



# AUTO CHARGING MOBILE BACK CASE

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**Abstract :** According to GSMA continuous knowledge data, there are already more over 10.57 billion mobile phone users worldwide, which is higher than the current global population estimate of 7.93 billion people provided by UN computerised examiner gauges. If you use a cell phone, you can definitely understand how frustrating it would be if the battery died in the middle of a workday or when you were out and about. Despite having an overwhelming amount of features and creative components, cell phones don't actually have a long battery life. To keep them in good functioning condition, you should charge them from time to time. You will see a charging station for your portable battery, but not everywhere. Anyone, especially in remote areas, can use solar-powered chargers because they are simple, practical, and ready to use. By using solar energy, you may solve the problems of energy dependence and common energy emergencies. versatile solar-powered charger that is quick to use. A portable solar-powered cell phone charger is simply a power electronic device that converts solar radiation into electrical current to recharge mobile phones' batteries. This charger is created by switching, managing, and shaping the flow of electrical energy from the source to the stack in accordance with the needs of the stack; this innovation is known as power hardware. In order to get the ideal steady voltage, an externally adjustable voltage controller is used. This device uses a universal sequential transfer connector to charge commonly available cell phones from all manufacturers. It is the most practical solution for charging cell phones because it is small, light, and contaminant-free.

**IndexTerms - Solar Energy, Power Electronics, Energy Crisis, Renewable Energy, Solar Charger.**

## INTRODUCTION

Cell phones are currently at the pinnacle of the electronic market. The demand for electricity is rising along with the use of cell phones. The amount of functions in phones is changing and growing every second in order to make life easier. This is increasing the need for long-lasting batteries with high power. Cell phone manufacturers produce the 3500–4000 mAh battery, but even then, it cannot meet human need. We need an electrical outlet to charge the batteries, but they are not always available. In this essay, a solar energy harvesting and power generation device is proposed. This device might be used to charge cell phone batteries. Solar energy is transformed into electricity by solar panels, which is then transformed into the necessary voltage for the purpose of charging the battery by a dc to dc converter. Even in faraway locations, anyone can utilize this equipment.

## BASIC COMPONENTS

The solar panel, dc to dc converter amplifier, integrated rear cover, and charging pin are the four main parts of this gadget. Following is an explanation of how the components are described:

**SOLAR PANEL:** A solar cell is a device that uses the photovoltaic effect to directly convert solar energy into electricity. When referring to devices designed expressly to capture energy from sunshine, the word photovoltaic cell is sometimes chosen; otherwise, the phrase solar cell is. Typically, semiconductors like silicon and germanium are used to make them. Photovoltaic arrays, solar modules, and solar panels are all constructed using cell assemblies. The area of science and engineering known as photovoltaic deals with the use of solar cells to generate usable electricity. The solar panel's specifications, which were used to make the gadget, are 12 V is the output voltage



Figure 1: Solar Panel

**Dual USB 5V 1a 2.1a:** This is the mobile power module Accessories, 18650 Circuit board shell. It has one input where the current from the solar panel is stored in the battery through this model. It has a power button for triggering purpose. This module contains a LCD display where the power available in the battery is indicated through this display. It has two terminals where the battery is connected to this module for power storing purpose. It has two output ports where we can get output of 5v & 1a and in another port 5v & 2a. It also has a LED for emergency purpose.

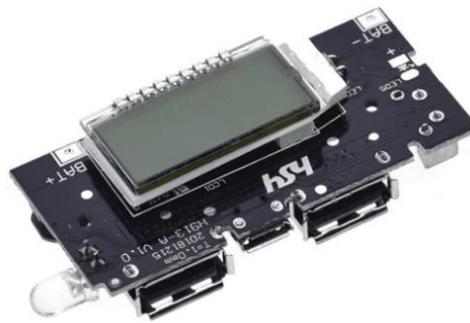


Figure 2: Dual USB 5V 1a 2.1a

**WORKING PRINCIPLE**

A smart mobile case is a tool used as an additional charging source for mobile devices. It operates on the photovoltaic effect theory, which states that when a substance is exposed to light, a voltage or electric current is generated in that material. When the solar panel mounted on the back of the phone case is exposed to sunlight, it begins to produce potential differences and sends them to a circuit for a dc to dc converter. The circuit transforms, amplifies, and increases the current while decreasing the voltage and beginning to charge mobile devices.

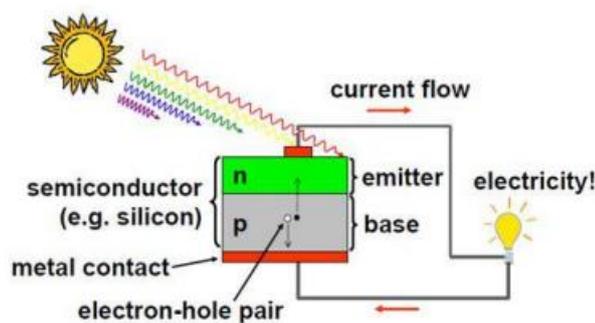
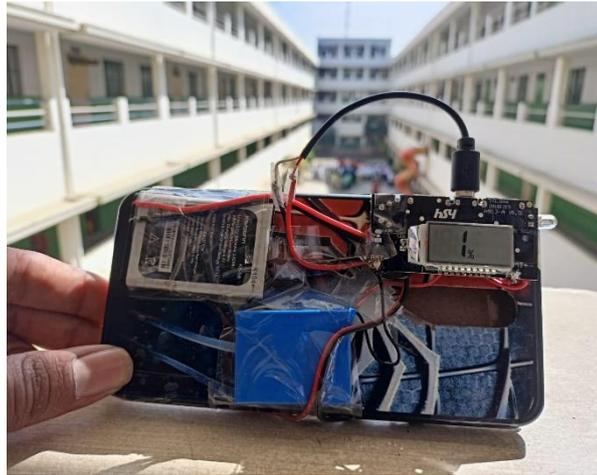
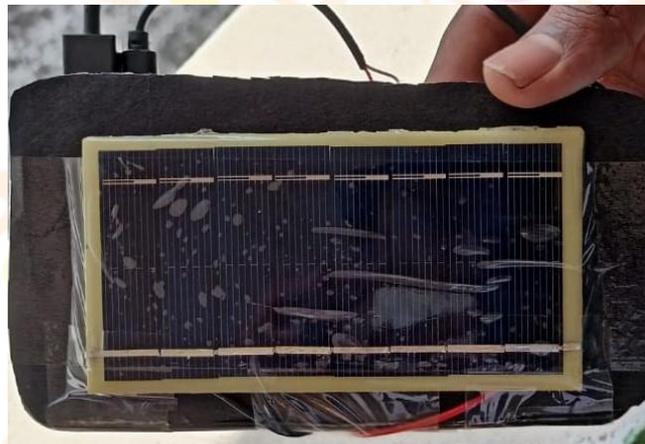


Figure 3: Working Principle

**PROTOTYPE**

*Figure 4.1: Prototype*



*Figure 4.2: Prototype Attached with solar panel*

- The solar panel is fixed with back case and the current is generated from the solar panel.
- The generated current is flow through the level indicator and the current is stored in a rechargeable battery.
- When the charger cable is plugged into the phone the stored current is sent through the level indicator to the phone.
- The power in and power out is shown in the indicator.

**TESTING/OUTPUT IMAGES**

*Figure 5.1: Testing Image*



*Figure 5.2: Testing in outdoor*

**RESULT**

The solar panel in the gadget can generate up to 12V of voltage and 500mA of current. This voltage is then passed to the dc convertor module, which increases the current to 3A while changing the voltage to 5V. A cell phone typically needs this much voltage and current to charge. As a result, our phone is fully charged.

**CONCLUSION**

The idea of efficiently charging a mobile phone without using power is presented in this paper. It is an entirely environmentally friendly device that charges a phone with solar power. The following conclusions can be drawn from the current work:

- (i) It is a cost-effective gadget that can be produced for only Rs. 500 and can be modified to meet the needs.
- (ii) With the right amount of solar exposure, this gadget can recharge an empty battery.
- (iii) In rural locations with severe electrical shortages, this gadget performs admirably.

This gadget can be upgraded in the future to charge batteries with different specifications by utilising solar panels and dc converter modules with various ratings.

**REFERENCE**

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