

Charging Battery without Using Wires

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Abstract – Battery life of mobile phone is always been a problem for producers. People are complaining about their mobile's battery life, that they don't have long battery life and they have to charge their phone several times. Portable electronic devices are very popular currently. People are demanding more and more for the longer battery life. These batteries need to be recharged or replaced from time to time. It is a stress to charge or change the battery after a while, especially when there is no power channel around. This wireless battery charger is expected to eliminate all the difficulties with today's battery technology. The advantage of this system is that mobile phones can be charged without using the wires and can save time and money. 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.

Index Terms – Rectenna, charger, microwave, sensors, electromagnet, antenna.

1. INTRODUCTION

Microwaves are radio waves (a form of electromagnetic radiation) with wavelengths extending from as long as one meter to as short as one millimeter. The prefix "micro-" in "microwave" is not meant to suggest a wavelength in the micrometer range. It indicates that microwaves are shorter having the shortest wavelengths. Microwave technology is extensively used for point-to-point telecommunications (i.e., non-broadcast uses). Microwaves are especially suitable for this use since they are more easily dedicated into thin rays than radio waves, allowing frequency to recycle; their comparatively higher frequencies allow broad bandwidth and high data transmission rates, and antenna sizes are smaller at lower frequencies because antenna size is inversely proportional to transmitted frequency.

2. RELATED WORK

Due to the increasing demand of the charging and batteries of mobile phones researchers have done some study and field work.

- Electromagnetic Field :-
- Microwave region

2.1 Electromagnetic Field :-

Electromagnetic spectrum is a range of all possible frequencies of electromagnetic radiation. When white light is excelled

through a prism it is separated out into all colors this is called a vital spectrum light. Consist of a very small particles are called as photons is a bundle of energy. Light travels at the speed of 3,00,000 km/hr and bounces back at our eye sight.

2.2 Microwave region

Microwave has the wave length range of 1 mm to 1 meter and the frequency is 3000 MHZ to 300 GHZ. Microwaves have wavelength that can be measured in centimeters microwaves are good for transmitting information from one place to another place because microwave energy can enter cloud, light rain and snow, clouds and smoke. Microwave radiation is still related with energy level that is usually considered harmless except for people with pace makers.

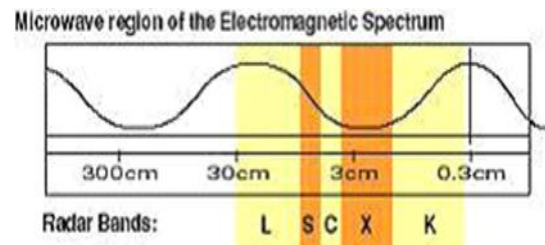


Fig: microwave region of the electromagnetic spectrum.

3. PORPOSED MODELLING

Architecture of system :

The system designing of wireless charging of mobile phone using microwaves mainly consist of four parts as transmitter design, receiver design, the Process of Rectification, sensor Circuitry.

3.1 Transmitter Design

A magnetron is a diode vacuum tube with filament in which filament act as the cathode shown in fig 3. Magnetron is actually behaved as an oscillator to produce microwaves. It can be done by assigning magnet between the resonating chambers which is the center of the oscillator. These resonating chambers are named as anode in the magnetron. When electrons passes through cathode and go direct towards the Anode, it passes through the magnetic field. It starts circulating in the resonating cavity and start producing waves according to its frequency and generate RF signal by this flow outside of the chamber.

3.2 Receiver Design

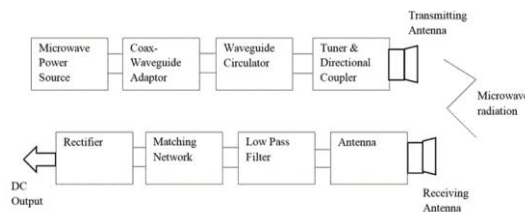
The basic addition to the mobile phone is going to be type of antenna that is used to convert microwave energy into DC electricity. Actually the size of rectenna can be reduced by using the Nano technology. We also have to add a sensor at receiver side. As we know we are going to charge the phone while a person is talking. So here sensor is used to detect whether the phone is using microwaves or not.

3.3 The Process of Renovation

Microwave can easily travel through the media but it also loses some energy. So our key objective is to correct the circuit and to correct the waves at the low cost. And also we have to do the detection more sensitive. As we know that connection rectification is more efficient than the single diode, we use this for the better performance. We use the shorty diode to get the better impedance.

3.4 Sensor Circuitry

The sensor circuitry is any message signal. This is very important as the phone has to be charged as long as the user is talking. . Thus a simple frequency to voltage converter would serve our purpose. And this converter would act as switches to trigger the retina circuit so on. So when our phone is receiving microwave signal it make the rectenna circuit on and charge the battery.



4. RESULTS AND DISCUSSIONS

The result and discussions made on above topic is about range of frequencies of microwaves as shown in the below table.

Designation	Frequency range
L Band	1 to 2 GHz
S Band	2 to 4 GHz
C Band	4 to 8 GHz
X Band	8 to 12 GHz
Ku Band	12 to 18 GHz
K Band	18 to 26 GHz
Ka Band	26 to 40 GHz
Q Band	30 to 50 GHz
U Band	40 to 60 GHz

Table 1 Resultant frequencies.

5. CONCLUSION

This device or system can make the people's effort less and can save the important time. As the mobile has become very necessary device now a days its battery is also an important factor. To save battery portably without using switches and wires this device proves as a best remedy on this disadvantage.

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