# WIRELESS SOLAR POWER BANK

[1] B.SURESH RAM, [2]P.MAHESH BABU, [3]K.RAVI KIRAN,[4]M.ROHITH REDDY,[5]K.BHARATH CHANDRA

[1]Assoc.professor, ECE Department, CMR College of Engineering & Technology

[2]Asst.professor, MECH Department, CMR College of Engineering & Technology

[3]Asst, professor, ECE Department, CMR College of Engineering & Technology

[4-5]B-TECH, Dept. of EEE, CMR COLLEGE OF ENGINEERING & TECHNOLOGY

**Abstract**

Automation has created a bigger hype in the electronics. The major reason for this type is automation provides greater advantages like accuracy, energy conversation, reliability and more over the automated systems do not require any human attention. Any one of the requirements stated above demands for the design of an automated device. Wireless energy transfer or wireless power is the transmission of electrical energy from a power source to an electrical load without a conductive physical connection. Wireless transmission is useful in cases where interconnecting wires are inconvenient, hazardous, or impossible. The problem of wireless power transmission differs from that of wireless telecommunications, such as radio. In the latter, the proportion of energy received becomes critical only if it is too low for the signal to be distinguished from the background noise. With wireless power, efficiency is the more significant parameter. A large part of the energy sent out by the generating plant must arrive at the receiver or receivers to make the system economical. The most common form of wireless power transmission is carried out using direct induction followed by resonant magnetic induction. The project consists of two self resonating copper coils of same resonating frequency of about 100KHZ. One copper wire is connected to the power source (transmitter), while the other copper wire is connected to the device (Receiver).The electric power from the power source causes the copper coil connected to it to start oscillating at a particular (KHz) frequency. Subsequently, the space around the copper coil gets filled with nonmagnetic radiations. This generated magnetic field further transfers the power to the other copper coil connected to the receiver. Since this coil is also of the same frequency, it starts oscillating at the same frequency as the first coil. This is known as 'coupled resonance' and is the principle of Tesla. This project results in a device where the electricity is transmitted wirelessly through copper coils for a distance range of about 10 cm. The system uses solar energy and pulse generator of 100 KHZ at the transmitter circuit. Therefore, the current flows from the coil on the transmitter side to the receiver side coil wirelessly connected with rectifier and regulator.

In this project we are using solar panel, Mosfet driver circuit, a pair of copper coils, rectifier, filter and a load.

## 1. INTRODUCTION

There are many forms of renewable energy sources on earth. Solar energy is one of this forms. Capturing sunlight and turning them into electricity for daily usage is a very good way to minimize expenditure and pollution. Solar energy has proven to be a clean and safe form of energy for our daily living and is made available naturally around most parts of world. Solar powered battery chargers are fast gaining popularity as they have been proven to be handy in many situations especially in the outdoors. Furthermore, this battery charger is quite portable and user friendly too as it is simple to handle. These attractive features are further enhanced by the fact that this type of battery charger is cheap to construct and has many added advantages.

The solar powered battery charger is environmentally safe too as it purely uses renewable energy and reduces chemical waste because it allows alkaline batteries to be reused for a certain amount of times before being disposed. This type of battery charger also has a longer life cycle as it requires minimal maintenance and can directly convert energy from the sun to produce electricity

## 2. RELATED WORK

Electricity generation using solar cells has been of particular interest for a long time and is fast gaining popularity among countries that lie across the equator.To understand how solar energy can be fully utilized, we first need to understand and useful way by utilizing an old, well-known physical phenomenon, the photovoltaic effect, whereby some of the sun's light is transformed directly into electricity. A photovoltaic solar cell is essentially a semiconductor which can generate as electric potential when ionized by radiation. In other words, a solar cell can convert the radiant energy of sunlight directly into electricity with high reliability and long life cycle.

There are many benefits to be gained from using solar energy as a power source. Photovoltaic technology has been proven to be a new and exciting energy source as its conversion method is both novel and unique. Photovoltaic power systems do not contain any moving parts which may wear out, do not contain any fluids or gasses which could leak and can operate at moderate temperatures. Furthermore, no fuel is needed to activate this system, making it a non-polluting and quick responding as well as almost maintenance free power source. Solar energy does not give rise for environmental energy sources which contribute dangerous chemical emissions.

## 3. IMPLEMENTATION

The usage of renewable sources of energy overcomes the exhaustible usage of power and charge. It reduces the environmental pollution and is much user friendly. During disasters and power outrages it can be used with an ease.

The main objective of the "**WIRELESS SOLAR POWER BANK"** is to offset personal electricity consumption, protect environment and ensure a backup power source. This is an energy storage device that obtains energy from the sun and uses it to charge or power various electronic gadgets.

**Solar panal** A solar cell or photovoltaic cell is a device that converts solar energy into electricity by the photovoltaic effect. Sometimes the term solar cell is reserved for devices intended specifically to capture energy from sunlight, while the term photovoltaic cell is used when the source is unspecified. An array of solar panels converts solar energy into a usable amount of direct current (DC) electricity.

**Rectifiers**

Rectifier is circuit which converts the ac in to dc. We have two types of rectifier.

1. Full wave rectifier
2. Half wave rectifier

Full wave rectifier again classified as follows

1. Bridge rectifier
2. Centre tapped full wave rectifier.

MOSEFT The metal–oxide–semiconductor field-effect transistor (MOSFET, MOS-FET, or MOS FET) is a transistor used for amplifying or switching electronic signals. Although the MOSFET is a four-terminal device with source (S), gate (G), drain (D), and body (B) terminals, the body (or substrate) of the MOSFET often is connected to the source terminal, making it a three-terminal device like other field-effect transistors.

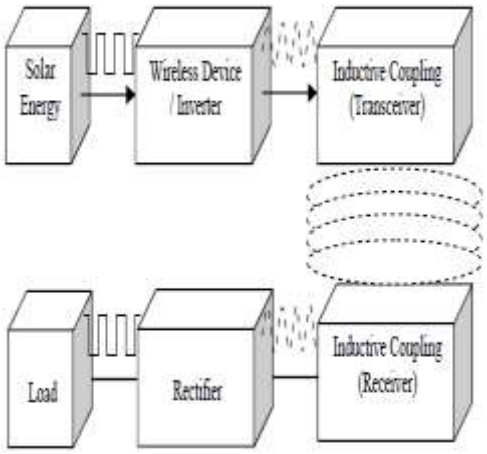
Copper coils An electromagnetic coil (or simply a "coil") is formed when a conductor (usually an insulated solid copper wire) is wound around a core or form to create an inductor or electromagnet. One loop of wire is usually referred to as a turn, and a coil consists of one or more turns.

A wireless power transmitter emits a magnetic field with the help of the coil with the same frequency emitted by wireless power receiver. In order for optimal impedance, cable reels used on both sides.

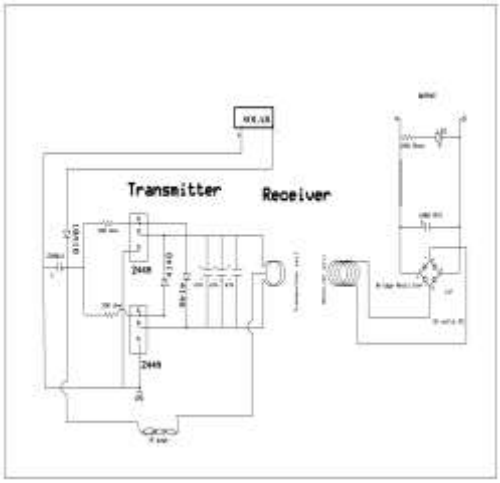
**Led inductor** LED's are used as indicator lamps in many devices, and are increasingly used for lighting. Introduced as a practical electronic component LED's emitted low-intensity red light, but modern versions are available across the visible, ultraviolet and infrared wavelengths, with very high brightness.

Methodology

This project results in a device where the electricity is transmitted wirelessly through copper coils for a distance range of about 10 cm. The system uses solar energy and pulse generator of 100 KHZ at the transmitter circuit. Therefore, the current flows from the coil on the transmitter side to the receiver side coil wirelessly connected with rectifier which converts AC voltage to DC voltage and these DC voltage is given to the load (LED).



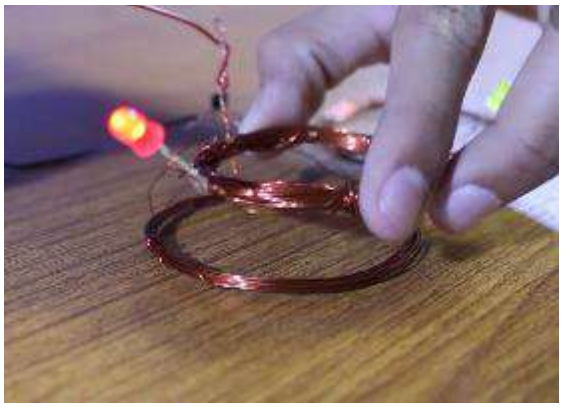

Block Diagram



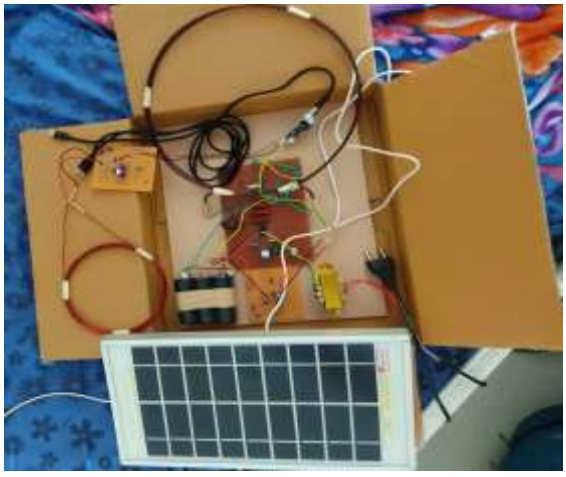

Schematic Diagram

## 4. EXPERIMENTAL RESULTS

The project **"WIRELESS POWER TRANSMISSION"** results in a device where the electricity is transmitted wirelessly through copper coils for a distance range of about 10 cm. The system uses solar energy and pulse generator of 100 KHZ at the transmitter circuit. Therefore, the current flows from the coil on the transmitter side to the receiver side coil wirelessly connected with rectifier and LOAD.



Copper Coil



Prototype

## 5. CONCLUSION

Integrating features of all the hardware components used have been developed in it. Presence of every module has been

reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced ICs with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested. Our project Wireless Power Transmission is mainly intended to Wireless energy transfer or wireless power is the transmission of electrical energy from a power source to an electrical load without a conductive physical connection. Wireless transmission is useful in cases where interconnecting wires are inconvenient, hazardous, or impossible. This project results in a device where the electricity is transmitted wirelessly through copper coils for a distance range of about 5 cm. The system uses pulse generator of 100 KHZ at the transmitter circuit. Therefore, the current flows from the coil on the transmitter side to the receiver side coil wirelessly connected with rectifier and regulator. In this project we are using transformer, RPS, Pulse Generator, a pair of copper coils, rectifier, filter and a load This system is incapable of giving feed back of the devices being operated. This can be eliminated by using Zigbee technology, which increases the operating distances also gives the feedback through LED indicators. GSM module also can be used to get the feedback of the electrical devices by sending the SMS in a particular specified format.

## 6. REFERENCE

[1] Sourabh Pawade, Tushar Nimje, Dipti Diwase. Goodbye Wires: Approach to Wireless Power
Transmission. IJETAE. 2012; 2(4).

[2] Wenzhen Fu, Bo Zhang, Dongyuan Qiu. Study on Frequency-tracking Wireless Power Transfer
System by Resonant Coupling. College of Electric Engineering South China University of Technology
Guangzhou, P. R. China. 510641.

[3] M. Fareq, M. Fitra. Solar Wireless Power Transfer Using Inductive Coupling for Mobile Phone
Charger. IEEE conference Publications. 2014: 473-476. Doi: 10.1109 /PEOCO.

[4] T.S. Hasarmani. Wireless Power Transmission for Solar Power Satellite. Department of Electrical
Engineering. Bharati Vidyapeeth Universitys College of Engineering. 2011.

[5] Rosa, Edward B. The Self and Mutual Inductances of Linear Conductors. Bulletin of the Bureau of Standards. 1908; 4(2): 301344. doi:10.6028/bulletin.