

WIRELESS BATTERY CHARGER (RF/ MICROWAVE TO DC CONVERSION)

Abstract:

This paper covers the basis and design of the wireless battery charger. The wireless charger will convert the RF/ microwave signal at 900 MHz frequency into a DC signal, and then store the power into an AAA battery. The project is divided into 3 parts: transmitter, antenna, and charging circuit. A complete discussion of the specifications of the battery charger is provided after data measurements. This paper also includes component list, financial, data results, and other key information.

Running out of batteries, your iPod or mobile is dying with a blinking signal—low battery. And you can do nothing but sigh that you forgot your charger. But how would you feel if the atmosphere around is filled with energy that can charge your device.

That very idea of wireless energy transfer was at the center of a talk called "Wireless Non Radioactive Energy Transfer" believes that wireless energy transfer is possible with in certain environments, such as inside a room or a factory pavilion. The vision for this sort of wireless-energy setup is to place power hubs on the ceiling of each room in the house so that a gadget can be constantly charged from any location in the home.

Key words: Wireless battery, R/f microwave signals, AAA battery, transistors, antenna, Charging circuit, I pod, mobile .

Conclusion:

In conclusion, power loss and efficiency are the major problems for this design project. Our design team has noticed the potential problem whether the converted DC power will be significant enough to charge up the battery. Therefore, the characteristics of the diodes should be mounted directly onto the antenna for minimum power dissipation. In addition to harmonics, the nonlinear diode creates a DC-bias in the resonant circuit which can be extracted without affecting the RF/ microwave characteristics of the resonant circuit. The time varying voltage and current relationship at the physical point of the diode in the cavity determines the loss in the diode and, consequently, the RF/ microwave to DC efficiency.

As the wireless technology is getting popular nowadays, the demand of battery is also increasing. The battery needs to be recharged or changed eventually. Therefore our team is inspired to design the wireless battery charger. This wireless battery charger will eliminate all the hassle with the battery.

As for now, there are no known companies which develop the wireless battery charger. This means that the opportunity is very big. Also, people tend to spend more money for convenience. It gives more reason that this device will have a very good market.

INTRODUCTION

Portable electronic devices are very popular nowadays. As the usage of these portable electronic devices is increasing, the demands for longer battery life are also increasing. These batteries need to be recharged or replaced periodically. It is a hassle to charge or change the battery after a while, especially when there is no power outlet around. Therefore, our team is inspired to design a wireless battery charger. This wireless battery charger is expected to eliminate all the hassles with today's battery technology.

As for now, there are no known companies that are developing the wireless battery charger. This means that there might be a good opportunity in the market for this type of product. Moreover, people tend to spend more money for convenience that meets the price. The outlook of this device is supported by the above predictions.

It would be convenient not having to worry about charging or changing the batteries and still have a working device. The advantage of this device is that it can wirelessly charge up the batteries which can save time and money in a long run for the general public. Base on this concept, the design team has come up with a new way to charge the batteries wirelessly. The project is to make a prototype device that converts microwave signals to DC power. Once the prototype has been proved to be working, it is possible to implement this prototype into other applications such as in television remote control, fire alarm, clock, and places that are far to reach to change battery.

DESIGN OVERVIEW

This wireless battery charger is designed to operate at 900 MHz. In this project, a power transmitter acts as the power source. It will transmit power to the receiver side. And then, the rectifier circuit in the receiver will convert the RF/ microwave signal into DC signal. After the DC signal is produced, the charging circuit will store the power into the battery. Here is the block diagram of the overall design.

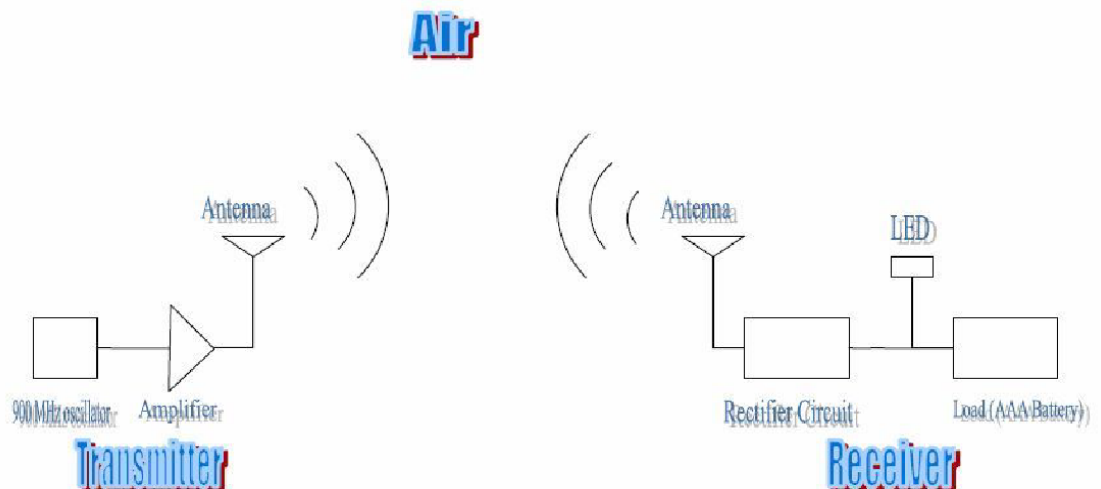


Figure 1: The overall wireless battery charger design