

电力系统

一种新型的零电压零电流转移DC-DC变换器

林国庆

福州大学电气工程与自动化学院¹

收稿日期 2006-4-12 修回日期 网络版发布日期 2007-11-5 接受日期

摘要

提出了一种新型的零电压、零电流转移DC-DC变换器,即通过采用两条辅助谐振网络实现了全部主、辅开关管的软开关,主开关管实现了零电压零电流开通、零电压零电流关断,开关管电压电流应力小,辅助开关管实现了零电流通断,特别适用于以IGBT作为开关器件的高电压大功率场合。并以其在Boost变换器的应用为例分析了它的工作原理,软开关实现条件,给出了谐振参数的设计方法,该软开关设计思想可以推广到其它基本的DC-DC变换器中。电路仿真和实验结果验证了所提出的方案是可行的。

关键词 [零电压零电流转换](#) [软开关](#) [DC-DC变换器](#)

分类号 [TM46](#)

A Novel Zero-voltage and Zero-current Transition DC-DC Converter

Abstract

a novel zero-voltage and zero-current transition dc-dc converter is presented in the paper. Soft-switching of the main switch and auxiliary switches can be achieved by using two auxiliary resonant networks. The proposed converter has such advantages as zero-voltage and zero-current turn-on and zero-voltage and zero-current turn-off for the main switch without increasing voltage and current stress, zero-current turn-on and turn-off for auxiliary switches. It is very attractive for high power application where igbt is predominantly used as the power switches. Its operation principle is analyzed through its application to the boost converter. The condition of soft-switching and the design considerations are analyzed in detail. The novel soft-switching cell can be also used in other basic dc-dc converters. Some experimental measurements are used to verify the theoretical prediction and analytical discussion.

Key words [zvzct](#) [soft switching](#) [DC-DC converters](#)

DOI:

通讯作者 林国庆 lgqe@sina.com; lgqe@163.com

作者个人主页 林国庆

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(264KB\)](#)

▶ [\[HTML全文\]\(OKB\)](#)

▶ [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](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“零电压零电流转换”的相关文章](#)

▶ 本文作者相关文章

· [林国庆](#)