

一种新型有源次级钳位全桥零电压零电流软开关PWM变换器

成庶¹;陈特放¹;余明扬¹

中南大学信息科学与工程学院¹

收稿日期 2006-11-16 修回日期 网络版发布日期 2008-5-10 接受日期

摘要

提出了一种新型的全桥移相零电压零电流变换器拓扑结构。新的变换器通过导通副边辅助电路中的钳位 MOSFET, 使得滤波电感两端电压被钳位为零, 输出滤波电容的电压全部作用在原边漏感上, 实现原边电流的迅速复位, 从而创造出良好的滞后臂零电流开关(zero current switching, ZCS)条件。新拓扑在有效零电压零电流开关(zero voltage zero current switching, ZVZCS)范围, 最大占空比等方面都优于其它拓扑结构。该文详细分析了新拓扑的工作过程和各项特性, 并试制样机, 验证了理论分析的正确性和新拓扑的有效性。理论分析和实验结果都证实了新拓扑非常适合中大功率场合应用。

关键词 [变换器](#) [全桥](#) [移相](#) [软开关](#) [有源次级钳位](#)

分类号 [TM 46](#)

A Novel FB-ZVZCS PWM Converter Using Improved Secondary Active Clamping Circuit

CHENG Shu CHEN Te-fang YU Ming-yang

Abstract

A novel full bridge (FB)-phase shift (PS)-zero voltage zero current switching (ZVZCS) converter is proposed. By turning on the clamp MOSFET during the primary current circulating period, this converter clamps the voltage on the output filter inductor at zero, so the voltage of the output filter capacitor is reflecting to the primary, and is applied to the leakage inductance to quickly reset the primary circulating current. This new topology has advantages in several aspects such as effective ZVZCS range, maximum duty cycle and so on. The operations and characteristic of the new topology are presented in detail; the features, analysis and design considerations are illustrated and verified on a prototype. Both the theory analysis and the experimental result proved that the new topology suits high power and high voltage output application perfectly.

Key words [converter](#) [full-bridge converter](#) [phase shifting control](#) [Rayleigh criterion](#) [secondary active clamp](#)

DOI:

通讯作者 成庶 lryan_cheng@yahoo.com.cn; DiNozzo_Cheng@hotmail.com

作者个人主页 成庶 陈特放 余明扬

扩展功能

本文信息

- ▶ [Supporting info](#)
- ▶ [PDF \(390KB\)](#)
- ▶ [\[HTML全文\]\(OKB\)](#)
- ▶ [参考文献\[PDF\]](#)
- ▶ [参考文献](#)

服务与反馈

- ▶ [把本文推荐给朋友](#)
- ▶ [加入我的书架](#)
- ▶ [加入引用管理器](#)
- ▶ [复制索引](#)
- ▶ [Email Alert](#)

相关信息

- ▶ [本刊中 包含“变换器”的 相关文章](#)
- ▶ 本文作者相关文章

- [成庶](#)
- [陈特放](#)
- [余明扬](#)