DC-DC Boost Converter

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ABSTRACT

The DC-DC converter is an electrical circuit that transfers energy from a DC voltage source to a load. A boost converter (step-up converter) is a DC-to-DC power converter with an output voltage greater than its input voltage. It is a class of switched-mode power supply (SMPS).

In this Project, it will build a system which can step up the input voltage which is boost converter with the 12V battery input. This project have a solar charger and it have a display system to display the digital voltage level of solar panel and output voltage. The output voltage of this project can be adjustable.This project mainly content few part of system which is, the input part which has battery charger, then is the power electronic circuit which is boost control, the display system, output control. The display system and output control is controlled by the microcontroller PIC16877A.

For decide the value of the component used in this project, there are few experiment has done before decide, which is investigate the resistor value of adj pin of LM137 and the output current and voltage , the relationship between frequency, value of inductor , duty cycle with the output voltage of boost converter.

In the result of LM317 show that, the lower value of R1 current limit is higher and the power lost is higher. In the result of boost converter show that, the relationship between the inductor and frequency switching is inversely proportional to the output voltage and the relationship between of duty-cycle and the output voltage is directly proportional.

In conclusion the expected output of this project has been achieved, the output voltage of this converter can be adjusted but it still not very accurate value, so if want to solve this problem it must use the microcontroller to auto adjust the duty-cycle.