

WIRELESS SOLAR CHARGER

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This report is submitted in partial fulfillment of requirements for the award of Bachelor of Electronic Engineering (Wireless Communication) with Honours

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UNIVERSITI TEKNIKAL MALAYSIA MELAKA
FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN
KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek : WIRELESS SOLAR CHARGER

Sesi Pengajian :

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DEDICATION

To beloved husband, mother, father, my supervisor (Miss Najmiah Radiah Bt Mohammad) and all my friend who are supported and helping me during doing this thesis until completed.

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ABSTRACT

In the present era of science and technology, everyone has a mobile phone for business or personal use. Existing mobile phones today can only be charged directly into electricity through a wire. For a more efficient, this project proposes the use of solar energy instead of electricity and then transmitted wirelessly to a mobile phone. The signal was transmit from transmitter circuit Radio Frequency (RF) and taken by the antenna at the RF receiver circuit. In this project, as a prototype the lamp has power 60 Watt was used to change the solar energy. The output from the RF receiver circuit, it can charge the phone battery from 3.5 V until 5 V through the air in range of 10 meters. Solar battery charger is suitable for commercial use because of low cost and requires no electricity

ABSTRAK

Dalam era sains dan teknologi kini, setiap orang mempunyai telefon bimbit untuk tujuan perniagaan atau kegunaan peribadi. Telefon bimbit sedia ada masa kini hanya boleh dicas secara terus ke bekalan elektrik melalui wayar. Sebagai cara yang lebih efisien, projek ini mencadangkan penggunaan solar sebagai pengganti tenaga elektrik dan kemudiannya dihantar ke telefon bimbit secara wayarles. Cara yang digunakan adalah dengan menghantar isyarat menggunakan litar penghantar Radio Frekuensi (RF) dan diambil oleh antenna pada litar penerima RF. Dalam projek ini, lampu 60 watt digunakan menggantikan tenaga suria dan keluaran daripada litar penerima RF, ianya dapat mengecas bateri telefon daripada 3.5 V sehingga 5 V dan tanpa menggunakan wayar dalam jarak 10 meter. Pengecas bateri solar ini sesuai untuk kegunaan komersil kerana kos yang rendah dan tidak memerlukan tenaga elektrik.

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LIST OF ABBREVIATION

PV	-	Photovoltaic
DC	-	Direct current
AC	-	Alternating current
LED	-	Light emitting diode
IC	-	Integrated circuit
USB	-	Universal serial bus

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CHAPTER 1

INTRODUCTION

This chapter will give an overview of the project such as project background, project objective, project scope, project methodology and a summary of this project. This chapter will explain briefly about the work from the beginning until the project is implemented.

1.1 Project background

Nowadays, most chargers are used in everyday requires us to uses electric cables to charge to the phone. But it is difficult for us to wait until the phone battery charge is fully charged before move to the different places. Lately, battery charger using solar energy need to locate under the sun but still uses the wire to connect the charger to the mobile phone.

A variant of this project compared to the chargers in the market is that it uses solar energy replaces electricity. In addition, it is also in charge the batteries in wireless. If you look at the technology in our time, most devices use wireless systems. By using solar panels (photovoltaic), solar energy was capture from the sun and then activated the transmitter before it transmits the energy.

According to the literature, the amount of nonrenewable energy such as petroleum and coal has been gradually becoming insufficient to meet demands. The problem of nonrenewable energy crisis has stimulated rapid development of renewable energy technology. Furthermore, mobility is increasingly viewed as an essential attribute of today's lifestyle, both personal and professional. So, advanced electronic devices such as cellular phones and portable computer now permit people on the move to operate more effectively than was possible at home and office bound environments of a generation ago. But the price of mobility has been increasing demanding and depending on the portable power source.

In this project, wireless smart charger is designed to introduce an alternative source where it is allows users to charge the phone using the sun without install the charging into the electric power. The users of solar panels are thin and small as a main component so it allows and enables users to take anywhere. This project was applied to cellular phone because they included from all aged stage and make easier for them to charging the batteries.

1.2 Project objectives

The objective of this project is to study the characteristic of solar energy as an alternative source. The topics was discuss in this thesis include the type of solar panel, the advantage and disadvantage used the solar panel. It is also about the output voltage can this solar panel can produce based on their type.

Then, other objective is to transfer the energy generated from solar cell via Radio Frequency (RF) for charging the battery of mobile phone. It is about the energy was produce using the RF transmitter and the receiver. It also discuss about the suitable frequency was used to make this project function properly.

1.3 Problem statement

This project was undertaken as a solution for the problem occurs on the previous design of wireless charger. The previous charger used the same basic of solar charger but it still used the wired to connect between solar charger and mobile phone. Moreover, charger in the market today also can charge the mobile phone but it cannot charge in the long range. So, this project was design to overcome the problem and get better result.

1.4 Project scope

The project scope for this project is finding solution to charging the mobile phone without wire and used the solar energy as a source. It is produce the energy using solar panel (photovoltaic) and transfer it through the air via Radio Frequency (RF) from transmitter to the receiver. The type of solar panel was used is an Amorphous where it can produce 12 volt as an output.

1.5 Methodology

In this project, the solar cell was used as an alternative source to change the electrical energy. Using the RF transmitter and receiver, the energy will be transfer trough air to charge the mobile phone. Using the component was show in chapter four, the project was design to get the result before it used to analysis the data. The method was used in this project have a few stage that will be involved in order to work out the aimed objectives in this project.

The project was beginning by discussion with the supervisor and collects the data from the book, journal and others. This project was dividing in two part where it is transmitter and receiver part. At transmitter part, it consists with the solar panel as the source and radio frequency (RF) transmitter. In the receiver part, it consist wit RF receiver and mobile phone.

1.6 Thesis Outline

This report has six (6) chapters will explain in detail about this project. The first chapter is an introduction in which the chapter will provide a brief description of the project is implemented as a background, project objectives, project scope, problem statement and expected result.

The second chapter a theoretical background where any facts and information obtained through the different reference materials will be reviewed to select one of the related techniques and methods to implement this project.

The third chapter a literature review, where the information from the previous project can be a guide for this project. From this information, the project was implementing for improvement.

The fourth chapter is a methodology where it will describes the methods and technique selected for implementation as in the previous chapter with in depth. In this chapter, it provides the material and equipments were used to doing this project.

The fifth chapter is a chapter that will explain the result and analysis of the project that have been studied. From the result, the analysis was do to see the project is function properly.

The last chapter of the fifth chapter in this report is conclusions and recommendations. In this chapter, conclusions are made on achieving the objective of the project.

CHAPTER II

THEORITICAL BACKGROUND

This chapter discusses the theories was used in this project. It used as guideline during project was do and all theory and research are related with this project.

2.1 Photovoltaic panel

This solar panel also known as photovoltaic (PV) panel is a packaged interconnected assembly of solar cells. It is one of the best renewable energy technologies because it would not produce noise, air pollution or green house gases [1]. It is used as a component in a larger photovoltaic system to offer electrical source for this project. Basically, it must withstand heat, cold and rain. Furthermore, the size of the solar panel is thin and small but can produce a big amount of power. The solar panel absorbs the energy from the sun as a power to produce the electrical energy.