

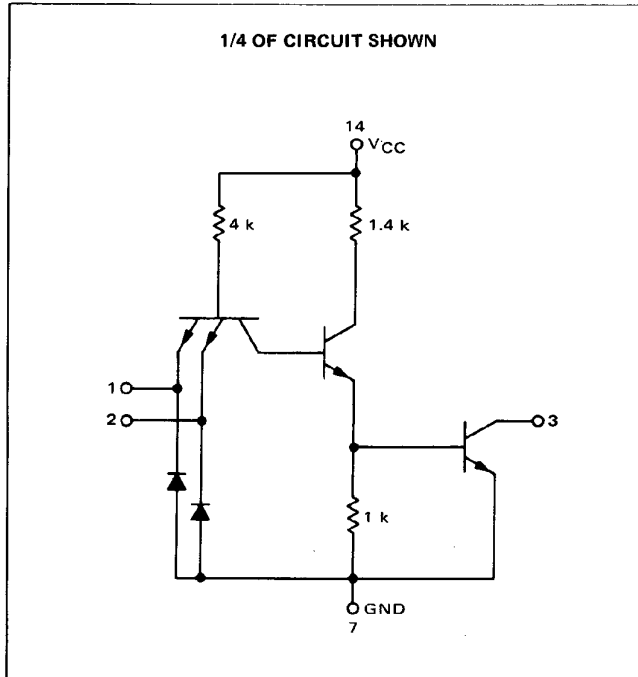
QUAD 2-INPUT "NAND" GATE  
WITH OPEN COLLECTOR

MTTL MC7400P series  
MTTL MC5400L/7400L series

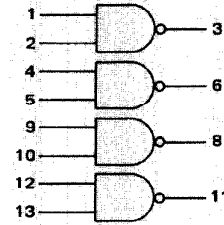


DECEMBER 1969

**MC5403L\***  
**MC7403P,L\***



This device consists of four 2-input NAND gates with no output pullup circuits. It can be used where the Wired-OR function is required, or for driving discrete components.



Positive Logic:  $3 = \overline{1 \cdot 2}$   
Negative Logic:  $3 = 1 + 2$

Input Loading Factor = 1  
Output Loading Factor = 10

Total Power Dissipation = 40 mW typ/pkg  
Propagation Delay Time = 35 ns typ

\* L suffix = TO-116 ceramic package (Case 632)  
P suffix = TO-116 plastic package (Case 605)  
See General Information section for package outline dimensions.

2

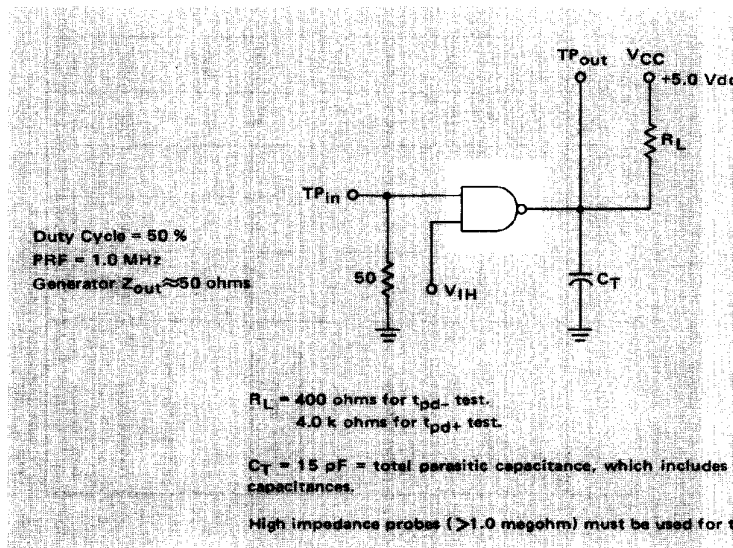
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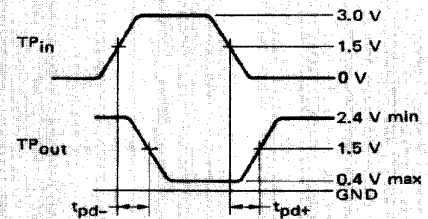
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not

VOLTAGE WAVEFORMS AND DEFINITIONS

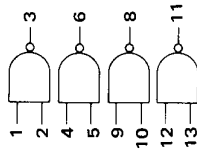


SWITCHING TIME TEST CIRCUIT



**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	MC5403 Test Limits -55 to +125°C				MC7403 Test Limits 0 to +70°C				TEST CURRENT/VOLTAGE VALUES (All Temperatures)																																		
			Min	Max	Unit	Min	Max	Unit	Volts																																				
			TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW:																																										
Input Forward Current	$I_F$	1	-	-1.6	mAdc	-	-1.6	mAdc	$I_{OL}$	16	0.4	2.4	$V_{IL}$	0.4	2.4	$V_{IH}$	5.5	5.5	$V_{IHH}$	4.5	4.5	$V_{R1}$	5.0	5.0	$V_{R2}$	5.0	5.0	$V_{th1}$	2.0	2.0	$V_{th0}$	0.8	0.8	$V_{CEX}$	5.5	5.5	$V_{CC}$	5.0	5.0	$V_{CCL}$	4.5	4.5	$V_{CCH}$	5.5	5.5
Leakage Current	$I_{R1}$	1	-	40	$\mu$ Adc	-	40	$\mu$ Adc	$I_{OL}$	16	0.4	2.4	$V_{IL}$	0.4	2.4	$V_{IH}$	5.5	5.5	$V_{IHH}$	4.5	4.5	$V_{R1}$	5.0	5.0	$V_{R2}$	5.0	5.0	$V_{th1}$	2.0	2.0	$V_{th0}$	0.8	0.8	$V_{CEX}$	5.5	5.5	$V_{CC}$	5.0	5.0	$V_{CCL}$	4.5	4.5	$V_{CCH}$	5.5	5.5
Output	$I_{R2}$	1	-	1.0	mAdc	-	1.0	mAdc	$I_{OL}$	16	0.4	2.4	$V_{IL}$	0.4	2.4	$V_{IH}$	5.5	5.5	$V_{IHH}$	4.5	4.5	$V_{R1}$	5.0	5.0	$V_{R2}$	5.0	5.0	$V_{th1}$	2.0	2.0	$V_{th0}$	0.8	0.8	$V_{CEX}$	5.5	5.5	$V_{CC}$	5.0	5.0	$V_{CCL}$	4.5	4.5	$V_{CCH}$	5.5	5.5
Output Voltage	$V_{OL}$	3	-	0.4	Vdc	-	0.4	Vdc	$I_{OL}$	16	0.4	2.4	$V_{IL}$	0.4	2.4	$V_{IH}$	5.5	5.5	$V_{IHH}$	4.5	4.5	$V_{R1}$	5.0	5.0	$V_{R2}$	5.0	5.0	$V_{th1}$	2.0	2.0	$V_{th0}$	0.8	0.8	$V_{CEX}$	5.5	5.5	$V_{CC}$	5.0	5.0	$V_{CCL}$	4.5	4.5	$V_{CCH}$	5.5	5.5
Output Leakage Current	$I_{CEX}$	3	-	0.25	mAdc	-	0.25	mAdc	$I_{OL}$	16	0.4	2.4	$V_{IL}$	0.4	2.4	$V_{IH}$	5.5	5.5	$V_{IHH}$	4.5	4.5	$V_{R1}$	5.0	5.0	$V_{R2}$	5.0	5.0	$V_{th1}$	2.0	2.0	$V_{th0}$	0.8	0.8	$V_{CEX}$	5.5	5.5	$V_{CC}$	5.0	5.0	$V_{CCL}$	4.5	4.5	$V_{CCH}$	5.5	5.5
Power Requirements (Total Device)	$I_{PDH}$	14	-	22	mAdc	-	22	mAdc	$I_{OL}$	16	0.4	2.4	$V_{IL}$	0.4	2.4	$V_{IH}$	5.5	5.5	$V_{IHH}$	4.5	4.5	$V_{R1}$	5.0	5.0	$V_{R2}$	5.0	5.0	$V_{th1}$	2.0	2.0	$V_{th0}$	0.8	0.8	$V_{CEX}$	5.5	5.5	$V_{CC}$	5.0	5.0	$V_{CCL}$	4.5	4.5	$V_{CCH}$	5.5	5.5
Power Supply Drain	$I_{PDL}$	14	-	8.0	mAdc	-	8.0	mAdc	$I_{OL}$	16	0.4	2.4	$V_{IL}$	0.4	2.4	$V_{IH}$	5.5	5.5	$V_{IHH}$	4.5	4.5	$V_{R1}$	5.0	5.0	$V_{R2}$	5.0	5.0	$V_{th1}$	2.0	2.0	$V_{th0}$	0.8	0.8	$V_{CEX}$	5.5	5.5	$V_{CC}$	5.0	5.0	$V_{CCL}$	4.5	4.5	$V_{CCH}$	5.5	5.5
Switching Parameters	$t_{pd-}$	1,3	-	15**	ns	-	15**	ns	$I_{OL}$	16	0.4	2.4	$V_{IL}$	0.4	2.4	$V_{IH}$	5.5	5.5	$V_{IHH}$	4.5	4.5	$V_{R1}$	5.0	5.0	$V_{R2}$	5.0	5.0	$V_{th1}$	2.0	2.0	$V_{th0}$	0.8	0.8	$V_{CEX}$	5.5	5.5	$V_{CC}$	5.0	5.0	$V_{CCL}$	4.5	4.5	$V_{CCH}$	5.5	5.5
Turn-On Delay	$t_{pd+}$	1,3	-	45**	ns	-	45**	ns	$I_{OL}$	16	0.4	2.4	$V_{IL}$	0.4	2.4	$V_{IH}$	5.5	5.5	$V_{IHH}$	4.5	4.5	$V_{R1}$	5.0	5.0	$V_{R2}$	5.0	5.0	$V_{th1}$	2.0	2.0	$V_{th0}$	0.8	0.8	$V_{CEX}$	5.5	5.5	$V_{CC}$	5.0	5.0	$V_{CCL}$	4.5	4.5	$V_{CCH}$	5.5	5.5
Turn-Off Delay	$t_{pd+}$	1,3	-	45**	ns	-	45**	ns	$I_{OL}$	16	0.4	2.4	$V_{IL}$	0.4	2.4	$V_{IH}$	5.5	5.5	$V_{IHH}$	4.5	4.5	$V_{R1}$	5.0	5.0	$V_{R2}$	5.0	5.0	$V_{th1}$	2.0	2.0	$V_{th0}$	0.8	0.8	$V_{CEX}$	5.5	5.5	$V_{CC}$	5.0	5.0	$V_{CCL}$	4.5	4.5	$V_{CCH}$	5.5	5.5

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



**MOTOROLA Semiconductor Products Inc.**

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