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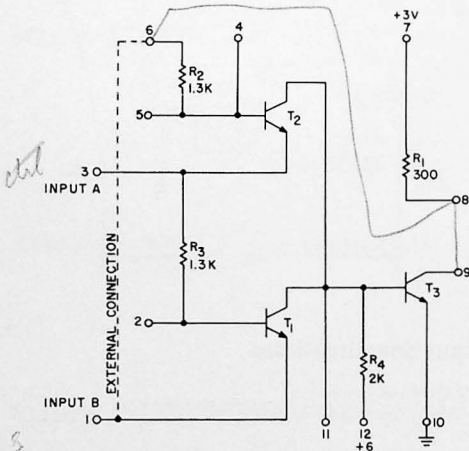
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Functional Description

The exclusive OR, XOR-1A module performs an exclusive OR function when the signals are applied to Pins 6 and 3 (Pins 6 and 1 must be externally connected in this operation). When both inputs are up ("1") or down ("0"), output will be "0" (at a potential of less than 0.31 Volts). When the inputs are not identical (i.e., one up and one down) the output will be ("1") (at a potential of 2.0V or 3.0V depending on the collector load).

The OR function can be accomplished by dotting collectors (parallel connected collectors) with other circuits or modules. However, only one collector resistor is required.

Schematic

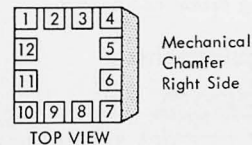


TRUTH TABLE

Input ⑥	Input ③	Output ⑧
1	1	0
1	0	1
0	1	1
0	0	0

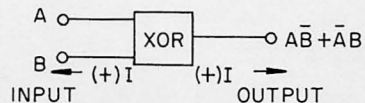
"1" ≥ 2.0 Volts
"0" ≤ 0.31 Volts

Terminal Configuration



Pins 2, 4, 5 and 11 Leave Open

Block Diagram



Maximum Ratings

Input Voltage = 3V

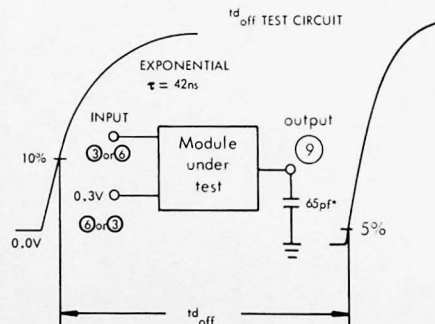
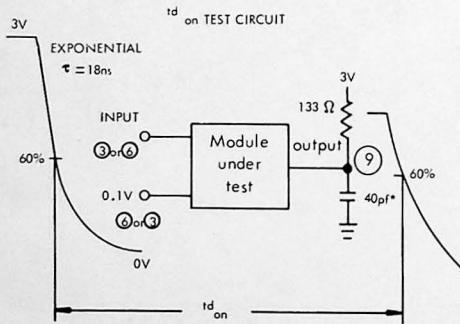
Output Voltage = 6V

$I_E = 40$ Milliamps

XOR-1A Module Functional Tests

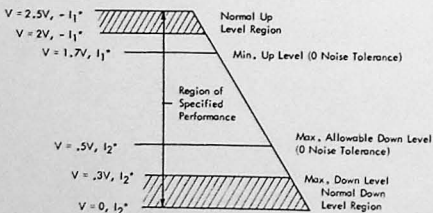
TESTS	TERMINAL CONDITIONS												o C	ADDITIONAL LOAD REQUIREMENTS	VARIABLE	LIMITS		UNITS
	1	2	3	4	5	6	7	8	9	10	11	12				MIN	MAX	
DC 0,1	TIE TO TERM 6		+0.43V			+2.0V	+2.88V	V_0	V_0	GND		+6.24V	75		V_0	1.8		V
DC 1,0	TIE TO TERM 6		+2.0V			+0.43V	+2.88V	V_0	V_0	GND		+6.24V	75		V_0	1.8		V
DC 0,0	TIE TO TERM 6		GND			+0.52V	+3.12V	V_0	V_0	GND		+5.76V	25 75	28 ms CURRENT INTO TERMINAL B	V_0	0.3	0.31	V
DC 0,0	TIE TO TERM 6		+0.52V			GND	+3.12V	V_0	V_0	GND		+5.76V	25 75	28 ms CURRENT INTO TERMINAL B	V_0	0.3	0.31	V
t_{don}	TIE TO TERM 6		INPUT			+0.1V	+3.0V	OUTPUT	40 pf TO GND	GND		+6.0V	25	133 OHM RESISTOR TIED BETWEEN TERMINALS 7&8	t_{don}	36	56	ns
t_{don}	TIE TO TERM 6		+0.1V			INPUT	+3.0V	OUTPUT	40 pf TO GND	GND		+6.0V	25	133 OHM RESISTOR TIED BETWEEN TERMINALS 7&8	t_{don}	36	56	ns
t_{doff}	TIE TO TERM 6		INPUT			+0.3V	+3.0V	OUTPUT	65 pf TO GND	GND		+6.0V	25 75		t_{doff}	37	55 67	ns
t_{doff}	TIE TO TERM 6		+0.3V			INPUT	+3.0V	OUTPUT	65 pf TO GND	GND		+6.0V	25 75		t_{doff}	37	55 67	ns
Z_{IN}	TIE TO TERM 6		V_{IN}			+2.3V	+2.88V	OUTPUT	OUTPUT	GND		+5.76V	75	787 OHM RESISTOR TIED FROM TERM 3 TO +2.88V	V_{IN}	1.9		V
Z_{IN}	TIE TO TERM 6		+2.3V			V_{IN}	+2.88V	OUTPUT	OUTPUT	GND		+5.76V	75	787 OHM RESISTOR TIED FROM TERM 6 TO +2.88V	V_{IN}	1.9		V

Test Waveforms



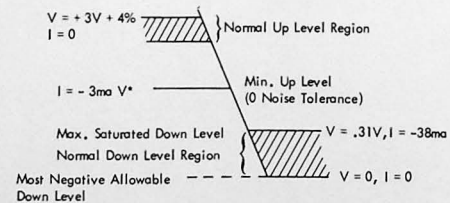
* Including probe capacitance

Input Requirements



* Determined by the collector load impedances of the driving blocks.

Output Specifications



*V determined by collector load impedance

Fan Out

Total available collector current = 38ma

$$38\text{ma} \geq I_{RC} + N_1 K_1 + N_2 K_2 + N_3 K_3 + \dots$$

I_{RC} = Collector resistor circuit

N_1 = Number of AI-2A loads

N_2 = Number of AOI-2A loads

N_3 = Number of AI-1A loads

K_1 = AI-2A loading constant = 2.3ma

K_2 = AOI-2A loading constant = 3.0ma

K_3 = AI-1A loading constant = 5.0ma

Maximum Power Supply Current Requirements

	<u>ON</u>	<u>OFF</u>
+6V	4.6ma	5.5ma
+3V	10.1ma	0ma

Maximum Power Dissipation

<u>ON</u>	<u>OFF</u>
59.0mw	24.0mw

$$\text{Average Normal Power Dissipation} = \frac{\text{NOMINAL ON} + \text{NOMINAL OFF}}{2} = 33.5\text{mw}$$

General Wiring Rules (For Printed Wire - 10 Mil Width Lines)

The input line length must not exceed 6 inches. The maximum net length at the output should be less than 60 inches unless longer delays can be tolerated.