

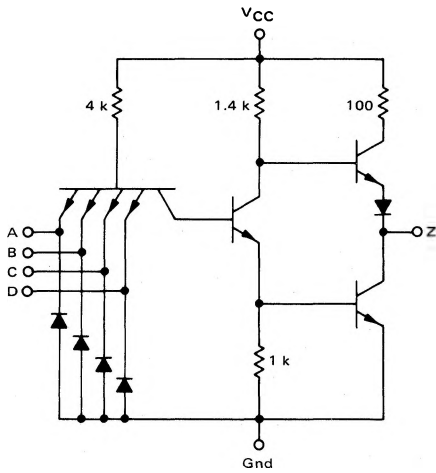
DUAL 4-INPUT "NAND" GATE

MC5400/7400 series

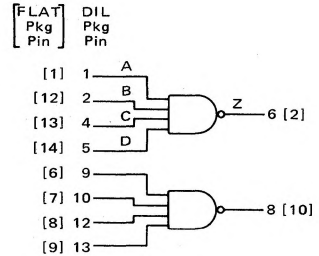
MC5420 • MC7420

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) MC7420 only.

CIRCUIT SCHEMATIC
 1/2 OF CIRCUIT SHOWN



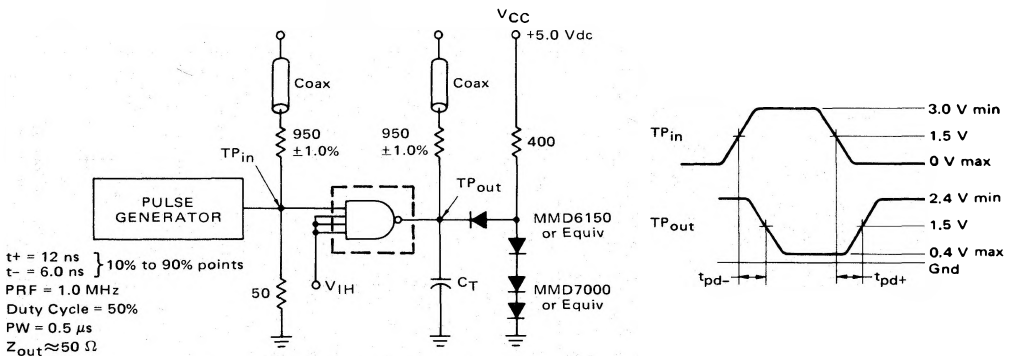
VCC = Pin 14 [4]
 Gnd = Pin 7 [11]



Positive Logic: $Z = \overline{A \cdot B \cdot C \cdot D}$
 Negative Logic: $Z = \overline{\overline{A} + \overline{B} + \overline{C} + \overline{D}}$

Input Loading Factor = 1
 Output Loading Factor = 10
 Total Power Dissipation = 20 mW typ/pkg
 Propagation Delay Time = 10 ns typ

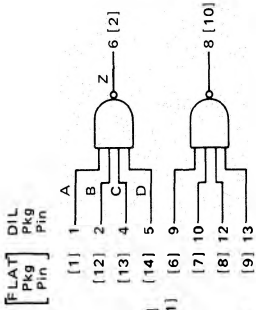
SWITCHING TIME TEST CIRCUIT AND WAVEFORMS



$C_T = 15 \text{ pF}$ = 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.

MC5420, MC7420 (continued)



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

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	MC5420 Test Limits -55 to +125°C		MC7420 Test Limits 0 to +70°C		TEST CURRENT/VOLTAGE VALUES (All Temperatures)												Pin 7 [11] is grounded for all tests in addition to the pins listed below: Gnd				
			Min	Max	Unit	Min	Max	Volts															
			TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW:																				
Input Forward Current	I _F	A	-	-1.6	mAde	-	-1.6	mAde	I _{OL}	I _{OH}	V _{IL}	V _{IH}	V _{IHH}	V _{R1}	V _{R2}	V _{th1}	V _{th1}	V _{th0}	V _{CC}	V _{CCL}	V _{CCH}	5.0	5.50
			40	40	μAde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.75
Leakage Current	I _{R1}	A	-	40	μAde	-	40	μAde	I _{OL}	I _{OH}	V _{IL}	V _{IH}	V _{IHH}	V _{R1}	V _{R2}	V _{th1}	V _{th1}	V _{th0}	V _{CC}	V _{CCL}	V _{CCH}	-	-
			1.0	1.0	mAde	-	1.0	mAde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Output Output Voltage	V _{OL}	Z	-	0.4	Vdc	-	0.4	Vdc	I _{OL}	I _{OH}	V _{IL}	V _{IH}	V _{IHH}	V _{R1}	V _{R2}	V _{th1}	V _{th1}	V _{th0}	V _{CC}	V _{CCL}	V _{CCH}	-	-
			2.4	2.4	Vdc	-	2.4	Vdc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Short-Circuit Current	I _{SC} †	Z	-20	-55	mAde	-18	-55	mAde	I _{OL}	I _{OH}	V _{IL}	V _{IH}	V _{IHH}	V _{R1}	V _{R2}	V _{th1}	V _{th1}	V _{th0}	V _{CC}	V _{CCL}	V _{CCH}	-	-
			11	11	mAde	-	11	mAde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Power Requirements (Total Device) Power Supply Drain	I _{PDH}	V	-	4.0	mAde	-	4.0	mAde	I _{OL}	I _{OH}	V _{IL}	V _{IH}	V _{IHH}	V _{R1}	V _{R2}	V _{th1}	V _{th1}	V _{th0}	V _{CC}	V _{CCL}	V _{CCH}	-	-
			11	11	mAde	-	11	mAde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Switching Parameters	I _{pd-}	A, Z	-	15**	ns	-	15**	ns	Pulse In	Pulse Out	-	-	-	-	-	-	-	-	-	-	-	-	-
			4.0	4.0	mAde	-	4.0	mAde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turn-On Delay	t _{pd+}	A, Z	-	22**	ns	-	22**	ns	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			4.0	4.0	mAde	-	4.0	mAde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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