AND OR INVERTER (AOI-2C)
MODULE P/N 841593

IBM INDUSTRIAL PRODUCTS

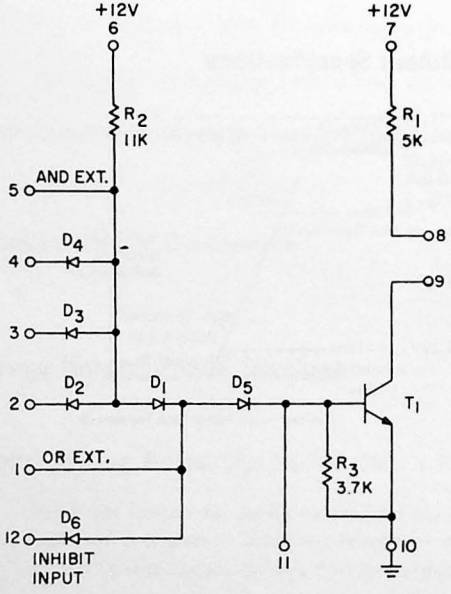
Functional Description

The AOI-2C module consists of a three diode positive AND circuit, followed by a diode OR and a saturating transistor inverter.

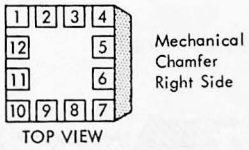
Pins 2, 3 and 4 are the AND inputs. Pin 5 can be used to extend the AND function. The OR function can be accomplished by:

1. OR extending Pin 1 using an AOX-1C, AOX-2C modules
2. dotting collectors (parallel connected collectors) with other modules - only one collector resistor is required.

Schematic

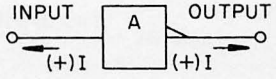


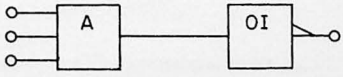
Terminal Configuration



PIN 11 LEAVE OPEN

Block Diagram





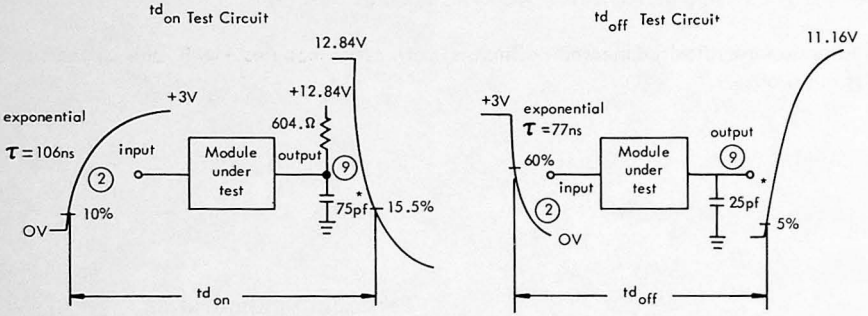
Maximum Ratings

Input Voltage = 13V
Output Voltage = 13V
I_E = 15 Milliamps

AOI-2C Module Functional Tests

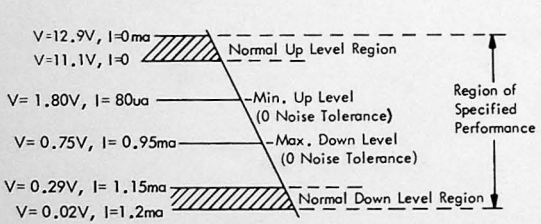
TESTS	TERMINAL CONDITIONS												°C	ADDITIONAL LOAD REQUIREMENTS	VARIABLE	LIMITS MIN	LIMITS MAX	UNITS
	1	2	3	4	5	6	7	8	9	10	11	12						
DC ON	–	1.90V	1.90V	1.90V	–	11.16V	12.84V	V_O	V_O	GND	–	–	25	10.5ma CURRENT INTO TERMINAL 9	V_O		0.29	V
DC NOISE	–	0.93V	12.84V	12.84V	–	12.84V	11.16V	V_O	V_O	GND	–	–	25		V_O	2.0		V
DC NOISE	–	12.84V	0.93V	12.84V	–	12.84V	11.16V	V_O	V_O	GND	–	–	25		V_O	2.0		V
DC NOISE	–	12.84V	12.84V	0.93V	–	12.84V	11.16V	V_O	V_O	GND	–	–	25		V_O	2.0		V
DC OFF	–	12.84V	12.84V	12.84V	–	12.84V	11.16V	V_O	V_O	GND	–	GND	25		V_O	11.14		V
DC NOISE	–	–	–	–	1.40V	–	11.16V	V_O	V_O	GND	–	–	75		V_O	2.0		V
td_{on}	–	INPUT	–	–	–	11.16V	12.84V	V_O	V_O	GND	–	–	25/75	SEE td_{on} TEST	td_{on}	65/60	412	ns
td_{off}	–	INPUT	–	–	–	12.84V	11.16V	V_O	V_O	GND	–	–	25/75	2.1K BETWEEN PINS 5 & 6 SEE td_{off} TEST	td_{off}	160	682/852	ns

Test Waveforms

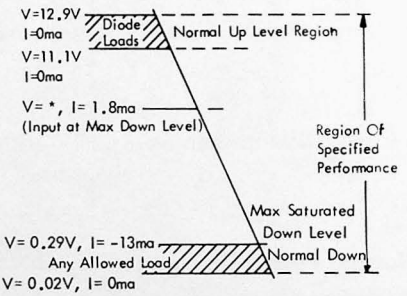


NOTE: 1.1KΩ external resistor to simulate full load condition
* Including probe capacitance

Input Requirements



Output Specifications

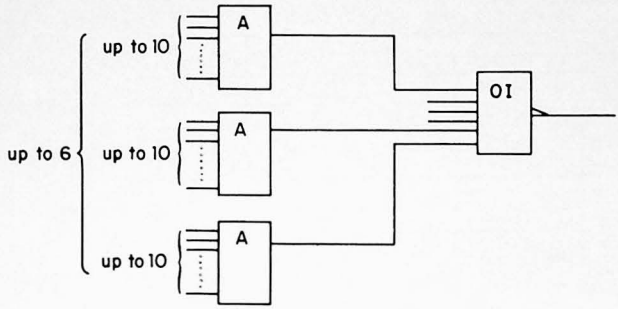


*Defined by collector load impedance.

Fan In

AND = Total of 10 inputs

OR = Total of 6 way OR's



Fan Out

Total collector current for the AOI-2C is 13ma

$13ma \geq I_{RC} + N_1K_1 + N_2K_2 + - - -$

I_{RC} = Total collector load resistor current

N_1 = Number of AOI-2C loads

N_2 = Number of AOI-1C loads

K_1 = 1.15ma - AOI-2C loading constant

K_2 = 2.3ma - AOI-1C loading constant

To double the Fan Out, the output collectors and inputs must be paralleled.

Maximum Power Supply Current Requirements

	ON	OFF
+12V	3.8ma	1.2ma

Maximum Power Dissipation

ON	OFF
55mw	15mw

Average Normal Power Dissipation $= \frac{\text{NOMINAL ON + NOMINAL OFF}}{2} = 26.0mw$

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

Total net length for AND extensions must not exceed 18 inches. OR extensions must be less than 6 inches. Total net length at either input ot output should be less than 60 inches unless longer delays can be tolerated.