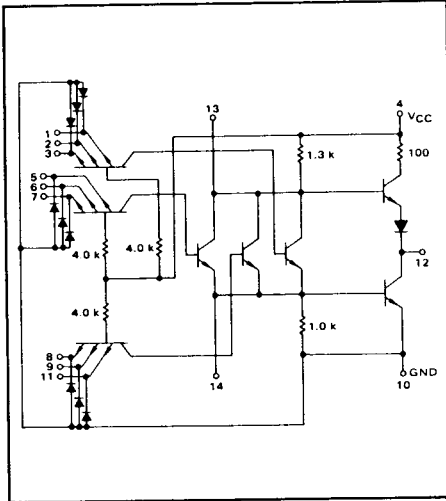


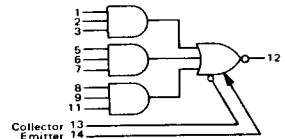
EXPANDABLE 3-WIDE 3-INPUT
"AND-OR-INVERT" GATE

MTTL I MC500/400 series

MC504 · MC554
MC404 · MC454



This device consists of three 3-input AND gates ORed together driving an output inverter. The common ORing nodes are available for expansion, and up to 10 AND gates can be ORed together using the MC509 or the MC510 series expanders. Care should be taken to minimize the amount of capacitance on the expander terminals in order to maintain switching speeds.



Positive Logic:

$$12 - (1 + 2 + 3) + (5 + 6 + 7) + (8 + 9 + 11) + (\text{Expanders})$$

Negative Logic:

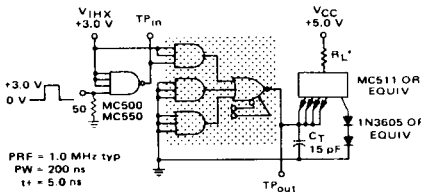
$$12 - [(1 + 2 + 3) + (5 + 6 + 7) + (8 + 9 + 11) + (\text{Expanders})]$$

Total Power Dissipation - 25 mW typ/pkg
Propagation Delay Time - 12 ns typ

TYPE NO.	INPUT LOADING FACTOR	(I _I)	OUTPUT DRIVE	(I _{OL})	TEMPERATURE RANGE
MC504	1	(-1.33 mA)	15 MC500 series Gates	(20 mA)	-55°C to +125°C
MC554			7 MC500 series Gates	(10 mA)	
MC404	1	(-1.66 mA)	12 MC400 series Gates	(20 mA)	0° to +75°C
MC454			6 MC400 series Gates	(10 mA)	

SWITCHING TIME TEST CIRCUIT

VOLTAGE WAVEFORMS AND DEFINITIONS

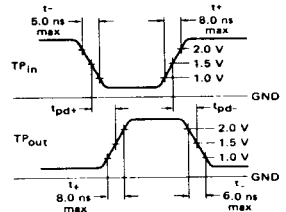


PRF = 1.0 MHz typ
PW = 200 ns
t_r = 5.0 ns
t_f = 5.0 ns

C_T = the total parasitic capacitance which includes probe, wiring, and load capacitances.

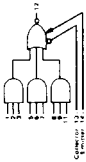
Scope rise time < 1.0 ns
Probe capacitance < 5.0 pF
Expander pins should be left open when measuring switching times.

*MC504 - 260 Ω
MC554 - 570 Ω
MC404 - 330 Ω
MC454 - 660 Ω



ELECTRICAL CHARACTERISTICS

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



Characteristic	Symbol	Pin												Unit	V _{CC}	V _{EE}	Grid		
		MC504, MC554		MC404, MC454		MC504, MC554		MC404, MC454		MC504, MC554		MC404, MC454							
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Input	Forward Current	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Leakage Current	I _P	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Inverse Beta Current	I _B	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Breakdown Voltage	BV _{in} (p)	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Output	V _{out} (p)	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Leakage Current	I _{OLK}	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Short-Circuit Current	I _{SC}	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Output Voltage	V _{OL}	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Power Requirements	I _{max}	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Power Supply Transients	I _{PUL}	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Switching Parameters	T _{PLH}	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Rise Time	t _r	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						
Fall Time	t _f	-55°C		+25°C		+125°C		0°C		+25°C		+75°C		I _{CC}	I _{EE}	V _{IN}	V _{OUT}	V _{CC}	V _{EE}
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max						

* Prime Fall-Out