عنوان مقاله:

Design and control of the high Step-Up DC-DC Converter with coupled inductor technique for renewable energy applications and controlling solar panel and DC motor speed

محل انتشار:

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نویسندگان:

Tina Alidoust - *Faculty of Electrical and Computer Engineering, University of Tabriz, Tabriz, Iran*

Ali Nadermohammadi - *Faculty of Electrical and Computer Engineering, University of Tabriz, Tabriz, Iran*

خلاصه مقاله:

This paper proposes a new non-isolated high step-up DC-DC converter with high voltage gain which is suitable for renewable applications. Also, the proposed converter utilizes coupled inductor technique and voltage multiplier cell (diode-capacitor) for increasing the voltage gain. The voltage gain of the proposed converter can be increased by selecting the appropriate turns ratio of the coupled inductor. The input ripple of the proposed converter is low and the lower input ripple causes the utilization of the proposed converter in renewable energy applications. The utilized solar panel in the proposed converter is an alternative to other power supplies that leads to diminishing air pollution and supply the shortage of fossil fuels. As well as, the solar panel of the proposed converter, single power switch, and DC motor speed controlled by PI controller. The zero current switching (ZSC) of the diode is obtained in the OFF state that decreased conduction losses. The proposed converter is simulated in MATLAB and the operation validity of the proposed converter is proven with MATLAB simulation.

کلمات کلیدی:

High step-up DC-DC converter, Coupled inductor technique, Control of DC motor speed, Renewable energies, Zero current switching