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LED驱动电源

## 高功率因数谐振式无桥型LED驱动电源

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## Resonant Bridgeless LED Driver with High Power Factor

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History +

### 摘要

针对传统LED驱动电源交流输入侧整流二极管导通损耗大的问题,提出了一种高功率因数谐振式无桥型LED驱动电源。该驱动电源利用谐振网络实现了正负极性增益,即无论是正电压输入还是负电压输入,负载端均可以实现正电压输出,进而实现了无桥输入。同时,利用谐振电容电荷平衡实现了各输出支路均流,解决了并联LED串的均流驱动问题。该驱动电源中的双向有源开关仅采用一个控制信号,简化了控制电路。对该LED驱动电源的工作模式及工作特性进行了理论分析。该驱动电源具有结构简单、输出升降压、电气隔离等优点。最后,搭建了一台98 W的实验样机,验证了理论分析的正确性及可行性。

### Abstract

Considering the problem of large conduction loss caused by the rectifier diode on the AC input side of the traditional LED driver, a resonant bridgeless LED driver with a high power factor is proposed, which uses a resonance network to realize positive and negative polarity gain. As a result, whether it is a positive or negative voltage input, the load terminal can always realize a positive voltage output, thus realizing bridgeless input. At the same time, the charge balance of resonant capacitor is used to realize current sharing of each output branch, which solves the problem of current sharing driving of parallel LED strings. The bidirectional active switch only uses one control signal, which simplifies the control circuit. The operation modes and working characteristics of the proposed LED driver are theoretically analyzed. This LED driver has advantages of a simple structure, output voltage step-up/down gain, and electrical isolation. Finally, a 98 W experimental prototype was built, and results verified the correctness and feasibility of theoretical analysis.

### 关键词

LED驱动电源;谐振;无桥;均流

### Key words

LED driver;resonant;bridgeless;current balancing

### 引用本文

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