

A new development of power converter for power management

Tsai, Shih-Chieh; Chen, Shih-Chang; Huang, Kun-Fang; Hsu,
Chao-Hsing; Liu, Wan-Chun; Yu, Chih-Chung;
Chung, Yi-Nung; Chen, Tsair Rong

Abstract

Among all the green energy, solar power is regarded as the best solution. However, the efficiency of photovoltaic (PV) generation systems is very low, and the output power is always changing with the weather conditions. In order to obtain the maximum output power, one maximum power point tracking (MPPT) denoted as Perturbation and Observation (P&O) method is applied. However, the photovoltaic (PV) panel can only generate electricity when there is sunshine. Therefore, in order to use the electricity generated from solar energy, it is necessary to have battery. Moreover, long time supply of electricity may cause insufficient power from the battery. Thus, aside from battery, often it is necessary to combine with the utility power. In this paper, we design a new development of power converter for power management. In this design, utility power, solar energy and battery are used as input power sources, providing different loads of output and as a charger for battery. This research uses a transformer combined with single chip controller to control the input activation control and output regeneration control. With the combined single chip controller, one transformer can reduce the volume and weight of the entire electric circuit.

Key words: Development of power converter for power management;
Perturbation and observation method;
Photovoltaic generation systems