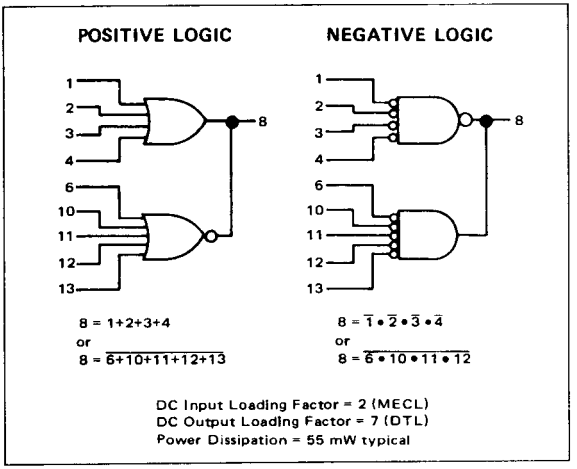
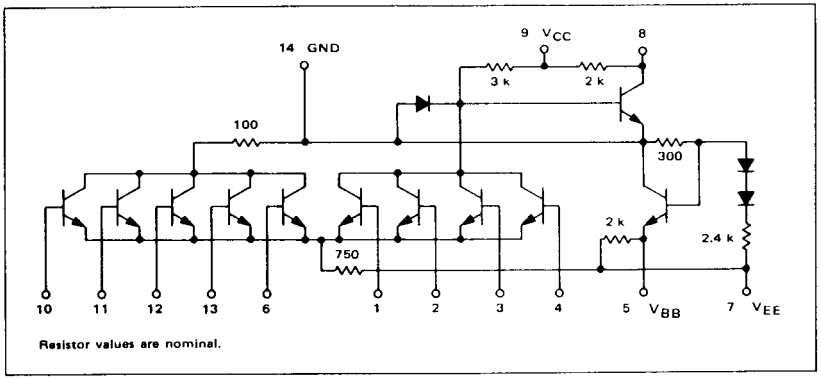
MC1018
MC1218

This level translator converts MECL signal levels to saturate logic levels. The translator will provide the positive logic OR or logic NOR function by connecting the internal bias driver output to the corresponding inputs of the differential amplifier, i.e., when pin 4 is connected to the reference bias, pin 5, pins 6, 10, 11, 12, and 13 become the inputs of a 5-input NOR gate. When pin 6 is connected to the reference bias, pin 5, pins 1, 2, 3, and 4 become the inputs of a 4-input OR gate.



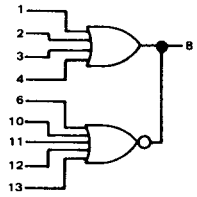
DC Input Loading Factor = 2 (MECL)
DC Output Loading Factor = 7 (DTL)
Power Dissipation = 55 mW typical

CIRCUIT SCHEMATIC



Resistor values are nominal.

168



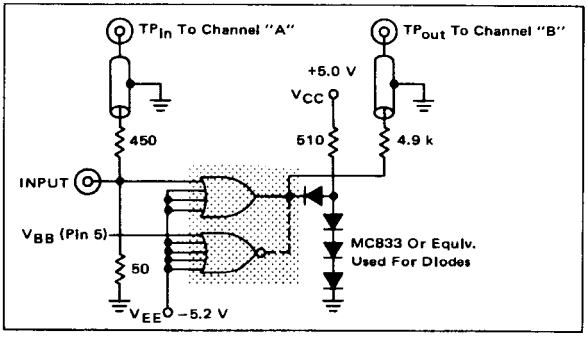
ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Pin Under Test	MC1218 Test Limits −55°C Min	−55°C Max	+25°C Min	+25°C Max	+125°C Min	+125°C Max	Unit	MC1018 Test Limits 0°C Min	0°C Max	+25°C Min	+25°C Max	+75°C Min	+75°C Max	Unit
Positive Supply Drain Current	I_C	9	-	-	-	3.0	-	-	mAdc	-	-	-	3.0	-	-	mAdc
Negative Supply Drain Current	I_E	7	-	-	-	11.0	-	-	mAdc	-	-	-	11.0	-	-	mAdc
Input Current	I_{in}	1 2 3 4 6 10 11 12 13	- - - - - - - - -	- - - - - - - - -	- - - - - - - - -	200 ↓	- - - - - - - - -	- - - - - - - - -	μAdc ↓	- - - - - - - - -	- - - - - - - - -	- - - - - - - - -	200 ↓	- - - - - - - - -	- - - - - - - - -	μAdc ↓
Input Leakage Current	I_R	1, 2, 3, 4* 6, 10, 11, 12, 13*	- -	- -	- -	0.2 0.2	- -	2.0 2.0	μAdc μAdc	- -	- -	- -	0.2 0.2	- -	2.0 2.0	μAdc μAdc
Output Voltage High	V_{OH}	8 ↓	- - - - - -	- - - - - -	4.6 ↓	- - - - - -	4.4 ↓	- - - - - -	Vdc ↓	- - - - - -	- - - - - -	4.6 ↓	- - - - - -	4.5 ↓	- - - - - -	Vdc ↓
Output Voltage Low	V_{OL}	8 ↓	- - - - - -	0.40 ↓	- - - - - -	0.40 ↓	- - - - - -	0.45 ↓	Vdc ↓	- - - - - -	0.45 ↓	- - - - - -	0.45 ↓	- - - - - -	0.50 ↓	Vdc ↓
Bias Driver Output Voltage	V_{BB} ①	5	-1.35	-1.20	-1.26	-1.10	-1.11	-0.98	Vdc	-1.28	-1.14	-1.26	-1.10	-1.19	-1.04	Vdc
Output Short Circuit Current	I_{SC}	8	-	-4.0	-	-3.8	-	-3.6	mAdc	-	-3.9	-	-3.8	-	-3.6	mAdc
			Typ	Max	Typ	Max	Typ	Max		Typ	Max	Typ	Max	Typ	Max	
Switching Times	t_{1-8-}	8 ↓	19	25	19	25	19	25	ns ↓	19	25	19	25	19	25	ns ↓
	t_{1+8+}		8.0	12	8.0	12	10	14		8.0	12	8.0	12	9.0	13	
	t_{6-8+}		8.0	12	8.0	12	10	14		8.0	12	8.0	12	9.0	13	
	t_{6-8-}		19	25	19	25	19	25		12	25	19	25	19	25	

① V_{BB} is supplied from pin 5, and applies from no load (0 mA) to full load (-1.0 mAdc)

* Individually test each input using the pin connections shown.

SWITCHING TIME TEST CIRCUIT @ 25°C



Circuit Shown For OR Configurations.
Connect Pin 5 to 4 For NOR.

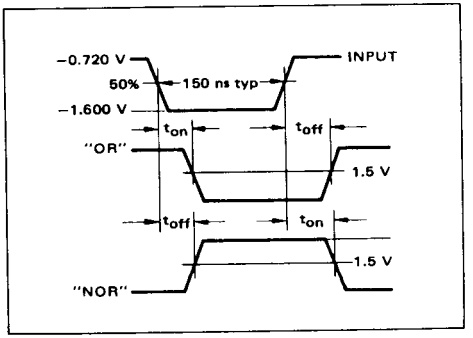
169

TEST VOLTAGE/CURRENT VALUES

	@Test Temperature	$V_{IL\ min}$ to $V_{IL\ max}$	$V_{IH\ min}$ to $V_{IH\ max}$	$V_{IH\ max}$	V_{CC}	V_{EE}	V_{BB}	I_{OH} (μA)	I_{OL} (mAdc)	I_L (mAdc)
		Vdc ±1.0%								
MC1218	−55°C	-5.2 to -1.405	-1.165 to -0.825	-	5.0	-5.2	1	-120	11.4	1.0
	+25°C	-5.2 to -1.325	-1.025 to -0.700	-0.700	5.0	-5.2	(1)	-120	12.0	1.0
	+125°C	-5.2 to -1.205	-0.875 to -0.530	-	5.0	-5.2	(1)	-120	10.8	1.0
MC1018	0°C	-5.2 to -1.350	-1.070 to -0.740	-	5.0	-5.2	(1)	-120	12.0	1.0
	+25°C	-5.2 to -1.325	-1.025 to -0.700	-0.700	5.0	-5.2	(1)	-120	12.0	1.0
	+75°C	-5.2 to -1.260	-0.950 to -0.615	-	5.0	-5.2	(1)	-120	11.4	1.0

TEST VOLTAGE/CURRENT APPLIED TO PINS LISTED BELOW:

Characteristic	Pin Under Test	$V_{IL\ min}$ to $V_{IL\ max}$	$V_{IH\ min}$ to $V_{IH\ max}$	$V_{IH\ max}$	V_{CC}	V_{EE}	V_{BB}	I_{OH}	I_{OL}	I_L	V_{CC} (Gnd)
Positive Supply Drain Current	9	-	-	-	9	1, 2, 3, 6, 7, 10, 11, 12, 13	4	-	-	-	14
Negative Supply Drain Current	7	-	-	-	9	1, 2, 3, 6, 7, 10, 11, 12, 13	4	-	-	-	14
Input Current	1	-	-	1	9	2, 3, 4, 7, 10, 11, 12, 13	6	-	-	-	14
	2	-	-	2		1, 3, 4, 7, 10, 11, 12, 13	6	-	-	-	
	3	-	-	3		1, 2, 4, 7, 10, 11, 12, 13	6	-	-	-	
	4	-	-	4		1, 2, 3, 7, 10, 11, 12, 13	6	-	-	-	
	6	-	-	6		1, 2, 3, 7, 10, 11, 12, 13	4	-	-	-	
	10	-	-	10		1, 2, 3, 6, 7, 11, 12, 13	4	-	-	-	
	11	-	-	11		1, 2, 3, 6, 7, 10, 12, 13	4	-	-	-	
	12	-	-	12		1, 2, 3, 6, 7, 10, 11, 13	4	-	-	-	
	13	-	-	13		1, 2, 3, 6, 7, 10, 11, 12	4	-	-	-	
Input Leakage Current	1, 2, 3, 4*, 6, 10, 11, 12, 13*	-	-	-	9	1, 2, 3, 4, 7, 10, 11, 12, 13	6	-	-	-	14
		-	-	-	9	1, 2, 3, 6, 7, 10, 11, 12, 13	4	-	-	-	
Output Voltage High	8	6, 10, 11, 12, 13	-	-	9	1, 2, 3, 7	4	8	-	-	14
		-	1	-		2, 3, 4, 7, 10, 11, 12, 13	6		-	-	
		-	2	-		1, 3, 4, 7, 10, 11, 12, 13			-	-	
		-	3	-		1, 2, 4, 7, 10, 11, 12, 13			-	-	
		-	4	-		1, 2, 3, 7, 10, 11, 12, 13			-	-	
Output Voltage Low	8	1, 2, 3, 4	-	-	9	7, 10, 11, 12, 13	6	-	8	-	14
		-	6	-		1, 2, 3, 7, 10, 11, 12, 13	4	-		-	
		-	10	-		1, 2, 3, 6, 7, 11, 12, 13		-		-	
		-	11	-		1, 2, 3, 6, 7, 10, 12, 13		-		-	
		-	12	-		1, 2, 3, 6, 7, 10, 11, 13		-		-	
		-	13	-		1, 2, 3, 6, 7, 10, 11, 12		-		-	
Bias Driver Output Voltage	5	-	-	-	9	7	-	-	-	5	14
Output Short Circuit Current	8	-	-	4	9	1, 2, 3, 7, 10, 11, 12, 13	6	-	-	-	8, 14
		Pulse In	Pulse Out								
Switching Times	8	1	8	-	9	2, 3, 4, 7, 10, 11, 12, 13	6	-	-	-	14
		1		-		2, 3, 4, 7, 10, 11, 12, 13	6	-	-	-	
		6		-		1, 2, 3, 7, 10, 11, 12, 13	4	-	-	-	
		6		-		1, 2, 3, 7, 10, 11, 12, 13	4	-	-	-	



SWITCHING TIME WAVEFORMS