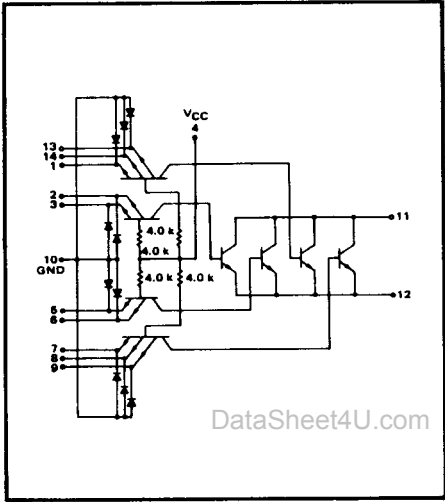


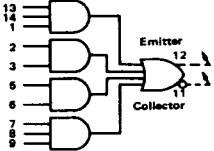
**4-WIDE 3-2-2-3 INPUT EXPANDER FOR "AND-OR-INVERT" GATES**

**MTTL I MC500/400 series**

**MC509 · MC559  
MC409 · MC459**



This device consists of two 2-input and two 3-input AND gates ORed together with the common ORing nodes made available as the output. The basic expandable gate can be expanded up to 10 AND gates by using the MC509 series or the MC510 series expander package.



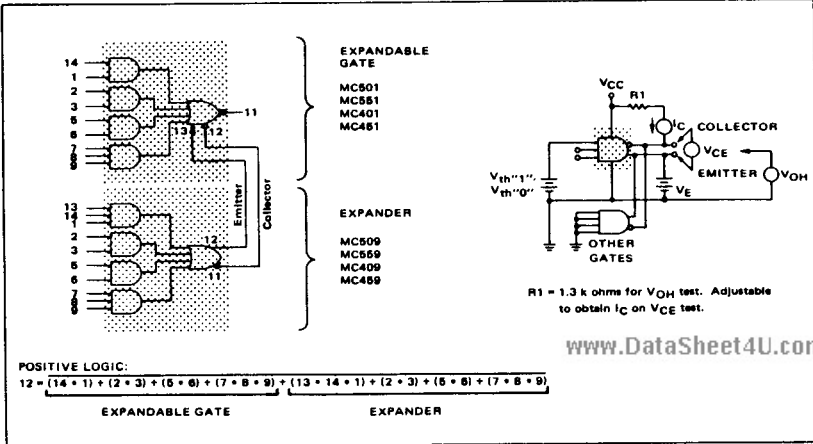
Total Power Dissipation = 20 mW/pkg.  
Propagation Delay Time:  
 $\Delta t_{pd} = +4.0$  ns typ (1.0 ns per ORed function)  
When added to the expandable "AND-OR-INVERT" gates.  
 $\Delta t_{pd}/pF = 1.0$  ns/pF typ  
Caused by additional capacitance at expansion points.

TYPE NO.	INPUT LOADING FACTOR (I <sub>F</sub> )	TEMPERATURE RANGE
MC509	1 (-1.33 mA)	-66°C to +126°C
MC559	1 (-1.66 mA)	0°C to +75°C

Full output loading factor of the expandable gate is maintained.

**APPLICATION: EXPANDABLE 4-WIDE "AND-OR-INVERT" GATE WITH A 4-WIDE 3-2-2-3 INPUT EXPANDER CONNECTED.**

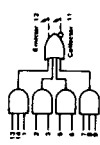
**V<sub>CE</sub>, V<sub>OH</sub> TEST CIRCUIT**



R1 = 1.3 k ohms for V<sub>OH</sub> test. Adjustable to obtain I<sub>C</sub> on V<sub>CE</sub> test.

MC509, MC559/MC409, MC459 (continued)

Characteristic	Symbol	Pin Under Test	TEST CONDITIONS												
			mA												
			$I_C$	$I_m$	$V_B$	$V_{E1}$	$V_{E2}$	$V_{E3}$	$V_{A1}$	$V_{A0}$	$V_{A2}$	$V_{CE}$	$V_{CC}$	$V_{CCH}$	
			Vdts												
			Temperature												
			MC509, MC559 -55°C +25°C +125°C MC409, MC459 +25°C +75°C												
			TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW:												
			$I_C$	$I_m$	$V_B$	$V_{E1}$	$V_{E2}$	$V_{E3}$	$V_{A1}$	$V_{A0}$	$V_{A2}$	$V_{CE}$	$V_{CC}$	$V_{CCH}$	Grid
Input															
Forward Current	$I_F$	1	-	2.3, 5.6, 7.8, 9.10, 13.14	-	-	-	-	-	-	-	-	-	-	4
Leakage Current	$I_R$	1	-	100	-	100	-	100	-	100	-	100	-	100	-
Inverse Beta Current	$I_L$	1	-	100	-	100	-	100	-	100	-	100	-	100	-
Breakdown Voltage	$BV_{BR}^{(1)}$	1	5.5	-	5.5	-	5.5	-	5.5	-	5.5	-	5.5	-	11
Output															
Output Voltage	$V_{OH}$	11	4.8	-	4.8	-	4.8	-	4.8	-	4.8	-	4.8	-	11
Leakage Current	$I_{OLK}$	11	0.65	-	0.65	-	0.65	-	0.65	-	0.65	-	0.65	-	11
Power Requirements (Total Device)															
Maximum Power Supply Current	$I_{max}$	4	-	-	-	-	-	-	-	-	-	-	-	-	11
Power Supply Diurn	$I_{PDR}$	4	5.0	-	5.0	-	5.0	-	5.0	-	5.0	-	5.0	-	10
	$I_{PDL}$	4	6.0	-	6.0	-	6.0	-	6.0	-	6.0	-	6.0	-	10, 13.14



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

\* Indicated pin is not to Vce (Pin 1, 3, 8, 9, 10, 11, 12)  
 \*\* Indicated pin is not to Vcc (Pin 1, 3, 8, 9, 10, 11, 12)  
 † VCE is referenced to the emitter voltage (Pin 12)

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