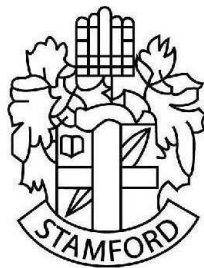


Performance Analysis of Solar Cell

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Declaration

This is to certify that the Thesis entitled “**Performance Analysis of Solar Cell**” has been completed satisfactorily and no part of the work has been published elsewhere for the requirement or fulfillment of any degree.

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Abstract

Solar cells are semiconductor devices that convert light directly into electricity. Solar PV panels consist of dozens of solar cells. Solar cells are made from silicon or other semi-conductive materials. They are manufactured in thin layers of film and are arranged into square-shaped panels and larger PV arrays. When sunlight strikes these panels chemical reactions aggravate resting electrons and the result is a consumable current.

Solar home system consists of several components and individual work by those make a successful operation of the system. Current generated within the cell of the panel flows through the charge controller and charges the battery. The battery stores electricity generated by the PV system. When the load is on, battery gives backup. To protect the components and to harmonize the functions between the components of a solar home system the charge controller plays vital role. It controls the charging system of the battery i.e. Protects the battery from over charge and deep discharge.

The aim of this work is to analyze the performance of Solar Home System. The responsibility of the work was to test the different components of a Solar Home System in the laboratory and compare the test results with the desired results. Some solar home system of remote Bangladesh was visited and some test was done in the field to find the malfunctioning in the real life.

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Dedication

To Our Beloved Parents & Teachers of Dept. Of EEE – Stamford University Bangladesh.

List of Figures

Fig 1.1: Bar chart representation of world energy situation.

Fig 1.2: Energy from sun.

Fig 1.3: Olmedilla Photovoltaic Park.

Fig2.1: Operating principle of a solar cell (schematic).

Fig2.2: Equivalent circuit diagram of an ideal solar cell connected to load.

Fig 2.3: Construction of the solar cell curve from the diode curve.

Fig2.4: Equivalent circuit diagram of the solar cell – short-circuit current.

Fig2.5: Equivalent circuit diagram of the solar cell – open-circuit voltage.

Fig2.6: Power curve and maximum power point (MPP).

Fig2.7: Ten step photo masking process.

Fig2.8: Change image size reduction with light field mask and negative resist.

Fig2.9: Change image size reduction with light field mask and positive resist.

Fig3.1: Parallel connection of solar cells.

Fig3.2: I-V characteristic curve for parallel connection.

Fig3.3: Partial shading in case of parallel connection.

Fig3.4: Series connection of solar cells.

Fig3.5: I-V characteristic curve for series connection.

Fig3.6: Series connection – one cell is completely shaded.

Fig3.7: Series connection with bypass diodes – one cell is completely shaded.

Fig3.8: I-V characteristic curve for series connection – one cell is completely shaded.

Fig3.9: Series connection – one cell is partly shaded.

Fig3.10: Series connection with bypass diodes – one cell is partly shaded.

Fig3.11: I-V characteristic curve for series connection – one cell is partly shaded.

Fig 3.12: Effect of temperature on the current-voltage characteristics of a solar cell.

Fig 3.13: Effect of series resistance on the current-voltage characteristics of a solar cell.

Fig 3.14: Effect of shunt resistance on the current–voltage characteristics of a solar cell.

Fig 3.15: Effect of reverse saturation current on the current-voltage characteristics of a solar cell.

Fig 3.16: Effect of ideality factor on the current-voltage characteristics of a solar cell.

Fig 4.1: Solar Home System and its different connection.

Fig 4.2: solar home system components.

Fig 4.3: Solar panel.

Fig 4.4: PV cells in a panel.

Fig 4.5: Roof Mount system.

Fig 4.6: Ground Mount system.

Fig 4.7: pole Mount system with tracker.
Fig 4.8: Building Integrated Photovoltaic (BIPV).
Fig 4.9: Shunt and serial regulator.
Fig 4.10: 12v DC to 220V AC inverter circuit diagram.
Fig 4.11: Inverter Circuit.
Fig 4.12: Square waveform with fundamental sine wave component, 3rd harmonic and 5th harmonic.

Fig 5.1: Open circuit voltage test of a solar panel.
Fig 5.2: Short circuit current test of solar panel.
Fig 5.3: Low voltage cut-off test.
Fig 5.4: Battery charging circuit diagram of a lead acid battery.
Fig 5.5: Battery discharging circuit diagram of a lead acid battery.
Fig5.6: Battery charging and discharging profile of a lead acid battery.
Fig 5.7: Testing of specific gravity of electrolyte of the battery cells.
Fig 5.8: Wave shape of inverter's output voltage.
Fig 5.9: Wave shape of inverter's output current.
Fig 5.10: Wave shape of inverter's output power.

Fig 7.1: Connecting a Solar Panel considering the appropriate angle.
Fig 7.2: Installation, maintenance and use in various places of SHS.
Fig 7.3: The effective use of SHS.
Fig7.4: Year wise SHS installed.
Fig7.5: Battery recycling procedure of IDCOL.
Fig 7.6: SHS installation growth (cumulative).

Fig 8.1: Solar Tracker.
Fig 8.2: Parabolic trough.
Fig 8.3: Solar Parabolic dish.
Fig 8.4: Power Tower.

List of Tables

Table 1.1: Growth of Renewable Energy.

Table 1.2: Yearly Solar fluxes & Human Energy Consumption.

Table 1.3: World's largest photovoltaic power plants.

Table 1.4: World's largest concentrating solar thermal power stations.

Table 2.1: Photoresist Components & Functions.

Table 4.1: Relation between Specific Gravity and terminal Voltage of an industrial Lead Acid Battery.

Table 4.2: Relation between SOC & battery voltage.

Table 5.1: Charging profile of lead acid battery.

Table 5.2: Discharging profile of lead acid battery.

Table 5.3: charging rate of a lead acid battery.

Table 5.4: Discharging rate of lead acid battery.

Table 7.1: List of PO.

Table 7.2: Progress with SHS's installation up to 26 July 2009.

Table 7.3: Division wise installation of SHSs.

Table 7.4: Price list of SHS by Grameen Shakti.

Table 7.5: Payment schemes of Grameen Shakti.

Table 7.6: Warranty of components.

Table 7.7 Solar set up May 2009 (Shingair Unit).

Symbols and Abbreviations

BIPV- Building Integrated Photovoltaic
CIGS- Cu (In, Ga) Se₂
CIS- CuInSe₂
DC-Direct Current
DOD- Depth of Discharge
FF- Fill Factor
I - Current
I_D- Diode current
I_o- Reverse saturation current
I_{Ph}-Photocurrent
IR-Infrared
I_{sc}-Short-circuit current
IV- Current-voltage
I_{MPP}- Current at the Maximum power point
MPP- Maximum power point
P_{max} -Maximum power
PV- Photovoltaic
P_{MPP}-power at the Maximum power point
q- Charge
R-Resistance
R_p- Parallel resistance
R_s- Series resistance
SG- Specific Gravity
SOC-State of charge
T-Temperature
V-Voltage
V_D-Diode voltage
V_{MPP}-Voltage at the Maximum power point
V_{OC}-Open-circuit voltage
η- Efficiency

Contents

| | | |
|------------------|---|----------------|
| Chapter 1 | Background Ideas | 1 – 10 |
| | 1.1 Introduction | 2 |
| | 1.2 Renewable Energy | 2 |
| | 1.3 Growth of Renewable Energy | 3 |
| | 1.4 Main forms/sources of renewable energy | 4 |
| | 1.5 Solar Energy | 4 |
| | 1.6 Energy from the Sun | 5 |
| | 1.7 Yearly Solar fluxes & Human Energy Consumption | 6 |
| | 1.8 Applications of solar technology | 6 |
| | 1.9 World's largest photovoltaic power plants | 7 |
| | 1.10 World's largest concentrating solar thermal power stations | 8 |
| | 1.11 Advantages of Solar power | 9 |
| | 1.12 Disadvantages of Solar Power | 9 |
| Chapter 2 | Working Principle of Solar Cell | 11 – 22 |
| | 2.1 Working principle | 12 |
| | 2.2 Theoretical Description of the Solar Cell | 13 |
| | 2.3 Ten- step process of photovoltaic device | 17 |
| | 2.4 Photoresist Composition | 20 |
| | 2.5 Types of Photoresist: | 21 |
| Chapter 3 | Solar Cell Technologies | 23 – 37 |
| | 3.1 Solar cell technologies | 24 |
| | 3.2 Generations of solar cells | 25 |
| | 3.3 From Single Cells to PV Arrays | 26 |
| | 3.4 Cell Temperature | 32 |
| | 3.5 Effect of resistance on solar cell | 33 |
| | 3.6 Reverse saturation current | 35 |
| | 3.7 Ideality factor | 35 |
| | 3.8 Sources of losses in solar cells | 36 |
| Chapter 4 | Solar Home System (SHS) | 38 – 55 |
| | 4.1 Solar Home System | 39 |
| | 4.2 Components of SHS - | 40 |
| | 4.3 Solar panel | 40 |
| | 4.4 Mounting System | 44 |
| | 4.5 Charge Controller | 46 |
| | 4.6 Battery | 48 |
| | 4.7 Inverter | 52 |
| Chapter 5 | Methods of Testing | 56 – 66 |
| | 5.1 Test result related to the solar panel | 57 |
| | 5.2 Tests related to the charge controller | 58 |
| | 5.3 Tests related to the battery performance | 60 |
| | 5.4 Tests related to the Lamp Circuit | 64 |
| Chapter 6 | User Guidelines for SHS | 67 – 70 |
| | 6.1 Solar Electricity | 68 |
| | 6.2 Different parts of solar home system | 68 |
| | 6.3 Use of Solar Electricity | 68 |
| | 6.4 User Guidelines | 68 |
| | 6.5 Special precautions for system warrantee | 68 |
| | 6.6 Safety measures for the battery | 69 |
| | 6.7 Safety measures for charge controller | 69 |

| | | | |
|------------------|-----|--|----------------|
| | 6.8 | Safety measures for lamp and other equipment | 69 |
| | 6.9 | Precautions | 70 |
| Chapter 7 | | SHS in Bangladesh | 71 – 84 |
| | 7.1 | SHS in Bangladesh | 72 |
| | 7.2 | IDCOL | 73 |
| | 7.3 | Battery Recycling | 75 |
| | 7.4 | List of Partner Organizations(PO) of IDCOL | 75 |
| | 7.5 | Progress with SHS's installation up to 26 July 2009 | 77 |
| | 7.6 | Division wise installation of SHSs | 78 |
| | 7.7 | Grameen Shakti | 78 |
| | 7.8 | IDCOL newsletters | 83 |
| | 7.9 | Visio of IDCOL: | 84 |
| Chapter 8 | | Discussion & Conclusion | 85 – 90 |
| | 8.1 | Improve to Performance of Solar Home System | 86 |
| | 8.2 | Competition with nuclear power | 89 |
| | 8.3 | Conclusion | 89 |
| | | Appendix A: Characteristic Equation of Solar Cell | 91 |
| | | Appendix B: Current – Voltage Characteristic of Diode | 93 |
| | | Appendix C: Fill Factor | 95 |
| | | References | 96 |