

带有源浮充平台的单相功率因数校正变换器

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摘要

为消除Boost变换器用于两级功率因数校正(power factor correction, PFC)器前级时的升压作用对输出电压的影响, 作者用充电泵功率因数校正变换器构造了有源浮充平台电路, 并将其应用于单相Boost型PFC变换器中, 设计了带有源浮充平台的单相功率因数校正变换器。该变换器保持了传统Boost型PFC变换器的优点, 输出电压大大降低, 拓宽了PFC电路的应用范围, 为设计后级DC-DC变换器提供了便利。仿真分析和实验结果均表明, 该变换器的输出电压大大降低, 可实现单位功率因数校正, 具有良好的动态性能。

关键词 [功率因数校正\(PFC\); Boost变换器; 有源浮充平台; 单周控制](#)

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A Single Phase Power Factor Correction Converter with Active Floating Charge Landing

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Abstract

Due to the step-up characteristic of Boost converter, the output voltage is higher than the peak value of the input voltage. When Boost converter is applied as the pre-regulator of two-stage power factor correction (PFC) converter, in order to eliminate the affect of its step-up characteristic on output voltage, based on power factor correction converter using charge pump, the authors construct active floating-charge-landing (FCL) circuit and apply it to single-phase Boost type of PFC converter, for this purpose a single-phase PFC converter with active FCL is designed. The designed converter keeps on the advantages of traditional Boost type of PFC converter, its output voltage is evidently reduced, the application range of PFC circuit is widened and offers convenience for the design of DC-DC converter in fo1lowing stage. Simulation and test results show that the proposed converter can reduce output voltage and implement unit power factor correction, and its dynamic performance is satisfactory.

Key words [power factor correction \(PFC\); Boost converter; active floating-charge-landing; one-cycle control](#)

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