Doogie Hardware Setup

A repository with hardware setup instructions for Doogie Mouse robot.

Introduction

This document is intended to assist the process of assembly the Doogie Mouse robot as well as instructed about good practice on the procedure. This guide it going to promove an order of soldering of components for get more facility during the mount process. The guide it going to start the process with de bottom board and next it going to the top board.

Materials

Before starts the process you will need have the tools and security equipment:

- 01 Soldering Iron (prefer thin tip);
- 01 Tin roll of 0,3mm thin thread;
- 01 Cut plier;
- 01 Nose plier;
- 01 Protection glasses;
- 01 Pair of soldering gloves.

With the tools in hands you will need to have too the eletronics components according the Figure 1 and the boards according the Figure 2.

Figure 1: Components used to assembly the Doogie Mouse robo

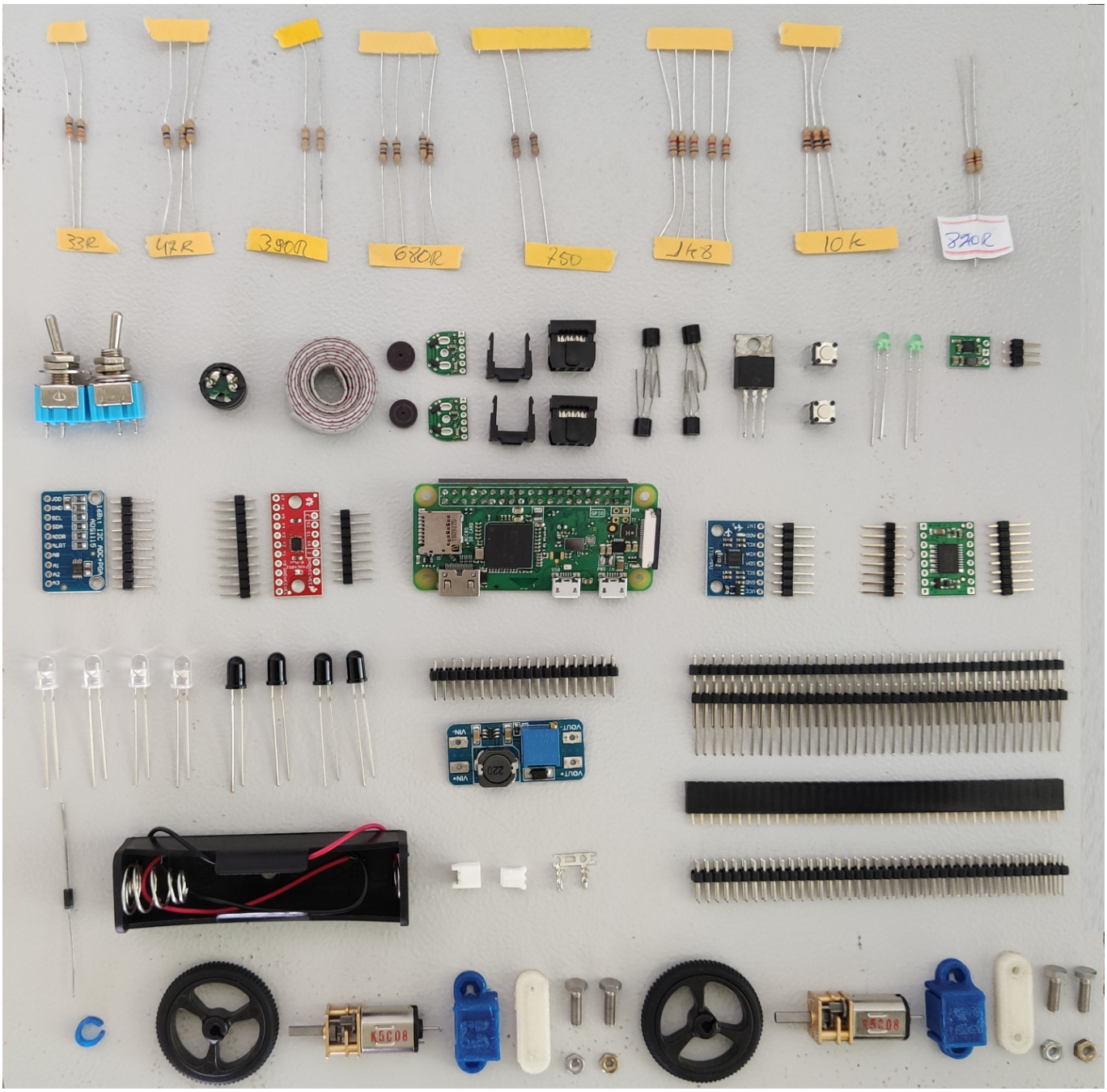
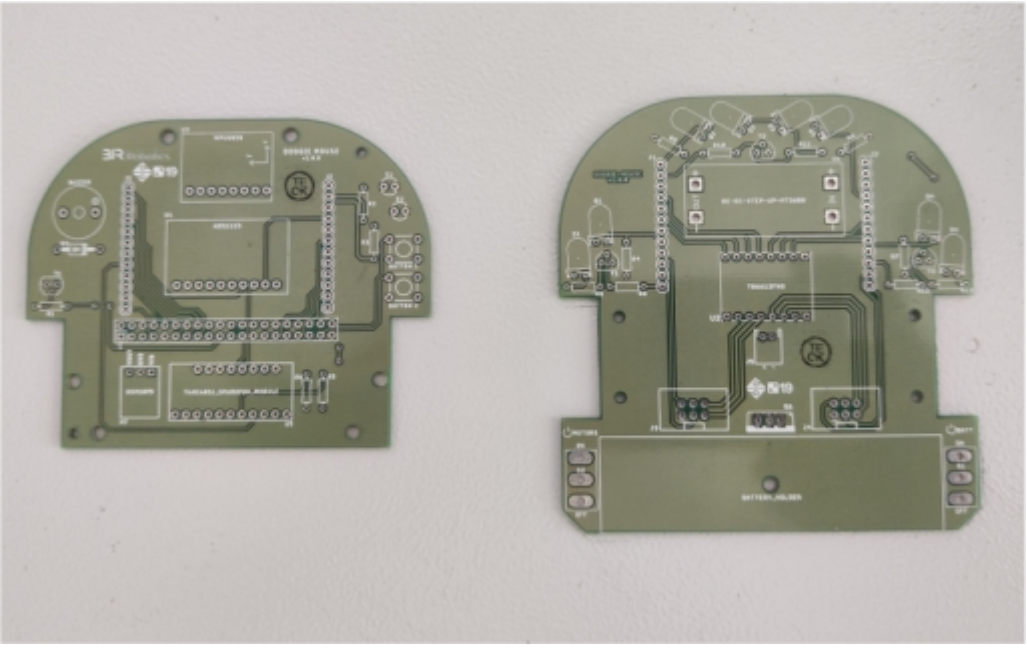


Figure 2: Top and bottom boards of Doogie Mouse robo

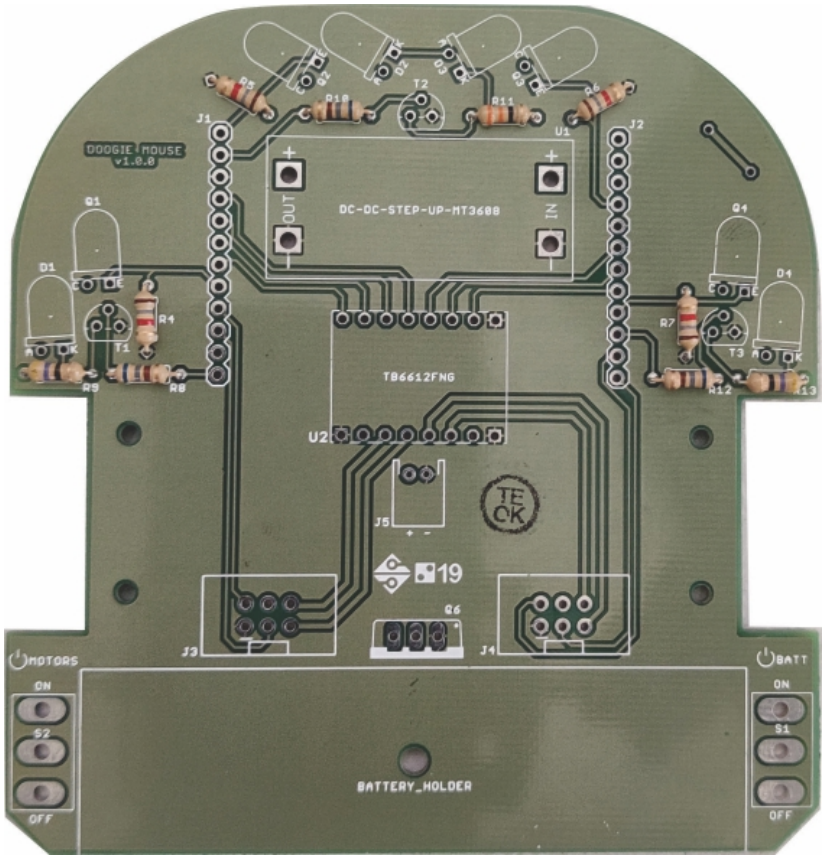


General Instructions

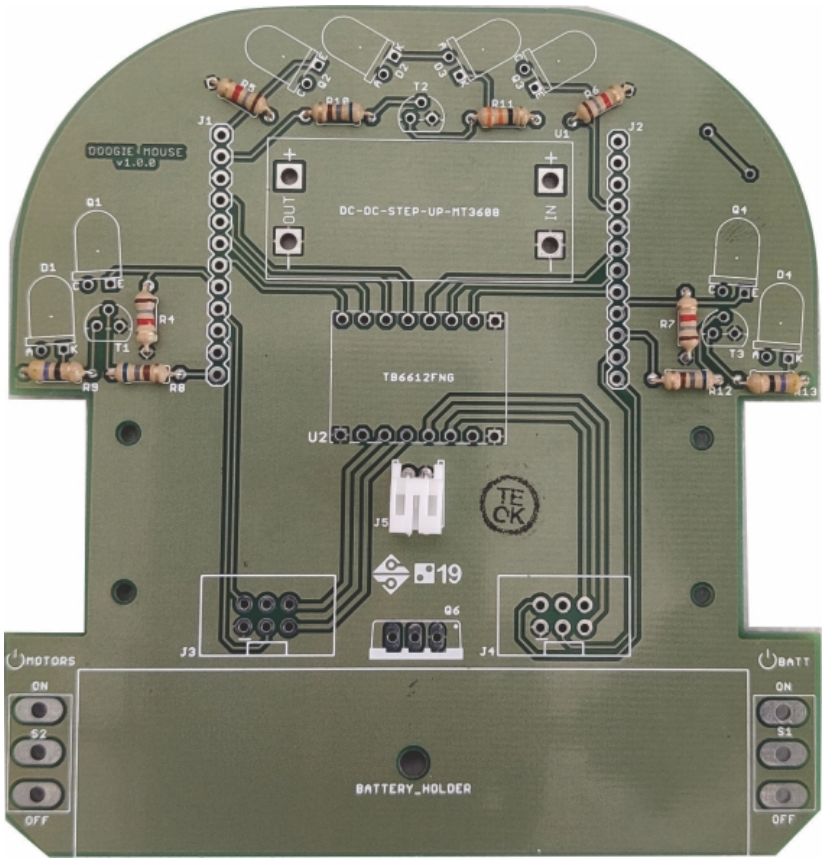
1. Every steps where there direct contact with metalic parts that will be welded, is advised use the nose plier for avoid accident for burnig.
2. After every steps maked take off the excess of the terminals of the eletronic components with help of cut plier.
3. Every process of componennts fixation will be maked with a Soldering Iron and tin.
4. Is advised make soldering process on a place with air flux for avoid the smoke resulted of the soldering process.
5. During all process you should to use the security glasses and soldering gloves for avoid accidents.

Bottom Board

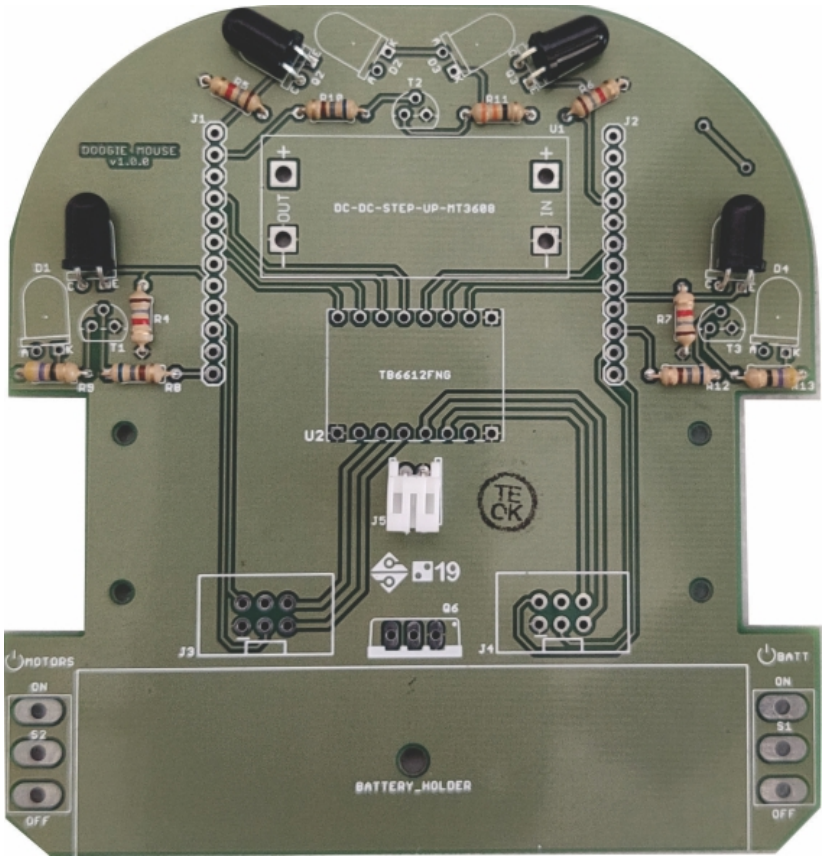
1. We are going to start the board assembly by the resistors, with help of soldering iron weld them on the board, look the picture below.



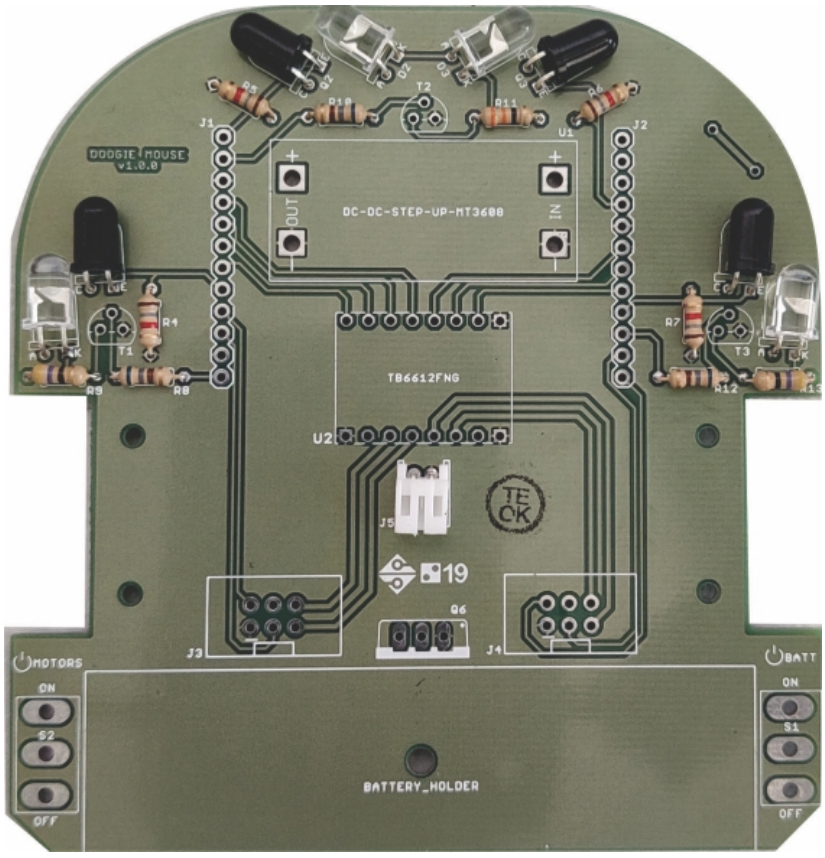
2. Now weld the batery connector.



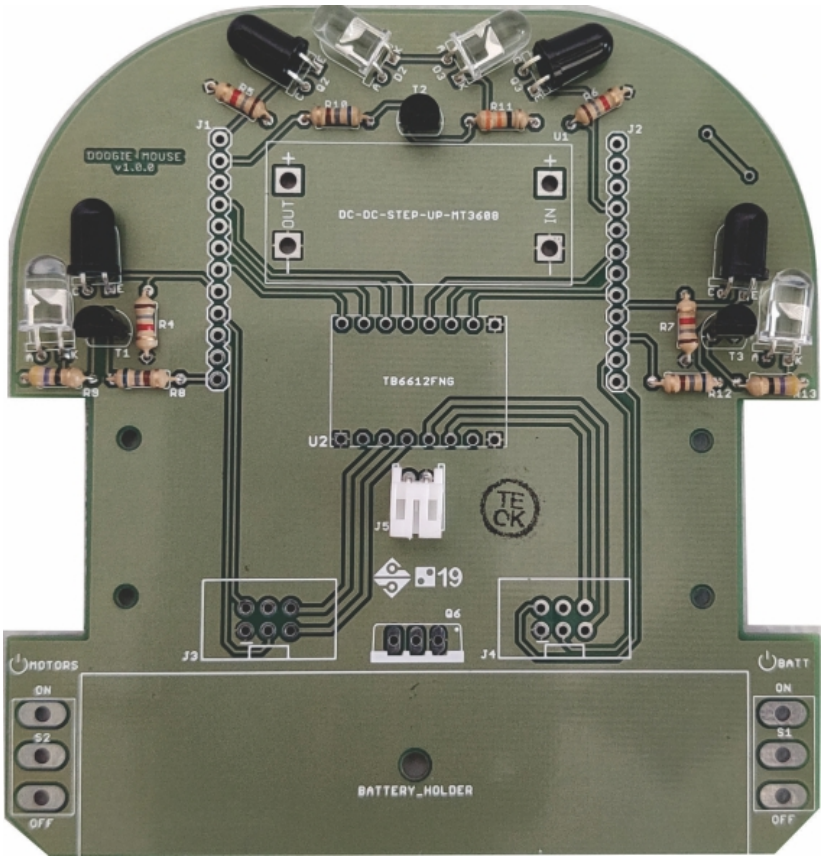
3. Put on and weld the emmiters leds of the infra red sensors.



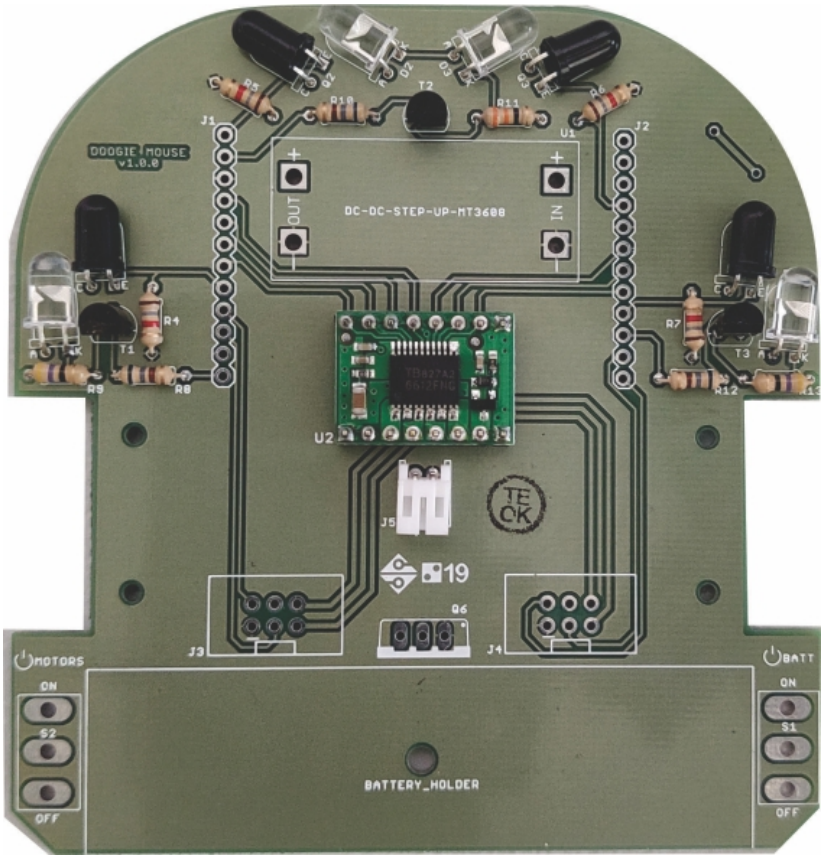
4. Next weld the receptors leds of the sensor.



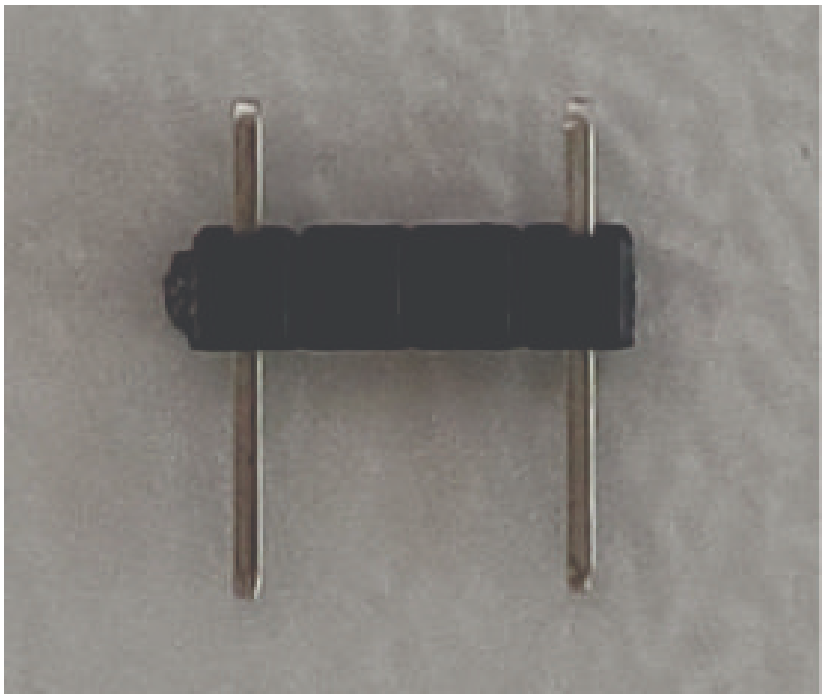
5. Weld the transistors on the board.



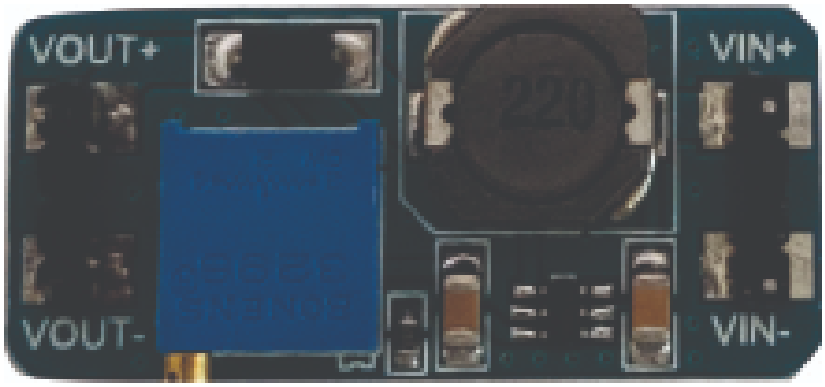
6. Now weld the H bridge.



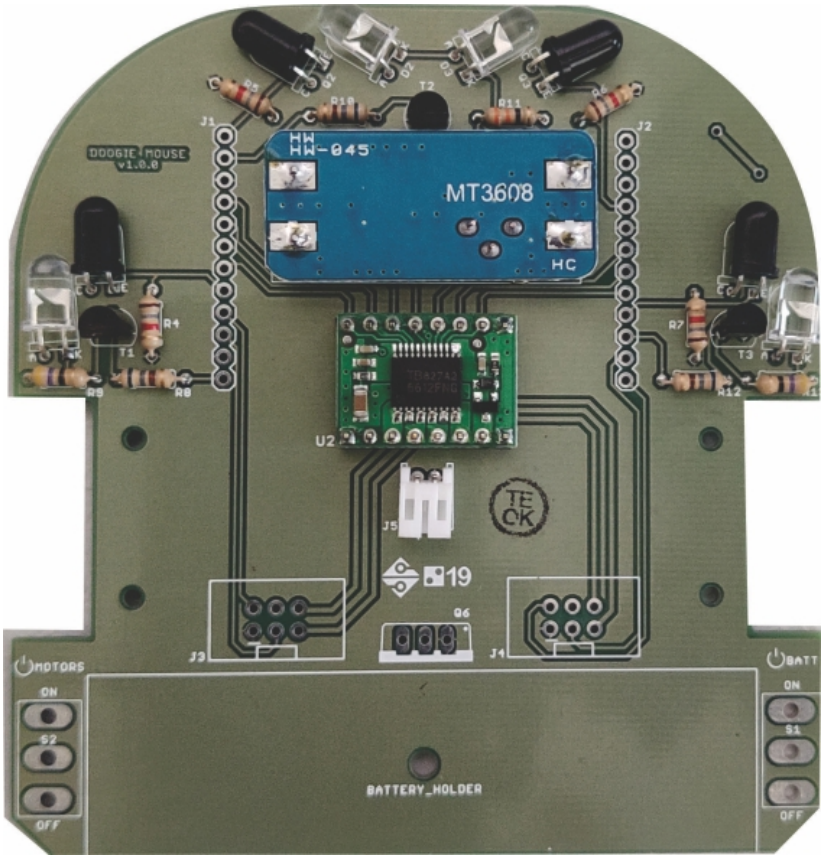
7. Using a pin bar and de cut pliers make two units of a new leaked pin bars according picture below .



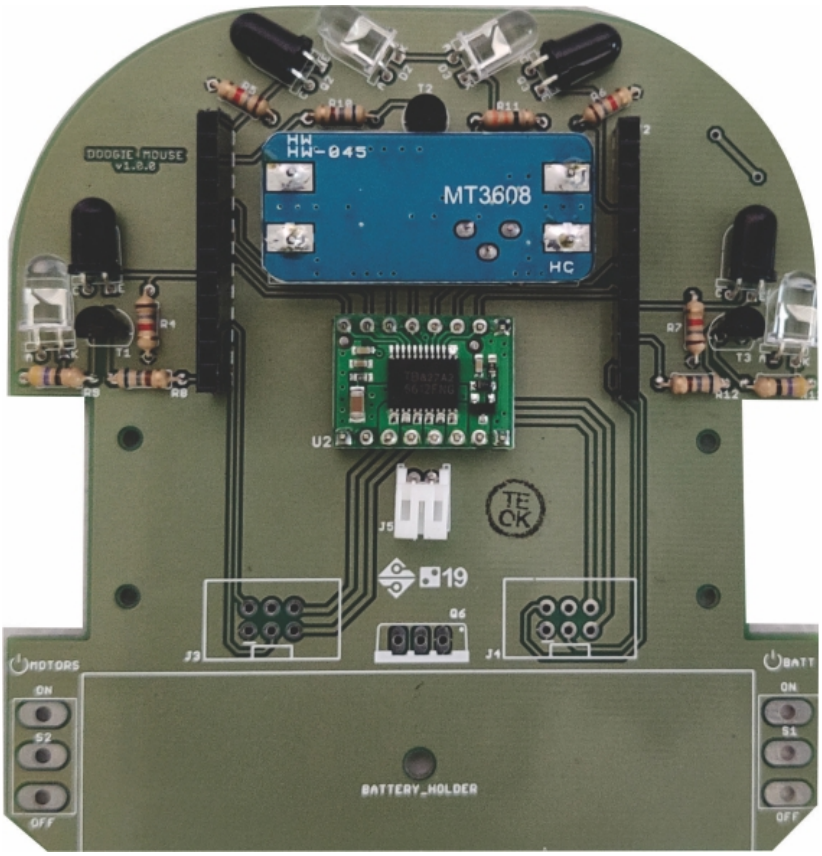
8. After make the leaked pin bars weld them on the extremity (VIN+/VIN- and VOUT+/VOUT-) of the electronic component, look the picture below.



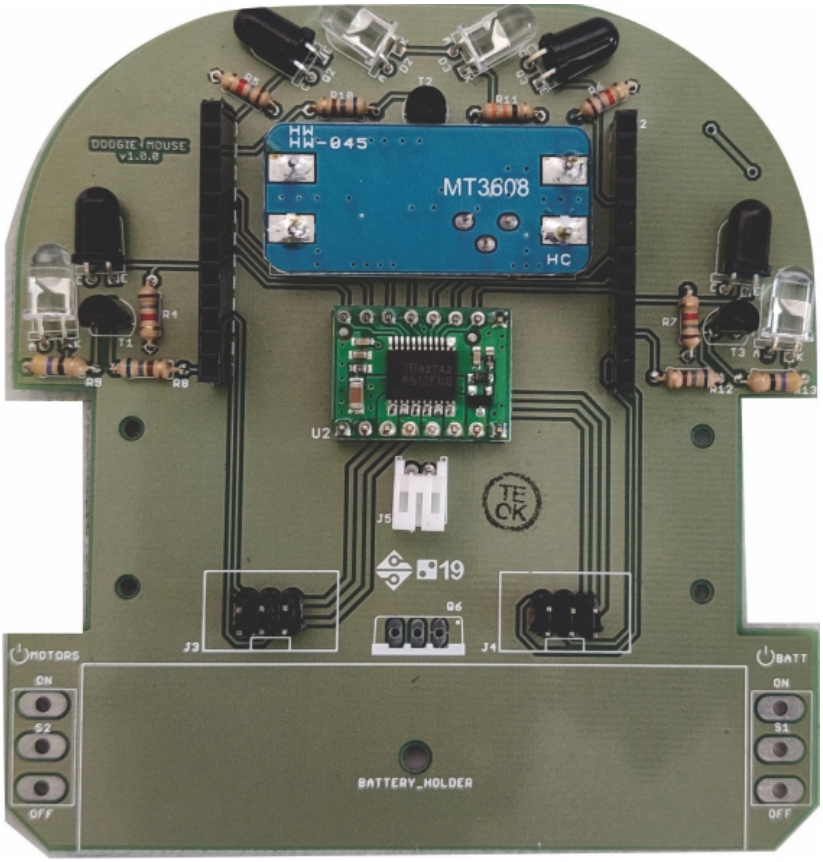
9. After the pins already to inserted in the tension regulator then weld them on de board.



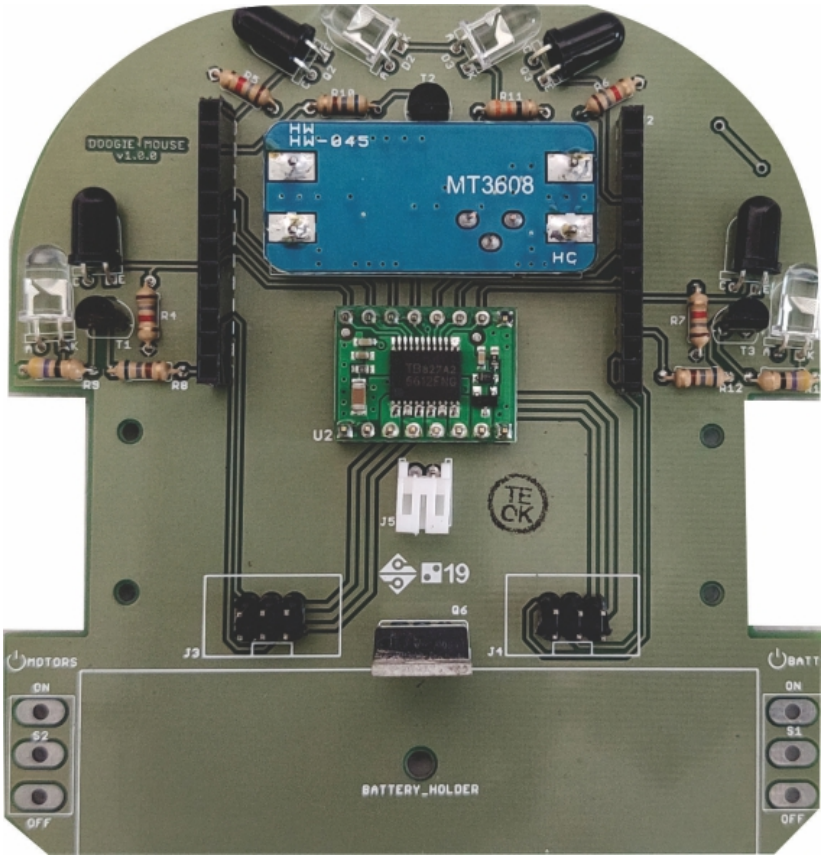
10. Weld the central pin bars on the board, use the nose plier as a helper tool.



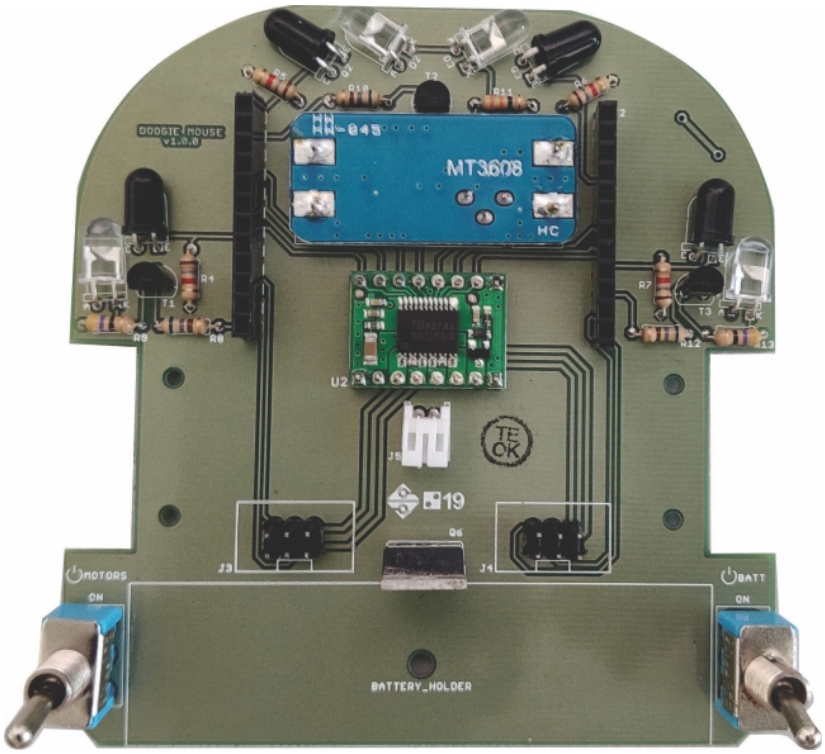
11. Weld the pin bars on the encoder and next secure the component on the board with de soldering.



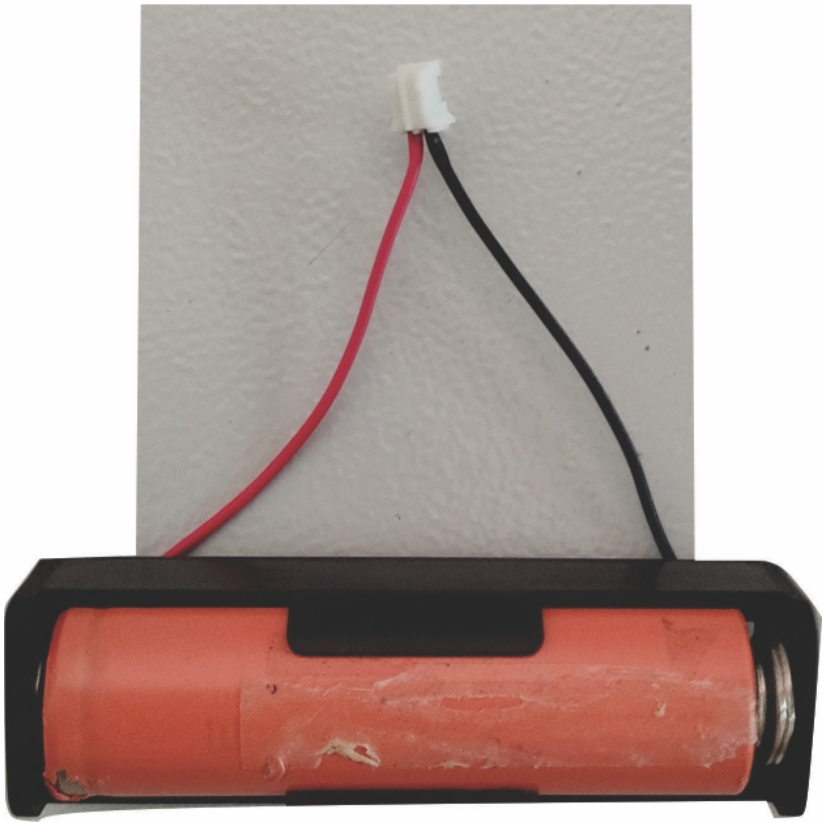
12. After this attach the mosfet on the board with help of soldering iron.



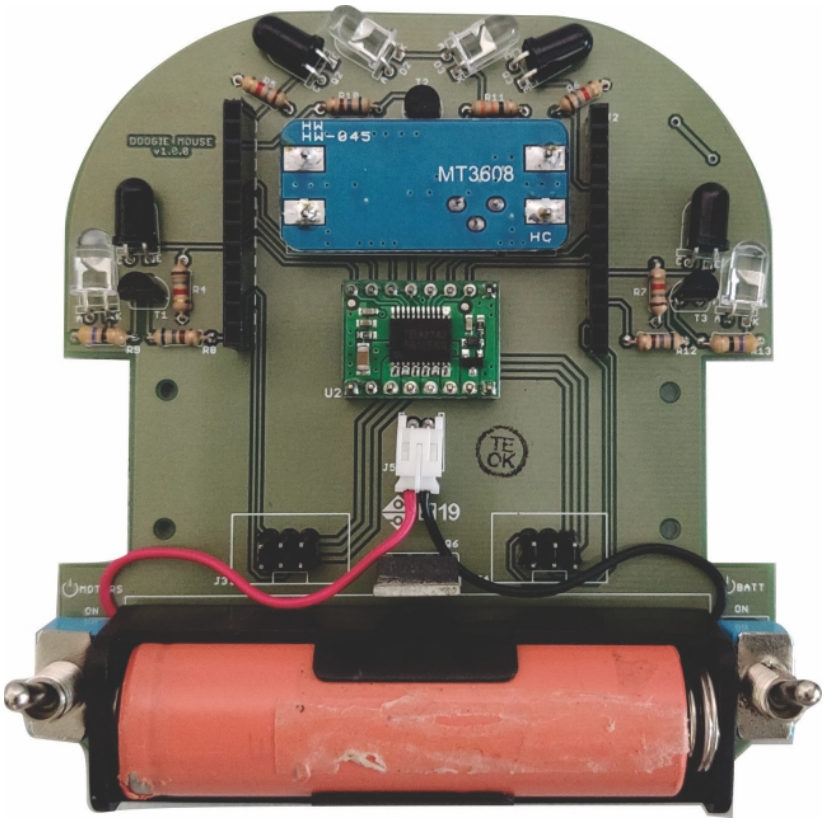
13. Then connect and weld the key (ON/OFF) on the board.



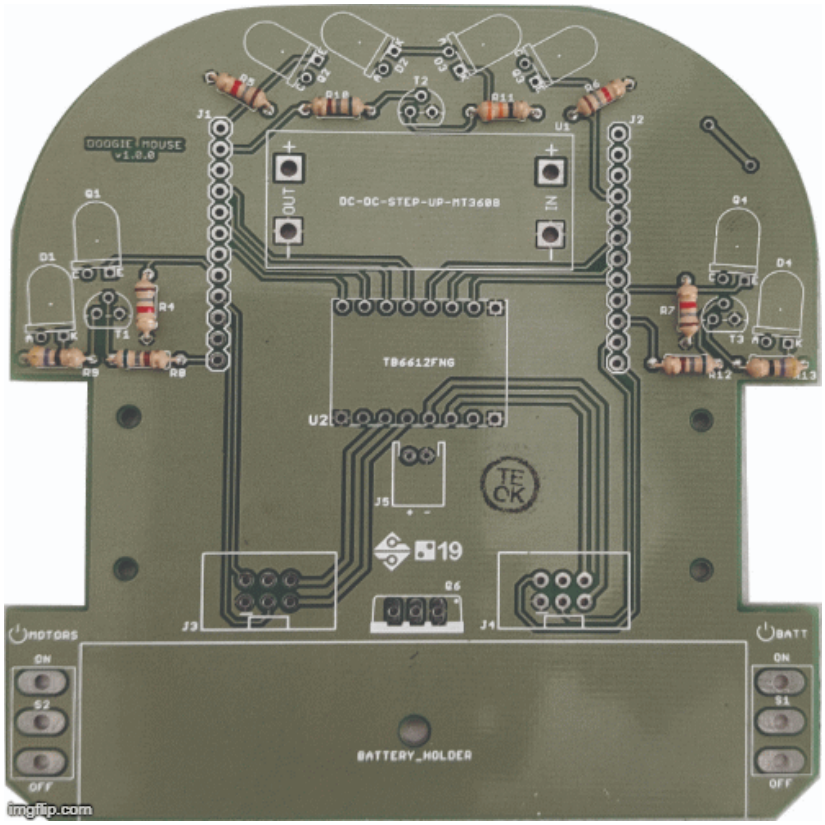
14. In this step weld the crimps and make the battery male connector.



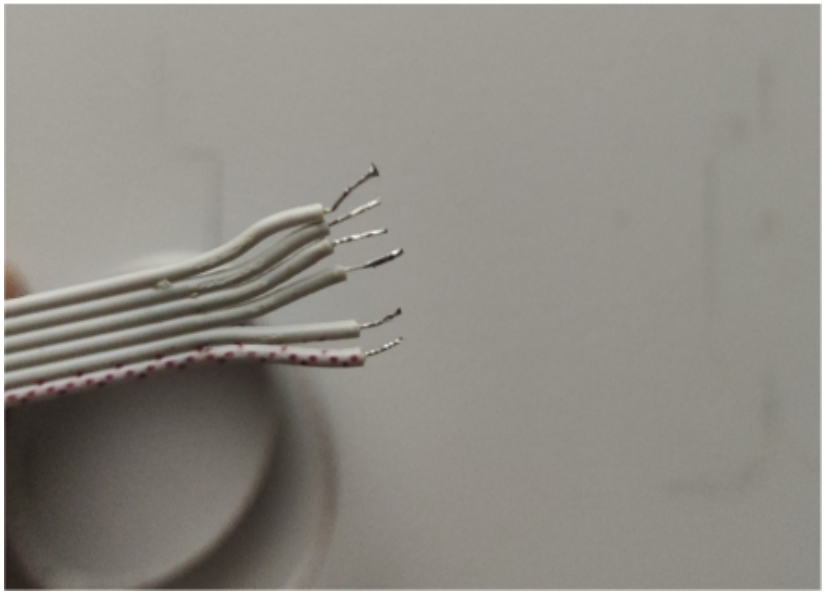
15. Now with the help of a screw nut and washer, hold the baterry support on the board.



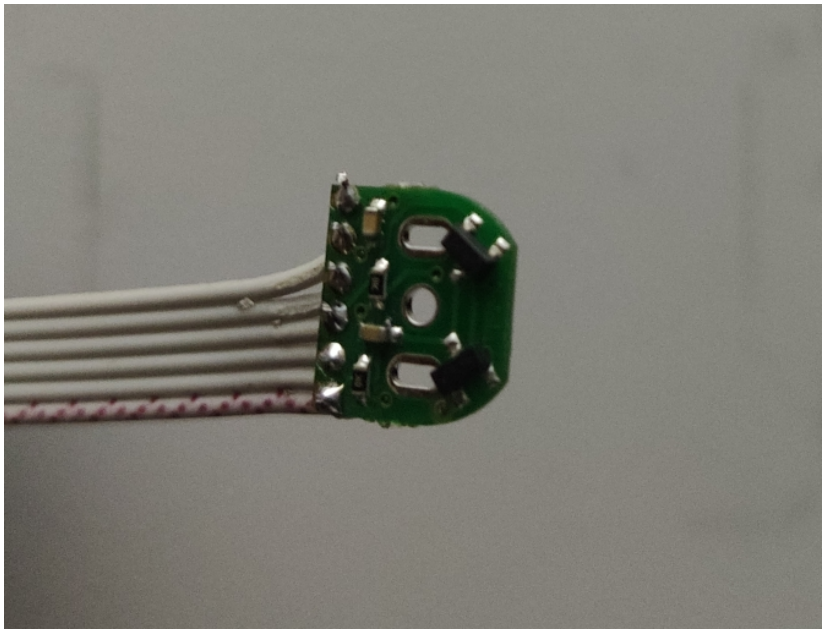
Look the full bottom board mount process in the GIF below.



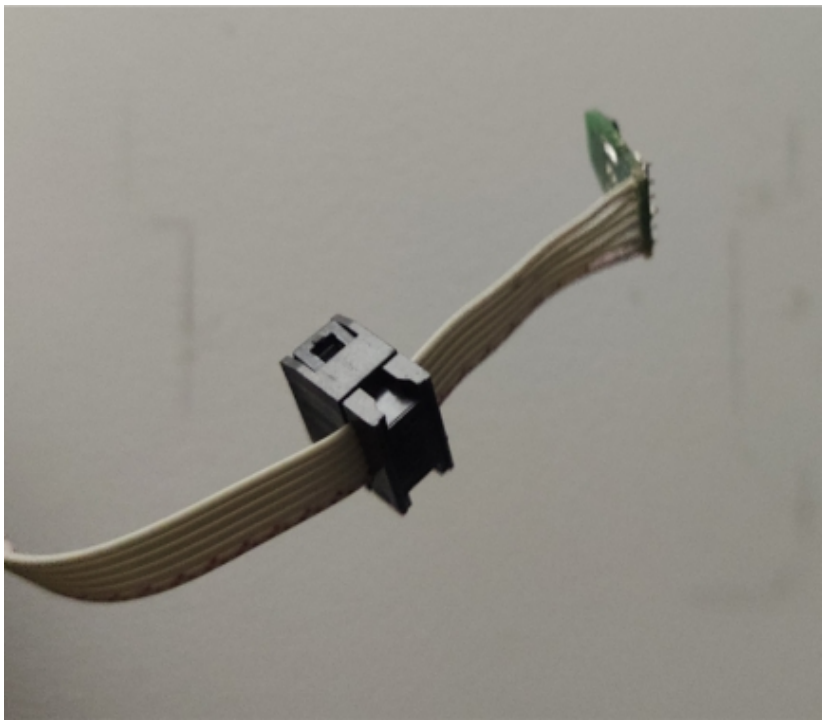
16. Now we going to start the confectation of motor set. First tin the end of flat cable.



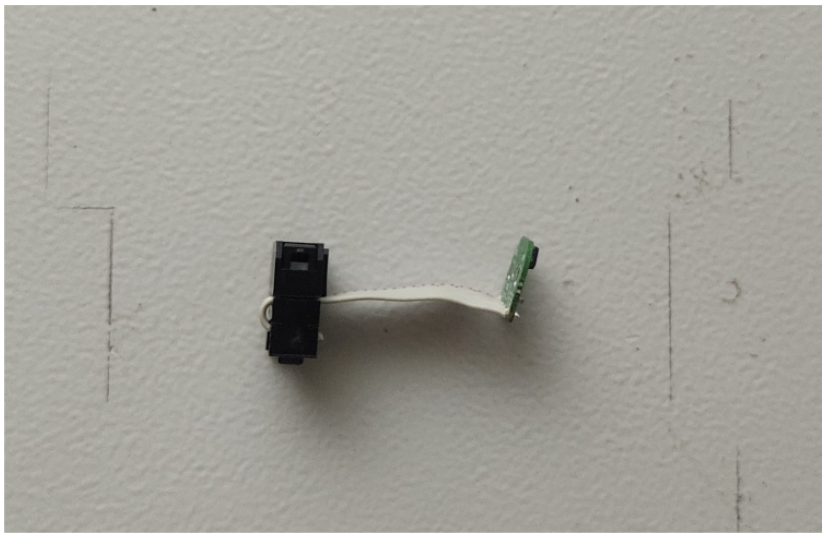
17. After this weld the flat cable on the magnetic encoder board. Look the picture below.



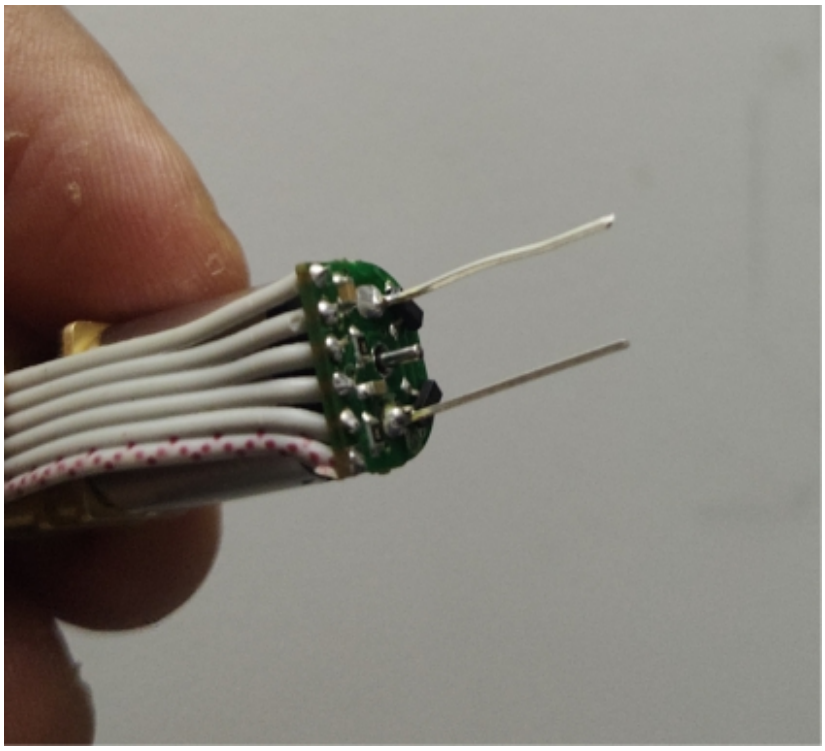
18. Then make the fixation of the female connector IDC. Be sure that the lenght of the cable are 25 mm .



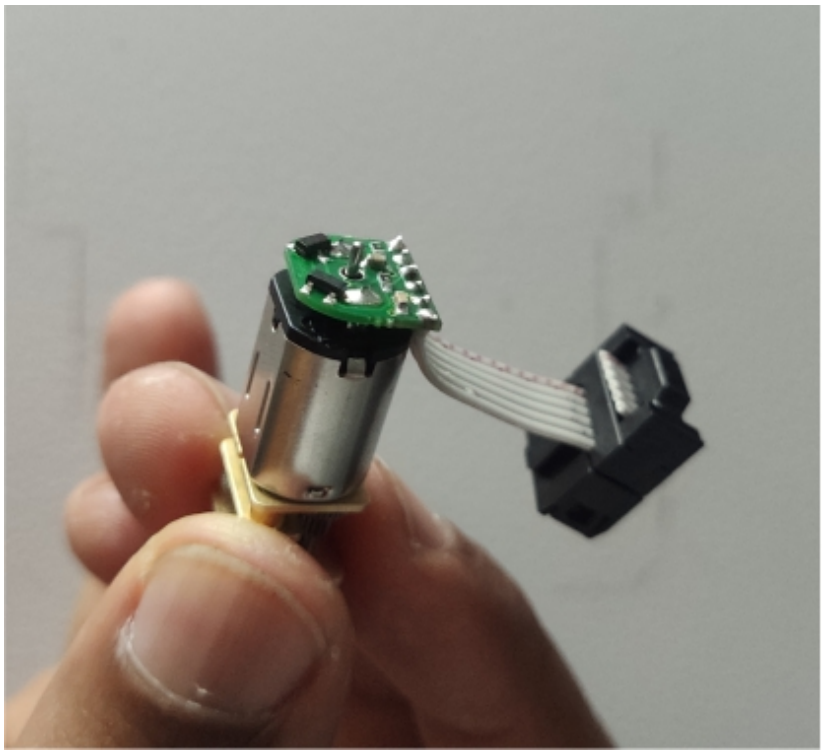
19. Next cut the excess cable.



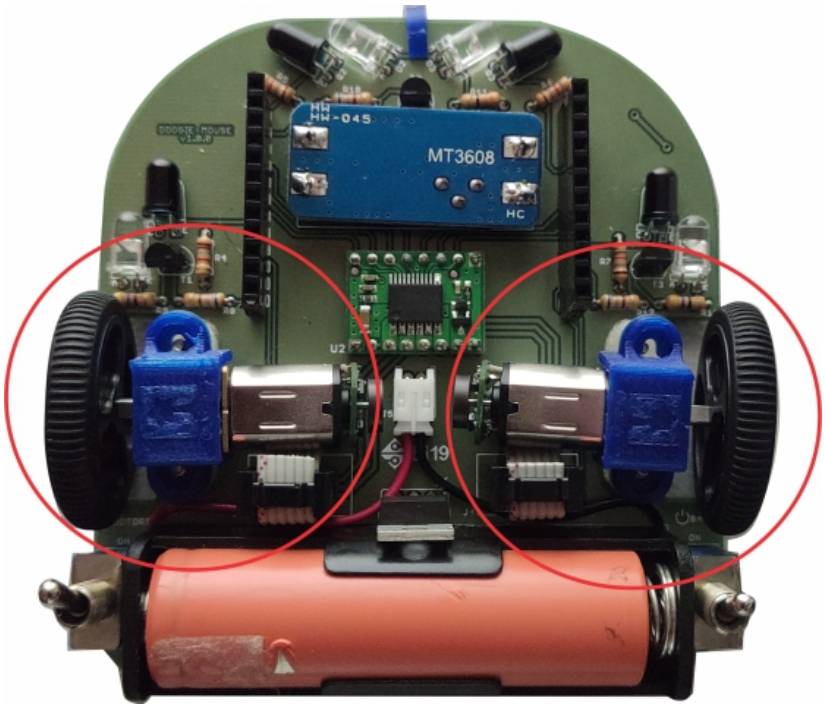
20. Use a metal guide for able weld the motor terminals on the magnetic encoder board. Pay attention on the polarity(M1 = + | M2 = -).



21. Cut the excess of the metal guide.



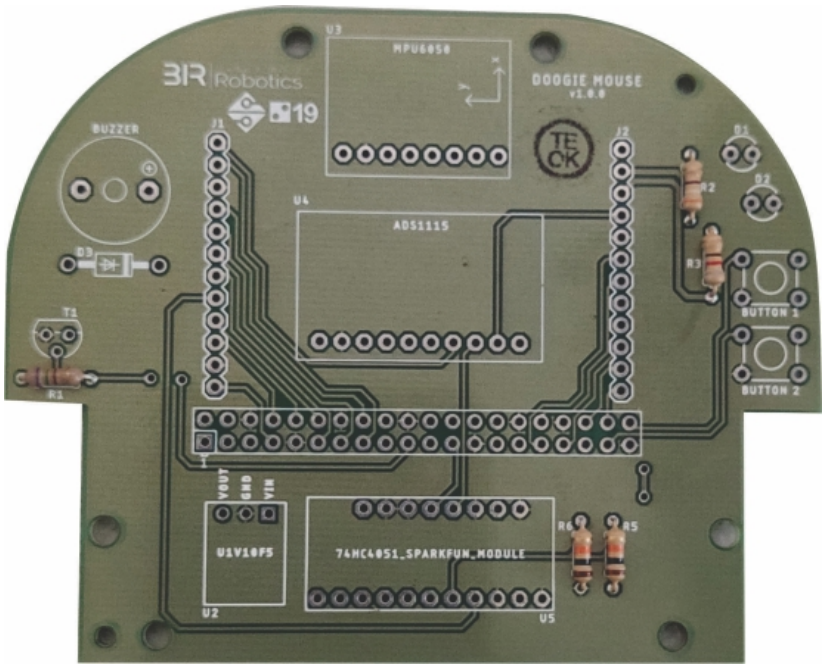
22. With help of bracket, screw and nut make the fixation of motor on the bottom board.



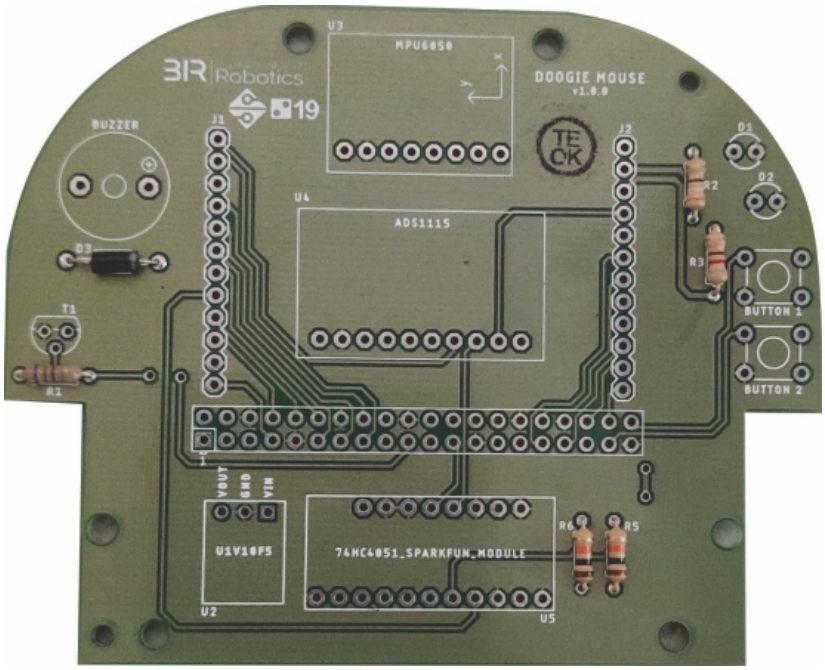
In this step the mount bottom board procedure is finished we will be now for the mount top board procedure.

Top Board

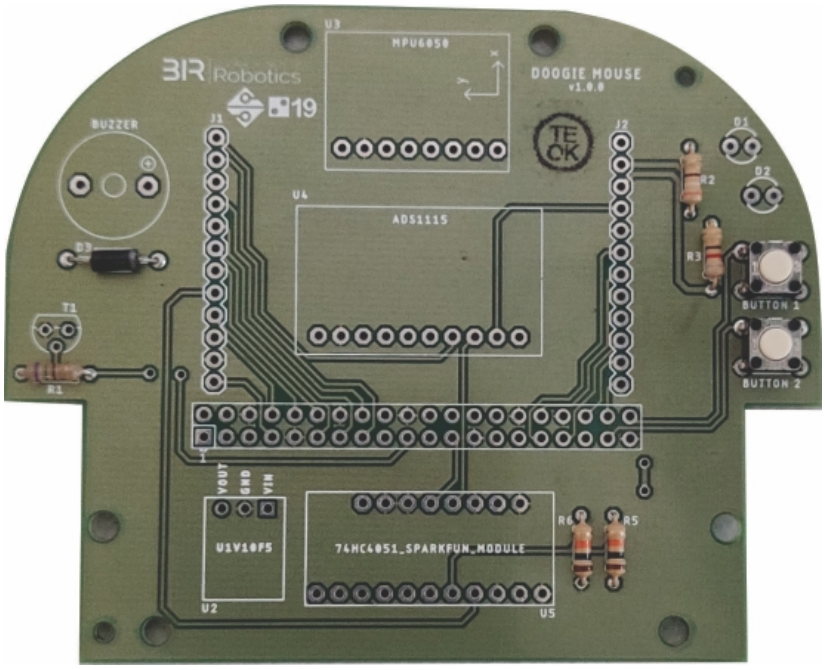
1. With the help of the soldering iron and tin connect and secure the resistors.



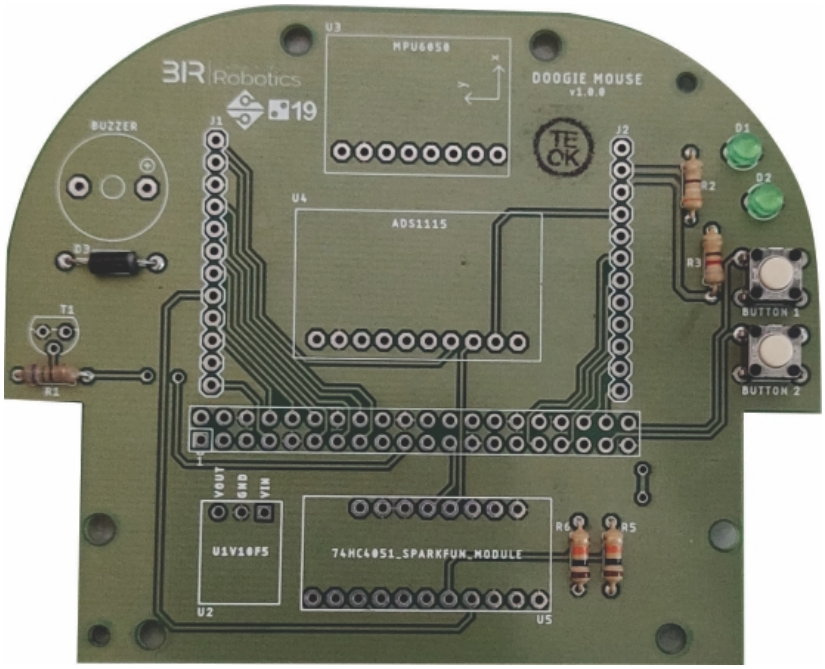
2. Weld the diode.



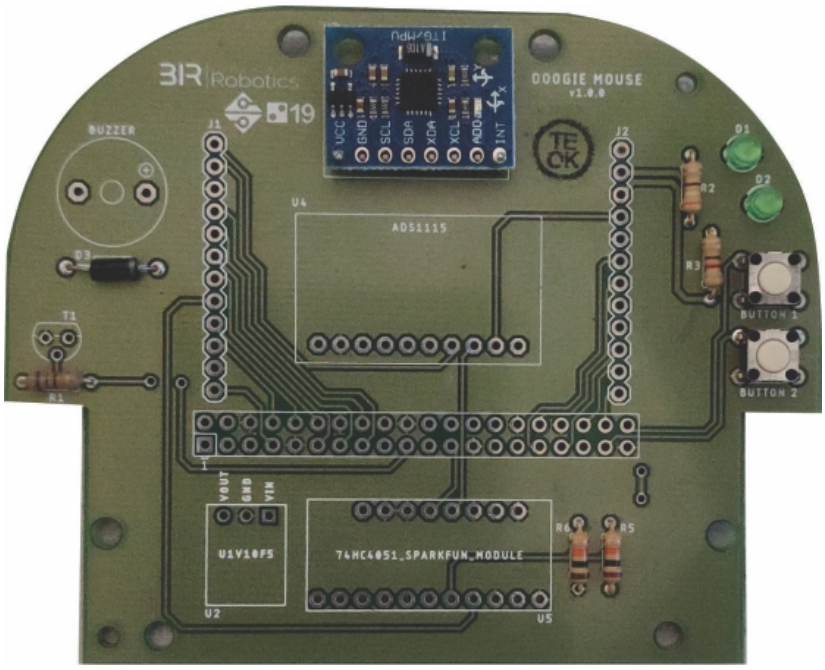
1. Then make the fixation and soldering of the push-buttons.



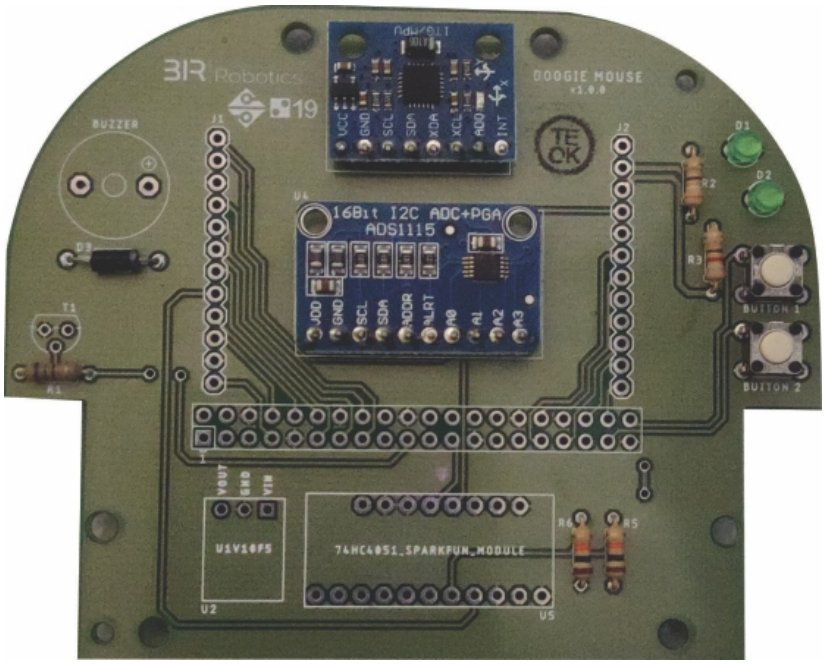
4. After this weld the leds on the right top corner of the board.



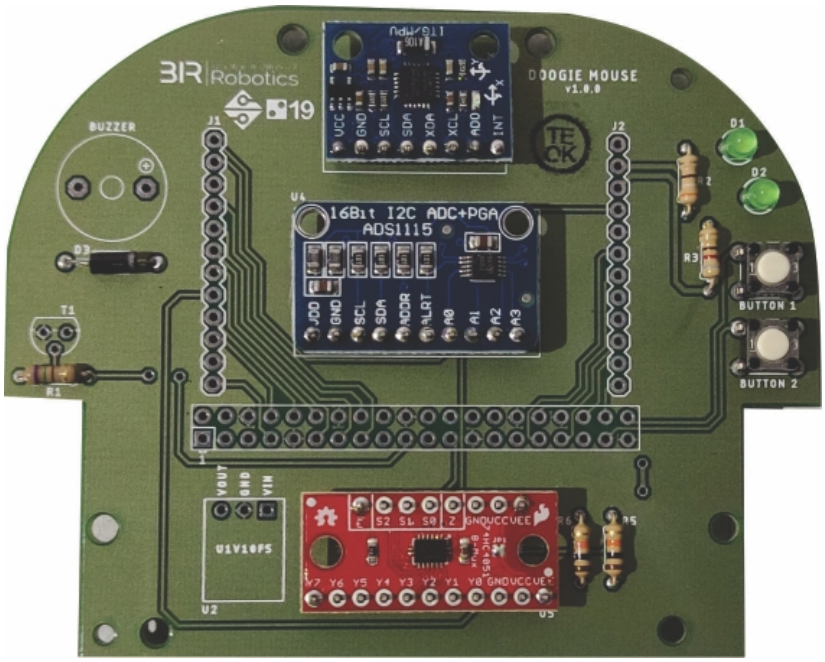
5. Weld the pin bars of the IMU on the component and then hold them on the board with soldering.



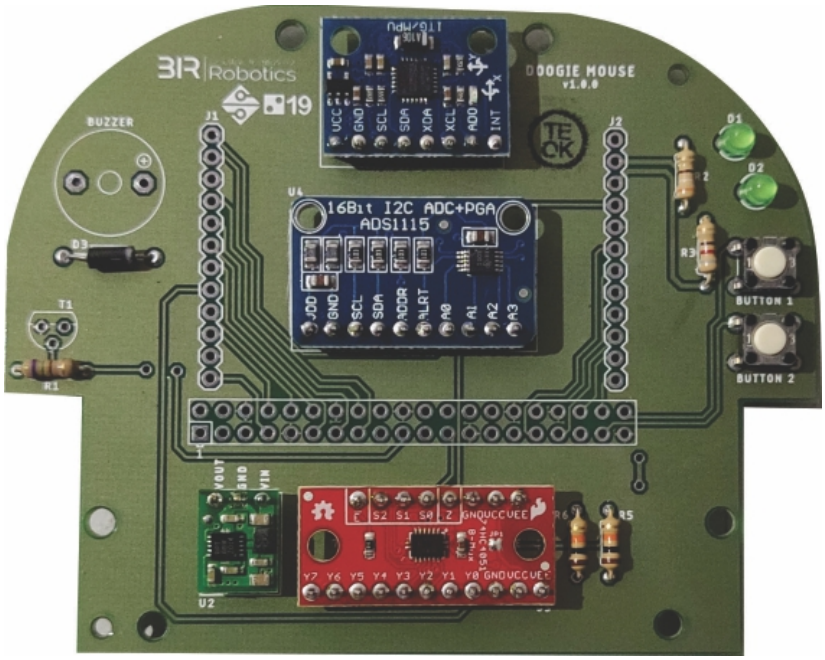
6. Like the previous step weld de pin for ADS then hold them on the board with soldering.



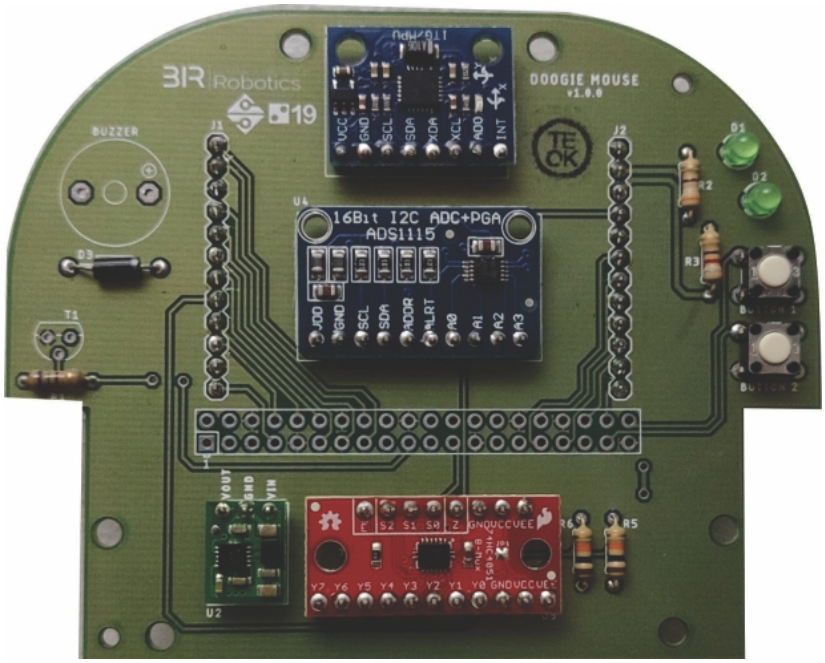
7. Of similar form make for the multiplexer.



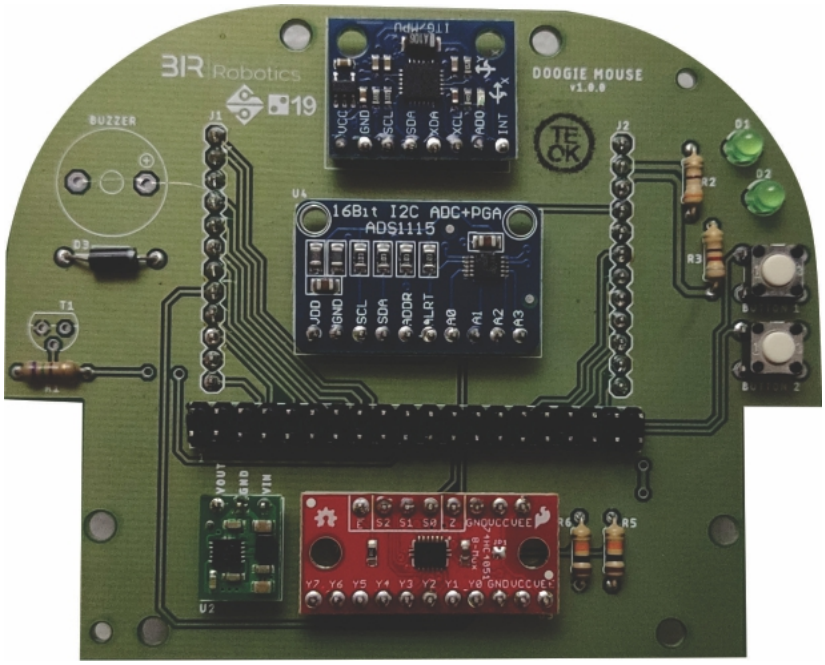
8. Repeat the step for the DC/DC conversor.



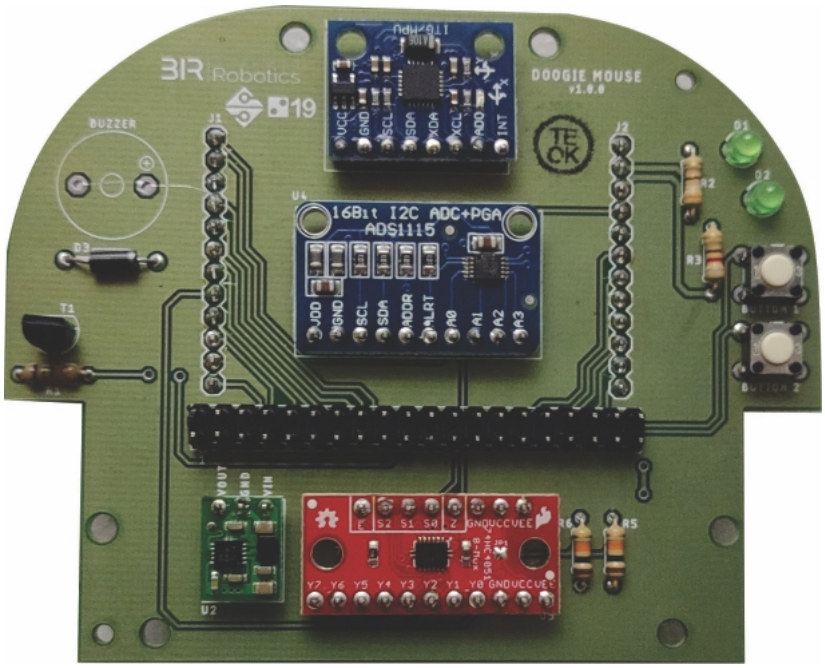
9. Weld the pin headers on the central conectors making the bigger part stay facing for the under board side side.



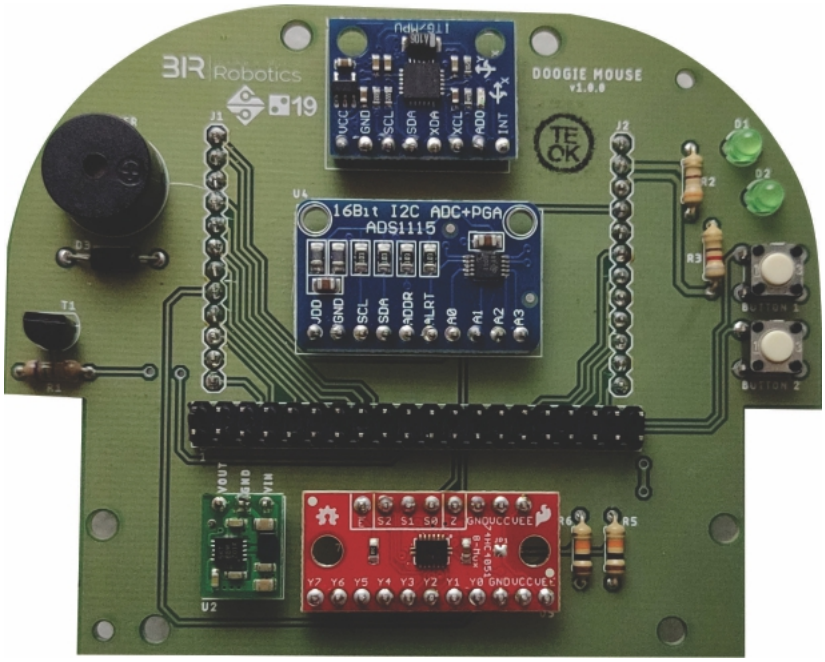
10. In this step weld the pin bar on the top board.



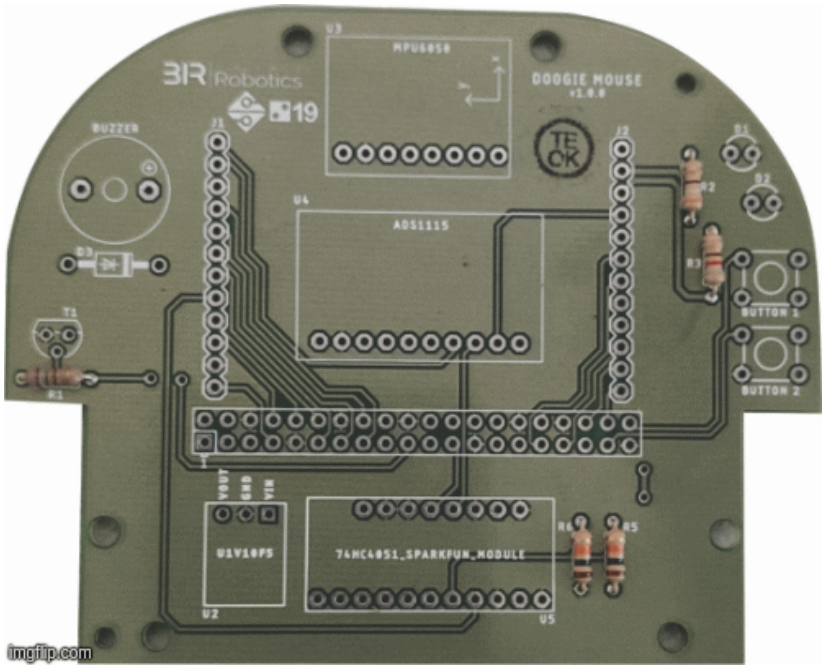
11. Now you will have to make the fixation of the transistor with soldering.



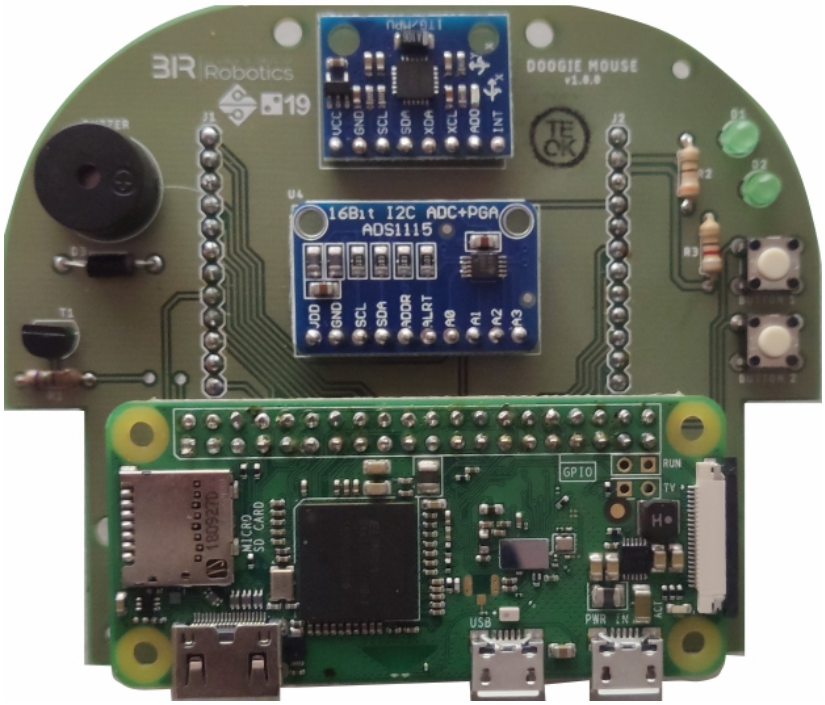
12. Weld the buzzer.



Look the full top board mount process in the GIF below.



13. For finish weld the female pin bar on de raspiberry Pi zero and connect on the top board.


BIR Robotics
DOOGIE MOUSE
v1.0.0
VCC
GND
SCL
SDA
XDA
XCL
ADO
INT
16Bit I2C ADC+PGA
ADS1115
VDD
GND
SCL
SDA
ADDR
ALRT
A0
A1
A2
A3
GPIO
RUN
TV
MICRO SD CARD
USB
PWR IN
ACT