Design and Implementation of Photovoltaic Inverter system usingMulti-cell Interleaved Fly-back Topology

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Abstract: In the current scenario, the world's interest revolves around renewable energy. This project presents the design and implementation of photovoltaic inverter system using multi-cell interleaved fly-back topology operating in continuous current mode. The primary objective of this study is the design of fly-back converter where multi cell are interleaved. The most distinctive feature proposed in this paper is the design of reducing multi-celled transformers into one. Thus the overall cost is reduced by achieving the same efficiency. The output power of the PV module controls each interleaved converter cell. In the fly-back converter, a single controllable MOSFET switch is used with switching frequency is in the range of 100 kHz. It is based on zero voltage switching technique, thus reducing the switching losses. Thus the overall efficiency of the converter is increaser. The design of interleaving reduces the ripple and reduces the usage of capacitors and size of the filter. A MPPT-perturb and observe (P&O) algorithm is implemented in this project for tracking the maximum power from the PV panel. In this design the main heart of the hardware module is the micro controller for MPPT algorithm. The programming language used for developing the software to the micro controller is Embedded C /Assembly. For compilation and debug, KEIL cross compiler is used. Micro Flash programmer is used for burning the developed code on Keil in to the micro controller Chip. The simulation of this project is implemented in Matlab/ Simulink.

Keywords :photovoltaic inverter, fly-back topology, MPPT algorithm, interleaved converter.

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