

大功率白光LED驱动电路的双环检测方法

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摘要：

基于CSMC 0.5 μm 标准CMOS工艺，设计了一种带有双环检测的大功率LED恒流驱动芯片。仿真结果表明，芯片可在2MHz频率下工作，驱动电流最高可达1.5A，在24V电源电压时，电源效率可达95%。当电源电压在6V跳变 $\pm 10\%$ ，驱动1W 350mA的LED时，LED电流精度达0.02%。对比单环检测模式，该电路的LED驱动电流响应时间缩短了近2/3。此模式在保持高精度恒流和高效率的同时，有效地缩短了LED驱动电流的响应时间。

关键词：大功率LED；恒流驱动；双环检测；电源电压传感；PWM

A double loop detection method of the power white LED driver circuit

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Abstract:

A power LED constant-current driver with double loop detection is designed with 0.5 μm standard CMOS process provided by CSMC. The simulation results show that the chip can work under 2MHz and its driving current can reach to 1.5A. When supply voltage is 24V, its power efficiency can reach to 95%. While driving a LED of 1W/350mA and supply voltage varies $\pm 10\%$ on 6V, the LED current changes only 0.02%. Compared to single loop detection, the response time of LED current is shortened by 2/3. It shortens the response time of LED current while maintaining high precision of constant current driving and high efficiency.

Keywords: power LED; constant-current driver; double loop detection; power supply-sensor; PWM

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