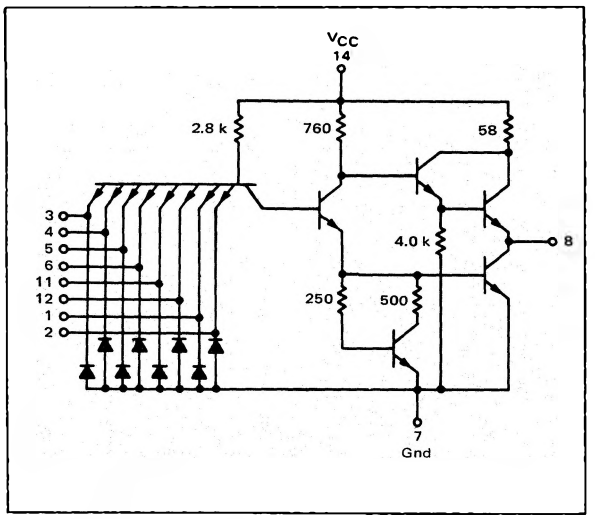
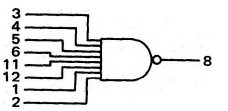
8-INPUT "NAND" GATE

MC3116F • MC3016F
MC3116L • MC3016L,P

(54H30J) (74H30J, N)



This device is an 8-input NAND gate. It is useful when processing a large number of variables, such as in encoders and decoders.



Positive Logic:

$8 = \overline{3 \bullet 4 \bullet 5 \bullet 6 \bullet 11 \bullet 12 \bullet 1 \bullet 2}$

Negative Logic:

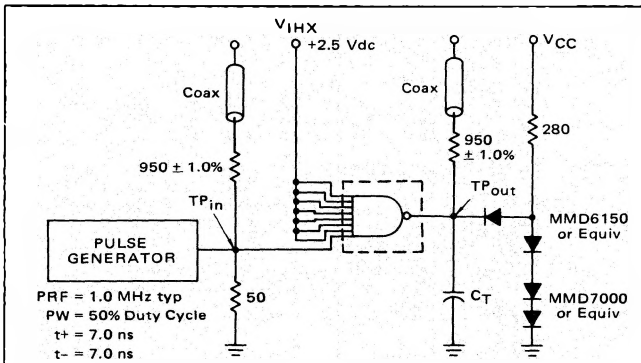
$8 = \overline{3 + 4 + 5 + 6 + 11 + 12 + 1 + 2}$

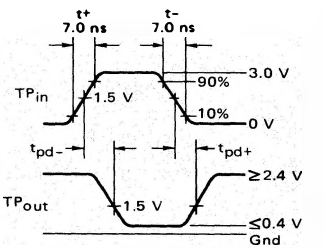
Input Loading Factor = 1
Output Loading Factor = 10
Total Power Dissipation = 22 mW typ/pkg
Propagation Delay Time = 8.0 ns typ

Pin numbers for the 54H30F/74H30F device are shown in the chart. These devices are available on special request.

DEVICE	PIN NUMBERS													
MC3116F,L/3016F,L,P	1	2	3	4	5	6	7	8	9	10	11	12	13	14
54H30F/74H30F	9	10	2	3	5	6	11	12	1	14	7	8	13	4

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS





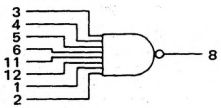
C_T = 25 pF = total parasitic capacitance, which includes probe, wiring, and load capacitances.

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 and the scope termination impedance constitute a 20:1 attenuator probe. Coax shall be CT-070-50 or equivalent.

General Information section for packaging.

ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one input of this device. To complete testing, sequence through remaining inputs in the same manner.



@ Test Temperature	TEST CURRENT/VOLTAGE VALUES													
	mA				Volts									
	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}
MC3116 −55°C	20	-2.0	-	-	1.1	2.0	0.4	2.4	4.0	-	5.0	4.5	5.5	-
MC3116 +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
MC3116 +125°C	20	-2.0	-	-	0.8	1.8	0.4	2.4	4.0	-	5.0	4.5	5.5	-
MC3016 0°C	20	-2.0	-	-	1.1	2.0	0.4	2.5	4.0	-	5.0	4.75	5.25	-
MC3016 +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
MC3016 +75°C	20	-2.0	-	-	0.9	1.8	0.4	2.5	4.0	-	5.0	4.75	5.25	-

Characteristic	Symbol	Pin Under Test	MC3116 Test Limits −55°C Min	MC3116 Test Limits −55°C Max	MC3116 Test Limits +25°C Min	MC3116 Test Limits +25°C Max	MC3116 Test Limits +125°C Min	MC3116 Test Limits +125°C Max	MC3016 Test Limits 0°C Min	MC3016 Test Limits 0°C Max	MC3016 Test Limits +25°C Min	MC3016 Test Limits +25°C Max	MC3016 Test Limits +75°C Min	MC3016 Test Limits +75°C Max	Unit	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
Input Forward Current	I_F	3	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	-2.0	mAdc	-	-	-	-	-	-	3	-	1, 2, 4, 5, 6, 11, 12	-	-	-	14	-	7
Leakage Current	I_R	3	-	50	-	50	-	50	-	50	-	50	-	50	μAdc	-	-	-	-	-	-	-	3	-	-	-	-	14	-	1, 2, 4, 5, 6, 7, 11, 12
Breakdown Voltage	BV_{in}	3	-	-	5.5	-	-	-	-	-	5.5	-	-	-	Vdc	-	-	3	-	-	-	-	-	-	-	-	-	14	-	1, 2, 4, 5, 6, 7, 11, 12
Clamp Voltage	V_D	3	-	-	-	-1.5	-	-	-	-	-	-1.5	-	-	Vdc	-	-	-	3	-	-	-	-	-	-	-	14	-	-	7
Output Output Voltage	V_{OL}	8	-	0.4	-	0.4	-	0.4	-	0.4	-	0.4	-	0.4	Vdc	8	-	-	-	-	3	-	-	1, 2, 4, 5 6, 11, 12	-	-	14	-	-	7
	V_{OH}	8	2.4	-	2.4	-	2.4	-	2.5	-	2.5	-	2.5	-	Vdc	-	8	-	-	3	-	-	-	1, 2, 4, 5, 6, 11, 12	-	-	14	-	-	7
Short-Circuit Current	I_{SC}	8	-40	-100	-40	-100	-40	-100	-40	-100	-40	-100	-40	-100	mAdc	-	-	-	-	-	-	-	-	-	-	-	-	14	-	1, 2, 3, 4, 5, 8, 8, 11, 12
Power Requirements (Total Device) Maximum Power Supply Current	I_{max}	14	-	-	-	6.5	-	-	-	-	-	6.5	-	-	mAdc	-	-	-	-	-	-	-	-	-	14	-	-	-	-	1, 2, 3, 4. 5, 7, 11, 12
Power Supply Drain	I_{PDH}	14	-	10	-	10	-	10	-	10	-	10	-	10	mAdc	-	-	-	-	-	-	-	-	1, 2, 3, 4, 5, 6, 11, 12	-	-	-	14	-	7
	I_{PDL}	14	-	4.2	-	4.2	-	4.2	-	4.2	-	4.2	-	4.2	mAdc	-	-	-	-	-	-	-	-	-	-	-	-	14	-	1, 2, 3, 4. 5, 7, 11, 12
Switching Parameters Turn-On Delay	t_{pd-}	3, 8	-	-	-	12	-	-	-	-	-	12	-	-	ns	Pulse In 3	Pulse Out 8	-	-	-	-	-	-	-	-	14	-	-	1, 2, 4, 5, 6, 11, 12	7
Turn-Off Delay	t_{pd+}	3, 8	-	-	-	10	-	-	-	-	-	10	-	-	ns	3	8	-	-	-	-	-	-	-	-	14	-	-	1, 2, 4, 5, 6, 11, 12	7