A new Topology for boost half bridge converter using maximum power point tracking and repetitive current control in grid connected photovoltaic microinverter system

Ali Farokhi*,Yaser Bostani Amlashi,

Abstract The purpose of this study is proposing a microinverter topology with an improved variable step maximum power point tracking algorithm alongside a repetitive current control for elimination of switching noises in output current of the system in both grid connected single phase photovoltaic system and for feeding an single phase asynchronous motor. In this study, basic concepts, algorithms, designing process, different topologies and the way that proposed control strategies will apply to system model and simulation of the system will be discussed. The purposes that in this study has tried to reach includes the following: • Reaching to low total harmonic distortion (THD) in injected current and voltage to grid by photovoltaic side. • Try to access to power factor near unit. • Try to make operating point of the system as close as possible to maximum power point with respect to power-voltage curve of photovoltaic array in different conditions. • Optimal design of grid side controller for reducing the switching noises in photovoltaic system output and making output power as close as possible to optimum reference current and stabilizing the system. • Reducing the number of used semiconductor devices in proposed microinverter topology with the purpose of reducing costs and losses and increasing the system reliability.

Keywords : Converters, semiconductor boost, photovoltaic, micro inverters