

**KEMENTERIAN
PENDIDIKAN
MALAYSIA**



SOLAR BAG

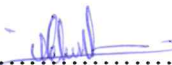
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**POLYTECHNIC SEBERANG PERAI
DECEMBER 2016**

DECEMBER 2016

PROJECT REPORT COMFORMATION

I hereby declare that the work in this report is my own except for quotations and summaries with have been duly acknowledged.

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APPRECIATION

Thank God for the grace and blessing, we can complete the project successfully. With a given time period, we have been able to complete the project, a log book and final initial proposal by referring the step had been given. The special thank goes to the helpful lecturer madam Nor Hanida Bt. Ahmad for the supports and guidance. The supervision and support that she gave truly help the progression and smoothness of the assignment project, which is the project of Hiking Solar Bag.

The co-operation is much indeed appreciated. This assignment project makes we realized the value of working hard to finish this project and as a new experience in how to search more information about the digital circuit. Besides, great appreciation goes to the rest of our beloved friends that always being supports during the project. The whole program really brought us together to appreciate the true value of friendship and respect of each other.

Last but not least, we would like to thank to anyone who help us to finish the project assignment. Without the guidance and assistance from them, this project would not be completed in a timely manner.

ABSTRAK

Ramai diantara pengembara mahupun penggemar aktiviti lasak seperti meredah hutan dan mendaki gunung akan menghadapi masalah yang sama, iaitu kekurangan makanan tambahan seperti biskut, yang memberikan tenaga segera. Hal ini adalah disebabkan oleh beg yang menyimpan makanan mereka tidak dapat mengalirkan sistem pengudaraan yang baik.

Oleh hal yang demikian, sebuah beg telah direka untuk mengatasi masalah ini. Beg ini merupakan sebuah beg yang mempunyai sistem pengudaraan yang aktif sekaligus dapat mengelakkan pakaian dan makanan yang disimpan lama tidak mempunyai bau yang tidak diingini atau makanan menjadi lemau dan basi.

Selain itu, penggunaan bateri sebagai bank kuasa juga turut dititikberatkan dalam beg ini. Hal ini adalah kerana bateri sebagai satu contoh penggunaan semula kuasa. Bank kuasa adalah salah satu punca kuasa yang boleh dikitarsemula. Hal ini membolehkan para pengembara mengecas gajet mereka dan mereka tidak perlu risau mengenai gajet yang kehabisan bateri lagi. Bank kuasa tersebut dicaj semula menggunakan panel solar yang diletakkan pada beg ini. Melalui pendekatan ini, penyelesaian lepas yang disimpan di dalam pangkalan kes akan diguna semula untuk menyelesaikan masalah baru melalui "Hiking Solar Bag". Beg ini dibangunkan dengan menggunakan bahasa pengaturcaraan Arduino dan menggunakan pengawal mikro Arduino.

ABSTRACT

Many of the travelers or even a fan of outdoor activities such as trackking and mountain climbing will face the same problem, namely the lack of additional food such as biscuits, which provide instant energy. This is due to their food storage bag that can not drain good ventilation.

As a result, a bag has been designed to overcome this problem. This bag is a bag that has a ventilation system that can be active at the same time avoiding clothes and food stored longer have undesirable odors or become slightly stale food and stale

In addition, the use of battery power as well as bank will also be covered in this bag. This is because the battery as an example of re-use of power. Power Bank is one of the causes of power that can be recycled. It enables travelers to charge their gadgets and they do not have to worry about running out of battery again gadgets. Power Bank is recharged using a solar panel placed on this bag. Through this approach, the last solution stored in the base case will be reused to solve new problems through "Hiking Solar Bag". This bag is developed using the Arduino programming language and using the Arduino microcontroller.

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CHAPTER 1: INTRODUCTION PROJECT

1.1 Introduction

Nowadays, with all tablets and smartphones that use touch screens and always have access to the internet, making it often runs out of battery quickly. As a result, we have identified the measures and projects that are compatible with this problem. We have created a bag that is able to charge and turn on the system airflow in the bag. Through the study of the project has been carried out, the existing project focuses on the use of solar and rechargeable battery. Therefore, we use this as a benchmark and springboard to carry out this project. The project aims to upgrade the existing project by adding new features such as the fan is switched on automatically if the level of heat inside the bag exceeds 30 degrees Celsius. It thus gives freshness and avoid the stuff in the bag of smelly or slightly stale. It also indirectly makes this bag an advantage as distinct from that of solar bags available in the market. It is also sure to be attractive to climbers and adventurers due to the resistance of the material and

also modernity fashion fashionable nowadays. The results of this project can be seen in the next few weeks to come.

1.2 Problem Statement

Problem Statement tells about all the problems that arise that make the study were selected to run. Among the main issues to be solved in the development of this project is the most traveler or outdoor enthusiasts find that clothing and food stored in a bag will smell musty due to stored and retained. This is caused by the bags itself do not have a good ventilation control system. The real problem that lies to be solved in terms of storage of goods in the bag. The goods storage includes storage of clothes and food. Many users difficult to make clothing such as pants, shirts and so on to stay smell fresh and free from any smelly odors. It is also associated with the storage of dry foods such as biscuits, snack, fresh foods such as handmade sandwich, canned food like sardines, jam, and so on. Dry food like biscuits, instant food and energy will become stale or slightly stale due to the ventilation system is inactive and closed. This will lead to the user as well as adventurers, outdoor enthusiasts will experience food shortages and this will cause them to not be able to continue their journey successfully and happily. As such, this bag was design to prevent this problem from continuing. One significant problem worksheets to be completed in line with the development project is the user will no longer be cut off supplies of fresh food that kept even the food stays fresh. Clothing stores users also will not smell caused by the presence of good ventilation. The bag also contains a power bank. Bank this power is used in this bag is intended to prevent the traveler or outdoor enthusiasts from running out of power on their mobile gadgets. Device gadgets such as smart phones, cameras, torchlight and so is likely to run out of

battery after a day of use. As such, this bag has been specially designed for them. This power bank will also be recharged using solar power. Therefore, they do not need to worry about power supply which they existed because there was sunlight everywhere. The power bank also will move the fan to maintain the freshness of the bag. It will also facilitate the traveler as they no longer need to find a power outlet to charge their gadgets. In addition, by using the power bank, they do not have to worry about the supply of the power bank itself. This is because the bank is authorized to use the power of 10 000mAh and rechargeable.

1.3 Research Objectives

There are several objectives that can be highlighted through this research. The objectives of this study are:

1. Introducing a new way in the storage of goods in the bag.

- Able to introduce a bag that has a ventilation system that can be active at the same time avoiding clothes and food stored longer have undesirable odors or become slightly stale food and stale.

2. Keep the temperature inside the bag at an appropriate level.

- Users can maintain the temperature inside the bag at an appropriate level. This may indirectly preserve the freshness in the bags and avoid being damaged clothes and food.

3. Use the Power Bank as a source of power that can be recycled.

- Users can maintain and ensure their gadgets always to power on
- Users do not have to worry about the power supply for the Power Bank because of the power bank will be recharged using solar power.

4. Stresses the importance of green energy consumption.

- Emphasize the use of green energy, namely solar panels to recharge the main power while the Power Bank Power Bank will move the fan on the bag.
- The fan is meant to drain and to improve and make the ventilation in the bag as an active ventilation system. It is indirectly protecting the environment and greening the planet.

1.4 Scope of Study

The scope of this study discusses the limits of the project in terms of users and systems as well as study. The scope of the study is also related to the scope of the implementation of the project. As such, the scope of this research project is using solar panels as the main source of energy. Power generated by solar panels is stored in batteries for use at night or when sunlight is scarce as a cloudy or in very dense woods. In addition, the battery will be used to drive the fan. In addition, the use of "HIKING SOLAR BAG" is limited to the capacity of the bag used. The system will be used in the program through the Arduino software. It allows the user to select the

appropriate temperature. In addition, users can also remove and reinstall the solar panel if the user wants to wash the bag.

1.5 Justification

Justification or interest in the project to discuss the development needs of the project, in terms of the benefits to be obtained and also the method and how it is realized either in terms of cost, time and so on. For example, users no longer need to worry about the freshness of the odors clothes and food stored in a bag. This is because the bag has an active ventilation system and well. This is of great concern to consumers who prioritize aspects of hygiene while doing adventure activities or when doing outdoor activities such as mountain climbing or trekking. In addition, users also do not have to worry about dry food stored in the bag, such as biscuits, snacks or extra food from becoming stale. Users need not worry about power on their gadgets. This is because there are batteries that are recharged using solar power. Solar power is one of green power. Next, users will also be more environmentally friendly. This is because these bags using a solar panel that uses solar energy to generate power so the battery can work at the same time maintaining the power of their gadgets. In addition, these batteries also will move the fan is in this bag. With a fan of this, users no longer need to worry about the freshness of the items in the bag.

1.6 Structure of the Report

This report contains five chapters. The first chapter discusses the introduction to the study. This chapter also discusses the problem that a study has been selected to run.

In addition, the first chapter also discusses the objectives of the study which lists four objectives of the study will be carried out and also to discuss the scope and rational of the study. Next, the second chapter tells about the background of the problem. This chapter also tells about the background issues that explain the project in terms of operations, equipment, and components used. The second chapter also tells about the study and analysis of existing products in the market in terms of advantages and disadvantages. This chapter also tells about a study on the techniques, equipment, related technology is used to solve the problem. Next, the third chapter discusses the methodology of the study and the fourth chapter presents the implementation of the study. The fourth chapter discusses the implementation of the project in general in terms of design, circuits, and methods of use of the project. The fifth chapter also tells about the test and the results of the project. This chapter describes the test results of the project and test the effectiveness of the test circuit project. Finally, the sixth chapter focuses on the conclusions and recommendations of improvement projects that can be brought to market soon.

CHAPTER 2: BACKGROUND STUDY

2.1 Introduction

In the process of designing this project, we have listing some kind of methods to use. The idea to build a "Hiking Solar bag" was triggered after making observations about the problems of the community discomfort during outdoor activities such as hiking, camping in the woods, cycling and traveling.

In this era, people like to do outdoor activities such as outdoor activities such as hiking, camping in the woods, cycling and traveling. Usually events like this take a long time and in a fairly hot. This is because temperature conditions in Malaysia is increasing.

In addition, other problems that often afflict the fans of outdoor activities and adventure is a gadget they often run out of battery. This will cause them to not be

able to express the beauty of the flora and fauna as well as beautiful moments with friends and loved ones.

In addition, a problem that often occurs during this activity is carried clothes wet and stinking if it rains. In addition, the clothes smelled musty if the situation in the heat bag. With the "Hiking Solar Bag" This problem can be avoided effectively.

2.2 Project Background

This section describes the related projects in general, particularly in terms of operation, equipment and components used.

The project is named as 'Hiking Solar Bag'. How to handle this project is to ensure that all equipment and components adequately equipped. The equipment is like a waterproof bag, fan, solar panel, LCD, fan holder, temperature sensors, wires, components, circuit boards and so on. The circuit has been completed is placed at the bottom of the bag, especially the temperature detector circuit with the horizontal position. Then, solar is placed in the outer bag along with LCD close to the circuit for easier to hook wire circuit. Thus, space can be saved.

Next, solar should be wrapped with transparent plastic bag because the sun rays penetrate the solar and not exposed to water. Fans also placed on the side of the left and right bag. Fans must use the fan to stand up straight and do not move. This concept is that it will work when the heat contained in the enclosed space increases.

When the heat is increased, the space cannot be closed to lower the temperature in the room by itself because of the lack of air flow in and out. With the installation of this equipment, the temperature will have an impact on heat detection device contained in the air and then bring the information to the control circuit.

In this control circuit, it will interpret the information received and to enable the fan to turn the next circuit. Once all is well, the fan cools the inside of the bag. For this system, the prayers used to generate system power supply to the circuit.

Next, the battery will be placed at the bottom of the bag. This is intended so that it can be removed and inserted easily. In addition, the battery position also simplifies the process of wiring and connection of the solar and the connection to the fan. In addition, it is also easily accessible by the user if they want to use the battery to charge their gadgets. The battery position also plays an important role in this project. This is because the battery is one of the most important components to the success of the project 'HIKING BAG SOLAR'. Lying beneath the span that will cause more will be used as a shock absorber and the pressure on the battery.

2.2.1 Temperature

Temperature plays an important role in the operation of this device. This is because it will start functioning based on the temperature conditions. Temperature sensor used was LM35. The temperature required to switch on the device depends on the user. Users will set their desired temperature. With the temperature conditions in our country is relatively high, the temperature inside a bag that is exposed in the open will increase rapidly.

With this tool, you can reduce the temperature inside the bag. This decrease depends on the temperature set by the user. Users will see the temperature on the LCD display. Operation of the circuit who always continuous operation will cause temperatures to drop and return to a predetermined temperature. With the goal of this project was achieved as required.

2.2.2 Control circuit

Tools that have been created will not work without using a circuit which has been specially designed for this device. The electronic circuits play a very important role in the operation of this device. Without the presence of this circuit, which is designed tool will not work according to the desired concept. The control circuit is installed will receive the information that was sent by the temperature sensors in turn interprets the information before turning on the circuit and turn on the fan.

In making the circuit, we also have some circuit which is suitable for the operation of the system our project. After making a number of discussions about the selection of a suitable circuit, we found it necessary to depend on several factors. For example LCD circuit, fan and temperature sensor it depends on the cost of the preparation, effectiveness, appropriateness with the desired situation and the preparation process circuit.

2.3 Review of existing products

This section describes a study of existing products in terms of manufacturing, cost, time, type of material used, application and user comfort and satisfaction.



Figure 1 Example of product in market

New solar backpacks are created by Voltaic can give you the option to recharge your laptop and other devices even when cloudy day.

2.3.1 Operational Aspects

Contains a battery with 10 watt solar module monocrystal, the power supply has two ports and four voltage settings that are connected to a battery of 60 watt. This new backpack give you the ability to recharge any mobile device anytime you need.

Placed in the sun for an hour, these units generate and store enough power to run a laptop computer for an average of 30 minutes.

When the sun is not available, the battery 'onboard' can be recharged by plugging it into an AC outlet. Battery big enough to double the turn on most computers, and supply of 16V or 19V.

Port of low voltage operate on 5V or 12V for most mobile devices.

2.3.2 Costing Aspects

In terms of cost, it is quite expensive bags. This is because it uses solar panels that have a high capacity. As we know, the price for a solar panel is more expensive compared with the battery. It will also be more expensive if its capacity is higher. It uses a high voltage because the notebook has a battery that high capacity.

In addition, the cost of the bags is also relatively expensive because of the high quality. This bag has its own unique characteristics such as waterproof, heat resistant and durable and rugged. Regardless of this bag is suitable for use as a laptop computer bag. This is because, a laptop computer is sensitive to heat and water. It can cause a laptop computer damaged if exposed to water and high temperatures. This bag also features impact resistant. In addition, these bags create a world-class company and brand is recognized by all countries. This can cause the price is quite expensive bags.

2.3.3 Types of Materials Used

The materials needed to build this bag is

- A battery with 10 watt solar module monocrystal
- The battery is 60 watt
- Bag laptop computer
- Port 5V and 12V
- Circuit board
- Wires
- Terminal block
- Arduino

In addition, the components used in the control circuit:

- Resistors
- Diode
- Transistor

2.4 Analysis of the problems of existing products

This section discusses the comparison between the advantages and disadvantages of existing products.

This product has many advantages to the user. For example, this bag can make it easier for users to have gadgets such as tablets and smart phones that use touch screens and always have access to the internet, making the battery often ran quickly to recharge their gadgets if there is no electricity. And users do not have to worry about using their gadgets wherever they are.

This bag can also protect consumer gadgets. This is because, this bag has features such as full protective waterproof and impact resistant. So, gadget stored in these bags will be delivered in good condition. In addition, this bag is easy to carry around only because of the stylish design and light weight.

However, these products also have disadvantages. For example, this bag will be exposed to sunlight for electricity. This is because solar need sunlight to generate electricity. As such, these bags will experience a rapid temperature rise. It will heat up the room in a bag. Therefore, the gadgets that are in the bag is susceptible to damage caused by such gadgets are mostly sensitive to high temperatures.

Accordingly, these bags are not suitable for users doing vigorous activities such as hiking, cycling and so on. This is because the solar panel on the bag does not have protection. Therefore, in case of accidents and minor accidents such as falls, it will cause the solar panel broken and damaged. If solar is broken, electricity can not be generated and recharges can not be done.

On the price front, this bag has a fairly expensive price. This is because the price of materials and components used expensive value. Therefore, not all users are able to have this product.

2.5 Studies on components and materials used.

This section describes the details of components, equipment and technology used in the production of the project.

2.5.1 Among the components and materials used:

- Resistors
- Adjustable Resistors
- diodes
- Terminal block
- Mosfet IRF510
- Temperature sensor DS18B20
- Solar 5V
- Batteries
- Arduino
- LCD

2.5.2 Description and the detailing of components and materials used:

1. Resistors

Resistors are the materials used to reduce and lowering the voltage. With the resistor, the voltage can be reduced so that other components are not damaged or burn when exposed to a high-voltage current. In addition, the resistors are made of insulating materials such as semiconductor materials such as carbon. Insulating material such as carbon is the most suitable material to minimize voltage. Resistors are also divided into two types of fixed resistors and resistor.



Figure 2 Resistor

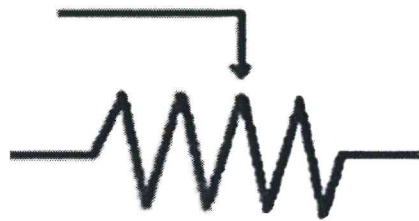


Figure 3 Variable Resistor

2. diode

Rectifier diode is usually used as a voltage through it. The diode used in the circuit to coordinate the flow of fan that goes directly to the circuit. Fans will function smoothly. Sometimes this can be used as a diode rectifier.

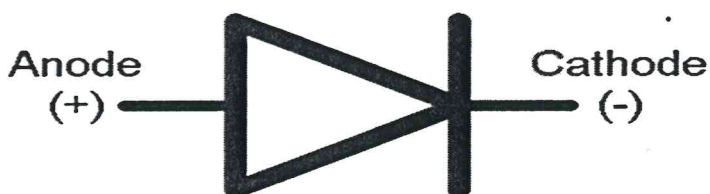


Figure 4 Diode

3. Mosfet IRF510

These N-Channel enhancement mode silicon gate power field effect transistor is an advanced power MOSFET designed, tested, and guaranteed to withstand a specified level of energy in the breakdown avalanche mode of operation. MOSFETs are designed for applications such as switching regulators, switching convertors, motor drivers, relay drivers, and drivers for high power bipolar switching transistors requiring high speed and low gate drive power. These types can be operated directly from integrated circuits. The MOSFETs used in fan circuit. Under this component, the fan can work at a pace that has been set.

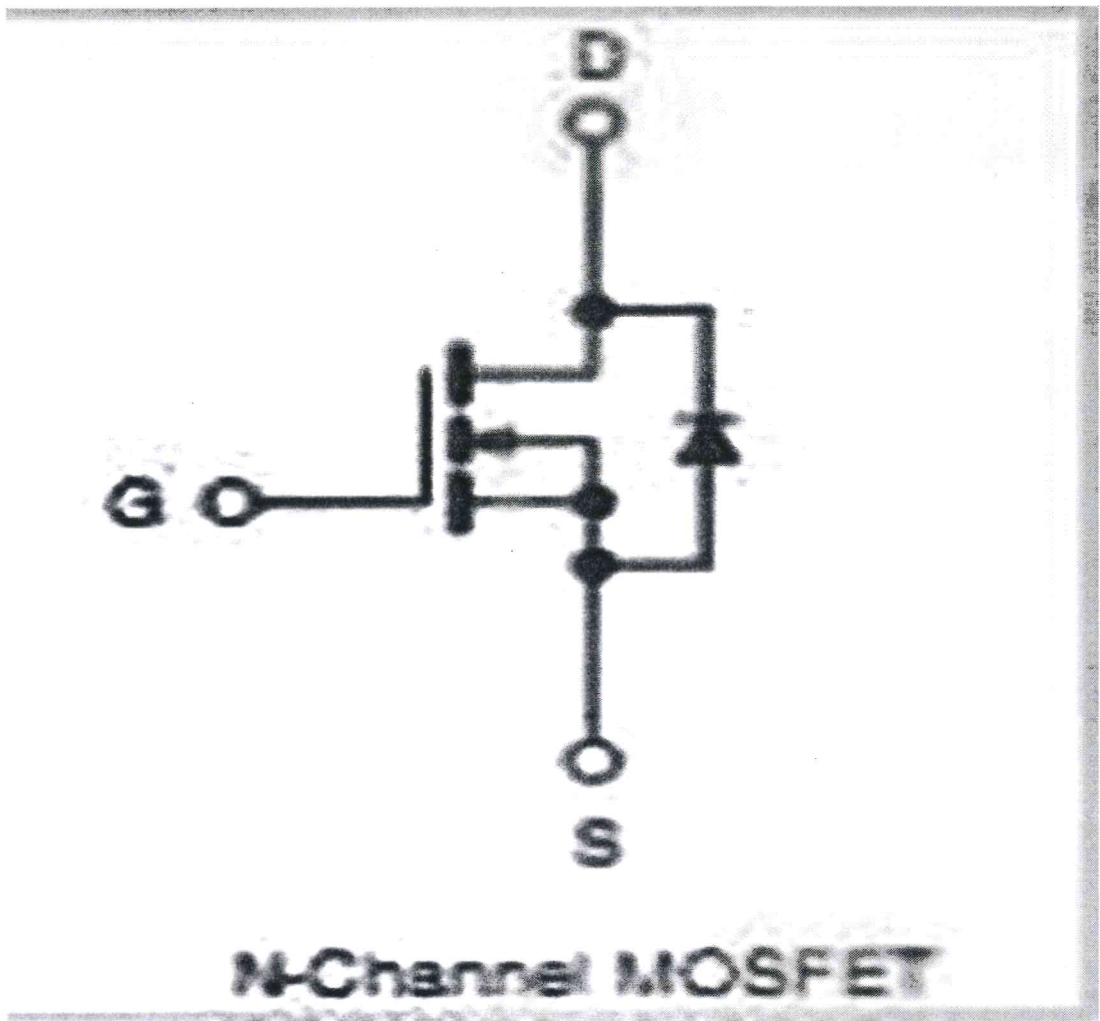


Figure 5 MOSFET

4. LM35

The temperature sensor is to detect the level of the current temperature. Using verifier LM35 temperature, the temperature can be measured is from -55°C to 150°C . temperature LM35 verifier has 3 port pins DQ, ACC and GND.

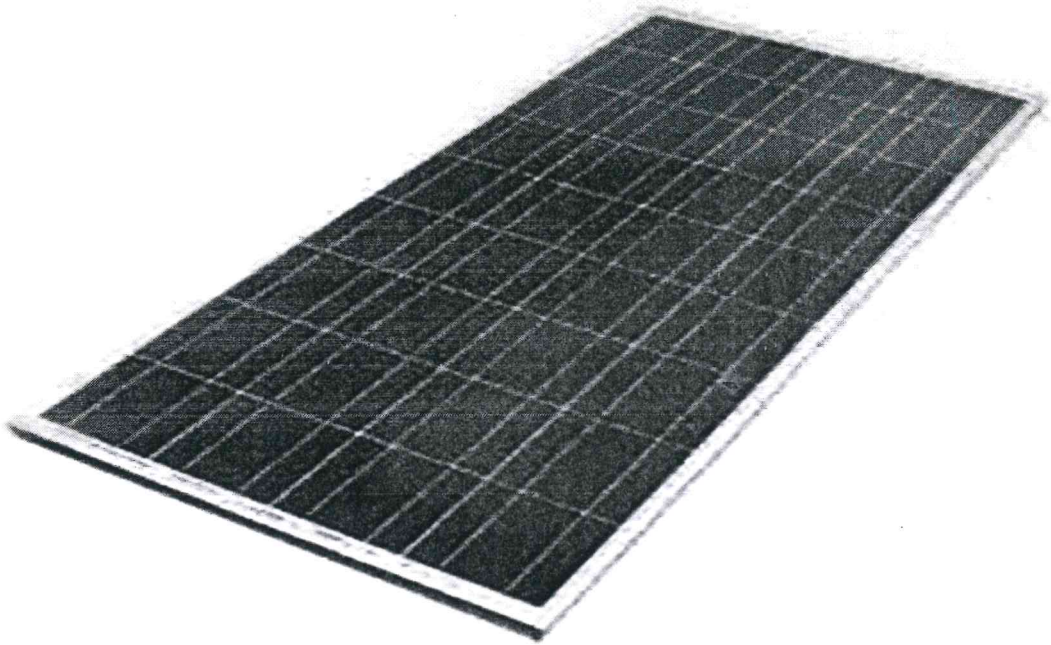


Figure 7 Solar panel

6. Battery / powerbank

Batteries have been used in this project. The battery is of type 18650 which can be recharged. Batteries used to store power generated by solar panels.

7. Arduino

Arduino is a tool that can be used to control an electronic and electrical systems. It is a computer platform based on a microcontroller and have software that is easy to write.