

Midterm Report

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October 7, 2022

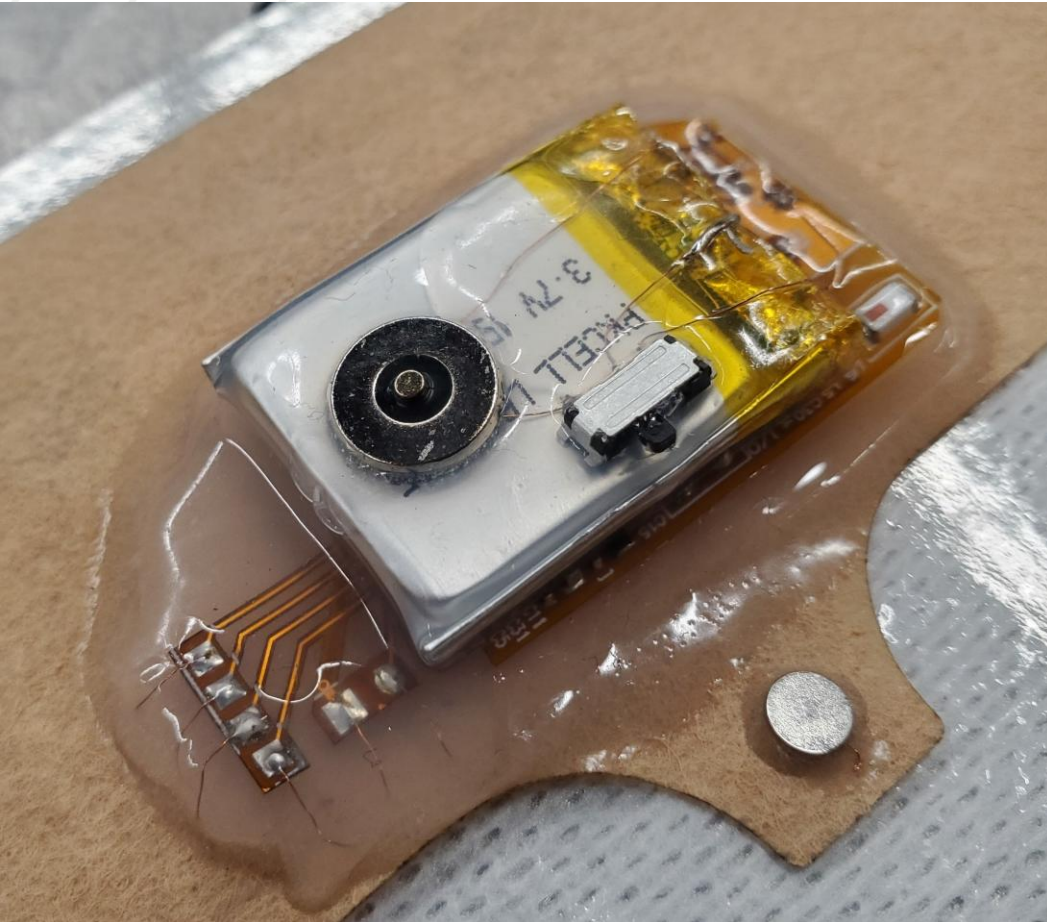
Bio-Interfaced Translational Nanoengineering Group



IEN Center for Human-Centric
Interfaces and Engineering (CHCIE)



Project Overview

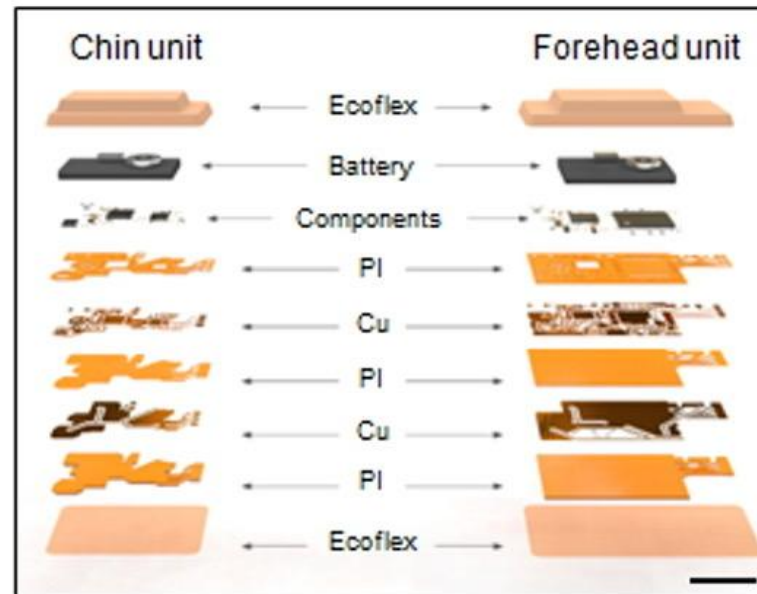
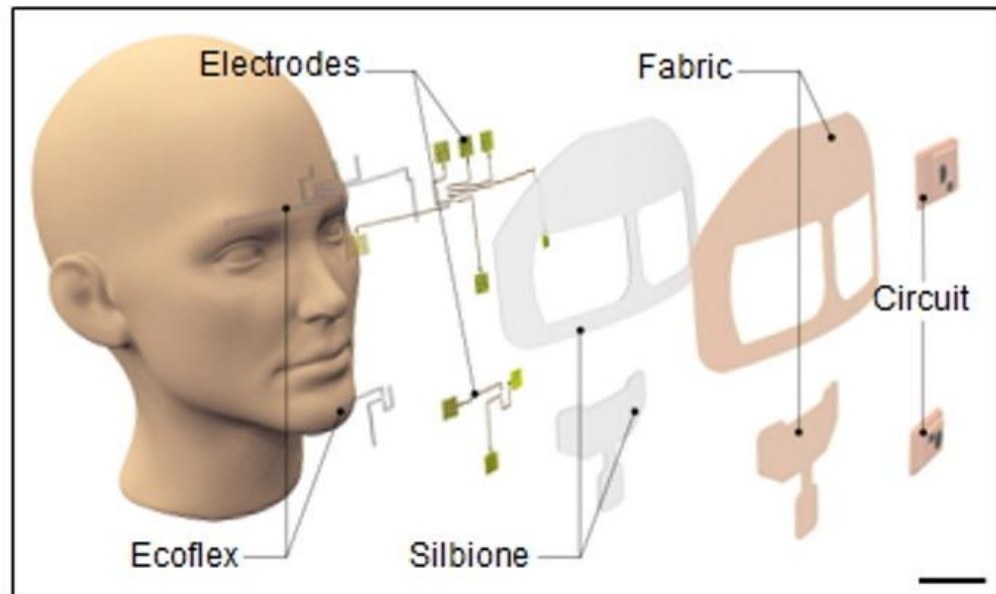
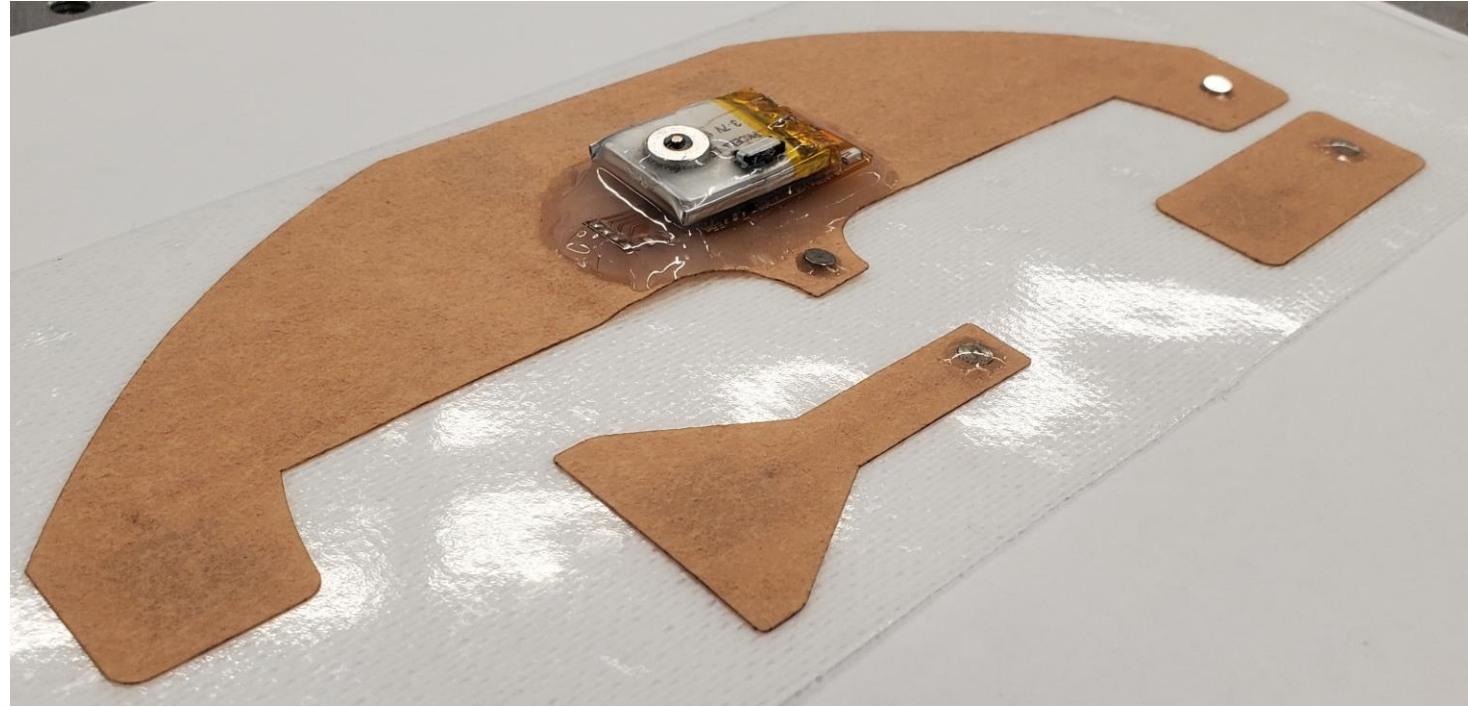


- **Sleep Stage Classifying Device**
 - Device Monitors EEG and Uses CNN to determine sleep stage and abnormalities
- **Semester Goal**
 - Fabricate Sleep Monitoring Device
- **Midterm Overview**
 - Fabricated Batteries
 - Fabricated Sleep Sensor Circuit

Sleep Device Design

Design Components

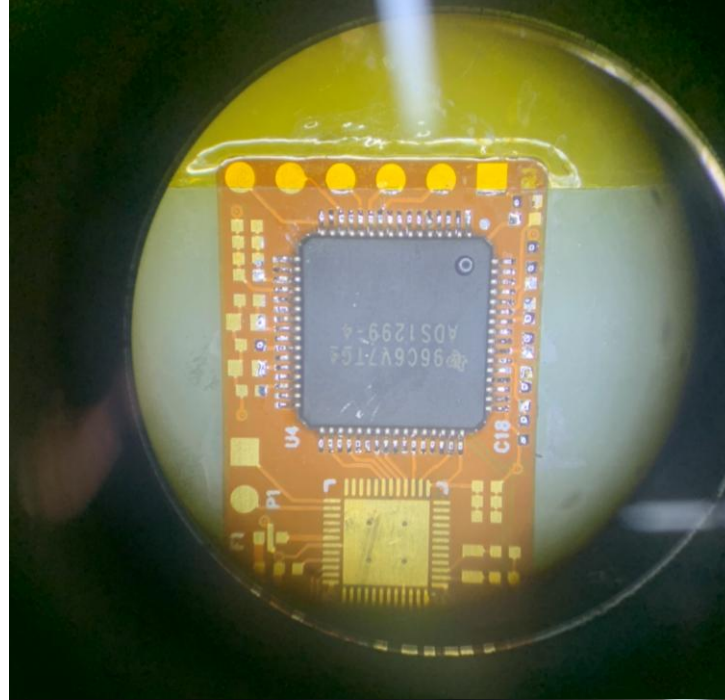
- Ecoflex
- Electrodes
- Circuit Component
- Battery



Device Fabrication: Circuit

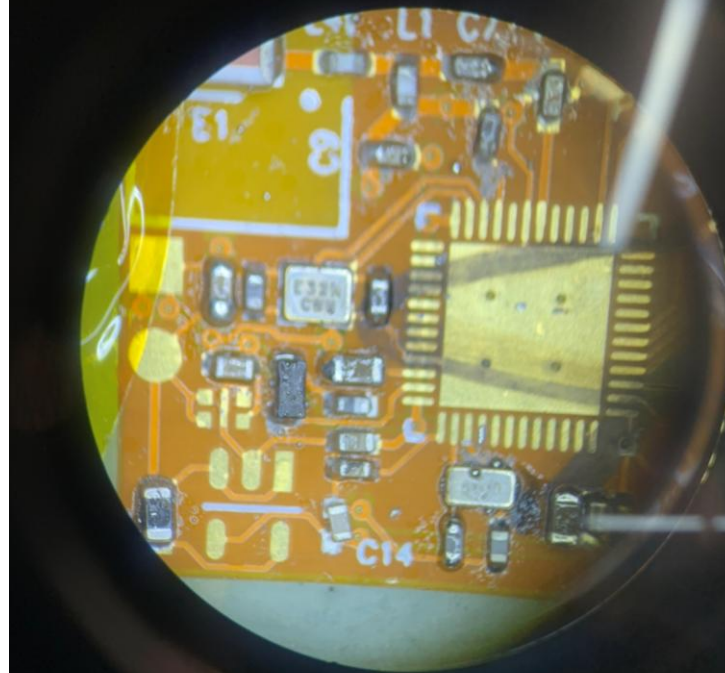
1. Integrated Circuit Component

- Soldered on the ADS 1299 Component First



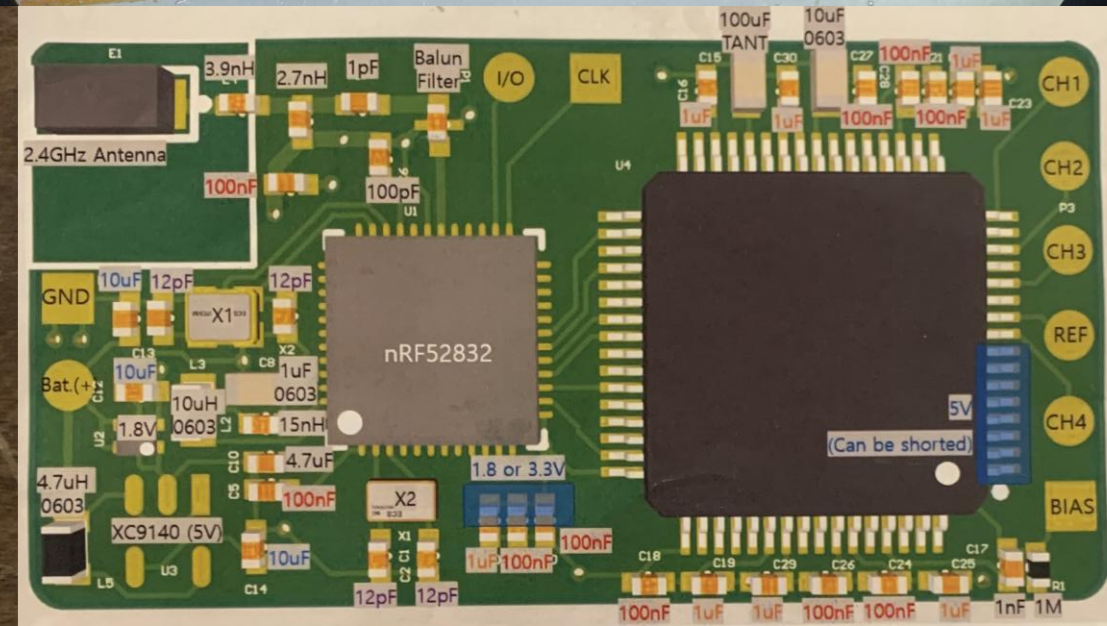
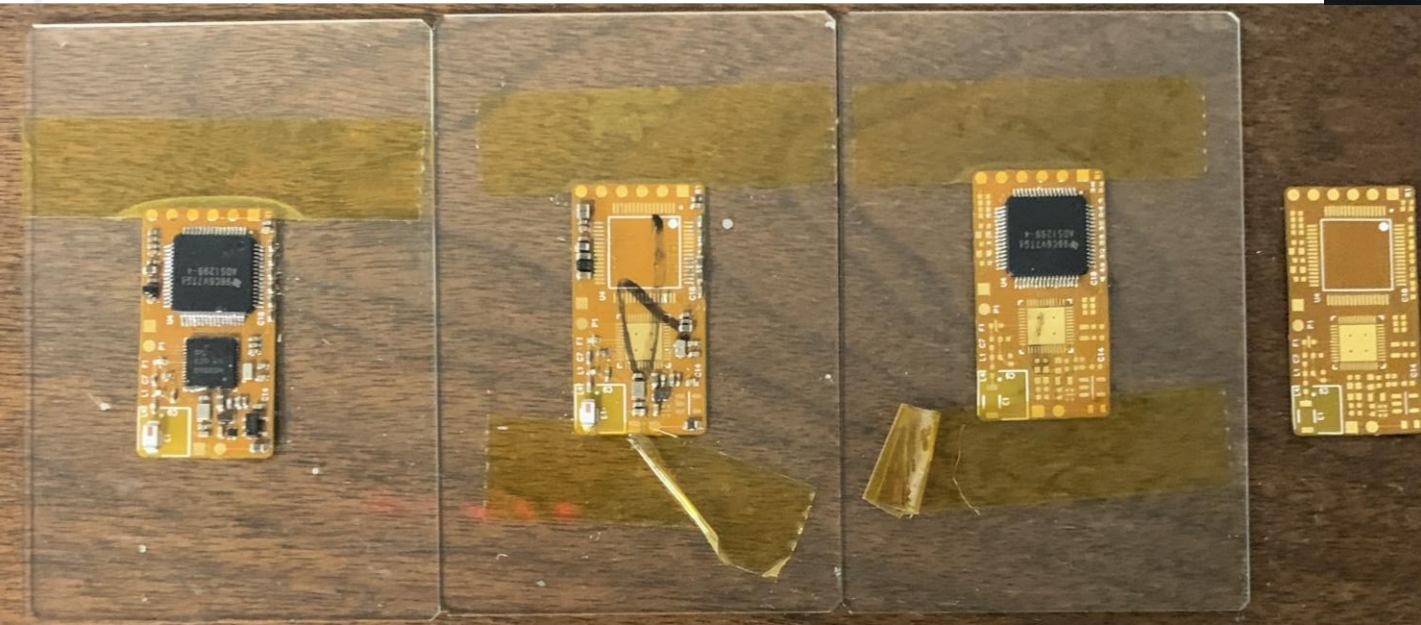
2. Surface Mount Soldering

- Used SM soldering to add on the smaller components such as resistors, capacitors, inductors, crystals, etc.



Final Product

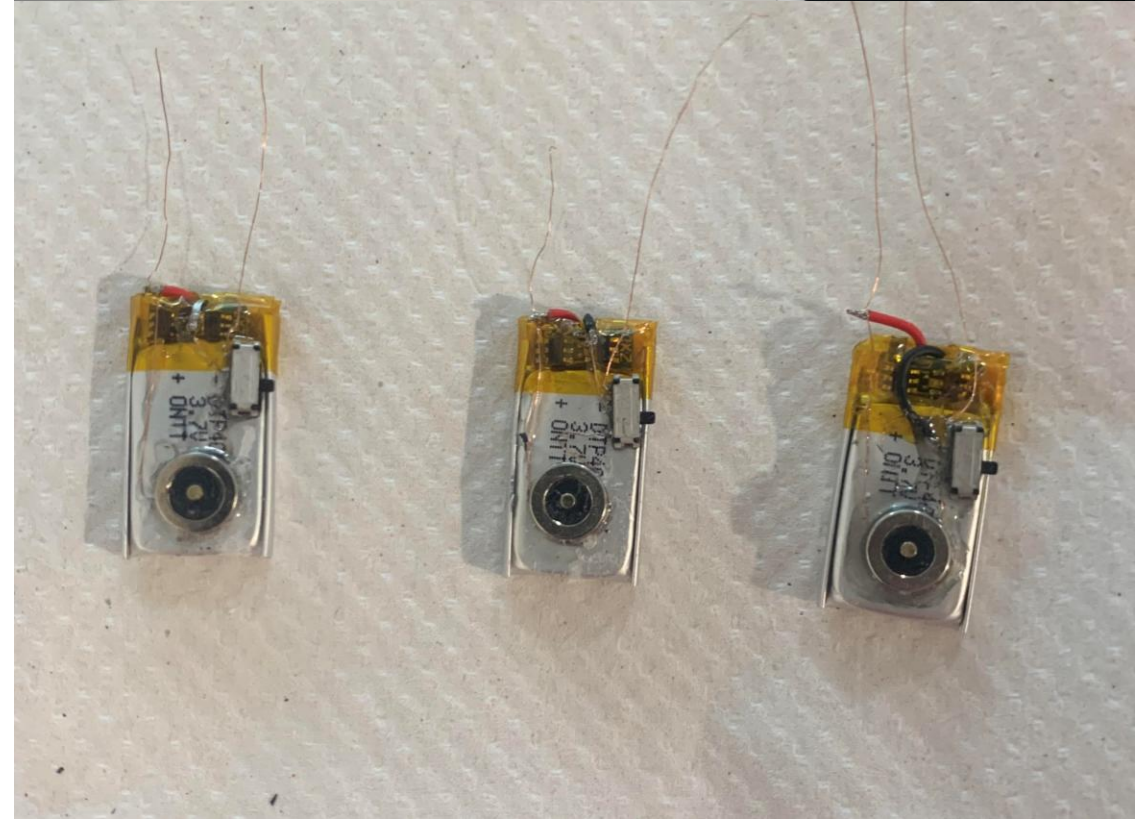
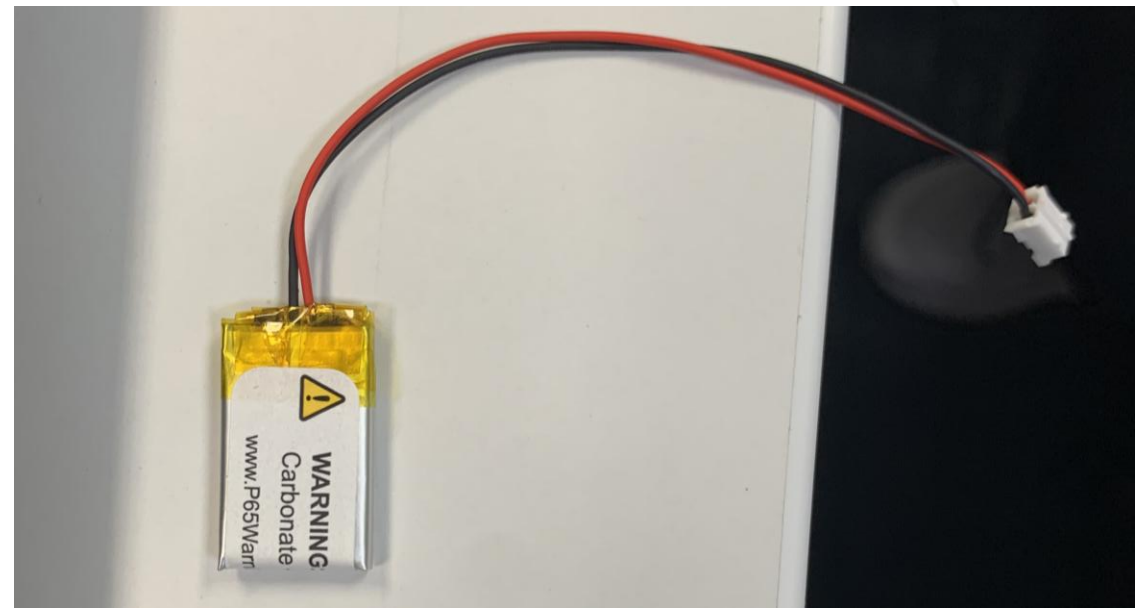
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Device Fabrication: Battery

Battery Components

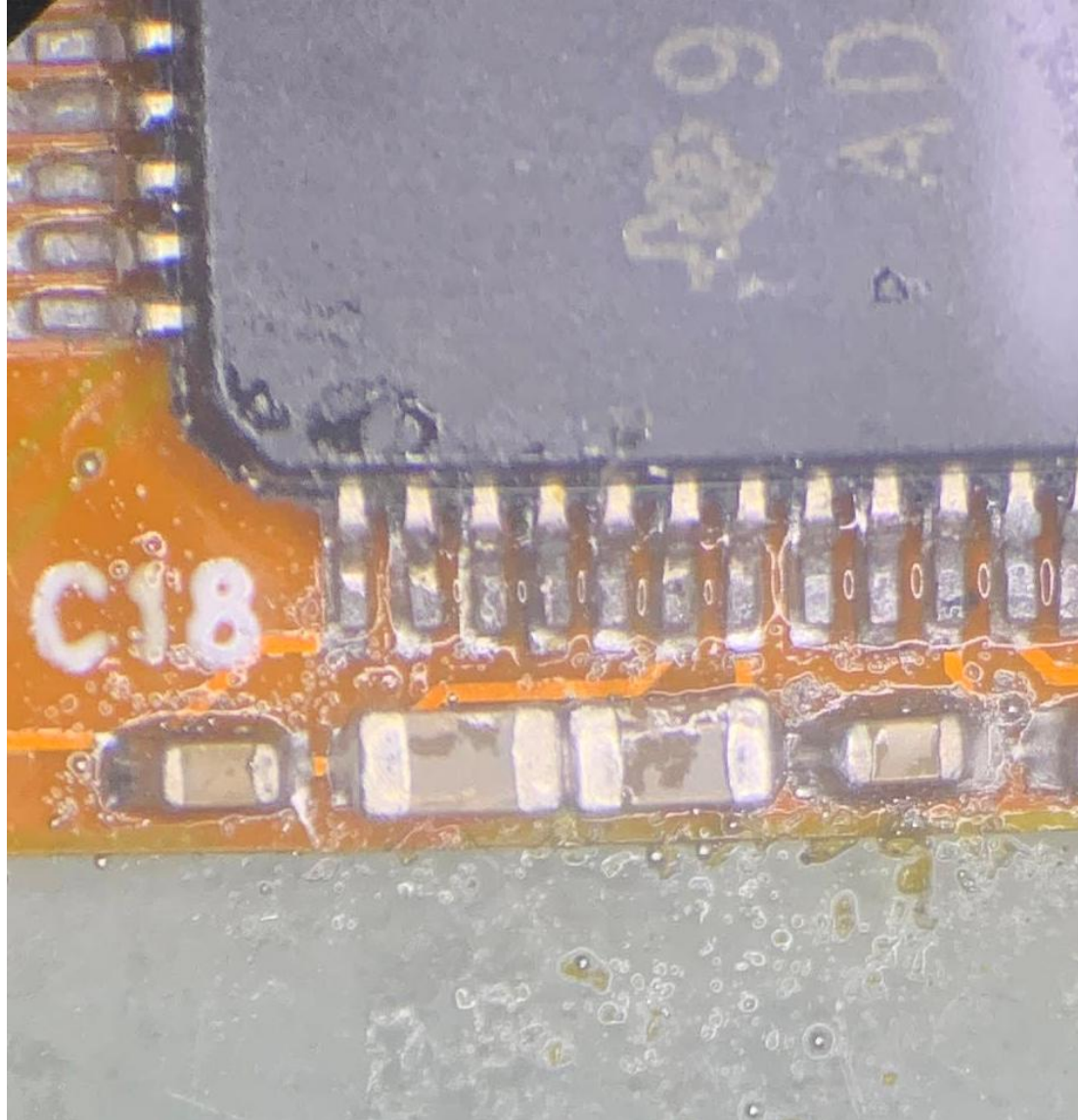
- Battery
- Re-charging Magnet
- Switch
- Copper Wire
- Epoxy Cover



PCB Challenges

Challenges

- Shorting of Components
- Shorting of IC



Next Steps of Integration

- Combined Battery and Circuit to Test
- Make Electrodes
- Encapsulate in Ecoflex

