

Make A Wireless Charging Stand

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Abstract

As the rapid development of electronics industry, the demand of electronic products using is increase. There is a question that how can we make it easier for us to charge electronic products. Wireless charging technology is way that help us to charge our electronic without wire. For example, to charge smart phones, users only need to put phones on the tray of the charger. For our project design, the microcontroller should be charged by the battery, which is positioned on the bottom of the cart. We will use the wireless charging technology to make the battery charged from the mat below without plug.

Introduction

Wireless charging is also called inductive charging. The principle of wireless charging is using an electromagnetic field to transfer the energy from the charger to the electronic device. Energy is sent from an inductive coupling to another inductive coupling, (see Figure 1) which is in the battery of an electrical device (Wikipedia).

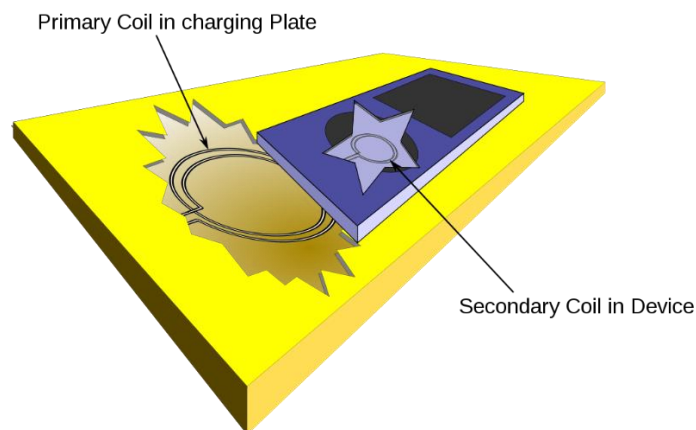


Figure 1(From Wikipedia)

How to make a wireless charging stand

1. Order a DIY wireless charging transmitter and receiver solution module (See Figure 2).



Figure 2

For the transmitter and receiver solution module, we can order from eBay, Amazon or anywhere from internet. Most of them are less than 15dollar. For the module, it includes two copper wire coils superposition to active the wireless charging. Each copper wire coils is connected to the wireless charger transmitter or receiver (See Figure 3 and 4).



Figure 3: Receiver



Figure 4: Transmitter

2. Connect the wireless charging module from wall wart to battery.

For the transmitter, it is connected to the wall wart (See Figure 5). The input voltage, which goes to the transmitter is 13.5V.

For the receiver, it is connected to the battery. The output voltage is 5V, which comes from the receiver. Also, to make red and black wires of the receiver module to connect to the USB interface of the battery. We should cut off a USB wire and make its red and black wires exposed. (See Figure 6)



Figure 5

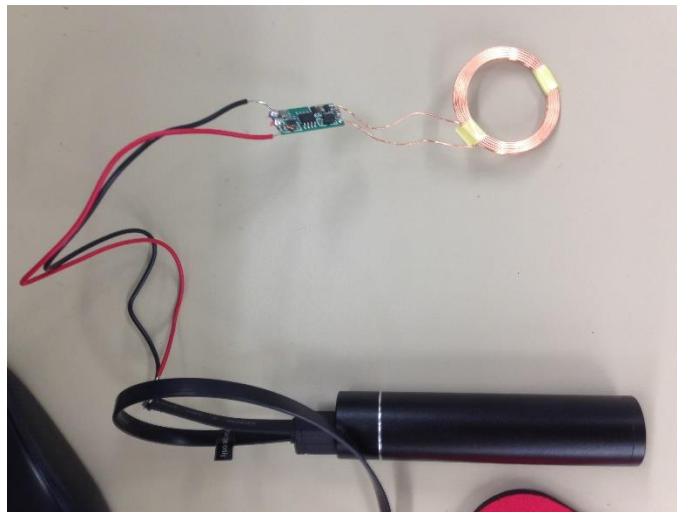


Figure 6

For making the battery to be charged by pugging the wall wart to the socket, we should put one coper wire coil close to the other coil. From Figure 6, we can see that we use the

wireless charging module to make the battery to be charged. Also, the battery charges the microcontroller.

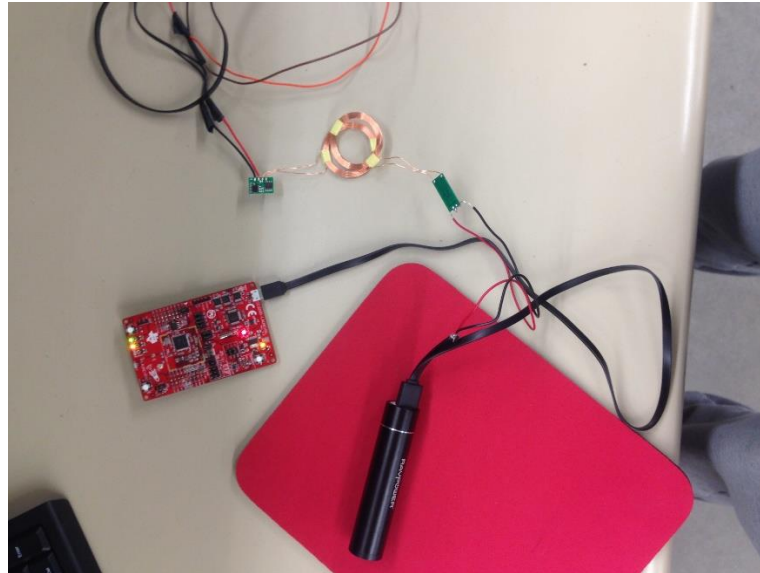


Figure 7

Conclusion

1. Testing voltage is very important, because we should make sure if the output voltage is in the range of device requirement to prevent the device from damaged. For easy to measure the output voltage from the receiver module, we can use the banana-to-grabber wires connect from the receiver module to the Agilent 34401A Digital Multicenter. The right output voltage should be around 5V. (See Figure 8)



Figure 8

2. This wireless charging design also can work, if we put a mouse pad in the middle of these two coils. (See figure 9)

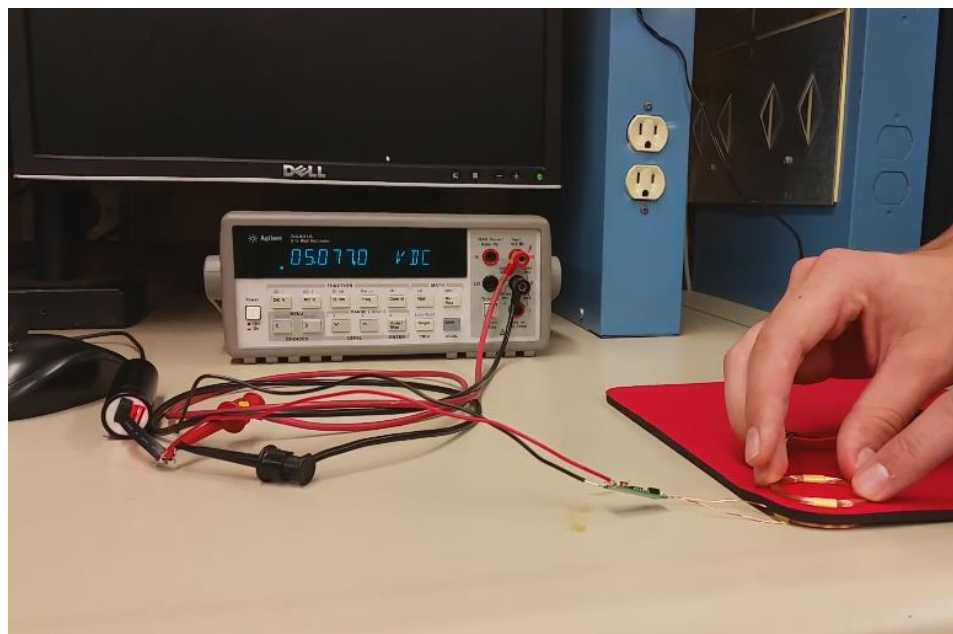


Figure 9

Reference

"Inductive charging." *Wikipedia* n.d. Web. 14 November. 2014

< http://en.wikipedia.org/wiki/Inductive_charging >