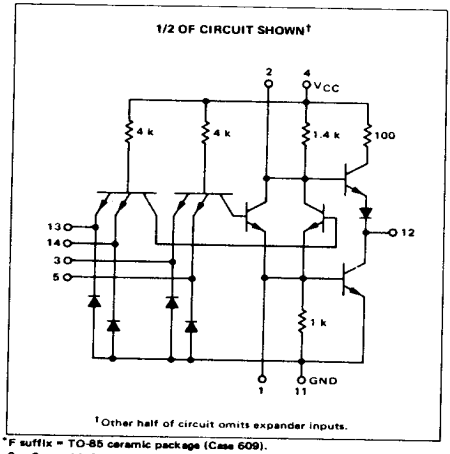
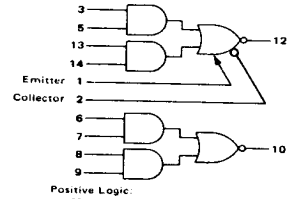
EXPANDABLE DUAL
2-WIDE 2-INPUT
"AND-OR-INVERT" GATE

MC5450F*
MC7450F*



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

This device consists of two AND-OR-INVERT gates, one of which is OR expandable. Each gate is made up of two 2-input AND gates ORed together and inverted. Up to four MC5460/7460 expander gates may be ORed with the device at the expander points.



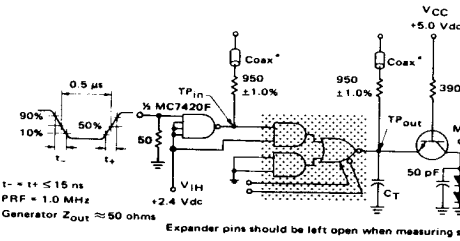
Positive Logic:
$12 = \overline{(3 \cdot 5) + (13 \cdot 14) + (\text{Expanders})}$

Negative Logic:
$\overline{3 + 5} \cdot \overline{(13 + 14)} \cdot (\text{Expanders})$

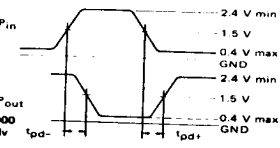
Input Loading Factor = 1
Output Loading Factor = 10

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

SWITCHING TIME TEST CIRCUIT



VOLTAGE WAVEFORMS AND DEFINITIONS



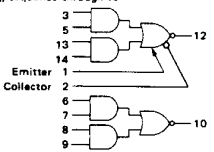
Expander pins should be left open when measuring switching times.

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 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.



	TEST CURRENT/VOLTAGE VALUES (All Temperatures)																					
	mA						Ohms	Volts														
	I_{OL}	I_{OH}	I_{X1}	I_{X2}	I_{X3}	I_{X4}	R_{EX} [3]	V_{EX} [3]	V_{IL}	V_{IH}	V_{INH}	V_{R1}	V_{R2}	V_{th1}	V_{th0}	V_{CC}	V_{CCL}	V_{CCH}				
MC5450	16	-0.4	0.41	0.27	-0.27	0.3	138	0.4	5.5	2.4	5.5	4.5	5.0	2.0	0.8	5.0	4.5	5.5				
MC7450	16	-0.4	0.62	0.15	-0.15	0.43	130	0.4	5.5	2.4	5.5	4.5	5.0	2.0	0.8	5.0	4.75	5.25				

Characteristic	Symbol	Pin Under Test	MC5450 Test Limits −55 to +125 C Min	Max	Unit	MC7450 Test Limits 0 to +70°C Min	Max	Unit	TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW: I_{OL}	I_{OH}	I_{X1}	I_{X2}	I_{X3}	I_{X4}	R_{EX} [3]	V_{EX} [3]	V_{IL}	V_{IH}	V_{INH}	V_{R1}	V_{R2}	V_{th1}	V_{th0}	V_{CC}	V_{CCL}	V_{CCH}	Gnd
Input																										
Forward Current	I_F	14	-	-1.6	mAdc	-	-1.6	mAdc	-	-	-	-	-	-	-	-	14	-	-	13	-	-	-	-	4	11*
Leakage Current	I_{R1}	14	-	40	μAdc	-	40	μAdc	-	-	-	-	-	-	-	-	-	14	-	-	-	-	-	-	4	3,5,11,13*
	I_{R2}	14	-	1.0	mAdc	-	1.0	mAdc	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-	-	4	3,5,11,13*
Expander Input Current	I_{EX}	2 [1]	-	-2.9	mAdc	-	-3.1	mAdc	12	-	-	-	-	-	-	1.2	-	-	-	-	-	-	-	-	4	3,5,11,13,14*
Base-Emitter Voltage	V_{BE}	1 [2]	-	1.0	Vdc	-	1.0	Vdc	12	-	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	4	3,5,11,13,14*
Output																										
Output Voltage	V_{OL}	12	-	0.4	Vdc	-	0.4	Vdc	12	-	-	-	-	-	-	-	-	-	-	-	13,14	-	-	-	4	3,5,11*
		12 [3]	-	0.4	Vdc	-	0.4	Vdc	12	-	-	-	-	1	2	-	-	-	-	-	13,14	-	-	-	4	3,5,11,13,14*
	V_{OH}	12	2.4	-	Vdc	2.4	-	Vdc	-	12	-	-	-	-	-	-	-	-	13	-	-	14	-	4	3,5,11*
		12	2.4	-	Vdc	2.4		Vdc	-	12	-	1	2	-	-	-	-	-	-	-	-	-	-	4	3,5,11,13,14*
Short-Circuit Current	I_{SC}	12	-20	-55	mAdc	-18	-55	mAdc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	3,5,11,13,14*
Power Requirements (Total Device) Power Supply Drain	I_{PDH}	4	-	13.2	mAdc	-	13.2	mAdc	-	-	-	-	-	-	-	-	-	-	-	1,3,4,5,6, 7,8,9,13	-	-	-	4	-	11
	I_{PDL}	4	-	7.2	mAdc	-	7.2	mAdc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4		3,5,11,12,13,14
Switching Parameters									Pulse In	Pulse Out																
Turn-On Delay	t_{pd+}	14,12	-	15**	ns	-	15**	ns	14	12	-	-	-	-	-	-	13	-	-	-	-	-	-	4	-	3,5,11*
Turn-Off Delay	t_{pd-}	14,12	-	29**	ns	-	29**	ns	14	12	-	-	-	-	-	-	13	-	-	-	-	-	-	4	-	3,5,11*

*Ground inputs to gate not under test.
**Tested only at 25°C.
[1] See Figure 1. [2] See Figure 2. [3] See Figure 3

FIGURE 1 – I_{EX} TEST CIRCUIT

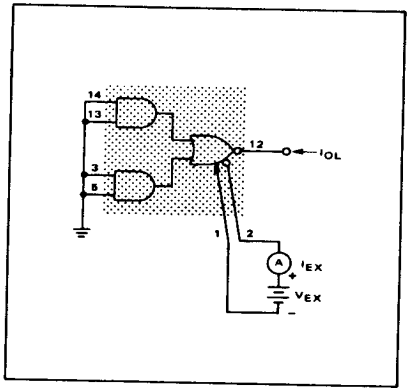


FIGURE 2 – V_{BE} TEST CIRCUIT

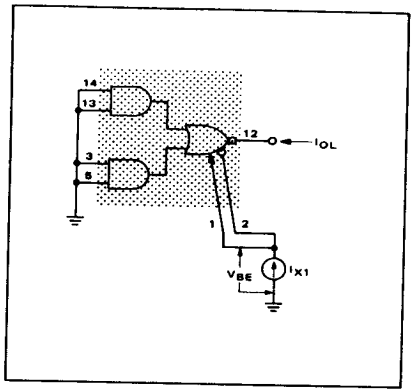


FIGURE 3 – V_{OL} TEST CIRCUIT