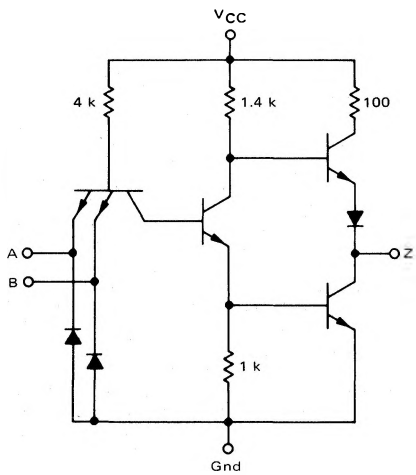
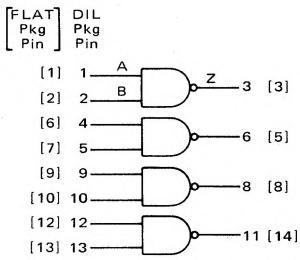
MC5400 • MC7400

Add Suffix F for TO-86 ceramic package (Case 607).
Suffix L for TO-116 ceramic package (Case 632).
Suffix P for TO-116 plastic package (Case 605) MC7400 only.

CIRCUIT SCHEMATIC
1/4 OF CIRCUIT SHOWN



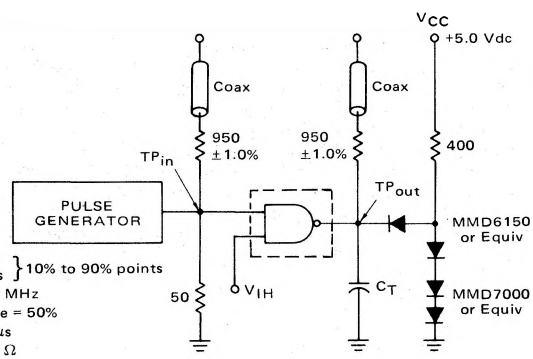
V_{CC} = Pin 14 [4]
Gnd = Pin 7 [11]



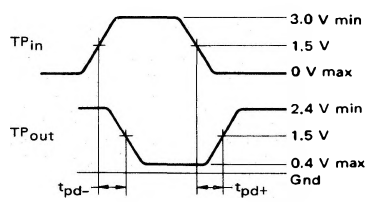
Positive Logic: $Z = \overline{A \bullet B}$
Negative Logic: $Z = \overline{A + B}$

Input Loading Factor = 1
Output Loading Factor = 10
Total Power Dissipation = 40 mW typ/pkg
Propagation Delay Time = 10 ns typ

SWITCHING TIME TEST CIRCUIT AND WAVEFORMS

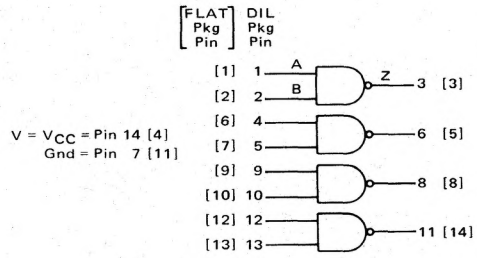


t+ = 12 ns
t- = 6.0 ns } 10% to 90% points
PRF = 1.0 MHz
Duty Cycle = 50%
PW = 0.5 μs
$Z_{out} \approx 50\ \Omega$



C_T = 15 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 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.

	TEST CURRENT/VOLTAGE VALUES (All Temperatures)											
	mA		Volts									
	I_{OL}	I_{OH}	V_{IL}	V_{IH}	V_{IHH}	V_{R1}	V_{R2}	$V_{th\,1}$	$V_{th\,0}$	V_{CC}	V_{CCL}	V_{CCH}
MC5400	16	-0.4	0.4	2.4	5.5	4.5	5.0	2.0	0.8	5.0	4.50	5.50
MC7400	16	-0.4	0.4	2.4	5.5	4.5	5.0	2.0	0.8	5.0	4.75	5.25

Characteristic	Symbol	Pin Under Test	MC5400 Test Limits −55 to +125°C Min	Max	Unit	MC7400 Test Limits 0 to +70°C Min	Max	Unit	TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW: I_{OL}	I_{OH}	V_{IL}	V_{IH}	V_{IHH}	V_{R1}	V_{R2}	$V_{th\,1}$	$V_{th\,0}$	V_{CC}	V_{CCL}	V_{CCH}	Pin 7[11] is grounded for all tests in addition to the pins listed below: Gnd
Input																					
Forward Current	I_F	A	-	-1.6	mAdc	-	-1.6	mAdc	-	-	A	-	-	B	-	-	-	-	-	V	*
Leakage Current	I_{R1}	A	-	40	μAdc	-	40	μAdc	-	-	-	A	-	-	-	-	-	-	-	V	B*
	I_{R2}	A	-	1.0	mAdc	-	1.0	mAdc	-	-	-	-	A	-	-	-	-	-	-	V	B*
Output																					
Output Voltage	V_{OL}	Z	-	0.4	Vdc	-	0.4	Vdc	Z	-	-	-	-	-	-	A,B	-	-	V	-	*
	V_{OH}	Z	2.4	-	Vdc	2.4	-	Vdc	-	Z	-	-	-	B	-	-	A	-	V	-	*
Short-Circuit Current	I_{SC}†	Z	-20	-55	mAdc	-18	-55	mAdc	-	-	-	-	-	-	-	-	-	-	-	V	A,B,Z*
Power Requirements (Total Device)																					
Power Supply Drain	I_{PDH}	V	-	22	mAdc	-	22	mAdc	-	-	-	-	-	-	All Inputs	-	-	-	-	V	*
	I_{PDL}	V	-	8.0	mAdc	-	8.0	mAdc	-	-	-	-	-	-	-	-	-	-	-	V	All Inputs
Switching Parameters									Pulse In	Pulse Out											
Turn-On Delay	t_{pd-}	A,Z	-	15**	ns	-	15**	ns	A	Z	-	B	-	-	-	-	-	V	-	-	*
Turn-Off Delay	t_{pd+}	A,Z	-	22**	ns	-	22**	ns	A	Z	-	B	-	-	-	-	-	V	-	-	*

*Ground inputs to gates not under test.
**Tested only at 25°C.
†Only one output should be shorted at a time.