

---

# Muscle BioAmp Patchy

Upside Down Labs

Apr 13, 2024

## CONTENTS

<b>1</b>	<b>Overview</b>	<b>2</b>
<b>2</b>	<b>Features &amp; Specifications</b>	<b>3</b>
<b>3</b>	<b>Hardware</b>	<b>4</b>
<b>4</b>	<b>Connecting with Arduino</b>	<b>6</b>
<b>5</b>	<b>Demonstration</b>	<b>7</b>
<b>6</b>	<b>Some project ideas</b>	<b>8</b>

Wearable ElectroMyoGraphy (EMG) sensor

**OVERVIEW**

Muscle BioAmp Patchy is a wearable ElectroMyoGraphy or EMG sensor that snaps directly to gel electrodes and connects to your muscle like a patch. It comes with reverse polarity protection, power indicator, onboard snap connectors, and Upside Down Labs' powerful BioAmp sensing technology for precise muscle signal recording. This enables you to easily integrate this sensor in your EMG- based Human-Computer Interface (HCI).



**FEATURES & SPECIFICATIONS**

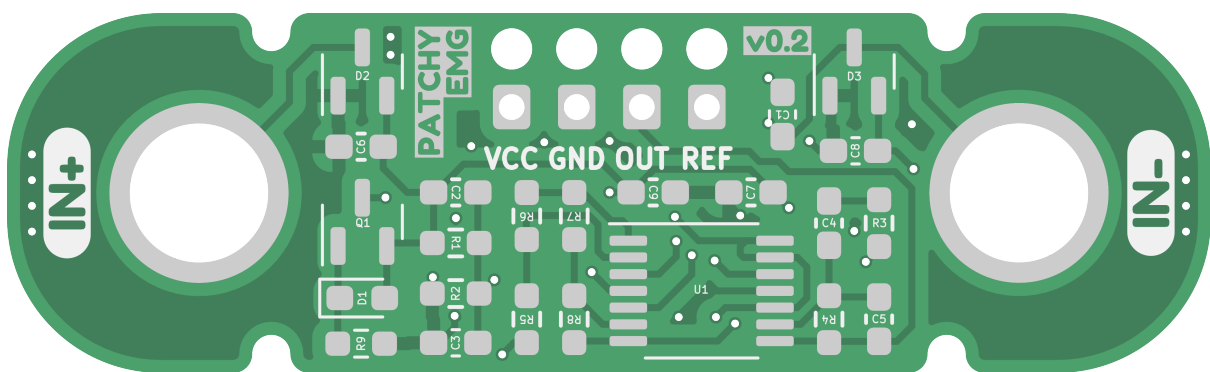
Minimum Input Voltage	4.5 V
Input Impedance	$10^{12}$ ohm
Fixed Gain	x2420
Bandpass filter	72 – 720 Hz
Wearable	Yes
Compatible Hardware	Any development board with an ADC (Arduino UNO & Nano, Espressif ESP32, Adafruit QtPy, STM32 Blue Pill, BeagleBone Black, Raspberry Pi Pico, to name just a few)
BioPotentials	EMG (Electromyography)
No. of channels	1
Electrodes	3 (Positive, Negative, and Reference)
Dimensions	47 x 14 mm
Open Source	Hardware + Software

[https://youtu.be/qRKU\\_HvapDE](https://youtu.be/qRKU_HvapDE)

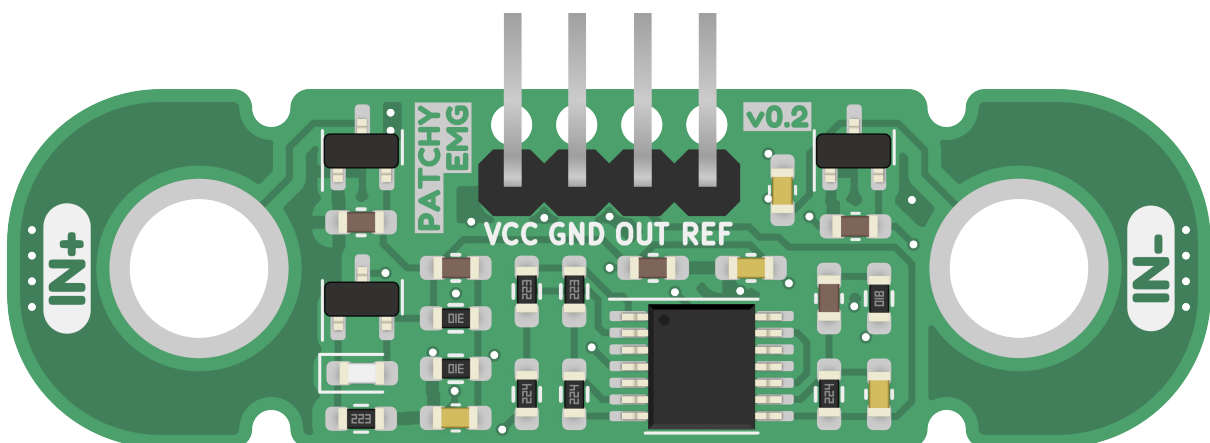
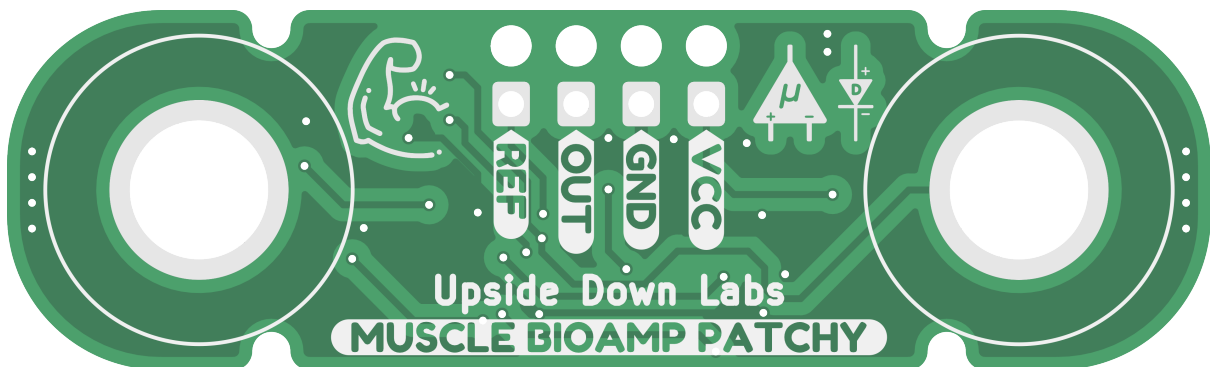
## HARDWARE

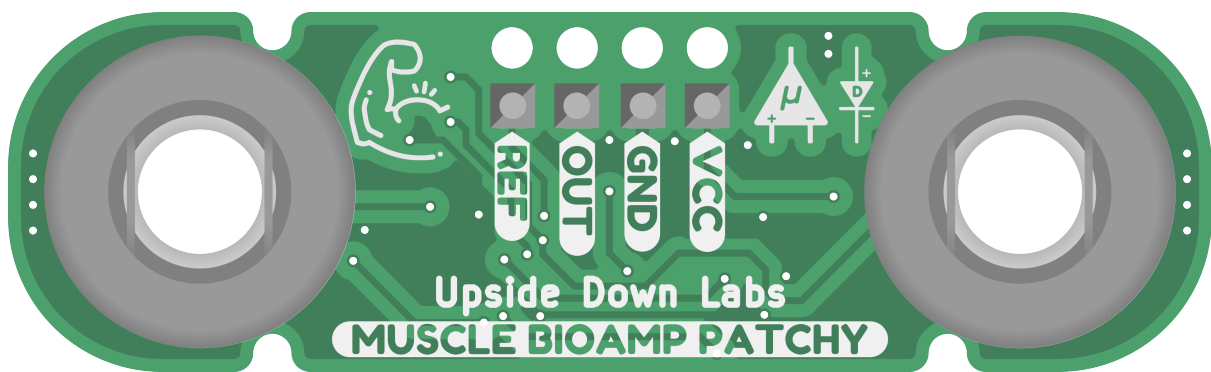
Images below shows a quick overview of the hardware design.

**PCB Front**



**PCB Back**

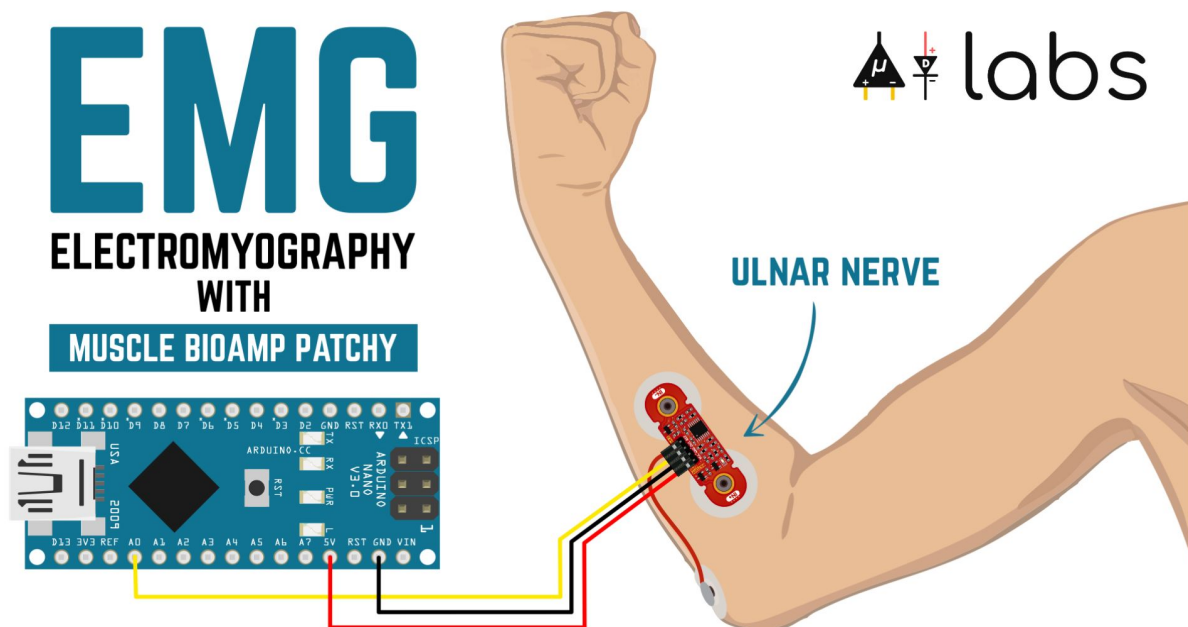




## CONNECTING WITH ARDUINO

To get started, you can pair Muscle BioAmp Patchy with any development board with an ADC (Arduino UNO & Nano, Espressif ESP32, Adafruit QtPy, STM32 Blue Pill, BeagleBone Black, Raspberry Pi Pico, to name just a few) or any standalone ADC of your choice.

For the connections and electrode placements, you can follow the diagram given below:





## **DEMONSTRATION**

After snapping the Patchy onto gel electrodes(placed on our targeted muscle), you can connect your patchy to the arduino via jumper cables, arduino to your battery operated laptop, and start recording your EMG easily. Follow the steps shown in the video below for the demonstration.

<https://youtu.be/4dnCX3U7LS8>

## SOME PROJECT IDEAS

Recording and Visualizing Muscle Signals (EMG) Using Muscle BioAmp Patchy (wearable Muscle Sensor)

<https://youtu.be/4dnCX3U7LS8>