

Type of article

# Power Management System using Hybrid Ac Micro Grid

D.Santhosh kumar<sup>1</sup>, V.Lavanya<sup>2</sup>, S.Muthulakshmi<sup>3</sup>

<sup>1,2,3</sup> Assistant Professor, PG Scholar, Department of EEE , Vivekanandha College of Engineering for Women Tiruchengode, India

**Abstract** - The energy will be generated in the non polluting source like the wind and solar the DGS is used for the managing the demand. For high penetration level it get the fast signal response because of the losses will be occurred by the sudden variation source. Suddenly the energy will increases and decreases due to the waves of sun and air. When this scheme it reduces the losses of energy and load at once. And the storage capacity is high. It improves the strategy for power management and it reduces the variation, load from the storage device. The demand of this scheme is focused on the energy base on the frequency improvement. This method is used to reduce the storage then impacts of microgrid due to the load fluctuation. It estimating the capacity without overflow size. The performance is good and experimental test used at any time.

**Keywords** - Photovoltaic (PV), Power Flow Control (PFC), Resistor Capacitor Diode (RCD), Decentralized Generation Systems (DGs).

## I. INTRODUCTION

When converter is used both AC and DC for active power factor correction because of to reduce the demand, harmonic pollution and then the efficiency is more[1]. The converter is divided into two parts

1. Single stage
2. Double stage

When using the double stage converter they are two processes is power flow control and voltage stability [2]. In this scheme they are mainly used for very good act such as humanizing power factor and diminishing the electrical energy anxiety. It experience the drawbacks of this system is module count, larger in volume, expenditure is more and the control translation is also low in single stage PFC converter[3]. In general power flow control and converter stage compulsory to contribute to ordinary switch. It decreases the count of sum module and become straightforward be in charge of complexity [4].

The solitary-stage converters are used the lower outlay and influence application. When using the Boost and fly back PFC converter it is commonly used in this stage[5]. A DC bus capacitor buffer for two differences one is the input power is instantaneous and the other one is output power.

Higher power issue and the productivity electrical energy are strongly regulated [6][7]. When RCD is used to take up the flow of power from side to side the leakage inductance.

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## II. PROPOSED METHODOLOGY

### A. Block Diagram

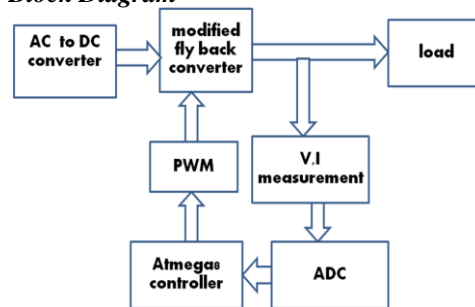


Fig. 1 Block diagram

### B. Boost PFC Converter

The design of ground referenced switch and single switch is most popular to PFC devices its because of power circuitry and then the control scheme is simple. And then less input power distortion is the reason to popular. The limitation of fact is the voltage inputs are lesser than its output[8][10].

### C. Fly Back PFC Converter

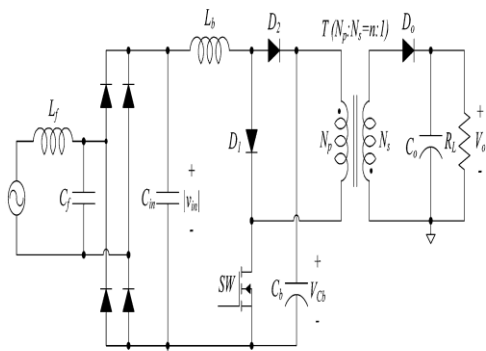
In this scheme less popular topology of PFC converter design because the difficult to control amateur to the 2 pairs of an un damp multifaceted poles. Then voltage output not necessarily limited to its input voltage. The output will be more or less then the input. It does not want to additional DC/DC stage of LED application. The converter will be reducing the input power ripple by incorporating 2properly wound inductances. Power loss occurs due to its current ripple will be reduced.



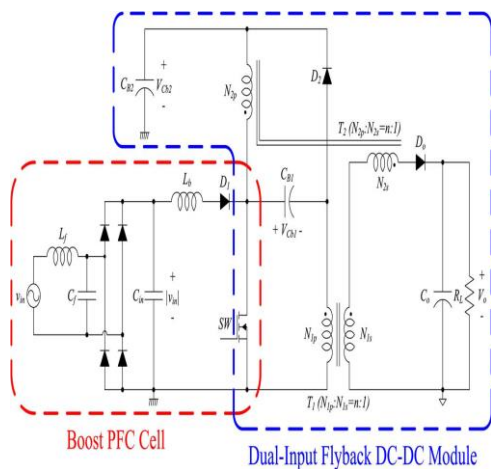
**D. Bridgeless FLYBACK Converter**

There is only one energetic control that will make topology straightforward except two inductors and capacitors makes the model difficult. Switch on and off time is depends on the operation and its each cycles is in positive half cycles [9]. Power loss will occurs when the current is circulated but it does not affect the efficiency but it affects the system performances. Diminutive signal linear analysis they perform while quasi-static circumstance then the participation and the productivity will be in the constant voltage level the switching is more than the line frequency[10].

**III.POWER MANAGEMENT SYSTEM**



**Fig. 2 power management system**



**Fig. 3 Fly Back DC-DC Module**

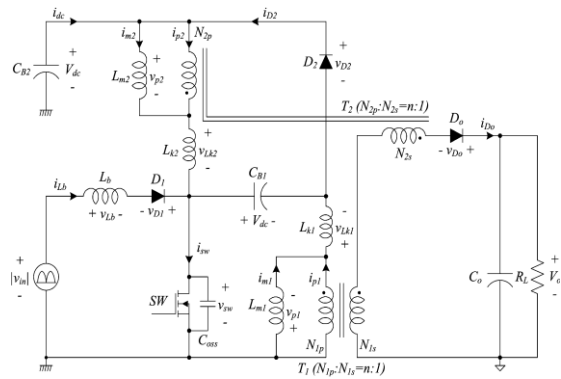
**A. Operation Mode Analysis Switch-On stage**

The on-time button S1 is resting on and then the D1 is rotten. The enter side L1 be exciting into the contribution electrical energy, C1 transfers the get-up-and-go into production elevation of Lo, and Lo is charge in this stage. In toting up the consignment existing come from the emotional output Co.

**Switch-Off stage**

The off-stage S1 is off and the D1 will be on. L1 charges the C1 and it provides the load current. The L2 is connected to the load and it charges the output Co and provides the load current. According to the voltage per second then the capacitor will be balancing a

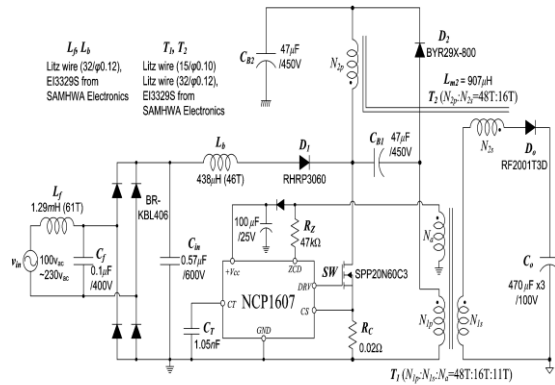
charge.



**Fig. 4 Circuit of Fly back Module**

To rising power factor, a make better PFC cell will work in DCM [6]. For galvanic segregation and gorge-switch function a dual-input fly back converter module, which consist of similar main windings and sequential less important windings, is calculated to operate in the CRM[5].

**B. Prototype Circuit of Converter**



**Fig. 5 Prototype Circuit of Converter**

**C. Atmega Controller**

Atmel mega AVR microcontrollers (MCUs) requiring higher cost of code, that the strategy present large plan and information reminiscences with presentation is far above the ground up to 20 MIPS. It reduces the power consumption. All mega AVR devices offer such faster for self-programmability, secure and effective in cost of the circuit. The Flash memory is upgrade in running your application. Widest assortment of strategy based on reminiscences, badge-count and peripherals. These comprise everything from general-purpose devices to models like PTC, USB, LCD controllers, as well as CAN, LIN and PSC. AVR devices feature ultra and independently selectable near to the ground-authority slumber modes that make the battery-powered perfect and it used in applications. Increasingly, the sequence driven, thus authority use it often becomes the input achievement

factor it is a consumer-gracious IoT-enable product and its power consumption application.

#### D. Modified Bridges Fly Back Converter Model

The system as have high possibility of instability. The method can reduce the reactive power effect needs to be considered to make a stable system. This scheme consists of uncertain interrupt. In addition, the damp route wills makes manager design a great deal easier than towering Q-issue. The R-C damp course the force will remove in corresponding circuit then capacitor is adopt to decrease the Q-factor and to stop from ebb and flow recent issue.

### IV. SIMULATION RESULTS

In order to verify the designed analog controller, simulations using simulation software PSIM are performed with verified parameters in chapter. In this simulation, MOSFETs and diodes are assumed as ideal devices and the other parameters of the power stage are same as design specifications. Simulation Result with Analog Controller, PSIM has a simulation model of the control IC, UC3854, which is used for analog controller implementations. All parameters including control parameters. As a result of simulation, a power factor of the simulation result is about 99% and total harmonic distortion is about 11%. This simulation is done with same controller parameters as designed. This simulation runs under the full-load condition.

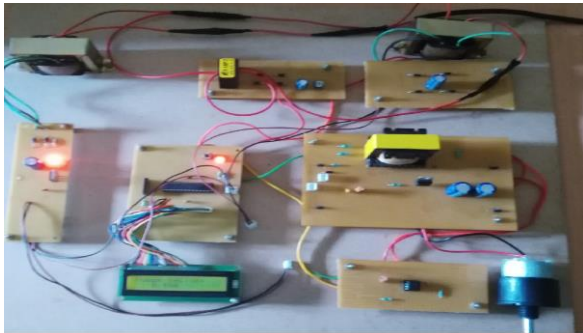


Fig. 6 Hardware Diagram

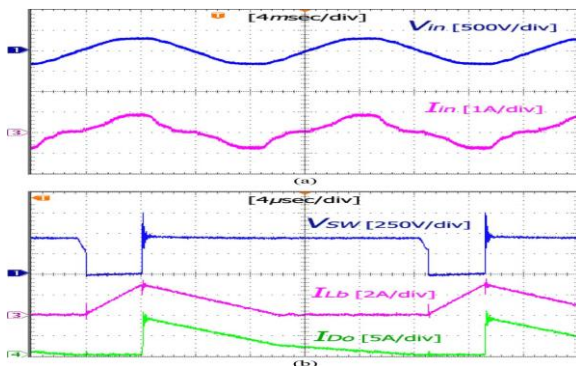


Fig. 7 Output Waveform

### V. CONCLUSION

The well-organized on its own-control increase-twin-contribution fly back converter has been used. Because the make better power flow control compartment operate in DCM, a far above the ground authority issue is achieve. The twofold-contribution fly back converter component, the switch defeat is considerably abridged due to the CRM process. In adding together the sum control adaptation good organization is better for the reason that some of the contribution power is in a straight line transfer to the consignment by the double effort of the scheme. Furthermore the engrossed force from the leakage inductors . In the prospect employment the ZVS process of the knob, not valley-switching function , will be deliberate for good organization upgrading. The hypothetical examination plan equations and new fallout have been provide.

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