



器件制备及器件物理

结温对GaN基白光LED光学特性的影响

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摘要：制备了一个可测量n型GaN材料电阻的白光LED样品,测量了从室温到170℃下的LED芯片的n-GaN材料的电阻,发现n-GaN材料的电阻随温度的升高而增大,且两者呈一定的指数关系。利用这一特性,通过测量LED工作状态下内部所用GaN材料的电阻,可以实现对LED结温的测量。通过改变积分球底板温度使LED样品处于不同的结温下,测量了白光LED的光谱及色度学参数,结果表明:白光LED的峰值波长、显色指数、色温、光通量均与结温成一定的线性关系。

关键词：发光二极管 结温 电阻 光谱 色度学参数

Dependence of GaN-based White LED Colorimetric Parameters on Junction Temperature

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Abstract: A white LED sample was fabricated which can be used to characterize the resistance of n-GaN at the range of 20 to 170 °C. The results reveal an exponential relation between resistance and temperature. This relation is utilized to detect junction temperature of LED chip by measuring the resistance of n-GaN in a working LED. The white LED working in different junction temperature was achieved by changing the temperature of its heat sink. Their colorimetric parameters are measured simultaneously. These results show that the peak wavelength, rendering index, color temperature and luminous flux of white LED have a linear relationship with junction temperature.

Keywords: light emitting diodes junction temperature resistance spectrum colorimetric parameters

收稿日期 2013-05-14 修回日期 2013-07-08 网络版发布日期

基金项目:

广东省高校优秀青年创新人才培养项目(2012LYM-0058)资助

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