

عنوان مقاله:

A New Multi-Input DC/DC Converter with Coupled and Switched Inductor applicable for Renewable Energy Sources

محل انتشار:

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خلاصه مقاله:

To overcome the low output voltage of Renewable Energy Sources (RESs) such as photovoltaic arrays (PVAs) and fuel cells, a new multi-input DC/DC converter is presented in this paper. This converter is based on a combination of modified quadratic buck-boost converters, Switched Inductors (SIs), and Voltage Multiplier Modules (VMMs). The high voltage gain can be achieved by adjusting the duty cycle and turn ratio of the coupled inductor of VMM. This structure inherits all the advantages of the SEPIC converter and using a bidirectional input port (in which an Energy Storage System (ESS) can be connected) and several unidirectional input ports. The load power can be flexibly divided among various power sources. Due to the buck-boost characteristics of the presented converter, it is suitable to charge-discharge the ESS. A Coupled Inductor (CI) is used to couple energy from input to the output equipped with the VMM. Moreover, the use of SI reduces the rise time and ripple of the input current. The stability of the proposed converter against momentary changes of VPV and Ro is the main advantage of this converter. Moreover, considering a secondary ESS as Vi instead of PV allows the converter to be active ۲۴ hours a day. In this converter, the use of two ESSs guarantees the supply of the required output power. In addition, two bidirectional input ports prepare the ESSs charging and discharging capabilities. To verify the analysis and feasibilities of the proposed converter, simulation results are presented.

کلمات کلیدی:

Coupled Inductor (CI), Energy Storage System (ESS), High Step-Up DC/DC Converter (HSUDC), Multi-Port Converter (MPC) Renewable Energy Sources (RES), Switched Inductor (SI)

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