UNIVERSAL WIRELESS CHARGER

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Abstract - *In this current information age, mobile phones are the basic needs of every person. It has become an indispensible basic part of our life. Recharging of the battery in mobile phone seems to be complicated task, since it is wired. In this paper we would like to propose the concept of charging the mobile phone using wireless communication. Wireless charging is set to be the major theme at this generation. It is the way of charging a device using microwave signals, which can eliminate the use of cables; power adapter etc. Charging is done automatically, when call connected in your mobile phone and as we talk in the mobile phone. This is done by the use of microwaves. Microwave Power Transfer(MPT) system works by converting power to microwave through a microwave generator and then transmitting the power through free space where it is received and converting back to power by a special device called a Rectenna.*

Key Words: Mobile phone, recharge, rectenna, wireless charging, microwave power transfer.

1. INTRODUCTION

Wireless transfer has been employed since long time in telecommunications. Radio waves, cellular transmissions and Internet WiFi are only a few examples of wireless transmission[1]. Recently, there's been a growing interest towards the experimentation of a deeply challenging idea for wireless applications: supplying electronic devices without cords. The development, application and spread of this new concept could make consumers life enormously easier, since wired chargers are often perceived as annoying and bulky objects. By magnetic induction, the power transmitter is represented by a grid -connected magnetic pad while the power receiver is integrated inside the load device. Users should only place their portable device upon the magnetic pad. Magnetic coupling [2]allows several devices to be simultaneously charged. In order to spread wireless battery charging, compatibility between chargers and devices is a key issue to deal with. Recently the Wireless Power Consortium (WPC) has built an international standard, also known as "Qi -standard", which aims at promoting the complete interoperability between power charging stations and rechargeable devices.

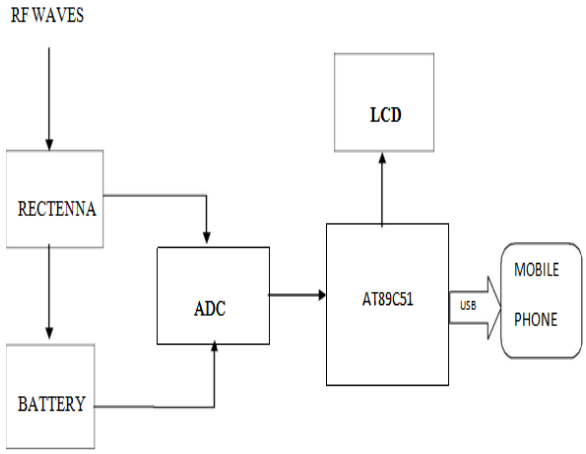

Fig. 1 Block diagram of wireless charger.

2. DESCRIPTION

2.1. RECTANNA

2.1.1 WHY TO USE RECTENNA?

A rectenna[3,4] is a rectifying antenna that is used to convert electromagnetic energy into direct current electricity. They are used in wireless power transmission systems that transmit power by radio waves. In this, 2.45GHZ rectenna (slotted wave guided antenna) is used. This type of antenna has different wavelength for

transmission and receiving. The efficiency of the antenna is high.

2.1.2 STRUCTURE OF RECTENNA

A straight forward rectenna component comprises of a dipole reception apparatus with a diode joined over the dipole components[5]. The diode redresses the AC current incited in the radio wire by the microwaves, to transform DC power, which controls a heap connected across the diode. Schottky diodes are normally utilized on the grounds that they have the most minimal voltage drop and most noteworthy rate and along these lines have the least power losses because of conduction and exchanging. The biggest current utilization of rectennas is in RFID labels, nearness cards and contactless keen cards, which hold an incorporated circuit (IC) which is controlled by a little rectenna component

2.1.3 SCHOTTKY HINDRANCE DIODE

A Schottky hindrance diode is not the same as a typical P/N silicon diode. The normal diode is framed by joining a P sort semiconductor with a N sort semiconductor. A Schottky obstruction diode is shaped by uniting a metal with a semiconductor. The material of the semiconductor typically is a semiconductor of n- sort (periodically p-sort), and the material of metal by and large is browsed diverse metals, for example, molybdenum, chromium, platinum and tungsten. Sputtering method interfaces the metal and the semiconductor. Different Schottky boundary diodes: Small indicator RF gadgets (left), medium and high power Schottky amending diodes (center and right). At the point when current courses through a diode there is a little voltage drop over the diode terminals. A typical silicon diode has a voltage drop between 0.6–1.7 volts, while a Schottky diode voltage drop is between roughly 0.15–0.45 volts[6,7]. This easier voltage drop can give higher exchanging speed and better framework productivity.

2.1.4 ANTENNA

A antenna which is used as transceiver i.e., transmits and receives the signals. Along with that it has an schottky diode is converts the RF wave into DC power. This diode works at 0.35V[8,9]. And it has lowest voltage drop and highest speed and therefore have the lowest power losses due to conduction and switching.

2.1.5 IMPEDANCE MATCHING AND FILTERING

Impedance matching circuit[10,13] is used to transfer maximum power and it has low power losses . The filter used in this circuit is low pass filter which aborbs the high frequencies and allows low frequencies to pass.

Zload=z*source

2.1.6 RECTIFICATION:

A rectifier is a electrical device composed of one or more diodes that converts AC to DC and vice-versa. A diode is a one way valve that allows an electric current to flow in only one direction. This process is called rectification. A rectenna is a redressing reception apparatus, a receiving wire used to change over microwaves into DC power. Being that a reception apparatus alludes to any kind of gadget that changes over electromagnetic waves into power or the other way around, a rectenna is basically a microwave receiving wire, rather than the pervasive radio and TV radio wires. Backwards rectennas, which change over power into microwave shafts. A rectenna embodies a lattice of dipoles and diodes for engrossing microwave vitality from a transmitter and changing over it into electric force. Its components are normally organized in a cross section example, providing for it a different appearance from generally reception apparatuses. A basic rectenna might be developed from a Schottky diode put between receiving wire dipoles . The diode corrects the current instigated in the radio wire by the microwaves. Rectenna are exceptionally effective at changing over microwave vitality to power. In research center situations, efficiencies over 90% have been seen with normality. In future rectennas will be utilized to create substantial-scale power from microwave bars conveyed from circling SPS satellites.

2.2 BATTERY

Batteries are classified into two broad categories[5,11], each type with advantages and disadvantages. Primary batteries irreversible (within limits of practically) transform chemical energy to electrical energy. When the initial supply of reactants is exhausted, energy cannot be readily restored to the battery by electrical means.

Secondary batteries can be recharged: they can have their chemical reactions reversed by supplying electrical energy to the cell, restoring their original composition. Some types of primary batteries used for example for telegraph circuits ,were restored to

operation by replacing the components of the battery consumed by the chemical reaction. Secondary batteries are not indefinitely rechargeable due to dissipation of the active materials, loss of electrolyte and internal corrosion

2.3 ADC

An analog to digital converter is a device that converts a physical quantity to digital number that represents the quantity amplitude[12]. It receives the signals from rectenna and battery and it can take only the particular voltage from battery.ADC 0808 is a Successive approximation type with 8 channels i.e. it can directly access 8 single ended analog signals.

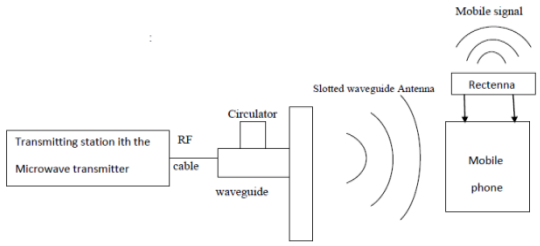

Fig.2 Transmitter circuit

2.4 ATMEL

The AT89c51 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory pro-grammer. By combining a

versatile 8-bit CPU with in-system programmable Flash on a monolithic chip, the Atmel AT89c51is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications.

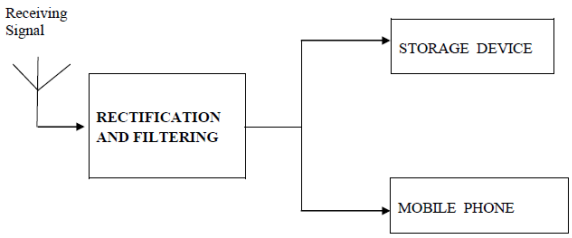

Fig. 3 Receiver circuit

The basic addition to the mobile phone is going to be the rectenna. Already the rectenna details are given above. It rectifies received microwaves into DC current a rectenna comprises of a mesh of dipoles and diodes for absorbing microwave energy[14] from a transmitter and converting it into electric power. Its elements are usually arranged in a mesh pattern, giving it a distinct appearance from most antennae. Fig.3 shows the received signal rectified to DC voltage , filtered and the voltage is stored in the storage device and the voltage is step downed to the requirement of the mobile phone necessity.

3. ADVANTAGES OF WIRELESS MOBILE CHARGER

Use of separate chargers is eliminated. Electricity is saved. The phone can be charged anywhere anytime. Lower risk of electrical shock because there are no exposed conductors

- Easier than plugging into a power cable.
- Corrosion does not occur when exposed to atmosphere
- Safe for medical implants for embedded medical devices allows recharging through skin rather than having wires penetrate through skin
- It does not require wire for charging.

4. CONCLUSION

Accordingly this paper effectively exhibits a novel technique for utilizing the force of the microwave to charge the cell telephones without the utilization of wired chargers. In this manner this system gives extraordinary point of interest to the cell telephone clients to convey their telephones anyplace regardless of the fact that the spot is without offices for charging. A

novel utilization of the rectenna and a sensor in a cell telephone could give another measurement in the disclosure of cellular telephone. In this present day era where we favor the most productive devices to serve our reasons, not even a marginally veered off gadget is satisfactory. The exceedingly fulfilled wireless sensor made by the precisely topnotch makers in the business befit our needs the most ideal way and turn out to be very powerful apparatuses to battle security rupture.

5. REFERENCE

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