



# AAF-3G

## Programmable, 2-Channel Instrumentation Amplifier for the AAF-3, AAF-3PCI, PGA-16 and OEM Data Acquisition Systems

The high-speed programmable gain AAF-3G instrumentation amplifier module is ideally suited for data acquisition systems. The AAF-3G provides 2 independent channels with differential input, single-ended output, and 11 steps of programmable gain. The analog inputs are internally protected for overloads up to  $\pm 40V$ , even when power is turned off. The AAF-3G has low offset voltage and low drift. The AAF-3G is ready for use in the AAF-3, AAF-3PCI, and PGA-16 PC plug-in boards. For OEM applications it requires  $\pm 15V$  power and 8 gain-programming logic signal levels.

The AAF-3G connects directly into a parent board via a 10-pin dual-row socket and a 10-pin dual row pin header. The header (P1) carries the power and control inputs. The socket (J1) carries the two differential channel inputs, the two single-ended outputs, and analog ground.

Analog ground is used as the reference for the digital control signals since the control signals do not change except in reprogramming and have extremely low (CMOS) return current. The analog ground plane also serves to shield against external disturbing signals.

The input impedance to the AAF-3G is very high. Each of the four input leads shows a  $2M\Omega$  resistance to analog ground.

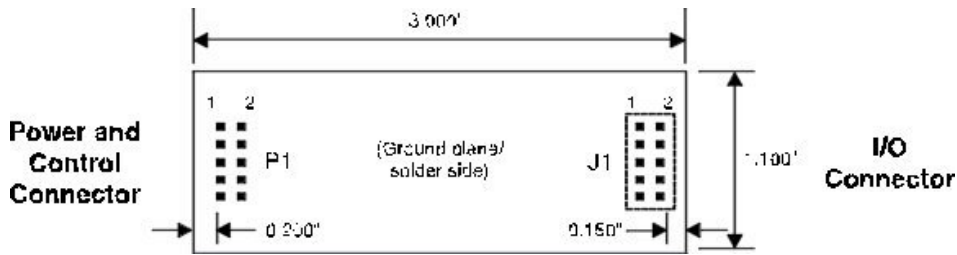
The low sides of the outputs have separate connector pins to facilitate connection to a differential device. These pins are both connected to analog ground.

The analog ground is typically connected to digital ground at one "holy" point in the sampling system. In most sampling systems this is located on the A/D board. The AAF-3G will introduce little or no current into this connection.

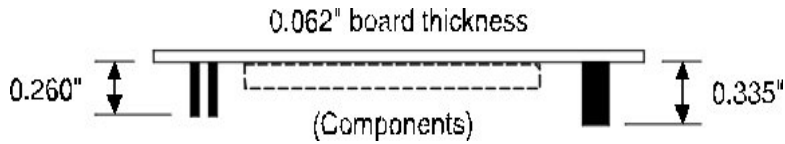


Operating Specifications	
Gain Steps	0.5, 1, 2, 5, 10, 20, 50, 100, 200, 500, 1000
Gain tolerance	@0.5            1%max @1-100        0.15%max @200-1000   0.3%max
Common mode rejection	75dBmin, 86dB typ. at a gain of 1
Common mode voltage	$\pm 10V$ max
Input Voltage	$\pm 10V$ max at again of 1
Input DC offset	$\pm 2.5mV$ max
Input Protection	$\pm 40V$ max, with power off or on
Input Impedance	$4M\Omega$ differential ( $2M\Omega$ each side to analog ground)
Input Bias Current	$\pm 2pA$ typ., $\pm 100pA$ max. ( $\pm 50pA$ typ. At $70^\circ C$ )
Input Offset Current	$\pm 1pA$ typ., $\pm 100pA$ max. ( $\pm 50pA$ typ. At $70^\circ C$ )
Frequency Range (-3dB)	Gain 0.5-5        1.2MHz typ. Gain 10-100     600kHz typ. Gain 200-1000   250kHz typ.
Amplifier Slew Rate	9/gain V/ $\mu$ sec typ.
Output Load	$2k\Omega$ min.
Operating Temperature	$0^\circ C$ to $70^\circ C$
Power Requirements	+15V 30mA -15V 30mA
J1 Socket	5x2 (10 position), 0.1" centers, 0.025" square
P1 Header	5x2 (10 position), 0.1" centers, 0.025" square
Dimensions	3.0"X1.0"X.4"
Board to Board Clearance	0.335"

### Alligator Technologies



**Top View**



**Side View**

### AAF-3G Mechanical Outline

#### 4-bit programming codes

Gain	Code
0.5	1100
1	0000
2	0001
5	0010
10	0011
20	0101
50	0110
100	0111
200	1001
500	1010
1000	1011

#### Socket and Header Pin Descriptions

Pin #	J1 Socket	P1 Header
1	In A High	+15V Power
2	Out A High	-15V Power
3	In A Low	Ch B ctrl bit 1
4	Agnd	Ch B ctrl bit 0
5	Agnd	Ch A ctrl bit 1
6	Agnd	Ch A ctrl bit 0
7	In B High	Ch B ctrl bit 2
8	Out B High	Ch B ctrl bit 3
9	In B Low	Ch A ctrl bit 2
10	Agnd	Ch A ctrl bit 3

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