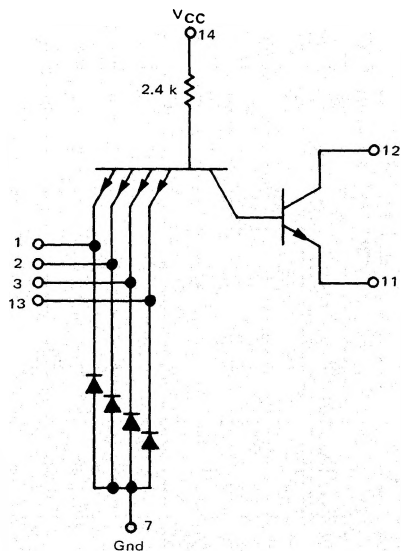


DUAL 4-INPUT EXPANDER
FOR "AND-OR-INVERT" GATES

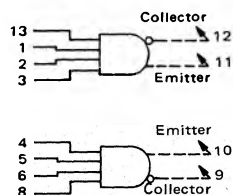
MC3100/MC3000 series

MC3130F • MC3030F
MC3130L • MC3030L,P
(54H60J) (74H60J,N)

CIRCUIT SCHEMATIC
1/2 OF CIRCUIT SHOWN



This device consists of two independent 4-input AND gates. The outputs of each gate are available as ORing nodes. Using the MC3030/3130 expander, with the MC3020/3120 expandable gate, up to four AND gates can be ORED together.



Input Loading Factor = 1

Full output loading factor of the expandable gate is maintained.

Total Power Dissipation = 15 mW typ/pkg

Propagation Delay Time:

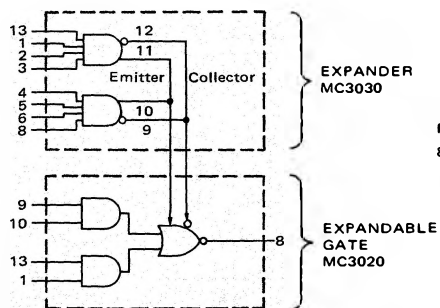
$\Delta t_{pd} = +1.0$ ns typ

When added to the expandable "AND-OR-INVERT" gate.

$\Delta t_{pd}/pF = +1.0$ ns pF typ

Caused by additional capacitance at expansion points.

APPLICATION: EXPANDABLE 2-WIDE 2-INPUT AND-OR-INVERT GATE
WITH A DUAL 4-INPUT EXPANDER CONNECTED



Positive Logic:

$$8 = (9 \bullet 10) + (13 \bullet 1) + (13 \bullet 1 \bullet 2 \bullet 3) + (4 \bullet 5 \bullet 6 \bullet 8)$$

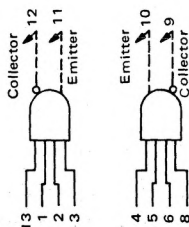
Expandable Gate

Expander

MC3130, MC3030 (continued)

ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one expander. The other expander is tested in a similar manner. Further, test procedures are shown for only one input of the expander being tested. To complete testing, sequence through remaining inputs



TEST CURRENT / VOLTAGE VALUES																	
				mA			Volts										
			@ Test Temperature	I _C	I _B	V _R	V _{RH}	V _F	V _{EE1}	V _{EE2}	V _{IH}	V _{IL}	V _{max}	V _{CCL}	V _{CCH}		
			MC3130	-55°C	6.0	-	-	2.4	4.0	0.4	1.10	0.80	2.0	1.1	-	4.5	5.5
				+25°C	6.0	1.0	-10	2.4	4.0	0.4	0.95	0.65	1.8	1.1	7.0	4.5	5.5
				+125°C	6.0	-	-	2.4	4.0	0.4	0.75	0.45	1.8	0.8	-	4.5	5.5
				0°C	6.0	-	-	2.5	4.0	0.4	1.00	0.70	2.0	1.1	-	4.75	5.25
		MC3030	+25°C	6.0	1.0	-10	2.5	4.0	0.4	0.95	0.65	1.8	1.1	7.0	4.75	5.25	
			+75°C	6.0	-	-	2.5	4.0	0.4	0.85	0.55	1.8	0.9	-	4.75	5.25	
TEST CURRENT / VOLTAGE APPLIED TO PINS LISTED BELOW :																	
				I _C	I _B	V _R	V _{RH}	V _F	V _{EE1}	V _{EE2}	V _{IH}	V _{IL}	V _{max}	V _{CCL}	V _{CCH}	Gnd	
Input	Characteristic	Symbol	Pin Under Test	MC3030 Test Limits													
				-55°C						+25°C							
				Min			Max			Min			Max				
				-2.0			-2.0			-2.0			-2.0				
I _F		1	-	-2.0	-	-2.0	-	-2.0	-	-2.0	-	-	-	-	14	7*	
Forward Current		1	-	50	-	50	-	50	-	50	-	-	-	-	14	2, 3, 7, 13*	
Leakage Current		1	-	-	5.5	-	-	-	-	-	-	-	-	-	14	2, 3, 7, 13*	
Breakdown Voltage		1	-	-	-	-	-	-	-	-	-	-	-	-	14	7*	
Clamp Voltage		1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Output	Characteristic	Symbol	Pin Under Test	MC3130 Test Limits													
				-55°C						+25°C							
				Min			Max			Min			Max				
				-2.0			-2.0			-2.0			-2.0				
V _{OL}		12	-	1.5	-	1.35	-	1.15	-	1.25	-	-	-	14	-	7*	
Emitter Current		11	-	-300	-	-300	-	-300	-	-300	-	-	-	12, 14	-	7**	
Collector Current		12	-	300	-	300	-	300	-	300	-	-	-	-	-	7*	
Power Requirements (Total Device)	Characteristic	Symbol	Pin Under Test	MC3030 Test Limits													
				-55°C						+25°C							
				Min			Max			Min			Max				
				-2.0			-2.0			-2.0			-2.0				
I _{max}		14	-	-	-	7.0	-	-	-	-	-	-	-	14	-	1, 2, 3, 4, 5, 6, 7, 8, 13	
Power Supply Drain		14	-	4.5	-	4.5	-	4.5	-	4.5	-	-	-	-	14	1, 2, 3, 4, 5, 6, 7, 8, 13	

* Ground inputs to gates not under test unless otherwise noted.

*** The inputs to both gates are ungrounded.