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High Step up Converter Voltage Multiplier for Photovoltaic System

Bhagat Shravani[1], Debhaje Sonali[2], Gavade Nikita[3], Patil Samruddhi[4], Mrs.A.A.Kekare[5]

[1,2,3,4] Students, Department of electrical Engineer, Sharad Institute of Technology Polytechnic Yadrav, Kolhapur (M.S)

[5]Guide, Department of electrical Engineer, Sharad Institute of Technology Polytechnic Yadrav, Kolhapur (M.S)

Abstract - *A novel high stride up high-proficiency interleaved converter with voltage multiplier module for sustainable power source framework, is proposed in this paper. A new voltage multiplier module made which is having exchanged capacitors and coupled inductors, with its blend a regular interleaved help converter acquires high stride up pick up without working at outrageous obligation proportion is composed. This proposed converter diminishes the present anxiety and furthermore lessens compels the info current swell, which diminishes the conduction misfortunes what's more, protracts the lifetime of the information source. Subsequently, substantial voltage spikes over the fundamental switches are lessened, and consequently the proficiency will be moved forward. Indeed, the low voltage stretch makes the low voltage-evaluated MOSFETs be embraced for diminishments of conduction misfortunes and cost. The proposed circuit planned with 12-V input voltage, 230-V yield. The most astounding effectiveness is 97.1%.*

Key Words: PV cell, Voltage multiplier

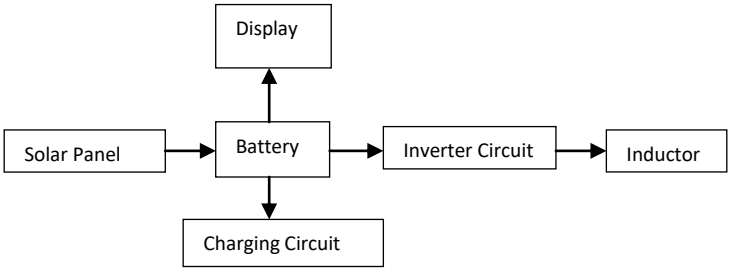
1. INTRODUCTION

Solar energy is one of the most important renewable energy sources that have been gaining increased attention in recent years. Solar energy is plentiful; it has the greatest availability compared to other energy sources. The amount of energy supplied to the earth in one day by the sun is sufficient to power the total energy needs of the earth for one year. Solar energy is clean and free of emissions, since it does not produce pollutants or by-products harmful to nature. The conversion of solar energy into electrical energy has many application fields. In this paper we have presented the photovoltaic solar panel's operation. Due to the large use of conventional sources for electricity production has produced a larger environmental hazards. This has given rise to the use of renewable energy sources such as wind, solar and tidal energy. Among this solar energy and wind energy are used on a large scale. The voltage output give by these renewable energy sources is very low thus a high dc-dc step-up converter are extensively used in these renewable energy sources. Photovoltaic system is gaining a large importance in producing electricity in recent years. In this system light energy is converted into electrical energy. This energy output can be converted in high voltage using step up dc-dc converter using grid by grid inverter or storage energy in battery. A typical photovoltaic system that consists of a solar module, a high stepup converter, a charge-discharge controller, a battery set, and an inverter. The high step-up converter performs importantly among the system because the system requires a sufficiently high step-up conversion.

2. LETERATURE REVIEW

This system helps us use the renewable energy resources for our day to day need of electricity and thus reduces pollution and thus indirectly keeps the environment clean. This system uses PIC KA3525A. A voltage multiplier module is presented in this system for converting the low voltage output of renewable energy sources in a high voltage level so that the energy can be used for proper functioning of the equipment's. The low output restricted the use of the renewable sources this system gives advantage that the sources can be used as the output can be converted into high voltage level.

3. BLOCK DIAGRAM



Block Dia.01

In this block diagram the voltage output give by these renewable energy is very low thus the high DC-DC step-up converter are extensively used in these renewable energy source. The PV source system is gaining a large importance in producing electricity in recent years. In this system the light energy is converted into electrical energy. This energy output can be converted in high voltage using step-up DC-DC converter using grid by grid inverter or storage energy in battery. A typical PV system that consist of a solar module a high step-up converter, a charge- discharge controller, a battery set and an inverter. The high step-up converter performs importantly among the system because the system requires a sufficiently high step-up conversion.

4. METHODOLOGY

4.1Voltage Multiplier/ Inverter Circuit: -

A voltage multiplier is an electrical circuit that converts DC electrical power from lower voltage to A higher DC voltage. There are several topologies available for DC-DC converter. Among them buck converter is in an increasingly popular topology, particularly in battery powered applications, as level of the output voltage can be changed with respect to input voltage. The commonly used a converter in PV systems is a DC/DC power converter. It ensures, through a control action, the transfer of the maximum of electrical power to the load. The structure of the converter is determined according to the load to be supplied. In this article we focus on the step-up DC/DC converter.

4.2 MOSFET Switch-:

MOSFET is a metal oxide semiconductor field-effect transistor. It is used for switching or amplifying signals. The ability to change conductivity with the amount of applied voltage can be used for amplifying and switching electronic signal.

4.3 IC:-

IC generate pure sine wave.

4.4 Solar Panel:-

The term solar panel is best applied to a flat solar thermal collector, such as a solar hot water or air panel used to heat water, air, or otherwise collect solar thermal energy. But 'solar panel' may also refer to a photovoltaic module which is an assembly of solar cells used to generate electricity. In all cases, the panels are typically flat, and are available in various heights and widths. An array is an assembly of solar-thermal panels or photovoltaic (PV) modules; the panels can be connected either in parallel or series depending upon the design objective. Solar panels typically find use in residential, commercial, institutional, and light industrial applications

4.5 MCU:

The boost converter is controlled by the microcontroller. It read the voltage and current of the solar panels through the A/D port of controller and calculates the output power. It also calculate power by reading the voltage and current of battery side in same way and send corresponding control signal to the boost converter and control the duty cycle of the converter by PWM signal through controller to accordingly increase, decrease or turn off the DC to DC converter. The pic is a perfect combination of performance, features, and low power consumption for this application. The control circuit compares the PV output power before and after a change in the duty ratio of the DC/DC converter control signal. It is expected that the MPP presents a constant oscillation inherent to the algorithm.

4.6 Storage: Storage device is 12v lead acid dry battery.

5. RESULT

1. Solar Panel Output 12.40V DC.

2. Battery output is 12.40 V DC.

3. Multiplier Circuit input is 12 V DC and output is 23 V DC. Inverter circuit output is 130V AC IC and MOSFET is response to increase the voltage.

4. Inductor output is 230V AC.

6. CONCLUSION

This paper has exhibited the hypothetical investigation of relentless state, related thought, reproduction comes about for the proposed converter. The proposed converter has effectively actualized a productive high stride up change through the voltage multiplier module. The interleaved structure diminishes the info current swell and disseminates the current through every part. Whatmore, the lossless latent clasp work reuses the spillage vitality and compels a huge voltage spike over the power switch. In the interim, the voltage weight on the power switch is confined and much lower than the yield voltage. The most noteworthy productivity is 96. In this manner, the proposed converter is reasonable for high-control or inexhaustible vitality applications that need high stride up transformation.

7. REFERENCES

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[4] K. Elissa, "Title of paper if known," unpublished.

BIOGRAPHIES

Name: Bhagat Shravani U.
Electrical Engineer

Name: Debhaje sonali A.
Electrical Engineer

Name: Gavade Nikita V.
Electrical Engineer

Name: Patil Samruddhi R.
Electrical Engineer