

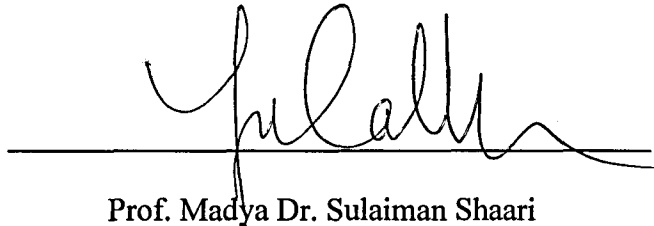
**DESIGN AND INSTALL PV STAND ALONE SYSTEM USING
10.3 W_p THIN FILM SOLAR MODULE FOR SMALL APPLIANCE**

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**Final Year Project Report Submitted in
Partial Fulfillment of the Requirement for the
Degree of Bachelor of Science (Hons.) Industrial Physics
In the Faculty of Applied Sciences
Universiti Teknologi MARA**

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This Final Year Project Report entitled “Design and Install PV Stand Alone System Using 10.3 Wp Thin Film Solar Module for Small Appliance” was submitted by Asrul Nizam Bin Abdul Latif in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Industrial Physics, in the Faculty of Applied Sciences, and was approved by



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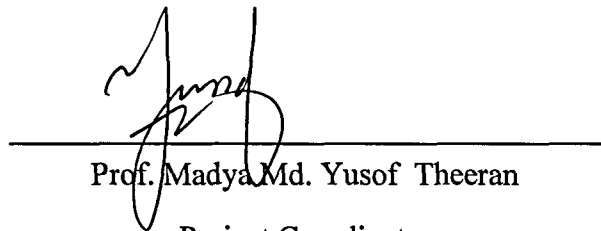
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ABSTRACT

A stand-alone photovoltaic system can be used to generate the needed electric energy. Since the solar modules only produce electric energy during daytime, it is necessary to store energy for the night or for cloudy days. Such storage systems mostly use rechargeable lead batteries. Three design methods have been compare and design method by Sulaiman Shaari et al., (2010) has been used to design a PV stand alone system with battery to light up the 40W of bulb for two hours. Microsoft Excel software has been used as simulation tool. Two cycles of charging and discharging process has been done. Time taken for the battery to fully charge is 13 hours. Within this period, the data collection of the charging process has been done to determine the performance of the thin film solar module with 10.3 Wp. Solar irradiance and the module temperature totally influenced the output power of the thin film solar module. The output power of the solar module is increased steadily with the solar irradiance but the output power is decreased while the module temperature got higher. The efficiency of the thin film solar module also has been calculated to determine the performance of the thin film solar module due to the solar irradiance and temperature. The efficiency of the thin film solar module at the field is 0.028 for the first and second cycle.

CHAPTER 1

INTRODUCTION

1.1 Background

Malaysia is one of the country that receives higher radiation of solar energy every year. Capturing the sunlight and turning them into electricity for daily using is a very good idea, and this thing have been applied as a technologies in the photovoltaic system technology. Since the development of early PV cells, the very first photovoltaic system has been applied in Malaysia in early 1980's. The applications of photovoltaic in Malaysia were mainly concentrated on stand-alone systems especially for rural electrification program. Most of rural area especially in Sabah and Sarawak use stand alone photovoltaic system to store energy that been converted from PV cells to a battery bank. Before install the PV stand-alone system, we have to design the system that meets the performance and reliability needs, and complies with all applicable safety codes and standards. After design the system that meets the performance and reliability needs, we need to install test, commision and do an acceptance test of a PV stand-alone system that meets the performance and reliability needs. Generally, we know that the efficiency and output power of solar cells change with temperature and solar irradiance level. In Malaysia, we have a tropical rainforest climate which is warm an sunny all