The design of a Novel Photovoltaic Charge/Discharge controller

葉名財、鍾翼能

E-mail: 9314951@mail.dyu.edu.tw

ABSTRACT

In this thesis, a high-efficiency high step-up converter, which consists of an energy clamp circuit and a voltage boost, is proposed. The boost converter functions as an active clamp circuit to suppress the voltage spike on power switch during the turn-off transient period. The boost converter output terminal and flyback converter output terminal are serially connected to increase the output voltage gain with the coupled inductor, a high voltage gain is achieved with less voltage stress on the power device, such as power MOSFETs and power diodes. The proposed scheme can easy to apply in photovoltaic applications. The battery can be charged through solar energy power and the magnetizing current which from the magnetizing inductance, and discharge to the load through the output terminal. A Sinusoid pulse width modulation (SPWM) AC output converter, which control by microcontroller, will simulation and experimental results is presented to demonstrate the performance. It shows that the proposed converter has high efficiency output.

Keywords : high step-up converter, active clamp circuit, voltage stress, Sinusoid pulse-width-modulation (SPWM).

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