A STUDY ON DESIGN SPECIFICATION OF SOLAR MOBILE CHARGER

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ABSTRACT

In this paper we are presenting a designing of a solar mobile charges. The development of solar chargers takes place from a fundamental level such as soldering lamination and panel making. The developed charger is planned for 6 volts with MA capacity in bright sunlight and down to 5 volts using the regulator. It is not possible to charge mobile batteries everywhere at any time every time, so we design this mobile charger so that we can charge mobile batteries anytime anywhere. In this paper we are using the concept of energy harvesting using solar energy for battery charging purpose. With its use, we can charge our mobile batteries in remote areas where there is a problem of electricity. The cost of this circuitry can be reduced to a certain extent so that the common man can easily buy it and benefit from it.

Keyword : - *Sunlight, Benefit, Charger, Mobile etc.*

1. INTRODUCTION

Solar power has long been attracting the attention of scientists and researchers as the perfect alternative solution to fossil fuel energy. Given the abundant amount of sunlight available to us as a blessing from our sun, it is not uncommon to wish to tap this energy that has been there since the beginning of time and use it to drive our engines and homes Does. Although this solar energy is abundantly available, efforts to use this energy and transfer it to a useful form and to run our day-to-day equipment have been in vain. This is the reason why solar energy has not become a major source of our energy needs.

However over the years, technology has allowed cellular phones to reduce the size of not only ICs, but also batteries. However, as technology has advanced and made our phones smaller and easier to use, one basic problem we still have is that we must plug the phone into the walls to recharge the battery. Most people accept reality because there is no other alternative to this problem so they carry extra batteries with them. It is not possible to charge mobile batteries everywhere at any time every time, so we design this mobile charger so that we can charge mobile batteries anytime anywhere. In this paper, we are using the concept of energy harvesting using solar energy

The purpose of charging the battery. With its use, we can charge our mobile batteries in remote areas where there is a problem of electricity. The cost of this circuitry can be reduced to a certain extent so that the common man can easily buy it and benefit from it.

It consists of a battery to store the energy generated by a PV cell. Since, the amount of electricity generated by PV cells is small; These traditional PV chargers may not meet user requirements [5] - [8]. Furthermore, these types of changes can only be used for personal use. The most common difficulty faced by the user is the quick drain of the mobile phone battery. A fully charged battery can run out within a few hours due to data packet service and back end processes, which are always active in the phone. The user contacts nearby shops to charge the mobile phone in an emergency. Although power banks are widely available in the market for emergency charging, it is not affordable for everyone.

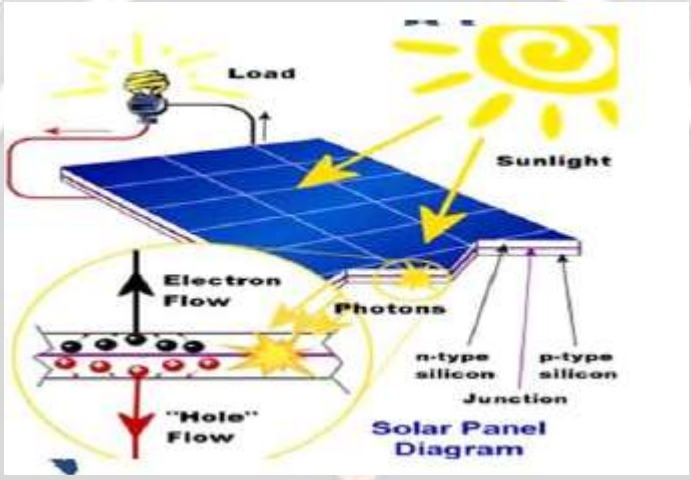
As the second largest country in Asia with a population of about 132.11, India is facing the challenge of irregular power supply. This is because less than 17% of the population has limited or no access to cheap electricity, hence the need to reduce the energy crisis in the nation. Due to India's growing population, the demand for electricity has increased without reliable supply to meet such demand. Shortages in electricity supply in this country, especially in rural slums where there are insufficient or no grid systems, meet the need to locate a renewable source of energy. Discovers that stand-alone photovoltaic (PV) system configuration provides an economical alternative to costly grid extensions in rural areas in the world. Small scale inexpensive production of solar energy can be used in phone charging as well as lighting up solar energy as a renewable energy source in rural areas, which is a source of technical knowledge and knowledge of solar resources Wide spread is gaining acceptance due to availability. Other renewable energy sources, it clearly has

many advantages over non-renewable energy sources, such as coal, oil and nuclear power, etc. As an environmentally friendly alternative to electricity generation, it is non-polluting, reliable and can be used anywhere for energy. Can produce the sunlight.

2. PHOTOVOLTAIC CELL

Photovoltaics is an area of technology and research related to the practical application of photovoltaic cells in producing electricity from light, although it is often used to produce electricity exclusively from sunlight. Cells can also be described as photovoltaic when the light source is not necessarily sunlight (lamplight, artificial light, etc.). In such cases the cell is sometimes used as a photodetector (for example infrared detectors, to detect light or other electromagnetic radiation near the visible range, or to measure the intensity of light.

The solar cell works on the principle of photovoltaic effect. Sunlight is made up of photons, or "packets" of energy. These photons have different amounts of energy corresponding to different wavelengths of light. When photons hit the solar cell, they can be reflected or absorbed. When a photon is absorbed, the energy. The photon is transferred to an electron in an atom of the cell (which is actually a semiconductor). With its newly found energy, the electron is able to escape from its normal state associated with the atom that is currently part of the atom. Becomes lightning.



To convert the sun's energy, PV cells capture photons; Produce free electrons that flow into cells to generate current [6]. The efficiency of the panel is determined by the semiconductor material that is formed from the cells. A single silicon photovoltaic cell can produce approximately 0.5V to 0.6V. The current generated by the silicon photovoltaic cell is between 28 mA / cm2and 35 mA / cm2. So, photovoltaic cells are connected in series-parallel combinations to achieve the desired power [9]. Since, electricity can be generated during only one day using solar PV technology; Night-time use requires either an efficient energy storage system (or) grid connection.

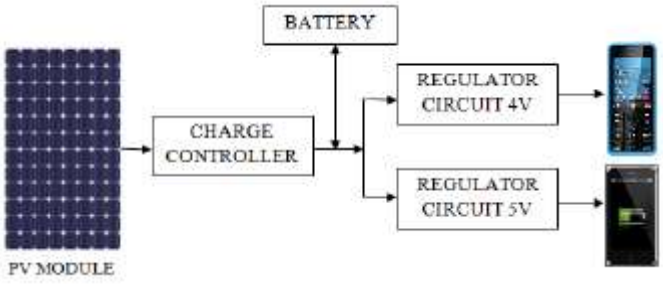
3. SOLAR POWERED MOBILE PHONE CHARGING SYSTEM

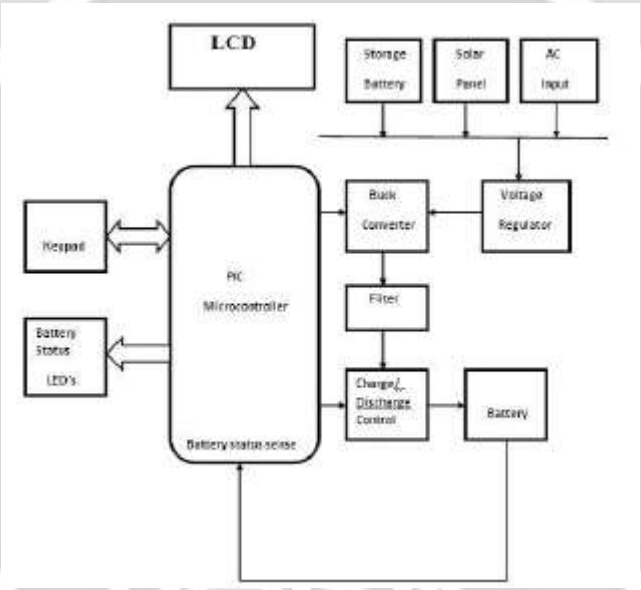
Solar powered mobile phone charging unit. The system consists of a PV module, charge controller, battery and two voltage regulation circuits. The energy generated by the PV module is stored in a battery that is connected to the PV module through a charge controller. The charge controller acts as a maximum power extractor and a voltage regulator for the battery. A vertical pole is used to mount the PV panel and a box is designed with proper ventilation to protect the battery and regulator circuits. Fig. 4 shows the structural design of the proposed system. This vertical structure can be installed for public use in public places. A universal charging port is connected to the regulation circuit to charge any mobile phone.

Here both the 7809 and 7805 capacitors are used to remove ripples and act as filter capacitors (to remove AC components). The ICS regulator is mainly used to maintain the precise voltage in the circuit that follows the power supply. A regulator is mainly employed with a capacitor connected parallel to the input terminal and output terminal of the IC regulator. Capacitors are used to check for large changes in input as well as output filters. Whereas bypass

capacitors are used to check for short duration spikes at input and output levels. Bypass capacitors are mainly small values used to bypass short duration pulses directly into the earth.

Due to the nature of solar energy, the two components require a functional solar power generator. These two components are a collector and a storage unit. The collector only collects the radiation that falls on it and converts a portion of it to other forms of energy (either electricity and heat or heat alone). The storage unit is required due to the non-stationary nature of solar energy; Only very small amounts of radiation will be received at certain times.





4. EXPLANATION OF CHARGER AND LIST OF COMPONENTS USED

Electronic gadgets like Mobile Phones and IPods have made our lives a lot easier. But, all of them suffer from one common drawback of charging them at regular periodic intervals. This becomes a problem when we are traveling or at a place where electricity is not available. Also using renewable energy source is quoted as the next generation fuel for all our electricity requirements.

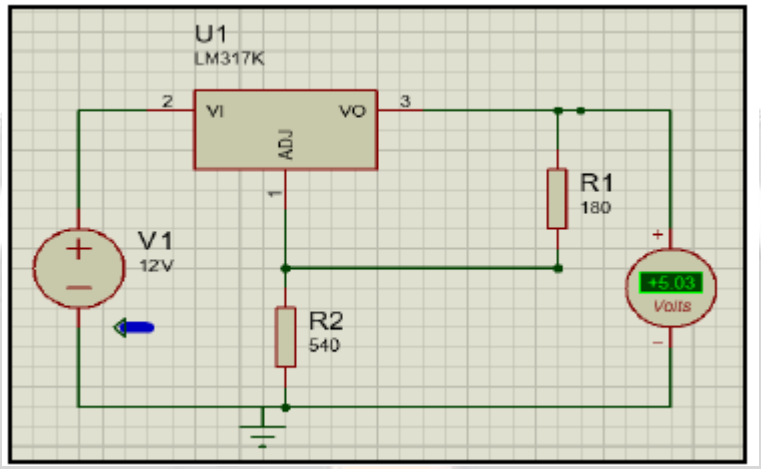
So, in this paper let us learn how easy it is to **Make Our Own Solar Cell Phone Charger** and also how it works.

Materials Required.s

1. Solar panel 5.5V 245mA (3 in Number)
2. 5V Boost converter module
3. Switch
4. Masking Tapes
5. Wires
6. Soldering kit

5. HARDWARE IMPLEMENTATION

The designed regulator circuit is simulated in the Proteus and the output is verified. Figs show simulation circuits of 5V circuits. The circuits are simulated with 12 V inputs and desired outputs are obtained.



6. FEATURES

- Charges standard capacity nickel metal hydride cell(NIMH) in 4-8 hrs
- Output constant rate of charging current
- Intelligent battery charging
- Some models of cell phones have built in solar charger and are commercially available for GSM cell phone
- models
- Solar phone charger comes in different shapes

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