Modeling and Maximum Power Point Tracking with Ripple Control of Photovoltaic System

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Abstract:

Abstract - This paper presents parameters determination of photovoltaic (PV) module based on data-sheet parameters using Newton-Raphson iterative method. The characteristic of photovoltaic module are drawn based on the extracted parameters. Simulation and maximum power point tracking (MPPT) are developed using Matlab/Simulink. Incremental conductance (INC) method for MPPT is used to control a dc-dc boost converter with resistive load. Parameters of boost converter are designed to operate in continuous conduction mode. State- space averaging technique is used to control standalone PV module and obtain inductance value for certain amount of ripple in boost inductor current at different temperature and irradiance conditions.

Keywords:

photovoltaic module, MPPT, INC algorithm and state-space averaging

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