

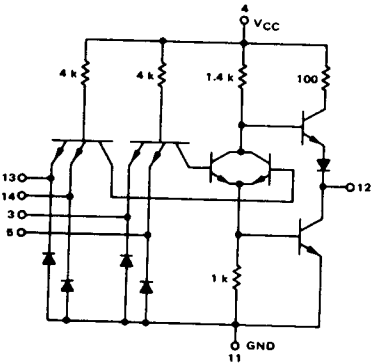
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DUAL 2-WIDE 2-INPUT  
"AND-OR-INVERT" GATE

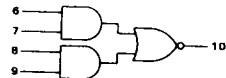
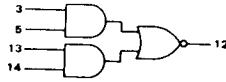
MTTL MC5400F/7400F series

MC5451F\*  
MC7451F\*

1/2 OF CIRCUIT SHOWN



This device consists of two AND-OR-INVERT gates. Each gate is made up of two 2-input AND gates ORed together and inverted.



Positive Logic:  $12 = (3 + 5) + (13 + 14)$

Negative Logic:  $12 = (\overline{3 + 5}) + (\overline{13 + 14})$

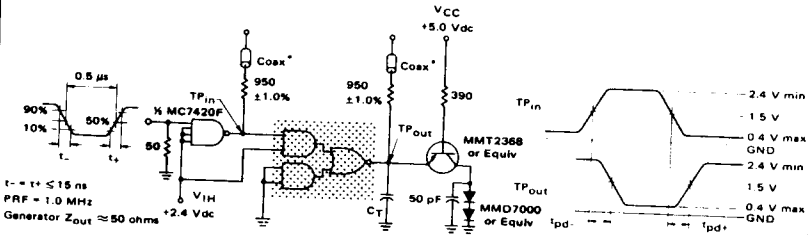
Input Loading Factor = 1  
Output Loading Factor = 10

Total Power Dissipation = 28 mW typ/pkg  
Propagation Delay Time = 13 ns typ

\*F suffix = TO-85 ceramic package (Case 609).  
See General Information section for package outline dimensions.

SWITCHING TIME TEST CIRCUIT

VOLTAGE WAVEFORMS AND DEFINITIONS



Ground inputs to gates not under test.

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

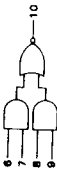
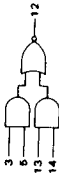
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MC5451F, MC7451F (continued)

**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	MC5451 Test Limits -55 to +125°C		MC7451 Test Limits 0 to +70°C		TEST CURRENT/VOLTAGE VALUES (All Temperatures)															
			Min	Max	Unit	Min	Max	Volts														
			TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW:																			
Input							$I_{OL}$	$I_{OH}$	$V_{IL}$	$V_{IH}$	$V_{OH}$	$V_{OL}$	$V_{IH1}$	$V_{IH2}$	$V_{OH1}$	$V_{OH2}$	$V_{CC}$	$V_{CCL}$	$V_{CCH}$			
Forward Current	$I_F$	14	-	-1.6	mAdc	-	-	-	14	-	-	-	-	-	-	-	-	-	-	-	4	
Leakage Current	$I_{R1}$	14	-	40	$\mu$ Adc	-	40	$\mu$ Adc	-	14	-	-	-	-	-	-	-	-	-	-	4	
	$I_{R2}$	14	-	1.0	mAdc	-	1.0	mAdc	-	14	-	-	-	-	-	-	-	-	-	-	4	
	$V_{OL}$	12	-	0.4	Vdc	-	0.4	Vdc	-	-	-	-	13,14	-	-	-	-	-	-	-	4	
Output	$V_{OH}$	12	2.4	-	Vdc	2.4	-	Vdc	-	-	13	-	-	-	-	-	14	-	-	-	4	
	$I_{SC}$	12	-20	-55	mAdc	-18	-55	mAdc	-	-	-	-	-	-	-	-	-	-	-	-	4	
Power Requirements (Total Device)																						
Power Supply: Drain	$I_{PDH}$	4	-	13.2	mAdc	-	13.2	mAdc	-	-	-	-	3.6, 6.7, 8, 9, 13, 14	-	-	-	-	-	-	-	4	
Switching Parameters																						
Turn-On Delay	$t_{pd}$	14, 12	-	13**	ns	-	15**	ns	-	13	-	-	-	-	-	-	-	-	-	-	-	4
Turn-Off Delay	$t_{pd}$	14, 12	-	29**	ns	-	29**	ns	-	13	-	-	-	-	-	-	-	-	-	-	-	4

\* Ground inputs to gates not under test.  
\*\* Testes only at 25°C.