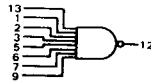
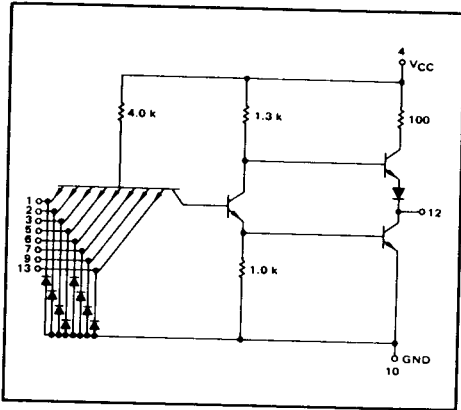


8-INPUT "NAND" GATE

MTTL I MC500/400 series

MC502 · MC552
MC402 · MC452

This device is an 8-input NAND gate. It is useful when processing a large number of variables, such as in encoders or decoders.



Positive Logic:
 $12 = \overline{1 \cdot 2 \cdot 3 \cdot 5 \cdot 6 \cdot 7 \cdot 9 \cdot 13}$
Negative Logic:
 $12 = \overline{1 + 2 + 3 + 5 + 6 + 7 + 9 + 13}$

Total Power Dissipation = 15 mW typ/pkg
Propagation Delay Time = 12 ns typ

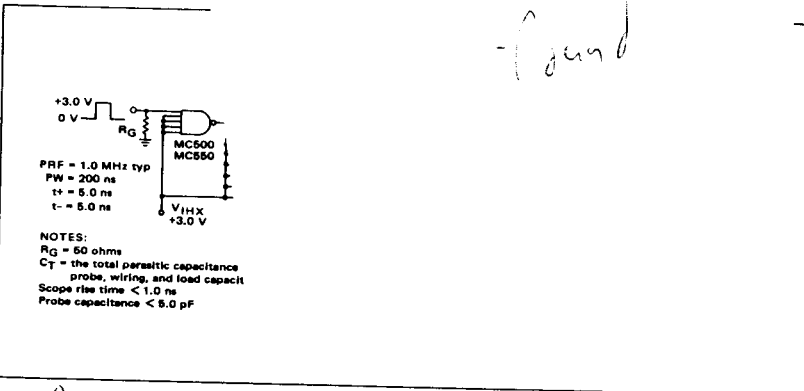
TYPE NO.	INPUT LO
MC502	
MC552	
MC402	
MC452	

MC402

RANGE
°C

MC
(ground)

SWITCHING



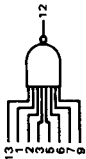
490

490

MC502, MC552/MC402, MC452 (continued)

ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one input of the gate. To complete testing, sequence through remaining inputs in the same manner.



TEST CONDITIONS

mA		Volts												
I_{OL}	I_{OH}	P_I	Std	V_{IH}	V_{IL}	V_{IK}	V_{IL}	V_{IH}	V_{IK}	V_{IH0}	V_{IH1}	V_{OH}	V_{OL}	V_{OH}
20	10	-1.5	-0.7	1.0	0.45	2.8	4.5	2.0	1.0	5.5	5.0	-	-	-
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	
20	10	-1.5	-0.7	1.0	0.45	2.8	4.5	1.4	0.9	5.5	5.0	-	-	
20	10	-1.2	-0.6	1.0	0.45	3.0	4.5	1.9	1.1	5.5	5.0	-	-	
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	
20	10	-1.2	-0.6	1.0	0.45	3.0	4.5	1.7	1.1	5.5	5.0	-	-	

TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW:

Characteristic	Symbol	Pin	MC502			MC552			MC402			MC452			Test Limits
			Min	Max	Unit	Min	Max	Unit	Min	Max	Unit	Min	Max	Unit	
Input															
Forward Current	I_F	1	-	-1.33	-	-1.33	-	-1.66	-	-1.66	-	-1.66	-	-1.66	mAdc
Leakage Current	I_R	1	-	100	-	100	-	100	-	100	-	100	-	100	μ Adc
Inverse Beta Current	I_L	1	-	100	-	100	-	100	-	100	-	100	-	100	μ Adc
Breakdown Voltage	$BV_{in}^{(1)}$	1	-	-	-	-	-	5.5	-	5.5	-	5.5	-	5.5	Vdc
Output															
Output Voltage	$V_{out}^{(2)}$	12	0.45	-	0.45	0.45	-	0.45	-	0.45	-	0.45	-	0.45	Vdc
Leakage Current	I_{OLK}	12	2.5	-	2.4	-	2.5	-	2.4	-	2.5	-	2.4	Vdc	
Short-Circuit Current	I_{SC}	12	-	250	-	250	-	250	-	250	-	250	-	250	μ Adc
Output Voltage	V_{OL}	12	-	0.40	-	0.40	-	0.40	-	0.40	-	0.40	-	0.40	Vdc
Power Requirements															
Maximum Power Supply Current	I_{max}	4	-	-	-	-	-	10	-	-	-	-	-	10	mAdc
Power Supply Drain	I_{PDR}	4	6.0	-	6.0	-	7.5	-	7.5	-	7.5	-	7.5	mAdc	
Switching Parameters															
Turn-On Delay	t_{pd}	1,12	-	-	-	-	-	24	-	-	-	-	-	24	ns
Turn-Off Delay	t_{pd}	1,12	-	-	-	-	-	20	-	-	-	-	-	20	ns
Rise Time	t_r	1,12	-	-	-	-	-	8.0	-	-	-	-	-	8.0	ns
Fall Time	t_f	1,12	-	-	-	-	-	5.0	-	-	-	-	-	5.0	ns

Characteristic	Symbol	Pin	MC502			MC552			MC402			MC452			Test Limits
			Min	Max	Unit	Min	Max	Unit	Min	Max	Unit	Min	Max	Unit	
Input															
Forward Current	I_F	1	-	-1.33	-	-1.33	-	-1.66	-	-1.66	-	-1.66	-	-1.66	mAdc
Leakage Current	I_R	1	-	100	-	100	-	100	-	100	-	100	-	100	μ Adc
Inverse Beta Current	I_L	1	-	100	-	100	-	100	-	100	-	100	-	100	μ Adc
Breakdown Voltage	$BV_{in}^{(1)}$	1	-	-	-	-	-	5.5	-	5.5	-	5.5	-	5.5	Vdc
Output															
Output Voltage	$V_{out}^{(2)}$	12	0.45	-	0.45	0.45	-	0.45	-	0.45	-	0.45	-	0.45	Vdc
Leakage Current	I_{OLK}	12	2.5	-	2.4	-	2.5	-	2.4	-	2.5	-	2.4	Vdc	
Short-Circuit Current	I_{SC}	12	-	250	-	250	-	250	-	250	-	250	-	250	μ Adc
Output Voltage	V_{OL}	12	-	0.40	-	0.40	-	0.40	-	0.40	-	0.40	-	0.40	Vdc
Power Requirements															
Maximum Power Supply Current	I_{max}	4	-	-	-	-	-	10	-	-	-	-	-	10	mAdc
Power Supply Drain	I_{PDR}	4	6.0	-	6.0	-	7.5	-	7.5	-	7.5	-	7.5	mAdc	
Switching Parameters															
Turn-On Delay	t_{pd}	1,12	-	-	-	-	-	24	-	-	-	-	-	24	ns
Turn-Off Delay	t_{pd}	1,12	-	-	-	-	-	20	-	-	-	-	-	20	ns
Rise Time	t_r	1,12	-	-	-	-	-	8.0	-	-	-	-	-	8.0	ns
Fall Time	t_f	1,12	-	-	-	-	-	5.0	-	-	-	-	-	5.0	ns

*Prime Fan-Out.