Portable Apple Watch Charger

Created by Ruiz Brothers

https://learn.adafruit.com/portable-apple-watch-charger

Last updated on 2024-06-03 01:43:49 PM EDT

Table of Contents

Overview

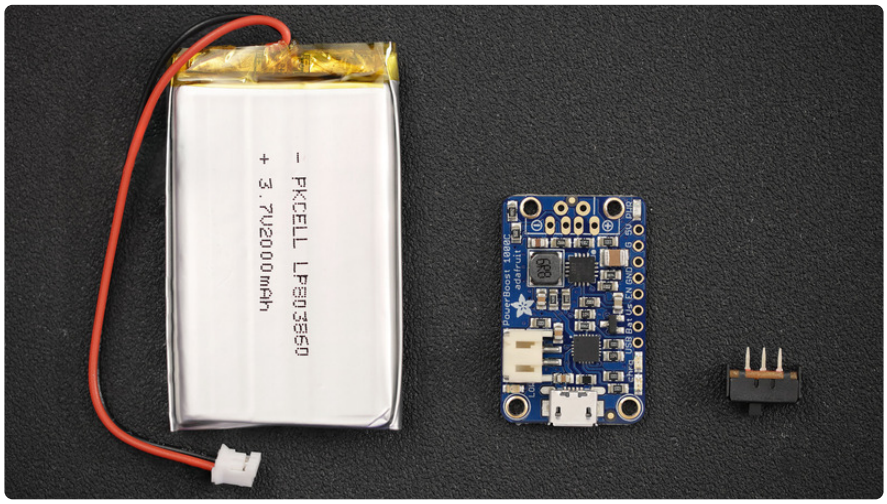
Here's how to build a wireless charger for Qi compatible devices like the Apple Watch.

Forget waiting on a kickstarter, you can hack your existing charger and build your own portable charger with components from Adafruit.

Smart Charging

The Adafruit Powerboost 1000C features smart charging. Combined with a 2000mAh lipo battery and a slide switch, you can build your own wireless charger that has lots of power.

Our 3D printed enclosure is compact and houses all of the components. You can choose from two case designs if you'd like to charge devices using a USB cable.



Prerequisite Guides

Check out the following guides below to get a better understanding of the Powerboost 1000C pin outs.

PowerBoost 1000C (https://adafru.it/jbk)

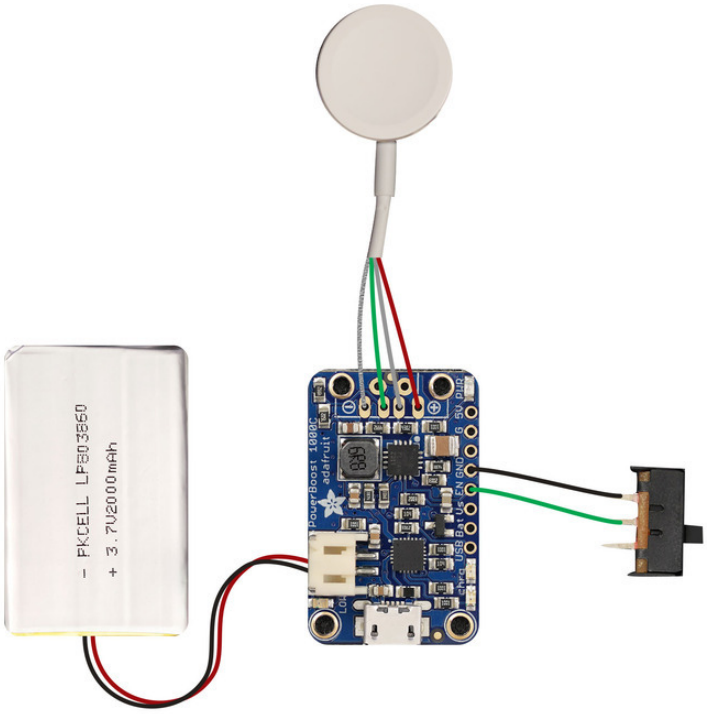
Parts, Tool & Supplies

If you don't have access to a 3D printer, you can send the files to a service or check with your local hackerspace/library.

- Powerboost 1000C (http://adafru.it/2465)
- Apple Watch Qi Charger
- 3D Printer (https://adafru.it/doT)

- Filament (http://adafru.it/2080)
- Flush cutters (http://adafru.it/152)
- #2-56 machine screws (https://adafru.it/f9O)

Circuit Diagram

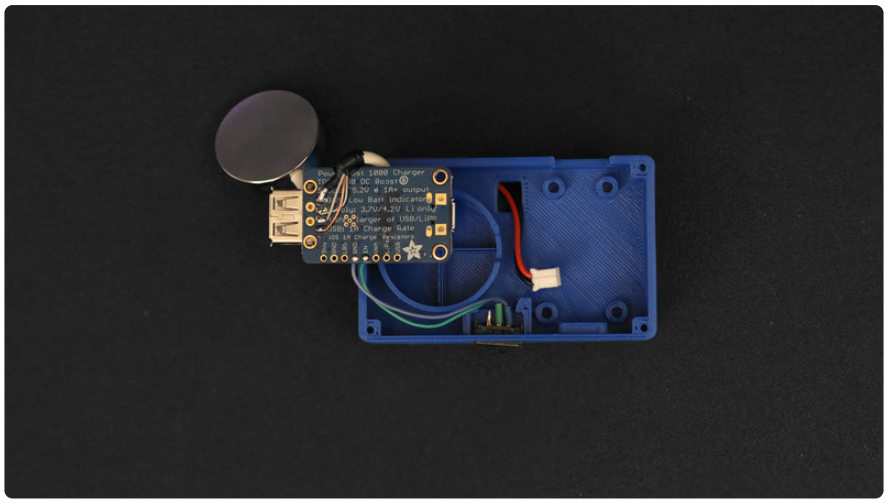


Take a moment to review the components in the circuit diagram. This illustration is meant for referencing wired connections - The length of wire, position and size of components are not exact.

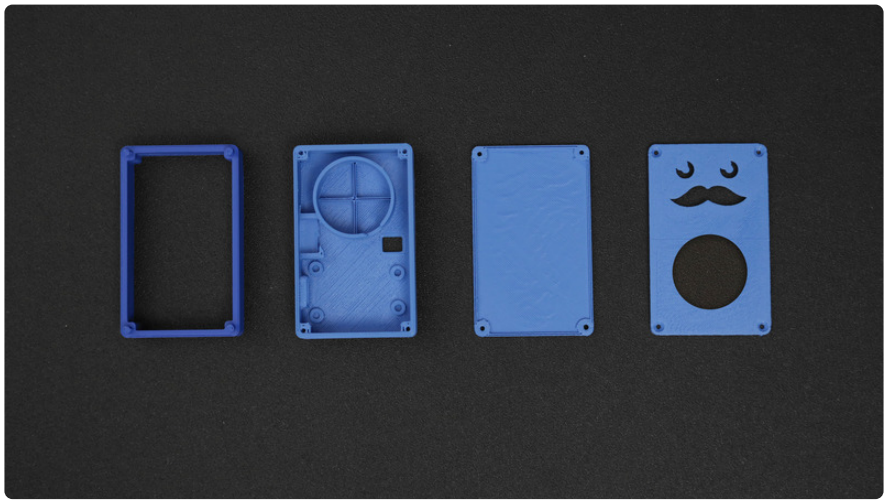
Qi charger has four wires, the threaded metal shield will act as our **Ground**, Green is **USB Data -**, white is **USB Data** + and **Red is Power**

The slide switch will need to connect to **Ground** and **Enable**.

Battery connects to the JST port next to the USB port on the Powerboost.



3D Printing



3D Printed Parts

All you need is these 4 parts:

Face cover, case, frame and back cover.

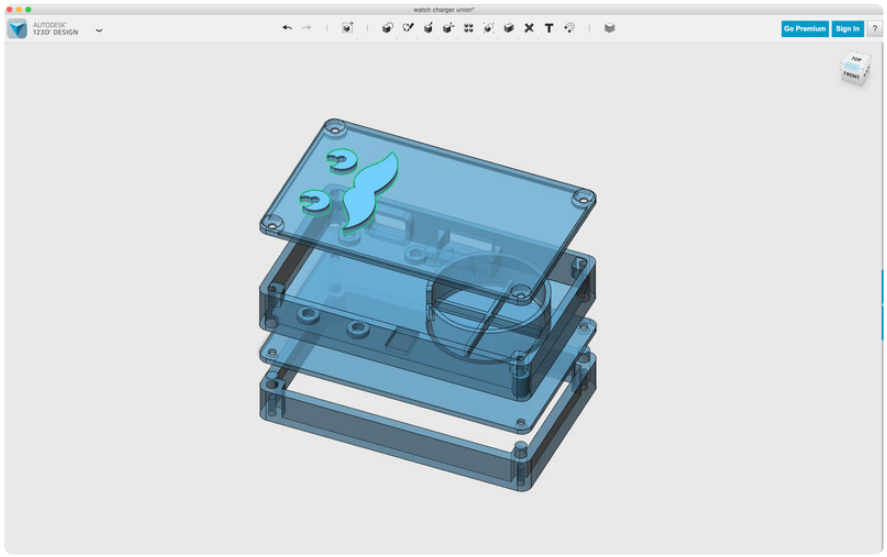
Download STLs

https://adafru.it/f9S

Slicer Settings

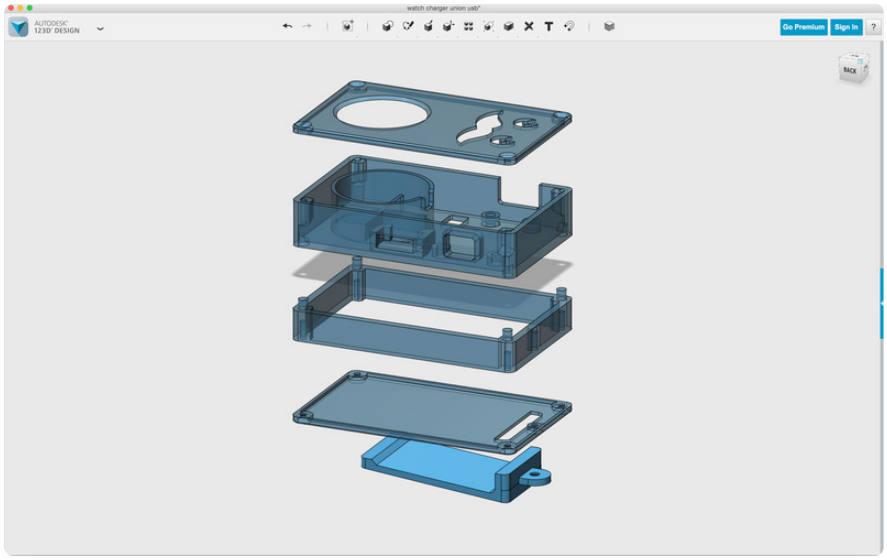
You can use the settings below as a reference. The parts are oriented in the center of the bed and ready to print "as is". They do not require any support material.

ChargeCase.stl ChargeFrame.stl ChargeFace.stl ChargeCover.stl	230c 2 shells 3 top/bottom shells 50mms print speed 10% infill	about an hour and a half to print all four parts.



Modify Design

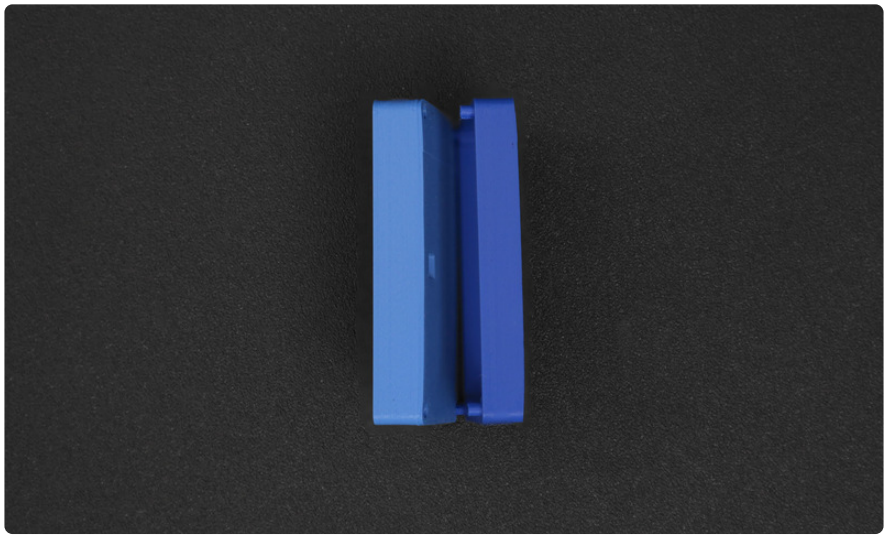
The parts were modeled in Autodesk 123D Design and available to modify. The file includes the original solids and sketches.



Materials

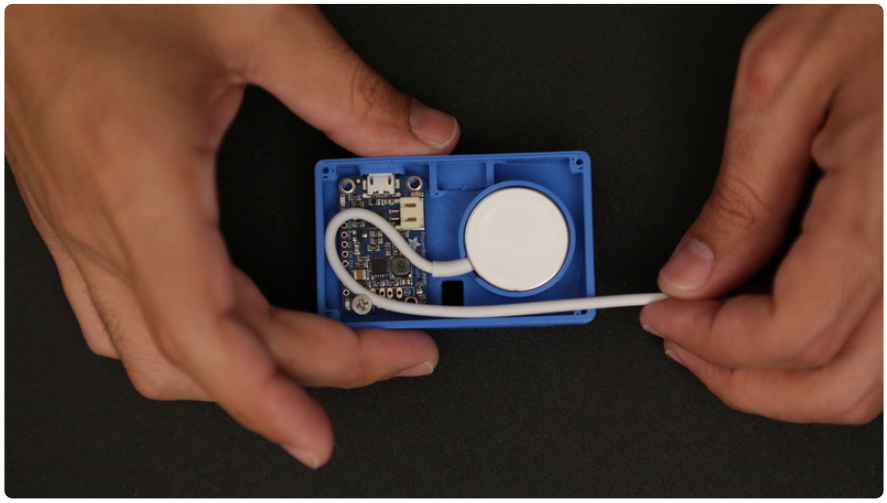
These parts have been printed in PLA but should print without any problems in ABS or other materials like bamboo and metal filaments.

Assembly



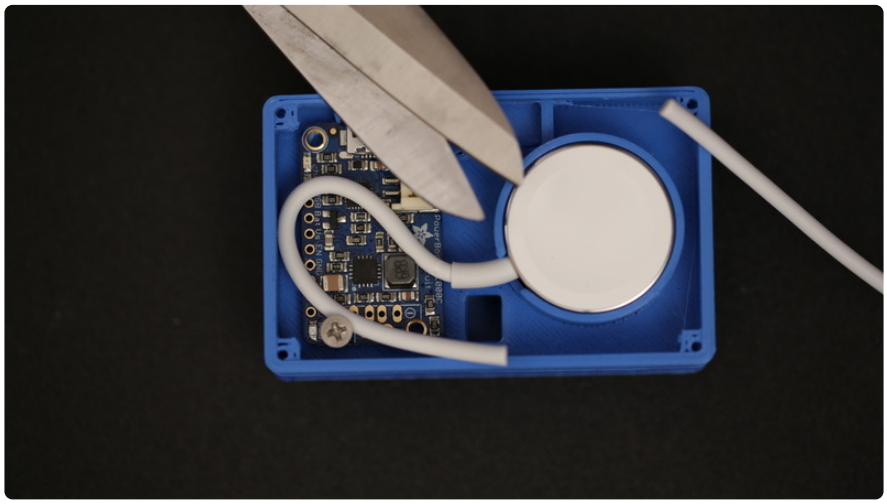
Snap Fit Frame

The frame and the main case snap fit together. Align the pins on the frame to the holes on the case to press fit together. The tolerences should be tight enough to securely hold the two pieces.



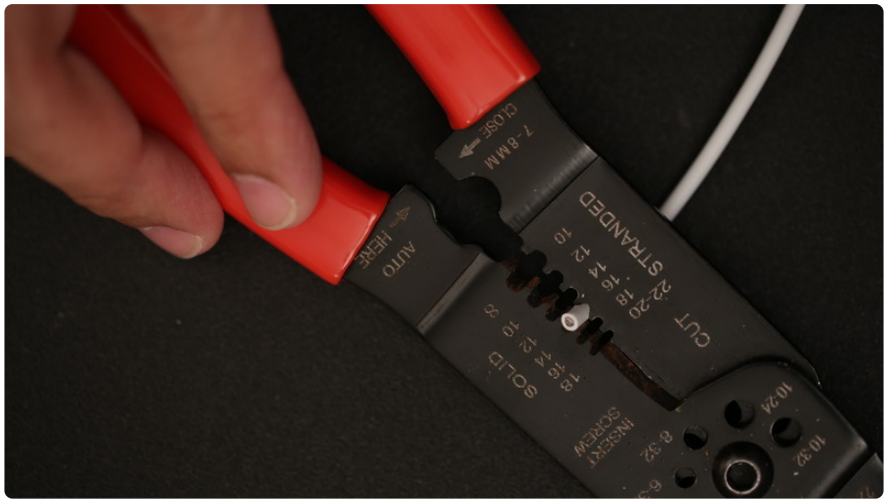
Measure cable lengths

Mount the Powerboost and a compatible Qi charger. Measure the length of cable needed in order to reach all of the pins out on the board. Make sure to have a little bit of slack. Use the screws help manage the cables while measuring.

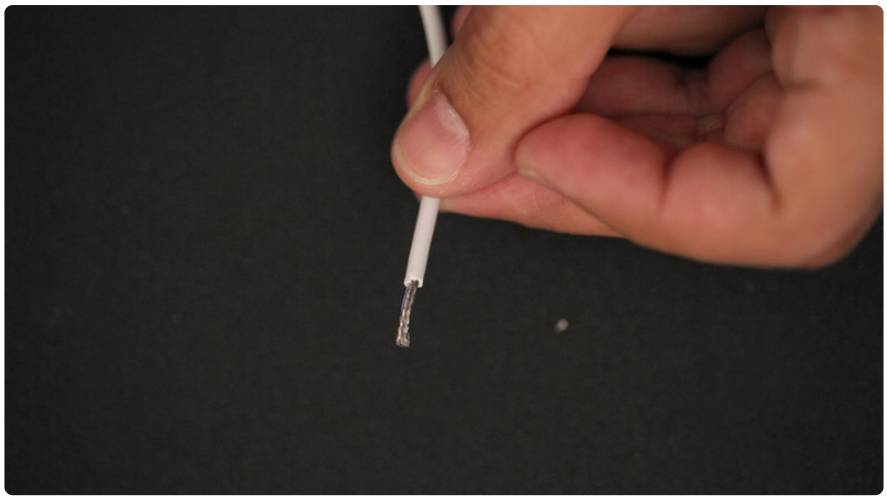


Cut and Strip

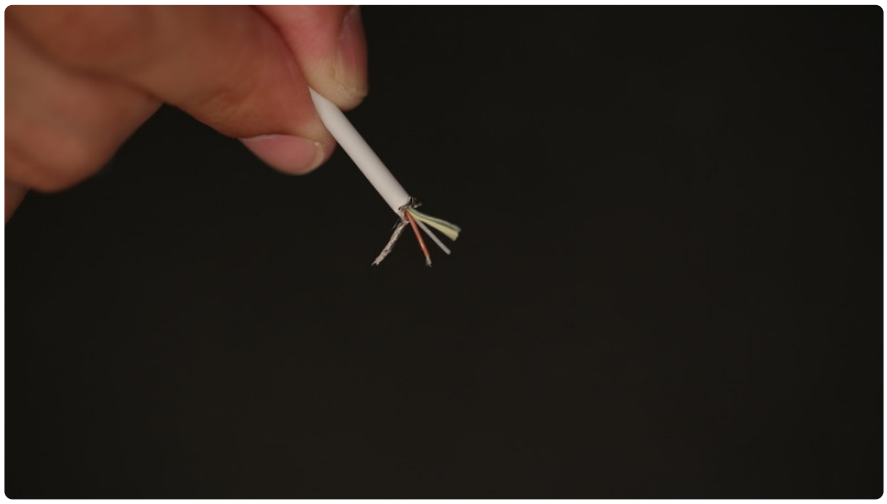
Use scissors to cut the Qi cable after taking measurments.



Use a 16 gauge wire stripper to remove about 2cm of sheathing from the cable.

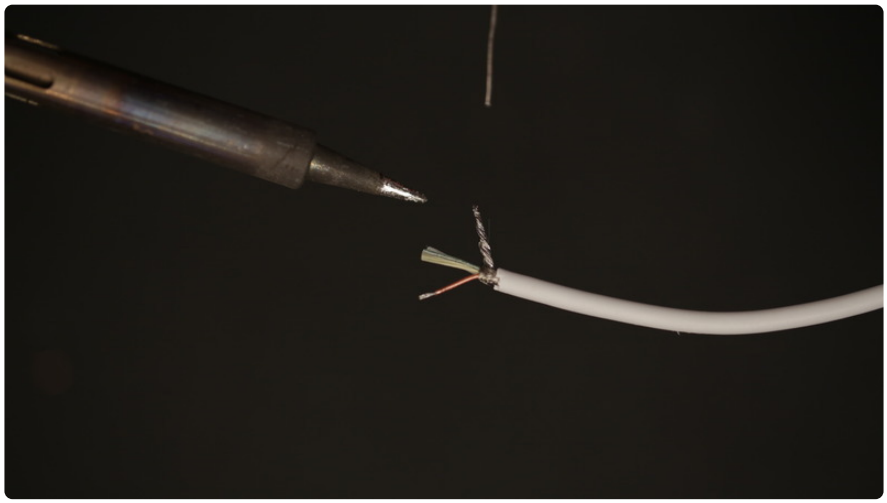


Be careful not to remove the metal shield, this will be our ground connection.



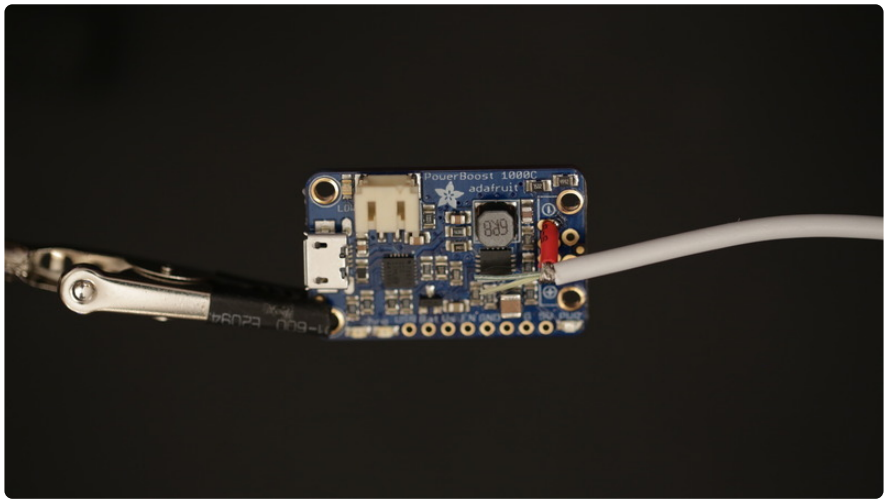
Prep ground connection

Twist the metal shield as shown in the picture above. Make sure there are no loose threads around other wires.



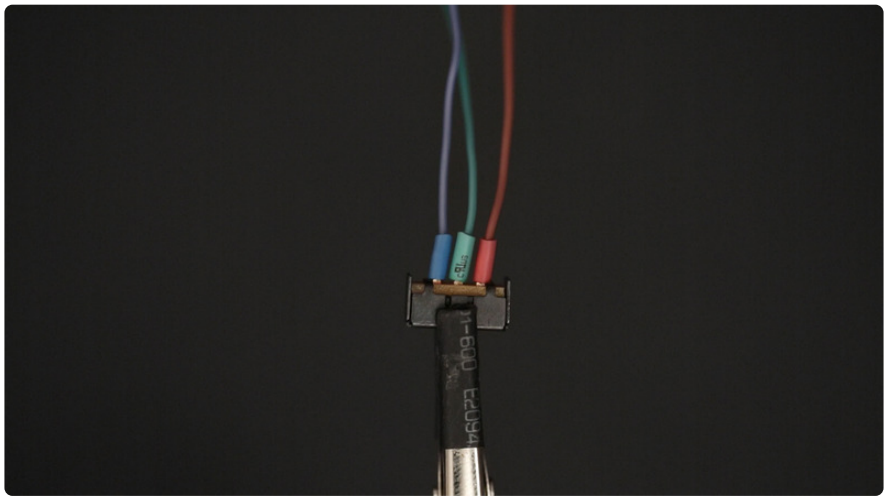
Tin wires

Prepare the four wires by stripping and tinning each. Remove enough sheathing so that the wire has enough length to reach the bottom side of the through hole.



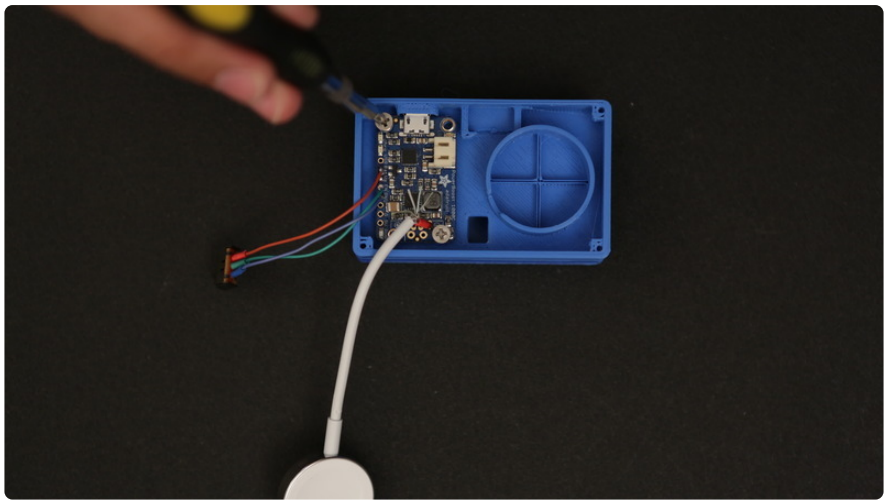
Heat shrink

We'll need to insulated the ground connection so it doesn't short any connections. Measure and cut a small piece of heat shrink so its long enough to cover the top portion of where the ground is exposed.



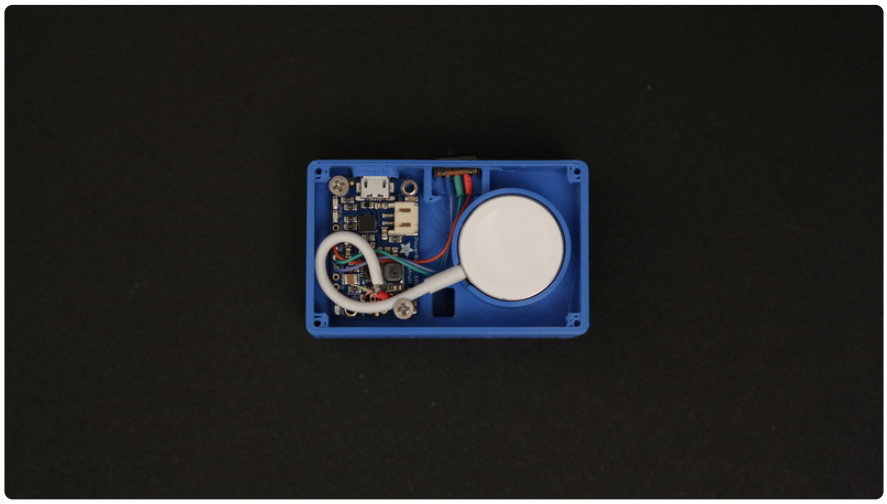
Slide switch

Mount the slide switch to the case to get measurements of how long we'll need to cut the silicone stranded wires. Take note of how the slide switch is mounted in relation to the pins outs on the Powerboost board.



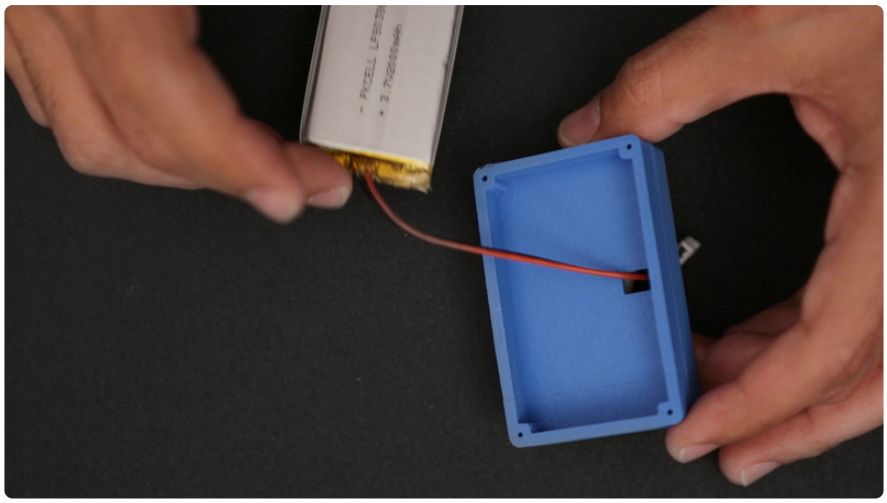
Solder Slide Switch

Use a third helping hand or panavise jr. to help solder the connections as shown in the circuit diagram page.



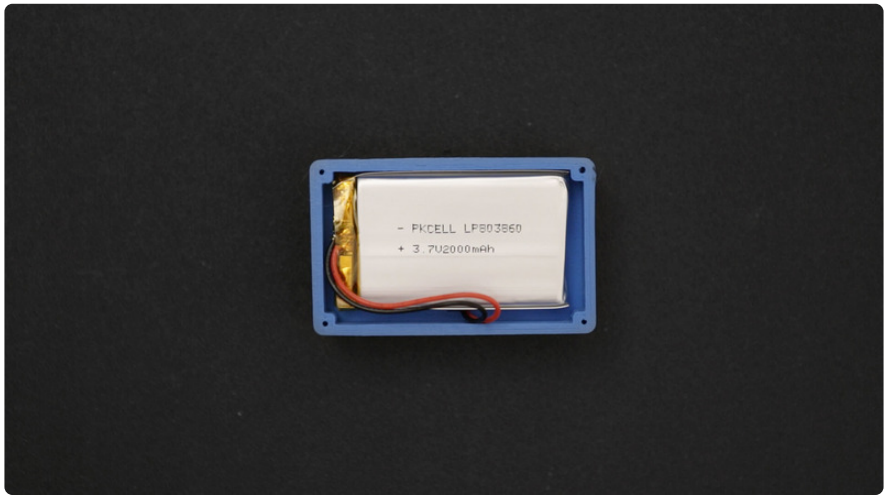
Wire management

Reference the picture above to arrange wires for the charger and slide switch. Use the mounted screws to help neatly arrange the cables.



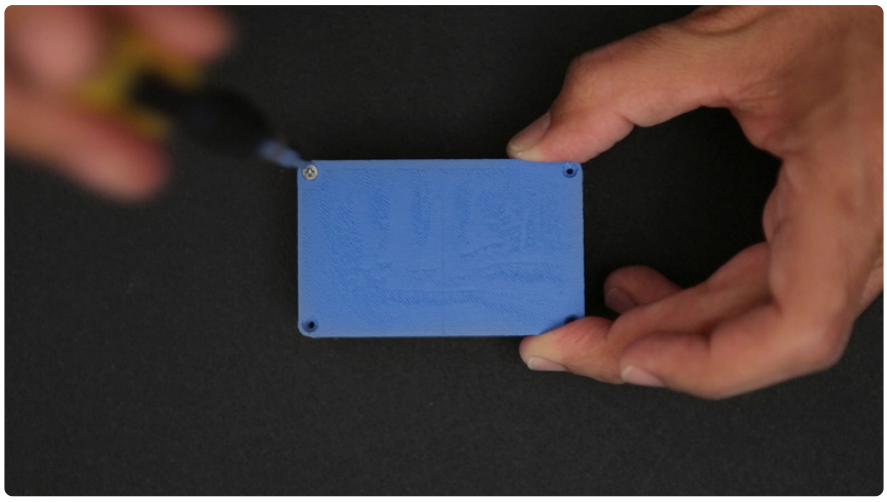
Battery install

Insert the battery JST connection through the bottom opening on the case. You'll only need to pass through enough wire to connect to the JST port on the Powerboost.



Battery cable

Arrange the battery cable along the walls of the case. This will aviod having to cut the cable. We'll want to neatly tuck the wires before mouting the cover.



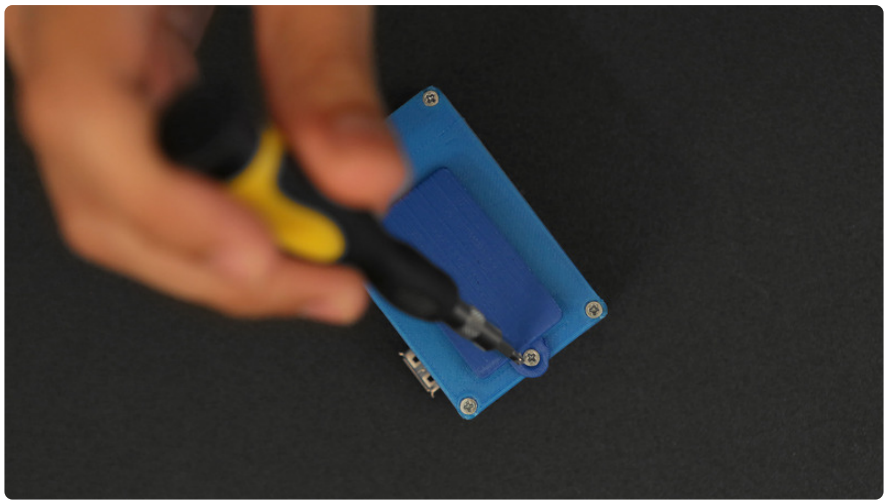
Cover screws

Use #2-56 machine screws to secure the bottom cover to the frame. It helps to pretap the holes with a screwdriver before mounting.

Clip Option

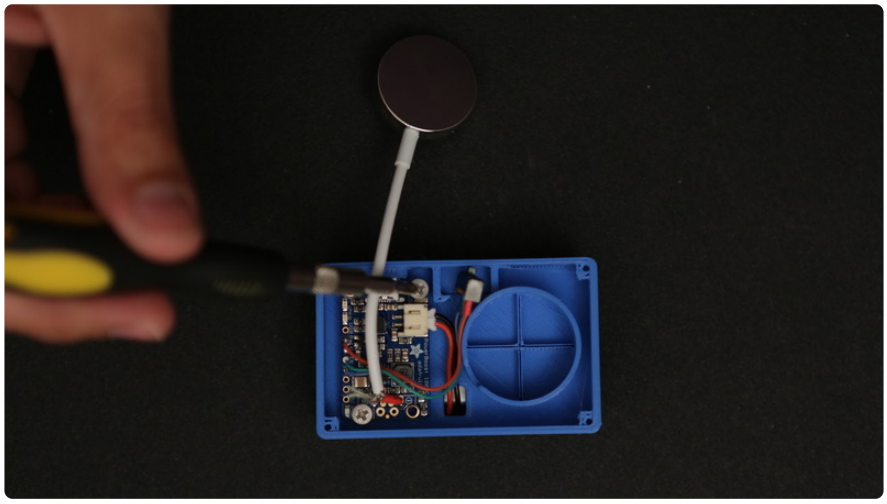
You can choose a version of the design that has slot opening to add the wearable clip. You'll also need to print the frame part that is adjusted for the clip.

Align the clip to the slot on the enclosure. Press the protrusion on the clip into the slot until the screw mount pushes up against the back of the enclosure



Secure Clip

Use a #2-56 screw to attach the clip to the cover part.

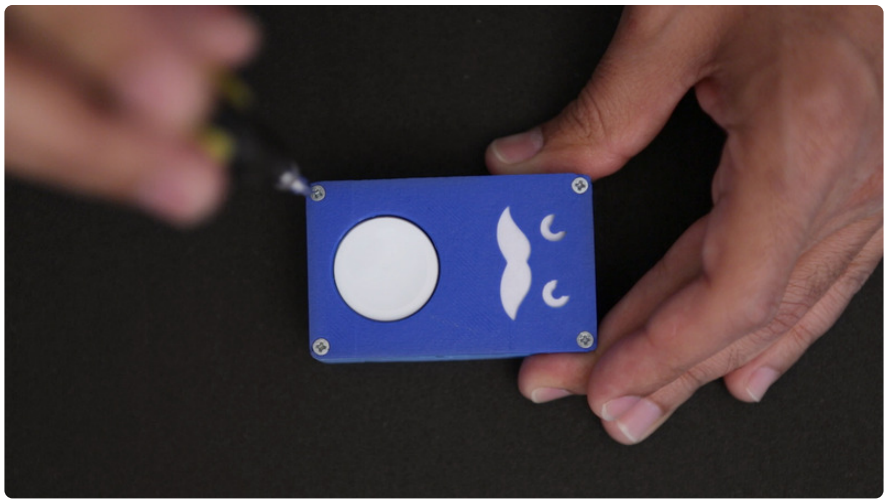


Connect battery

Slightly arrange the JST wire to fit through the tight space. You can use flat pliers to help plug the battery into the Powerboost.

Test circuit

Flip on the slide switch and test the circuit before mouting the face cover.



Mount face cover

Use four more #2-56 screws to mount the face cover. Rememer you can customize the face by editing the source files.

The slim enclosure makes it great traveling and even fits nicely in your pocket.