

ABSTRACT

Mobile phones, laptops and table pc are all electronic devices which allows the user to be wireless. However, the user still needs to charge the batteries of these wireless devices using wires. Wirelessly power transfer is the process of transferring power wirelessly and one of the method of doing it is RF harvesting. RF harvesting is done by rectifying the signal from an RF energy source to a DC voltage to power the device.

The objective of this project is to charge a lithium ion battery which is the battery of choice for today's electronic devices using a RF energy source.

This is done by having a signal generated from a 440 MHz transmitter which will be rectified and amplified using an 8 stage Villard Voltage Multiplier at the receiver end. The output voltage from the voltage multiplier will be used to charge a lithium ion battery. Simulations were done to examine the characteristics of a voltage multiplier to increase the efficiency of the circuit design.

The circuit was tested via wires using a 2 MHz function generator. The output voltage needs to reach higher than the battery voltage which is 3.7V. The test was able to generate 4V but the current was 4mV so the charging time was 550 hours. Then the circuit was tested wirelessly using the 440 MHz transmitter, the output voltage from the wireless testing was not able to reach the voltage required to charge the battery which was 4V. The voltage multiplier at the final stage could not generate any output because the power received was not high enough.

The circuit was also tested to try to tap into a GSM broadcasting tower where the length of the wire was added. The output of the circuit was 2mV.

Keywords: RF harvesting, Lithium ion battery, battery charging, wireless power transfer, voltage multiplier