INTERNATIONAL RESEARCH JOURNAL IN ADVANCED ENGINEERING AND TECHNOLOGY (IRJAET) E - ISSN: 2454-4752 P - ISSN : 2454-4744
VOL 5 ISSUE 2 (2019) PAGES 4335 - 4340
RECEIVED : 10.03.2019 PUBLISHED : 12.04.2019
April 12,2019

FREQUENCY BASED WATER HEATER FROM RENEWABLE ENERGY RESOURCES

Mr. N. Jeevanantham[1], Mr. S. Iyyappan[2], Dr. M. Sudhakaran[3]

[1]UG Scholar, Dept. of EEE, Ganadipathy Tulis's Jain Engineering College, Vellore, India.

[2]Assistance professor, Dept. of EEE, Ganadipathy tulsis's jain engineering college, Vellore, india.

[3]Associate professor, Dept. of EEE, Gandipathy tulsis's jain engineering college, Vellore, india.

ABSTRACT:

Now a day's, the demands for electricity has been increased. But electricity production is low. The production of satellite frequency is higher. So, the producing electricity with the spacecraft frequency is a simple technique. This can reduce electricity shortages. Using the spacecraft frequency, the electricity is generated freely without any pollution. So this project is used to produce electricity from renewable energy source.

1. INTRODUCTION

The increasing demands for flexibility as well as technological Even though there are several advanced technological innovations are available today for electrical energy generation. Most of the domestic products are dependent on electricity. Electricity conservation through the following generation, and can be useful. Moreover, renewable energy through the use of the majority of the grid can be controlled. Coal fuels such as natural gas can greatly save. Renewable fuels through the use of a variety of impacts from the global warming to protect human lives. Frequency in a bid to generate electricity using this new study is located. Space craft frequency is easily available and renewable fuel in the world. So, we try to convert in this energy to electrical energy. For the better output we can use pre-amplifier. Constant boosted output delivered from the pre-amplifier. Using the inverter circuit and boost up the output voltage using to the water heater. This water heater is always working under the renewable energy.

2. PROPOSED SYSTEM:

This project is completely based on renewable sources such as solar. This is required to collect frequency from satellite. It is achieved by low noise block (LNB). This collected frequency is converted into DC voltage then given to the pre-amplifier circuit. After the gained output voltage is directly given to the inverter circuit. Inverted AC voltage is stepped up using the transformer, to required level and given to the any AC applications like Water heater, lighting system. The signal input indication and power on indication also allotted in various color LED's and adjustable ampere and voltage level options also given in the pre-amplifier. The output of the ac voltage from the inverter board from 300v to 700v AC. That AC supply is used to the water heater purpose. The high conducted copper material used to electrode rod

INTERNATIONAL RESEARCH JOURNAL IN ADVANCED ENGINEERING AND TECHNOLOGY (IRJAET) E - ISSN: 2454-4752 P - ISSN : 2454-4744
VOL 5 ISSUE 2 (2019) PAGES 4335 - 4340
RECEIVED : 10.03.2019 PUBLISHED : 12.04.2019
April 12,2019

for induction heating purpose. The copper material is suitable for the induction heating. Because it is a good conducting material. And as well as low resistance material so the power wastage should be avoided.

3. HARDWARE IMPLEMENTATION

BLOCK DIARAM

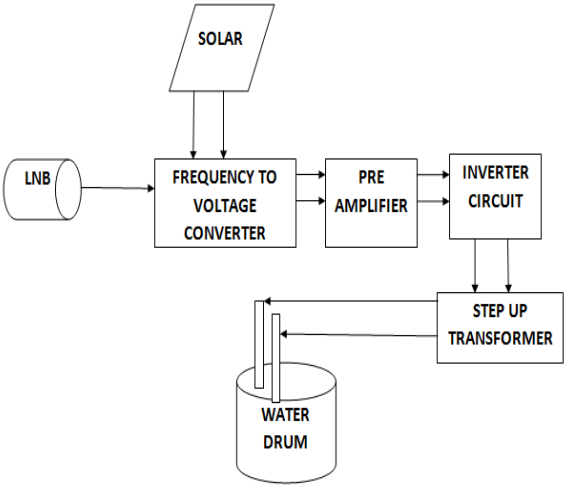

Fig.3.1 Block diagram

The satellite frequency is collected from the LNB (low noise blocker).The higher frequency is given to the frequency to voltage converter. The DC voltage output is given to inverter circuit. The op-amp reference DC voltage is given from solar panel. Inverted Ac voltage given to the step up transformer. After transfer the AC supply is directly given to the water heater terminals.

A. LNB [Low Noise Blocker]

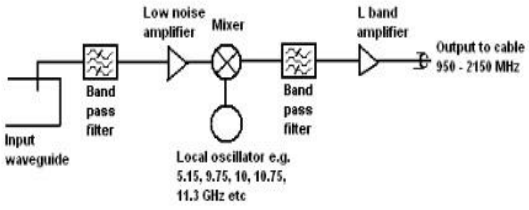

Fig.3.2 LNB internal diagram

The expression block refers to the conversion of a block of microwave frequencies as received from the satellite being down-converted to a lower (block) range of frequencies in the cable to the receiver. Satellites broadcast mainly in the range 4 to 12 to 21GHz. The diagram shows the input waveguide on the left which is connected to the colleting feed or horn. As shown there is a vertical pin through the broad

INTERNATIONAL RESEARCH JOURNAL IN ADVANCED ENGINEERING AND TECHNOLOGY (IRJAET) E - ISSN: 2454-4752 P - ISSN : 2454-4744
VOL 5 ISSUE 2 (2019) PAGES 4335 - 4340
RECEIVED : 10.03.2019 PUBLISHED : 12.04.2019
April 12,2019

side of the waveguide that extract the vertical polarization signals as an electrical current. The satellite signals first go through a band p[ass filter which only allows the intended band of microwave frequency to band pass filtered frequency.

B. FREQUENCY TO VOLTAGE CONVERTER

This IC is basically a voltage to frequency converter but it can be used as a frequency to voltage converter. Its applications also include A to D conversion and long term titration. In this circuit, LM331 is used to convert frequency into voltage. The voltage on the output is proportional to the frequency at the input.

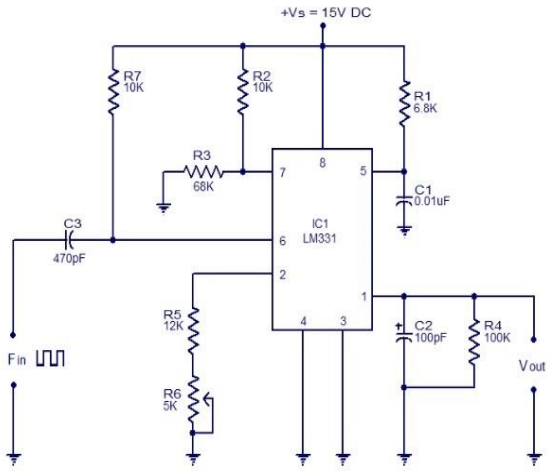

Fig.3.3 voltage to frequency circuit diagram

It is an 8 pins IC. The source is connected to pin 8 and supplies 15v DC. Pins 3 and 4 are connected to round. The input frequency is given at pin 6 and the output voltage is taken from pin 1. The input frequency is differentiated by using the resistor R7 and capacitor C3 and then the resultant pulse train goes to pin 6. The timer circuit gets triggered by the built–in comparator circuit in the IC when the negative edge of the pulse train appears at pin 6. The current flowing out of pin 6 is proportional to the values of capacitor C1 and resistor R1 and the input frequency. Therefore we get the output voltage across the resistor R4 which is proportional to the frequency of the input. 15v DC is used in this circuit but the operating voltage of IC can be between 5 volts to 30 volts DC. The value of the resistor R3 is dependent upon the supply voltage.

C. SOLAR PANEL

Photovoltaic solar panels absorb sun light as a source of energy to generate electricity. A photovoltaic module is packaged, connected assembly of typically 6*10 photovoltaic solar cells. Photovoltaic modules constitute the photovoltaic array of a photovoltaic system that generates and supplies solar electricity in commercial and residential applications. The most common application of solar energy of collection outside agriculture is solar water heating systems.

D. INVERTER CIRCUIT

INTERNATIONAL RESEARCH JOURNAL IN ADVANCED ENGINEERING AND TECHNOLOGY (IRJAET) E - ISSN: 2454-4752 P - ISSN : 2454-4744
VOL 5 ISSUE 2 (2019) PAGES 4335 - 4340
RECEIVED : 10.03.2019 PUBLISHED : 12.04.2019
April 12,2019

A power inverter or inverter is an electronic device or circuitry that changes direct current to alternating current. The input voltage and frequency and overall power handling depend on the design of the specific device or circuitry. Static inverters do not use moving parts in the conversion process.

E. STEP UP TRANSFORMER

A transformer is a static electrical device that transfers electrical energy between two or more circuits. A varying current in one coil of the transformer produces a varying magnetic flux, which in turn, induces a varying electromotive force across a second coil wound around the same core. Electrical energy can be transferred between the two oils, without a metallic connection between the two circuits. Faradays law of induction discovered in 1831 described the induced voltage effect in any oil due to changing magnetic flux encircled by the coil. Transformers are used for increasing or decreasing the alternating voltages in electric power applications, and for coupling the stages of signal processing circuits.

4. HARDWARE RESULT

The best way to implement my ideas and view is to develop them in form of hardware, which will be useful or us to drive and find any practical difficulties in the implementation. As per the conditions it is the best way to develop co-designing process where both the hardware and software programming should synchronize mutually the hardware and software design specification is done initially such that which is suitable for what sort of operations to be performed. As far as this project is concerned the hardware is basically designed for domestic home application of water heating and industrial water heating purpose.

SIMULATION OUTPUT

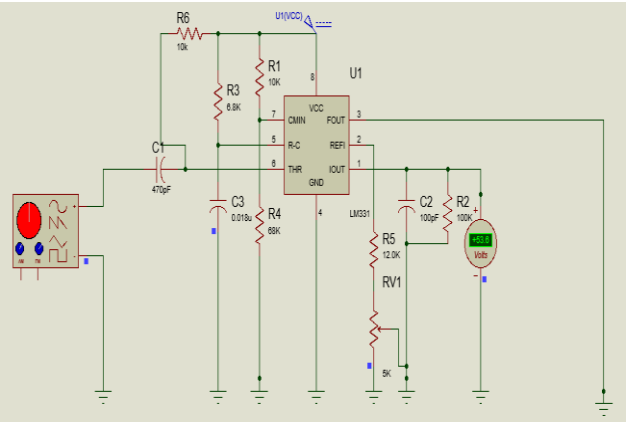

Fig. 5.1 simulation output

10 to 500 KHz frequency is given to the frequency to voltage converter circuit the output of the circuit around 50 V DC.

INTERNATIONAL RESEARCH JOURNAL IN ADVANCED ENGINEERING AND TECHNOLOGY (IRJAET) E - ISSN: 2454-4752 P - ISSN : 2454-4744
VOL 5 ISSUE 2 (2019) PAGES 4335 - 4340
RECEIVED : 10.03.2019 PUBLISHED : 12.04.2019
April 12.2019

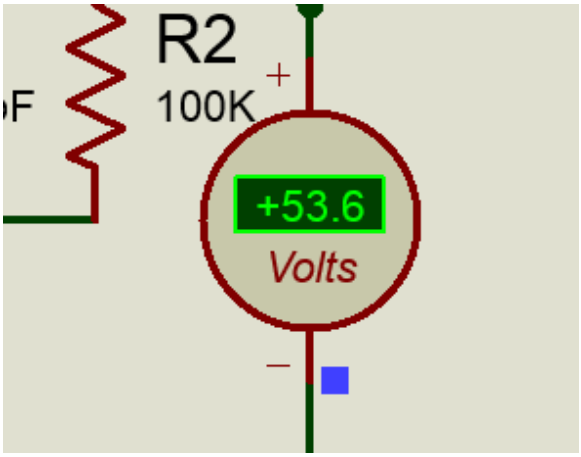

Fig.5.2 voltmeter reading

CONCLUTION

In this project a novel idea is proposed to efficiently power generation from the satellite and solar renewable resource. So uninterrupted power generation and utilization from the project. And most useful to the direct consumers. Because they need every day purpose of water heater for drinking and bathing. So in this project full and fully used advanced technique.

REFERENCE

[1] Back jamali and aydin babajhini "A 0.2- 2.6 GHz instaneous frequency to voltage converter in 90 nm CMOS"rice university, houston, tx, 77005, rws 2016.

[2] Djemouai, M. sawam, M. slamani" High performance integrated CMOS frequency to voltage converter, "in proc 1998 tenth international conference on micro electronics.

[3] Lebanon's marker domestic solar water heaters; energy for sustainable development17 (2013) 54-61

[4] Ruchi sulka, k.sumathy, philips erickson, jiawei Gong, recent advances of solar heating systems. A renewable and sustainable energy revise 19(2013)173-190

[5] S.cui V. Acharya," A low power and wide tuning range frequency locked loop for a cognitive radio system," in proc. 2009 IEEE radio and wireless sympathy San Diego, CA pp.364-367.

[6] TVs. sulthan babji'' frequency to voltage converter, using the BJT components,"in year of 2001-2002.

[7] visuvinesh " frequency to voltage converter, using microcontroller",in proc.2005- IEEE, micro controller based frequency generation . In the year of 2005-2006.

[8] z, zhao,k.h.wu, and j.s. Lai, "utility grid with high penetration PVmicro inverters operating under burst mode using simplified simulation model" in proc. Energy convers. Congr. Expo., 2011,pp.3928-3932.