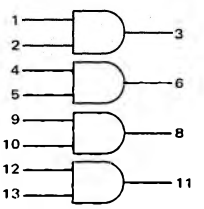
MC3101F • MC3001F
MC3101L • MC3001L,P

(54H08J) (74H08J,N)

CIRCUIT SCHEMATIC
1/4 OF CIRCUIT SHOWN



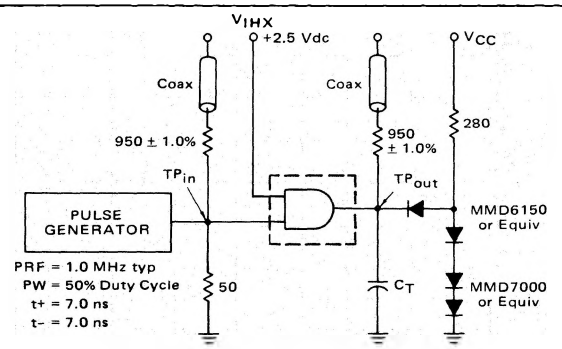
This device consists of four 2-input AND gates. This non-inverting function is useful for optimizing logic design, or for direct implementation of standard logic equations.

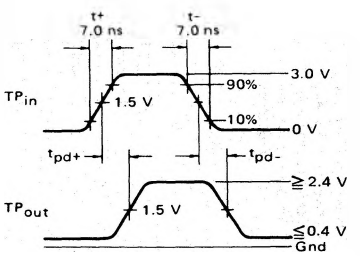


Positive Logic: 3 = 1 • 2
Negative Logic: 3 = 1 + 2

Input Loading Factor = 1
Output Loading Factor = 10
Total Power Dissipation = 112 mW typ/pkg
Propagation Delay Time = 9.0 ns typ

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS





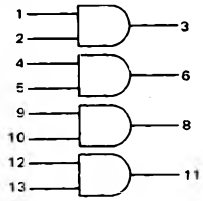
C_T = 25 pF = total parasitic capacitance, which includes probe, wiring, and load capacitances.

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 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 gates are 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	MC3101 Test Limits −55°C Min	−55°C Max	+25°C Min	+25°C Max	+125°C Min	+125°C Max	MC3001 Test Limits 0°C Min	0°C Max	+25°C Min	+25°C Max	+75°C Min	+75°C Max	Unit
Input Forward Current	I_F	1	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	-2.0	mAdc
Leakage Current	I_R	1	-	50	-	50	-	50	-	50	-	50	-	50	μAdc
Breakdown Voltage	BV_{in}	1	-	-	5.5	-	-	-	-	-	5.5	-	-	-	Vdc
Clamp Voltage	V_D	1	-	-	-	-1.5	-	-	-	-	-	-1.5	-	-	Vdc
Output Output Voltage	V_{OL}	3	-	0.4	-	0.4	-	0.4	-	0.4	-	0.4	-	0.4	Vdc
	V_{OH}	3	2.4	-	2.4	-	2.4	-	2.5	-	2.5	-	2.5	-	Vdc
Short-Circuit Current	I_{SC}	3	-40	-100	-40	-100	-40	-100	-40	-100	-40	-100	-40	-100	mAdc
Power Requirements (Total Device) Maximum Power Supply Current	I_{max}	14	-	-	-	34	-	-	-	-	-	34	-	-	mAdc
Power Supply Drain	I_{PDH}	14	-	24	-	24	-	24	-	24	-	24	-	24	mAdc
	I_{PDL}	14	-	48	-	48	-	48	-	48	-	48	-	48	mAdc
Switching Parameters Turn-On Delay	t_{pd-}	1, 3	-	-	-	15	-	-	-	-	-	15	-	-	ns
Turn-Off Delay	t_{pd-}	1, 3	-	-	-	12	-	-	-	-	-	12	-	-	ns

@ Test Temperature	TEST CURRENT/VOLTAGE VALUES mA I_{OL}	I_{OH}	I_{in}	I_D	Volts V_{IL}	V_{IH}	V_F	V_R	V_{RH}	V_{max}	V_{CC}	V_{CCL}	V_{CCH}	V_{IHX}
MC3101 −55°C	20	-2.0	-	-	1.1	2.0	0.4	2.4	4.0	-	5.0	4.5	5.5	-
MC3101 +25°C	20	-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
MC3101 +125°C	20	-2.0	-	-	0.8	1.8	0.4	2.4	4.0	-	5.0	4.5	5.5	-
MC3001 0°C	20	-2.0	-	-	1.1	2.0	0.4	2.5	4.0	-	5.0	4.75	5.25	-
MC3001 +25°C	20	-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
MC3001 +75°C	20	-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: I_{OL}	I_{OH}	I_{in}	I_D	V_{IL}	V_{IH}	V_F	V_R	V_{RH}	V_{max}	V_{CC}	V_{CCL}	V_{CCH}	V_{IHX}	Gnd
-	-	-	-	-	-	1	-	2*	-	-	14	-	-	7
-	-	-	-	-	-	-	1	*	-	-	-	14	-	2,7
-	-	1	-	-	-	-	-	*	-	-	-	14	-	2,7
-	-	-	1	-	-	-	-	*	-	-	14	-	-	7
3	-	-	-	1	-	-	-	2*	-	-	14	-	-	7
-	3	-	-	-	1	-	-	2*	-	-	14	-	-	7
-	-	-	-	-	-	-	-	1,2*	-	-	-	14	-	3,7
-	-	-	-	-	-	-	-	1,2,4,5,9, 10,12,13	14	-	-	-	-	7
-	-	-	-	-	-	-	-	1,2,4,5,9, 10,12,13	-	-	-	14	-	7
-	-	-	-	-	-	-	-	-	-	-	-	14	-	1,2,4,5,7, 9,10,12,13
Pulse In 1	Pulse Out 3	-	-	-	-	-	-	*	-	14	-	-	2	7
1	3	-	-	-	-	-	-	*	-	14	-	-	2	7

*Since this is a non-inverting gate, power drain is minimized by tying the inputs to gates not under test to V_{RH}.