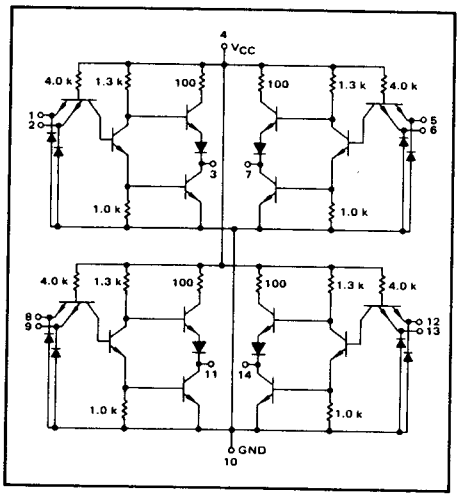
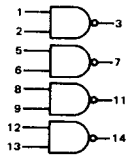
MC508 · MC558
MC408 · MC458



This device consists of four 2-input NAND gates. The four gates in a single package represent increased functional flexibility. For example, a dual set-reset flip-flop may be obtained if each pair of gates is externally cross-coupled.

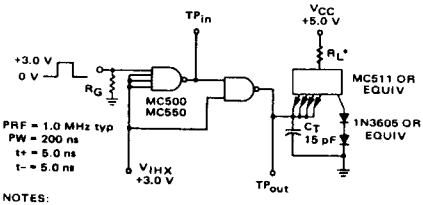


Positive Logic: $3 = \overline{1 \cdot 2}$
Negetive Logic: $3 = \overline{1 + 2}$

Total Power Dissipation = 60 mW typ/pkg
Propegation Delay Time = 10 ns typ

TYPE NO.	INPUT LOADING FACTOR	(I_F)	OUTPUT DRIVE		(I_{OL})	TEMPERATURE RANGE
MC508 MC558	1	(−1.33 mA)	15 7	MC500 series Gates MC500 series Gates	(20 mA) (10 mA)	−55°C to +125°C
MC408 MC458	1	(−1.66 mA)	12 6	MC400 series Gates MC400 series Gates	(20 mA) (10 mA)	0° to +75°C

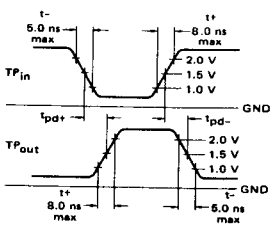
SWITCHING TIME TEST CIRCUIT



NOTES:
R_G = 50 ohms
C_T = the total parasitic capacitance which includes probe, wiring, and load capacitances.
Scope rise time < 1.0 ns
Probe capacitance < 5.0 pF
Ground inputs to all gates not under test.

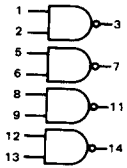
*MC508 – 260Ω
MC558 – 570Ω
MC408 – 330Ω
MC458 – 660Ω

VOLTAGE WAVEFORMS AND DEFINITIONS



ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one gate. The other gates are tested in a similar manner. Further, test procedures are shown for only one input of the gate being tested. The other input is tested in the same manner.



@ Test Temperature		I_{OL} mA Pr*	I_{OL} mA Std	I_{OH} mA Pr*	I_{OH} mA Std	I_{in} mA	V_{IL} Volts	V_{IH} Volts	V_R Volts	$V_{th\,1}$ Volts	$V_{th\,0}$ Volts	V_{out} Volts	V_{CC} Volts	V_{CCH} Volts	V_{IHX} Volts
MC508*, MC558	−55°C	20	10	-1.5	-0.7	1.0	0.45	2.8	4.5	2.0	1.0	5.5	5.0	-	-
	+25°C	20	10	-1.5	-0.7	1.0	0.45	2.8	4.5	1.7	1.2	5.5	5.0	8.0	3.0
	+125°C	20	10	-1.5	-0.7	1.0	0.45	2.8	4.5	1.4	0.9	5.5	5.0	-	-
MC408*, MC458	0°C	20	10	-1.2	-0.6	1.0	0.45	3.0	4.5	1.9	1.1	5.5	5.0	-	-
	+25°C	20	10	-1.2	-0.6	1.0	0.45	3.0	4.5	1.8	1.2	5.5	5.0	7.0	3.0
	+75°C	20	10	-1.2	-0.6	1.0	0.45	3.0	4.5	1.7	1.1	5.5	5.0	-	-

Characteristic	Symbol	Pin Under Test	MC508, MC558 Test Limits −55°C Min	−55°C Max	+25°C Min	+25°C Max	+125°C Min	+125°C Max	MC408, MC458 Test Limits 0°C Min	0°C Max	+25°C Min	+25°C Max	+75°C Min	+75°C Max	Unit	TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW: I_{OL}	I_{OH}	I_{in}	V_{IL}	V_{IH}	V_R	$V_{th\,1}$	$V_{th\,0}$	V_{out}	V_{CC}	V_{CCH}	V_{IHX}	Gnd†
Input																												
Forward Current	I_F	1	-	-1.33	-	-1.33	-	-1.33	-	-1.66	-	-1.66	-	-1.66	mAdc	-	-	-	-	-	2	-	-	-	4	-	-	1,10
Leakage Current	I_R	1	-	100	-	100	-	100	-	100	-	100	-	100	μAdc	-	-	-	-	-	1	-	-	-	4	-	-	2,10
Inverse Beta Current	I_L	1	-	100	-	100	-	100	-	100	-	100	-	100	μAdc	-	-	-	-	-	1	-	-	-	4	-	-	2,10
Breakdown Voltage	BV_{in} "0"	1	5.5	-	5.5	-	5.5	-	5.5	-	5.5	-	5.5	-	Vdc	-	-	1	-	-	-	-	-	-	4	-	-	10
	BV_{in} "1"	1	5.5	-	5.5	-	5.5	-	5.5	-	5.5	-	5.5	-	Vdc	-	-	1	-	-	-	-	-	-	4	-	-	2,10
Output																												
Output Voltage	V_{out} "0"	3	-	0.45	-	0.45	-	0.45	-	0.45	-	0.45	-	0.45	Vdc	3	-	-	-	-	-	1	-	-	4	-	-	10
	V_{out} "1"	3	2.5	-	2.4	-	2.7	-	2.5	-	2.4	-	2.5	-	Vdc	-	3	-	-	-	-	-	1	-	4	-	-	10
Leakage Current	I_{OLK}	3	-	250	-	250	-	250	-	250	-	250	-	250	μAdc	-	-	-	-	-	-	-	-	3	4	-	-	1,2,10
Short-Circuit Current	I_{SC}	3	-10	-45	-10	-45	-10	-45	-10	-45	-10	-45	-10	-45	mAdc	-	-	-	-	-	-	-	-	-	4	-	-	1,2,3,10
Output Voltage	V_{OL}	3	-	0.40	-	0.40	-	0.45	-	0.40	-	0.40	-	0.45	Vdc	3	-	-	-	1	-	-	-	-	4	-	-	10
	V_{OH}	3	2.8	-	3.2	-	3.35	-	3.0	-	3.1	-	3.15	-	Vdc	-	3	-	1	-	-	-	-	-	4	-	-	10
Power Requirements (Total Device)																												
Maximum Power Supply Current	I_{max}	4	-	-	-	20	-	-	-	-	-	20	-	-	mAdc	-	-	-	-	-	-	-	-	-	-	4	-	1,5,8,10,12
Power Supply Drain	I_{PDH}	4	-	24	-	24	-	24	-	30	-	30	-	30	mAdc	-	-	-	-	-	-	-	-	-	4	-	-	10‡
	I_{PDL}	4	-	12	-	12	-	12	-	12	-	12	-	12	mAdc	-	-	-	-	-	-	-	-	-	4	-	-	1,5,8,10,12
Switching Parameters																Pulse In	Pulse Out											
Turn-On Delay	t_{pd-}	1,3	-	-	-	20	-	-	-	-	-	20	-	-	ns	1	3	-	-	-	-	-	-	-	4	-	2	10
Turn-Off Delay	t_{pd-}	1,3	-	-	-	20	-	-	-	-	-	20	-	-	ns	1	3	-	-	-	-	-	-	-	4	-	2	10
Rise Time	t_+	1,3	-	-	-	8.0	-	-	-	-	-	8.0	-	-	ns	1	3	-	-	-	-	-	-	-	4	-	2	10
Fall Time	t_-	1,3	-	-	-	5.0	-	-	-	-	-	5.0	-	-	ns	1	3	-	-	-	-	-	-	-	4	-	2	10

* Prime Fan-Out
† Ground inputs to gates not under test, during ALL tests unless otherwise noted.
‡ The inputs to all gates must be ungrounded.