AD623 - Instrumentation Amplifier

Overview

Single and Dual-Supply, Rail-to-Rail, Low Cost Instrumentation Amplifier

Specifications

- Rail to Rail Instrumentation Amplifier
- Can operate and Single and Dual supply voltage
- Operating current: 550uA (max)
- Gain Range: 1 to 1000
- Bandwidth: 800KHz
- Set gain with only one resistor
- Available in 8-Pin PDIP,SOIC and VSSOP packages

Pinout

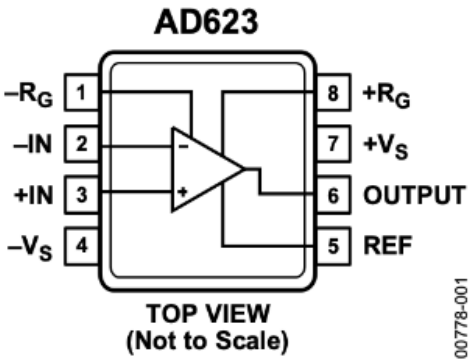
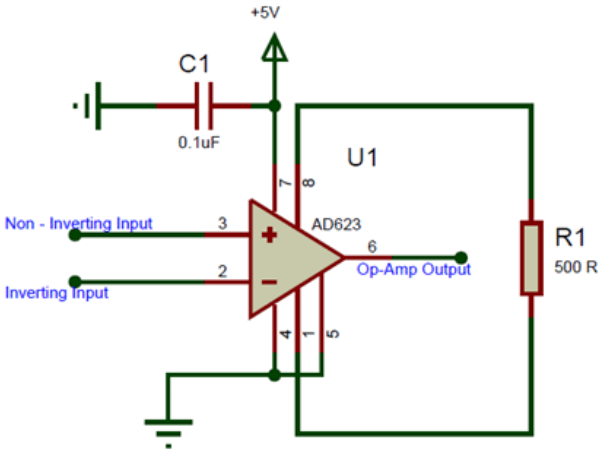


Figure 2. Pin Configuration

Pin Number	Pin Name	Description
1	Gain (-Rg)	Inverting Gain Terminal connected to resistor to set gain value
2	Inverting Input (IN-)	The Inverting input pin of the Op-Amp
3	Non-Inverting Input (IN-)	The Non-Inverting Input Pin of Amplifier
4	Power (-Vs)	Negative supply terminal
5	Reference	Output reference input. Normally connected to common
6	Output	Amplifier output pin
7	Power (+Vs)	Positive supply terminal
8	Gain (+Rg)	Non - Inverting Gain Terminal connected to resistor to set gain value

How to use AD623 IC

The AD623 only requires a resistor to sets its gain value and hence can be easily set up. A very basic commonly used circuit for the AD623 is shown below.



The IC is powered using the pin 7 and pin 4, here I have used a singly supply of +5V hence the pin 4 is grounded. If a dual supply voltage is used the pin 4 will be provided with negative voltage. The non - inverting pin (pin 2) and the inverting pin (pin 3) is connected the signal which has to be amplified or compared base on the application of the Op-Amp. The Reference pin (pin 5) is normally grounded along with pin 4, the reference pin is used to direct the output towards a voltage when the difference voltage between the inverting and the non-inverting pin is 0V.

The **Gain of an Op-Amp** can be set by simply connecting the right value of resistor across the pin +Rg (pin 8) and the pin –Rg (pin 1). Here I have connected a resistor of value 500 which will set the Op-Amp at a gain value of 100. The formulae to calculate the value of gain from R is given below

$$G = \frac{49.4\ k\Omega}{R_G} + 1$$

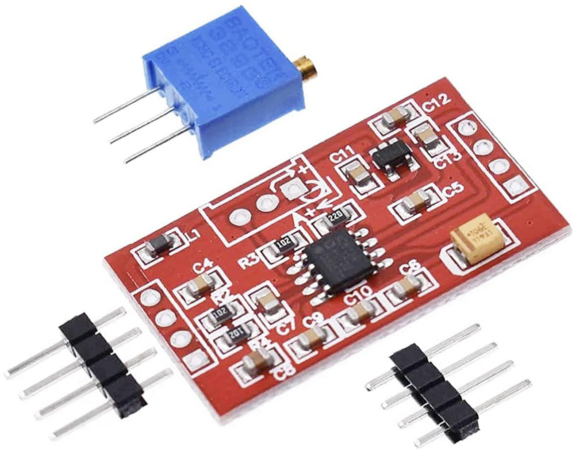
Alternatively you can also use the chart below which has the value of resistor and standard gain values listed.

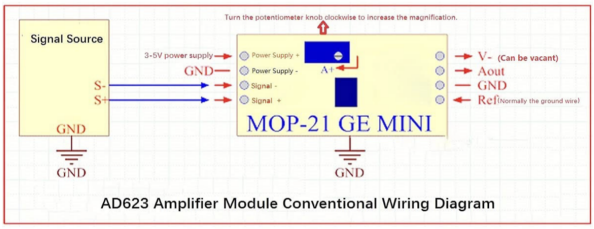
Table II. Required Values of Gain Resistors

1% Std Table Value of R_G, Ω	Calculated Gain	0.1% Std Table Value of R_G, Ω	Calculated Gain
49.9 k	1.990	49.3 k	2.002
12.4 k	4.984	12.4 k	4.984
5.49 k	9.998	5.49 k	9.998
2.61 k	19.93	2.61 k	19.93
1.00 k	50.40	1.01 k	49.91
499	100.0	499	100.0
249	199.4	249	199.4
100	495.0	98.8	501.0
49.9	991.0	49.3	1,003

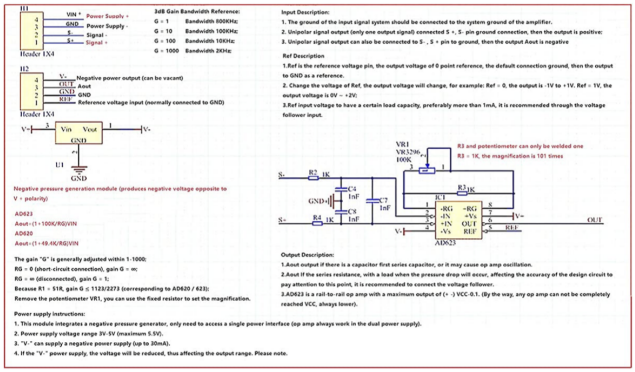
With no external resistor, the AD623 is configured for unity gain (G = 1), and with an external resistor, the AD623 can be programmed for gains of up to 1000.

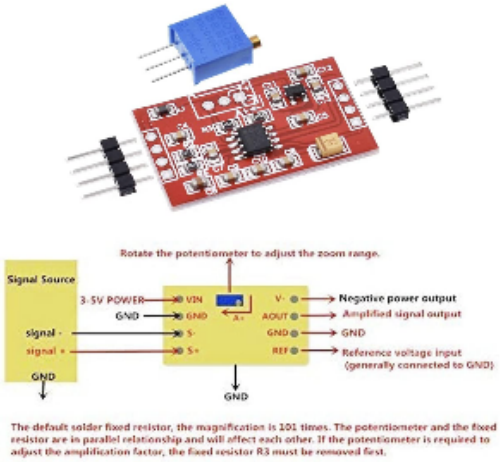
DKARDU AD623 Millivolt Voltage Amplifier Module





1. It is recommended to use a smaller magnification (such as 50/100 times) to test, and then transferred to the required multiples of use.
2. Adjust the "A + "knob clockwise to increase the magnification (up to 1000 times);
3. When adjusted to the maximum, you can hear the potentiometer issued a slight click sound, that has been adjusted to the end.
4. You can also use a resistor to fix the magnification so that the magnification value is more stable.





The default solder fixed resistor, the magnification is 101 times. The potentiometer and the fixed resistor are in parallel relationship and will affect each other. If the potentiometer is required to adjust the amplification factor, the fixed resistor R3 must be removed first.

References

Reference	URL
Datasheet	https://www.analog.com/media/en/technical-documentation/data-sheets/ad623.pdf
Amazon Link	Amazon.ca Link

AD623 Instrumentation Amplifier IC	https://components101.com/ics/ad623-instrumentation-amplifier-pinout-datasheet