adafruit learning system

3D Printed Qi Wireless Charging Stand

Created by Ruiz Brothers

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Guide Contents

Overview

Wireless Charging Stand

This project is an exercise in creating a convenient way to hold and charge mobile devices using a Qi wireless module (https://adafru.it/idb) and transmitter. This simple design allows you to quickly change the mounts to customize for your device. The universal Qi transmitter works great with devices that already include a built-in Qi module!

Parts List

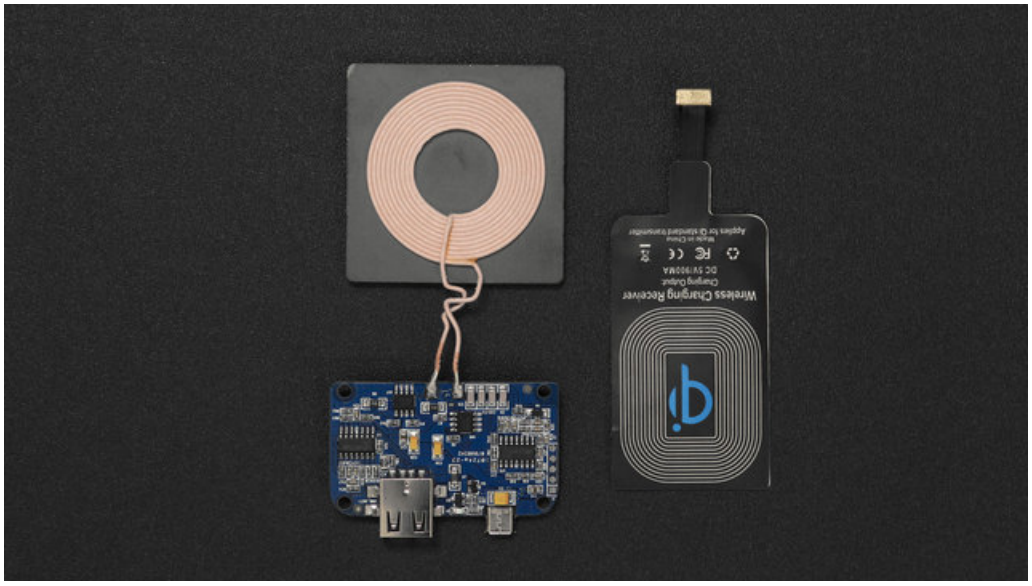
Below are the parts used in this project. If your mobile device does not feature wireless charging, you can grab a compatible Qi charging receiver (https://adafru.it/Cg7).

- Qi Charging Receiver Module (http://adafru.it/2677) - for Lightning Connector
- Universal Qi Wireless Charging Transmitter (http://adafru.it/2162)
- MicroUSB Cable
- 5V Power supply (DC) (http://adafru.it/501)

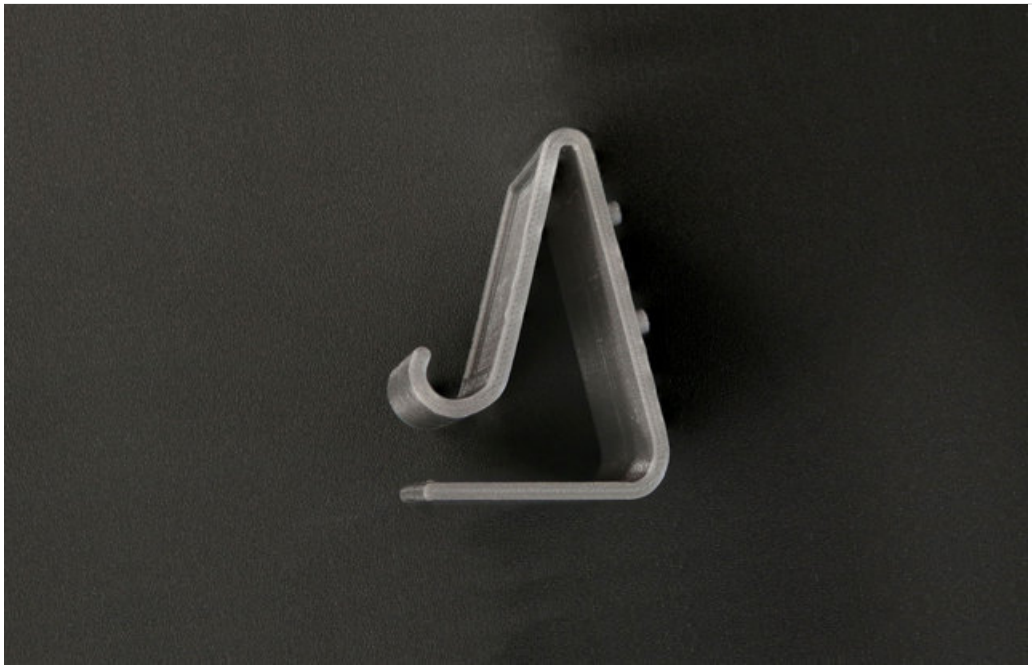
Tools

Here's a list of tools we used to for this project.

- 3D Printer (https://adafru.it/fUw) with 150mm x 150mm minimum build volume
- Filament (https://adafru.it/enm) (1.75mm, 2.85mm, ABS, PLA, etc.)
- Screwdriver (https://adafru.it/diL)
- Soldering Sucker (https://adafru.it/idd)
- Solder Iron (https://adafru.it/ide)
- Solder (https://adafru.it/doU)
- M3 x .5 x 6m phillips flat head machine screws (https://adafru.it/idf)



3D Printing



Printing Settings

Use the settings below for reference. The parts were printed on the Printrbot Simple Metal. We used CURA to slice the parts using default profile.

plusStand.stl NexusStand.stl	230c Extruder No Supports or Raft 2mm Retraction 10% infill 2 Shells 60mm/s print speed 80mm/s travel speed	about about 3 hours to print all parts.

https://adafru.it/idg

https://adafru.it/idg

Customize Design

You can modify the original solids in the CAD files to make a custom project.

Materials

The parts can be printed in different types of filament. The most common filaments like PLA and ABS will do just fine

but you can of course experiement with copperFill, bambooFill, Semiflex, PET and Nylon.

Tolerances

The parts were tested with common printing settings (listed in the table). With a parameter of 2 shells, theres only a few areas where tolerances really matters - the wire cutouts and the mounting holes.

Test fit the parts by inserting the coil part into the recess. Check to see if the cutouts are large enough for the wires to fit through. If the cutouts are too tight, you can loosen it with a filing tool.

The standoffs should fit machine screws listed in the BOM. These can be threaded by fastening in the appropriate sized screw.

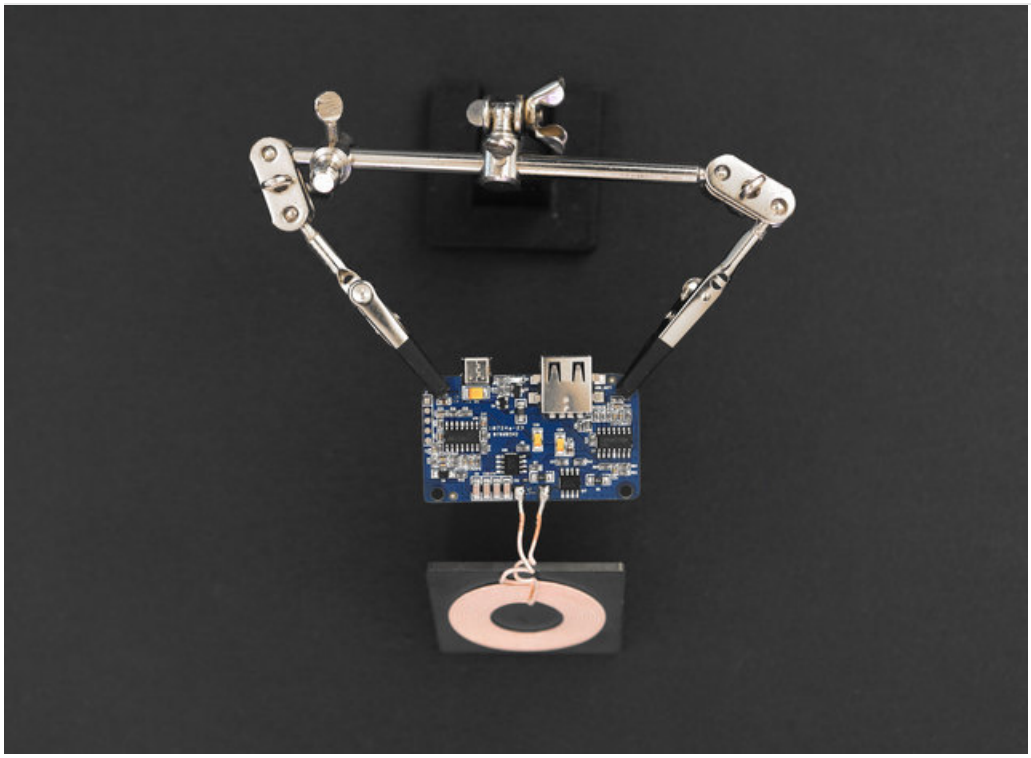
Bed Leveling

Any parts with large surface require a well leveled build plate. If you're using a heated bed, you can minimize warping. Blue tapers tape, build tak, and sticky adhesives can help keep your part flat and adhere to the bed.

Clean up

If there's any string or artifacts left over from retraction and oozing, clean up the part by trimming them off using a pair of flush snips.

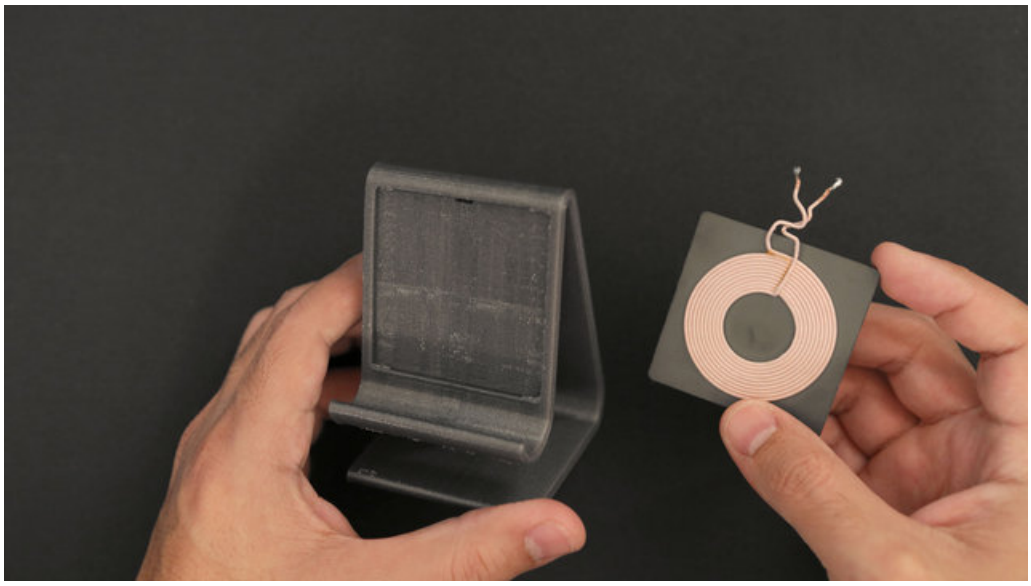
Assembly



Prepare board

To hide the wires that connect the coil to the board, we can unsolder the wires from the coil. Hold the board up using a panavise or a set of helping third hands.

Clean up off any large blots of solder that may be on the pads or wires with a solder sucker.

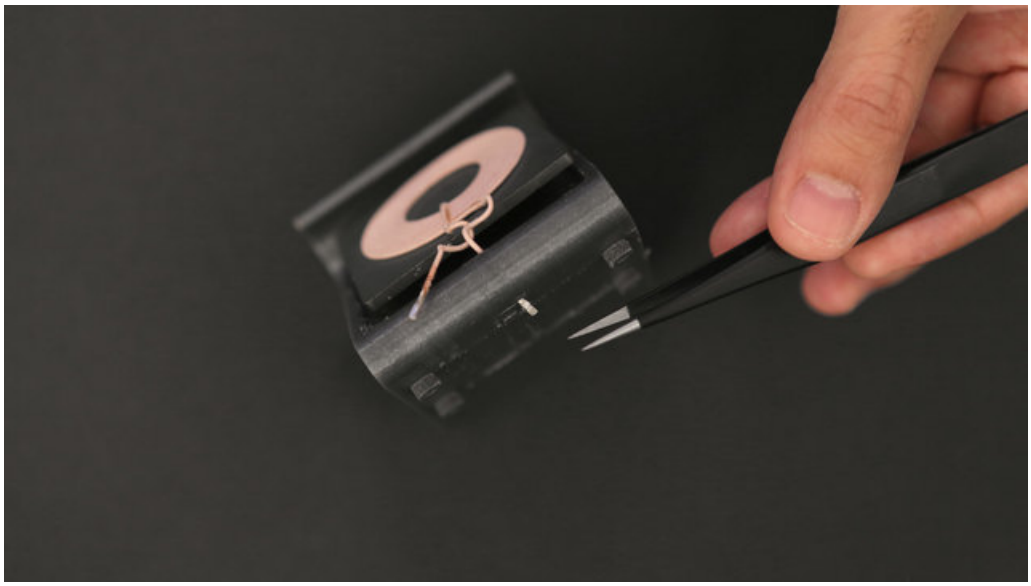


Thread wires through stand

Check that the wire can fit through the cutout. Use a filing tool to widen the cutout. Make sure no blobs of solder are

blocking wires from fitting through.

The metal square should snap fit into the recess on the stand. First, poke the wire tips through the cutout. Use tweezer to pull the rest of the wire through.

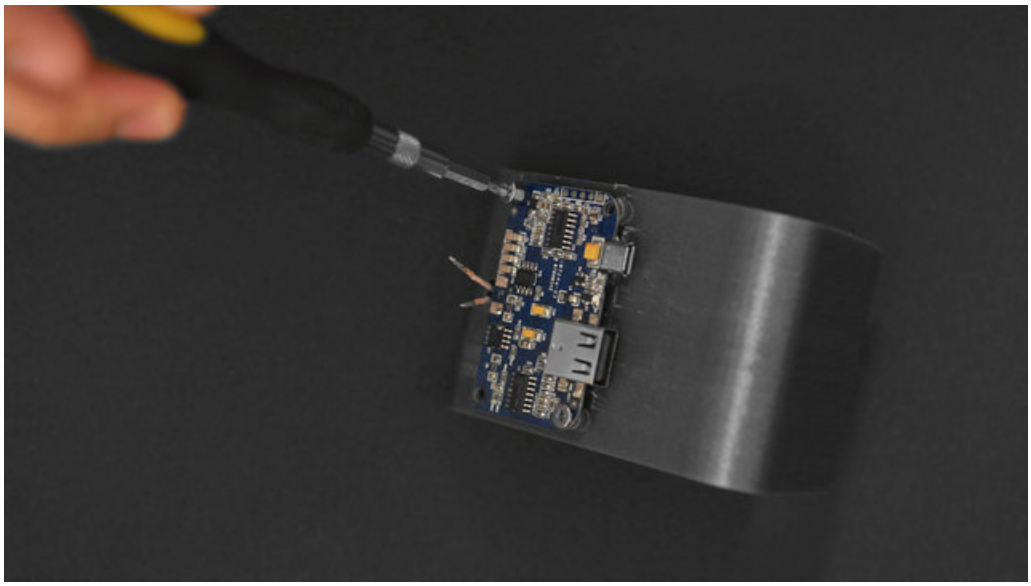


The protective coating is easy to chip off, be careful not to bend wires excessively.

Snap fit coil

The recess on the stand should have enough clearence for the wires to snap fit in to place.

Thread the whole length of the wire through the cutout and then press fit the top of the metal square.

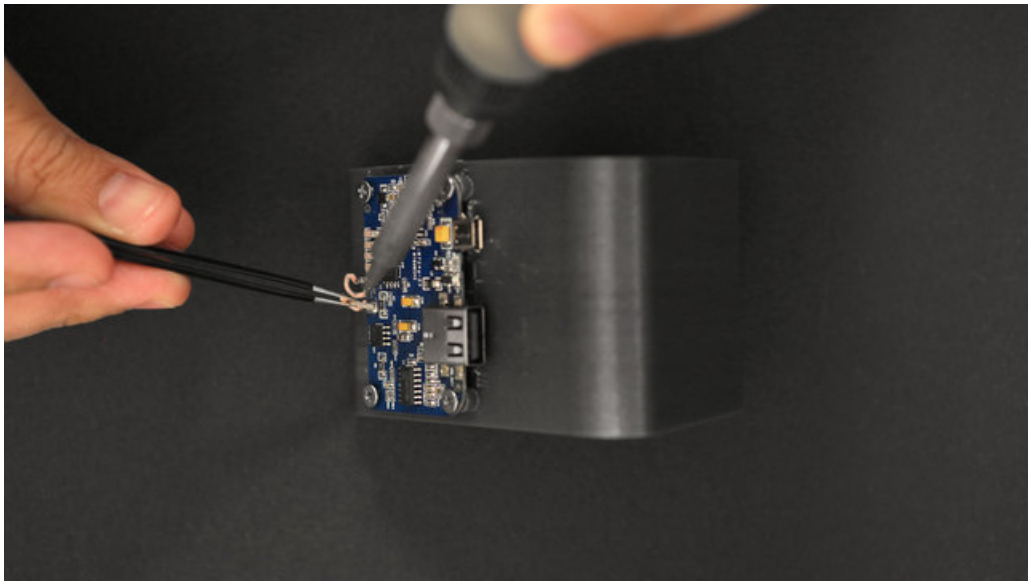


Mount the board

Place the PCB over the standoffs and line up the mounting holes with the standoffs. Position the board so the USB

ports are facing towards the bottom of the stand.

Use M3 x .5 x 6m phillips flat head machine screws (https://adafru.it/idf) to mount the board to the stand offs.



Resolder connections

Take care not to bend each wire as you solder the connects back to the board.

Use tweezers to help keep wires steady while you solder. The wire coming from the inside of the coil connects to the pad closest to the small black chip on the board.

Wirelessly Charge Devices

Connect a microUSB cable to an available port on a computer or 5V power supply to charge devices.

Customize design

Modify the source files to make the stand portable by adding a battery to the bottom of the stand!