

[本期目录](#) | [下期目录](#) | [过刊浏览](#) | [高级检索](#)[\[打印本页\]](#) [\[关闭\]](#)

器件制备技术及器件物理

LED封装结构对出光率的影响

宁磊, 史永胜, 史耀华, 陈阳阳

陕西科技大学 电气与信息工程学院, 陕西 西安 710021

摘要：出光率是影响LED发光效率的重要因素之一,优化LED出光率可以提高LED的器件发光效率。文章利用TracePro软件模拟分析封装腔体的形状与出光率关系不大,而封装腔体的张角、封装腔体顶面的凹凸性与出光率有较大出光率还与腔体的高度、封装腔体的反射率、腔体的母线均相关。总之LED封装结构会影响LED出光率,在进行LED封装时,要选择合适结构才能获得较高的LED出光率。

关键词：LED 封装结构 出光率

Influence of Package Structure on LED Light Extraction

NING Lei, SHI Yong-sheng, SHI Yao-hua, CHEN Yang-yang

School of Electrical and Information Engineering, Shaanxi University of Science and Technology, Xi'an 710021, C

Abstract: The light extraction plays an important role in LED encapsulation to obtain a high efficiency. The influence of package structure on LED light extraction was investigated by the TracePro simulation in this work. The results show that cavity shape almost has no effect on light extraction, ratio of light-out depends on the flare angle of cavity, ratio of light-out is related to the height, reflectance and bus of a certain cavity. Overall, the structure of package truly affects the LED light extraction, hence package structure plays a significant role in LED packaging with high light extraction.

Keywords: LED encapsulation structure light extraction

收稿日期 2009-12-31 修回日期 2010-01-14 网络版发布日期 2010-12-20

基金项目:

陕西科技大学博士基金项目

通讯作者:

作者简介: 宁磊(1985-),男,陕西西安人,硕士研究生,研究方向:LED照明光源设计。E-mail:0809007@sust.edu.cn

作者Email:

参考文献:

[1] Li Y Q, van Steen J E J, van Kervel J W H, et al. Luminescence properties of red-emitting $M_2Si_5N_8 : Eu^{2+}$ ($M = Ba$) LED conversion phosphors [J]. *Journal of Alloys and Compounds*, 2006,417: 273-279. [2] Sun X Y, Zhang J H, X, et al. A green-yellow emitting $\beta-Sr_2SiO_4 : Eu^{2+}$ phosphor for near ultraviolet chip white-light-emitting diode [J]. *Rare Earths*, 2008,26(3): 421-424. [3] Zhu Chaofeng, Liang Xiaoluan, Yang Yunxia, et al. Luminescence properties of Tm/Tb/Sm co-doped glasses for LED applications [J]. *J. Lumin.*, 2010,130(1): 74-77. [4] Jung K Y, Kim Y C. Luminescence enhancement of Eu-doped calcium magnesium silicate blue phosphor for UV-LED application [J]. *J. Lumin.*, 2009,129(6): 615-619. [5] Niu Nanhui, Wang Huaibing, Liu Jianping, et al. Enhanced luminescence of InGaN/GaN multiple quantum wells by strain reduction [J]. *Solid-State Electronics*, 2007,51(6): 860-864. [6] Fujii T, Sharma R, et al. Increase in the extraction efficiency of GaN-based light-emitting diodes via surface roughening [J]. *Phys. Lett.*, 2004,85: 855(1-3). [7] Huang H W, Kao C C, Chu J T, et al. Improvement of InGaN-GaN light-emitting diode performance with a nano-roughened p-GaN surface [J]. *IEEE Photonics Technology Lett.*, 2005,17(5): 983-985. [8] 剑清. 照明用LED光学系统的计算机辅助设计[J]. 半导体光电, 2004,25(3): 181-200.

本刊中的类似文章

1. 周羲君, 冯仕猛. 均匀照明LED背光板设计[J]. 液晶与显示, 2012,(6): 774-779
2. 余文佳, 王瑞光, 宋喜佳. 气象预警信息显示终端设计[J]. 液晶与显示, 2012,(5): 677-681
3. 桂劲征, 陈宇, 苗静, 丁柏秀. 基于HVS的LED显示屏亮度均匀性评估方法[J]. 液晶与显示, 2012,(5): 658-665
4. 张建飞, 史永胜, 宁青菊, 牛力. 单级PFC LED驱动电源的研究与设计[J]. 液晶与显示, 2012,(5): 671-676
5. 于洪春, 邓意成, 郑喜凤. 面积约束下的最优阈值法分割LED像素点阵[J]. 液晶与显示, 2012,(5): 653-657
6. 冉峰, 何林奇, 季渊. 无线OLED微显示器系统的设计与实现[J]. 液晶与显示, 2012,(5): 633-637
7. 邱西振, 张方辉, 丁磊. 一体化封装的LED仿真[J]. 液晶与显示, 2012,(4): 499-502
8. 张宝龙, 徐西印, 李丹, 李云峰, 姚连芳, 薛芸芸, 曹雯, 郭海成. 用于CS-LCoS微型投影机的大功率LED驱动电源设计[J]. 液晶与显示