

Design and Simulation of Low Cost Boost-Half- Bridge Microinverter with Grid Connection

Authors : P. Bhavya, P. R. Jayasree

Abstract : This paper presents a low cost transformer isolated boost half bridge micro-inverter for single phase grid connected PV system. Since the output voltage of a single PV panel is as low as 20~50V, a high voltage gain inverter is required for the PV panel to connect to the single-phase grid. The micro-inverter has two stages, an isolated dc-dc converter stage and an inverter stage with a dc link. To achieve MPPT and to step up the PV voltage to the dc link voltage, a transformer isolated boost half bridge dc-dc converter is used. To output the synchronised sinusoidal current with unity power factor to the grid, a pulse width modulated full bridge inverter with LCL filter is used. Variable step size Maximum Power Point Tracking (MPPT) method is adopted such that fast tracking and high MPPT efficiency are both obtained. AC voltage as per grid requirement is obtained at the output of the inverter. High power factor (>0.99) is obtained at both heavy and light loads. This paper gives the results of computer simulation program of a grid connected solar PV system using MATLAB/Simulink and SIM Power System tool.

Keywords : boost-half-bridge, micro-inverter, maximum power point tracking, grid connection, MATLAB/Simulink

Conference Title : ICEPE 2014 : International Conference on Electrical and Power Engineering

Conference Location : Singapore, Singapore

Conference Dates : March 30-31, 2014