

Photovoltaic phase-locked loop circuit board

What is a phase-locked loop control strategy for a grid-connected photovoltaic inverter?

Based on that, a phase-locked loop control strategy for the grid-connected photovoltaic inverter is designed on the customized IP core technology of FPGA. The strategy realizes real-time tracking and adjustment of the phase difference between the photovoltaic inverter system and the grid.

What is a phase-locked loop control strategy?

Based on that, a phase-locked loop control strategy... In traditional grid-connected photovoltaic inverters, the SPWM signal generation process is complex and inflexible, and the phase-locked loop is easily affected by grid fluctuations and voltage waveform distortion. Based on that, a phase-locked loop control strategy...

What is a phase-locked loop (PLL)?

The proposed control scheme uses a phase-locked loop (PLL) to establish the microgrid frequency at the inverter terminals, and to provide a phase reference that is local to the inverter. The proposed controller has been tested extensively in simulation and hardware.

Does phase lock ring affect grid-connected system in a weak grid environment?

In order to study the effect of phase lock ring on the grid-connected system in a weak grid environment, comparing the inverter output impedance bode diagram when considering and without phase lock ring, the inverter output impedance diagram in two cases is shown in Fig. 5.

How a solar photovoltaic system is connected to a grid?

The solar photovoltaic system is connected to the grid through a DC/DC converter and an IGBT-based inverter. To synchronize the inverter with a grid, the phase-locked loop plays a major role in the inverter control. Generally, a basic synchronous reference frame based phase-locked loop is used.

How does a voltage control loop work?

The voltage control loop employs a two pole two zero (2P2Z) compensator and regulates the input DC bus voltage at the reference level V_{bus_ref} by generating the reference current command for the current loop. The current loop forces the inductor current I_L to track the reference signal I_{L_ref} generated by the voltage loop.

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