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GRID-CONNECTED PHOTOVOLTAIC POWER SYSTEM USING BOOST HALF- BRIDGE CONVERTER AND MPPT ALGORITHM

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ABSTRACT

Paper focuses on the power electronics used in the renewable energy systems especially in the photovoltaic applications. In recent years, interest in natural energy has grown in response to increased concern for the environment. Due to the limitations in the energy available from conventional sources, worldwide attention is being focused on renewable sources of energy. Especially, the energy obtained from solar arrays, becomes more and more important. In grid connected applications, a modular micro-inverter integrated with each photovoltaic (PV) panel can reduce the overall system cost and increase the system reliability and MPPT efficiency. In order to make the PV generation system more flexible and expandable, the backstage power circuit is composed of a high step-up converter and a pulse width-modulation (PWM) inverter. The traditional voltage-fed-full-bridge DC-DC converter suffers high cost, low transformer efficiency and discontinuous input current problems. A current-fed-half-bridge converter topology is utilized herewith continuous input current current, low cost and high efficiency features. A single-phase PV micro inverter system with galvanic isolation is presented. By integrating micro inverter to each PV panel, localized MPPT of each individual PV panel can be achieved, thus loading to fast tracking speed and higher system efficiency.

KEYWORDS: PV Array, Boost, Half, Bridge, Grid, Connected Photovoltaic (PV) System, Maximum Power Point Tracking, Repetitive Current Control