

# Prototype Design of Space Based Wireless Solar Power Transmitting Satellite for Ground Based Power Station

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**Abstract** - Solar power satellite is a proposed satellite built in earth and it use in the transmission line. It consists of large scale, clean and stable electric power source. Solar energy is converted into electromagnetic waves by using solar power satellite. The receiving antenna placed on earth will receive the microwaves from the transmitter converted into electricity. Wireless Power Transmission system is more essential in solar power satellite. The microwave been present in WPT will collects solar energy and converts them into electrical energy. This method is advanced one then conversional method. Wireless Power Transmission is most convenient technology for partial application in terms of power value and efficiency.

**Keywords:** Solar energy, Wireless Power Transmission (WPT), Solar Power Satellites (SPS), Transmitter, Receiver.

## I. INTRODUCTION

The Wireless power supply it is a devices which supply electric power (in the air medium) to apparatus without using power cables or it is used in practical source. The wireless electric power transmission line is realized and it can be sub divided into three types.

- Electromagnetic induction type
- Radio reception type
- Resonance type

Electromagnetic induction is a non-contact power transmission and the electric current used to one of adjacent coils is induces an electromotive force then other coil with is used magnetic flux as a medium.

WPT is the break out technology that provides solar energy and it's used for communication devices without using the power units. The world around films like R&D then the lot of attention in scientists technology has been attracting with the remarkable progress. It will be used recently then this

mobile application used like PDAs, Laptops, Mobile phones, Tab and other handheld gadgets then the recharging purpose using the battery. It is known that electromagnetic energy is associated with the propagation of electromagnetic waves.

The waves like electromagnetic it is used in WPT. The major difference between communication systems and the WPT the efficiency is more. Maxwell's that derives that the field of electromagnetic and its power is used to diffused the signal for all directions. Though we transmit energy to communicated devices and it diffused at all directions. Though the receiving power is enough for a transmission of information, then the efficiency is more to transmitter and receiver is quiet low.

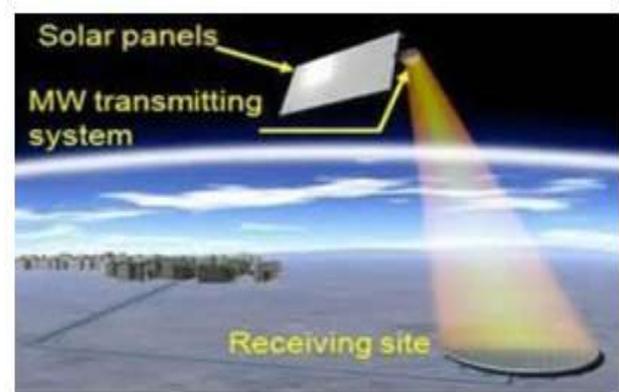


Figure 1: Point-to-point power transmission

## II.METHODS OF WIRELESS TRANSMISSION

### a) Electromagnetic Transmission

The Electromagnetic waves can be used for transmit the power without using wires. It is converting electricity into energy of the light like a laser beam and then firing beam at a receiving target, such the PV cell on a small aircraft and the single target of the beamed power. This is known as “power beaming”.

**b) Evanescent Wave Coupling**

Researchers at MIT believe then they have discovered a new way to wireless transmit power using the non-radioactive electromagnetic energy to resonant tunneling. Since then the electromagnetic waves would tunnel, then it could not be mixed through the air to the absorbed or wasted, and would not be disrupted electronic devices then the range up to 5 meters of range.

**c) Electrodynamics**

WPT is the main problem to be associated with non-resonant inductive coupling. It depends on the length and then the efficiency will be maintained in the transmission line. And it is used for transmitting and receiving source then frequency will be maintained at 50Hz. The current source will be AC or DC and the pulse width modulation is used for variable cycles. The size will maintain at large distance will measure at few times.

**d) Radio and Microwave**

The distances will be larger and the waves of transmission line are used for directly. The wavelength is shorter than the radiation on electromagnetic range is in micro. Energy of Microwave is converted into electricity and maintaining the efficiency at 95%. This is the proposed scheme of transmission line.

**e) Electrostatic Induction**

The frequency will be higher than current will be varying and the voltage difference between the two node plates. The capacitive will be maintained in electric field over the ground of plane.

**III. SOLAR POWER GENERATING SATELLITES**

The generating of PV power by using of satellite. When the power will be generated by the waves of sun and it convert into the electricity then the frequency will be changed in morning and evening. Receiving antenna will be reconverted the electricity. The power will be distributed to the Earth.

This system provides the design of WPT with is assigned in the terms of power range. The super capacitor bank provides a more stable power without any other fluctuations. Here we use VHF electromagnetic waves which are safe at the larger power levels and environment friendly.

**IV. USE OF MPT IN SPS**

When using this scheme the geo synchronous is located in space in the earth. 99% of light waves will be collected in large space of the antenna array will collect the wave and its in micro. It maintain in good condition and it transmitting the beam of the ground. In transmission line will deal with some spectrum regulator. It only used for sending and receiving antenna space by the RTA.

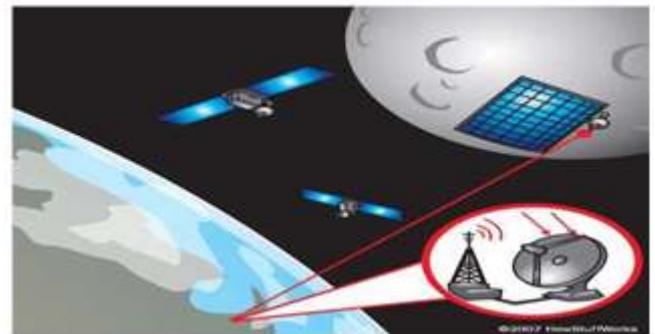


Figure 2: Solar power satellite

**V. BLOCK DIAGRAM**

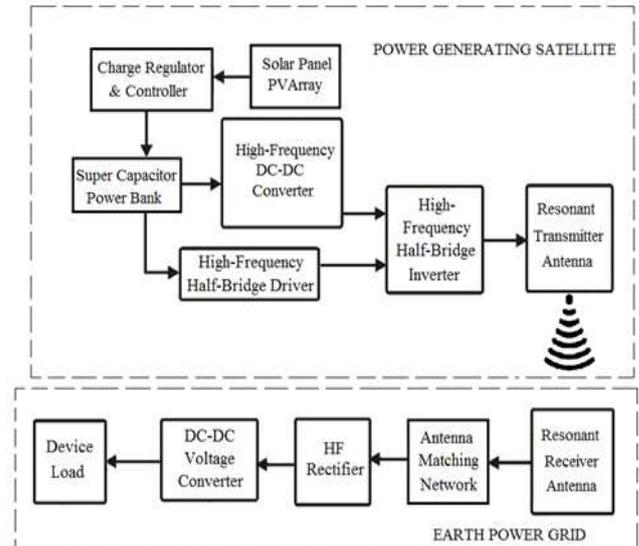


Figure 3: Block diagram of proposed system

**a) Solar Panel PV Array**

Solar PV arrays collect light radiation from a space and convert them into the DC electrical output.

**b) Charge Regulator & Controller**

Charge regulator controls the charging current and voltage to the solar panel output and stores energy to the battery bank.

**c) Super Capacitor Bank**

Super capacitor bank stores the electrical power output from the solar panels and it provides energy to the power converter.

**d) High Frequency Converter**

High frequency converter consists at the high frequency oscillator which generates a PWM pulses and the drives using MOSFET'S. Here two separate PWM pulses PWM1 and PWM2 are produced and it supplied to the MOSFET gate.

**e) Resonant Receiver Antenna**

The receiving antenna receives electromagnetic waves from the transmitter antenna and converts into the high frequency electrical output.

**f) Antenna matching Network**

It matches the oscillator frequency to the antenna frequency to be maintaining resonance tuning of the receiver and transmitter.

**g) HF Rectifier**

HF rectifier consists of the fast switching rectifier diodes which are converts HF voltage into DC voltage and it filters the output voltage which is utilized by the loads.

**VI. CIRCUIT DIAGRAM**

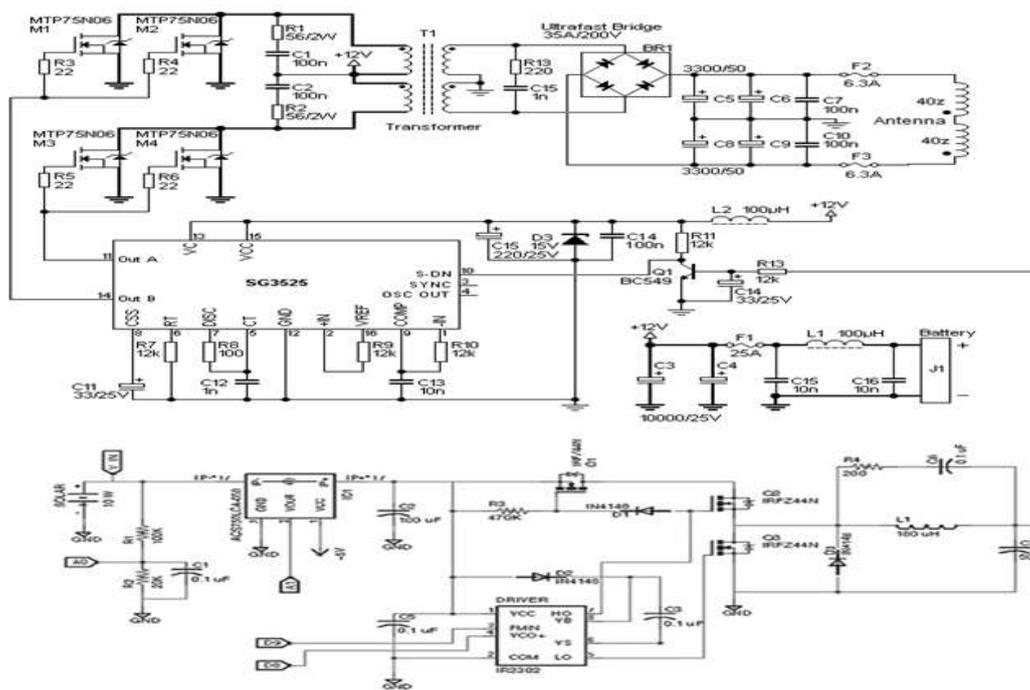


Figure 3: Circuit Diagram

**VII. PROTOTYPE**



Figure 4: Prototype model

**VIII. CONCLUSION**

The fossil fuel is used to develop the promising alternative it does not pollute any gas. When using this scheme the efficiency will improve. The cost of SPS will be higher and it consists large potential. It requires the large scale at it involved both political and economic. When using this to improve efficiency and the cost will be reduce. It gets the optimal source. 95%of efficiency improves by using this PV cells. When using this scheme to find the innovative solution

and it over come the barrier. Then demand and the fault will be reduced.

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