基于零电压开关的 X 射线高压电源设计

中文摘要

X 射线高压电源现在已经应用于生活中的许多方面，但也存在一定的能量损失，研究损失的来源，并寻找相应方法改进并试验其可行性。X 射线高压电源连接 PWM 型电源，它一般是以硬开关模式达到运行的目的。运行的时候电压波形出现重合，能量流失过多。高频化能够达到减小占用空间、重量的要求。它也能加大开关的能量的流失。为此，我要学习研究电压/电流波形不重复的方法。本文提出利用零电压开关技术作为直流升压方法。首先，学习零电压开关的理论基础，研究电路工作原理，然后设计零电压开关和高压电路方案。最后结合软件模拟方案可行性。

关键词：零电压开关　X 射线高压电源　高压电路

Abstract

X-ray high voltage power supply is now widely used in all aspects of life, but there will be certain losses, and the source of loss will be studied. The corresponding method is found to improve and test its feasibility. The PWM switching power supply used in X-ray high voltage power supply works according to the hard switching mode, and the voltage waveform overlaps in the switching process, and the loss is large. Although high frequency can achieve the purpose of reducing the occupation of space and weight.It can also increase the energy loss of the switch. To this end, I must learn the method of studying the non-repetition of voltage and current waveforms. In this paper, zero voltage switching technology is proposed as DC boost method. First of all, I want to learn the theoretical basis of zero-voltage switch and the principle of circuit operation. Then, I will design a zero-voltage switch and related high-voltage circuits. Finally, the scheme is simulated by software and its feasibility is verified.

Keywords: zero voltage switch；X-ray high voltage power supply；high-voltage circuit

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