



INPUT BRIDGELESS RESONANT AC-DC CONVERTER FOR AC SUPPLY

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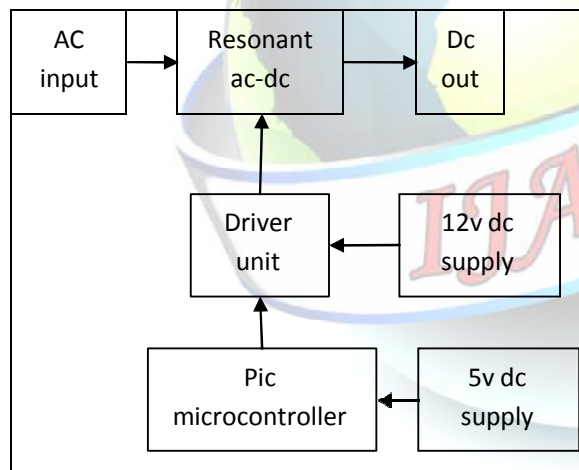
FINAL YEAR, DEPT OF EEE ,SCSVMV UNIVERSITY,KANCHIPURAM,INDIA

ABSTRACT

Ac supply as input source to bridgeless resonant AC-DC Converter to find boost voltage dc side.

This manuscript proposes a input bridgeless resonant ac-dc converter to achieve ac-dc conversion, step up voltage and match optimal impedance for a channel electromagnetic energy harvesting system. Alternating voltage is stepped up through the switching LC network is then rectified by a freewheeling diode..

Proposed block diagram



Proposed system

Efficiently convert low-amplitude alternative voltages of ac input into a regulated dc output voltage.

The topology is capable of interfacing multiple, independent, alternating, input sources without using a diode bridge.

Very-low-amplitude voltages can be stepped

number of input sources result even in higher output voltage.

The resonance nature of operation eliminates the switching losses, and allows high frequency switching.

It also enables miniaturization through using substantially smaller capacitive and magnetic components.

Furthermore, this topology reduces the voltage stress on power transistors.

Resonant AC-DC Converter

New input bridgeless resonant ac-dc converter, is proposed to efficiently convert low-amplitude alternative voltages of multiple EMR generators into a regulated dc output voltage.

The topology is capable of interfacing multiple, independent, alternating, input sources without using a diode bridge.

Very-low-amplitude voltages can be stepped up to a relatively high voltage. Larger number of input sources result even in higher output voltage.

The resonance nature of operation eliminates the switching losses, and allows high frequency switching.

It also enables miniaturization through using substantially smaller capacitive and magnetic components.

The multi-input converter uses the self-inductance of input sources, and only utilizes one magnetic component and one diode.

Pic microcontroller

PIC micro controller is used to generate PWM pulse for switch.

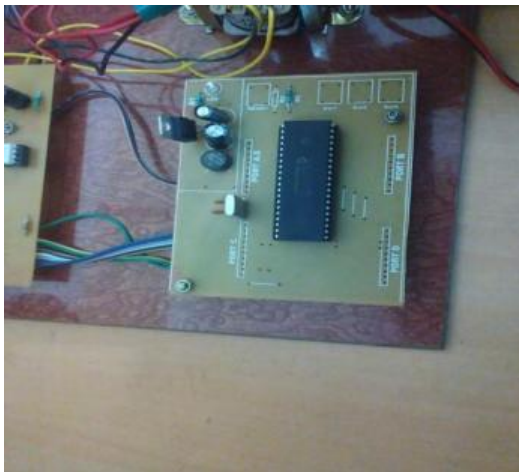
It is called pulse generate unit.

We can get 20 PWM pulses from 40 pin ic (PIC 16f877a)

PIC micro controller's output is dc signal.

Its output is a 5v dc signal.

To generate PWM pulses from PIC ic, Dc supply is supplied to PIC ic.



Hardware-Driver unit

Driver unit is set of optocoupler, resistor half wave rectifier circuit.

It is used to amplified PIC dc signal from 5v dc signal to 12v dc signals to switch(MOSFET).

To operate Driver unit, it is need 12v dc supply.



Advantages

- Low cost
- Single switch only used

Tools used

- Matlab

Output

- Hardware

Conclusion

This manuscript introduces a multi-input bridgeless resonant ac-dc converter suitable for efficient, low-voltage, low-power, ac-dc power conversion of ac input. The multi-input single-stage topology is capable of directly converting independent, low-amplitude, alternative voltages of AC input to a stepped-up dc output voltage with relatively high efficiency. Low-frequency alternating voltages of AC supply is first converted into a high-frequency alternating voltage through an LC network and then it is rectified into a dc output voltage through a soft-switched diode. Optimal electrical impedance matching is achieved through proper LC network is design and PFM control to scavenge maximum power of AC input. In addition, high-frequency is soft-switching and increases the potential of size and miniaturization without suffering from switching losses. The topological concept, presented in this manuscript, can be adapted for rectification of any inductive voltage sources or electromagnetic energy-harvesting device.

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