

Study the application of DBR in GaN LEDs

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ABSTRACT

Due to the mature of epitaxy and process technologies, the application of nitride-based LEDs becomes more extensive. In order to improve the junction temperature and reduce the shading effect of electrodes, the flip-chip technology for LED package was also proposed and developed. The light will emit from substrate side surface for flip-chip packaged LEDs. The output intensity can be further enhanced if a reflector is deposited on the top surface of LEDs. In this thesis we have deposited a distributed Bragg reflector (DBR) on the top surface of LEDs to improve the output light intensity. The DBR is composed of SiO₂ and TiO₂. The reflectivity and transmittance were measured for the DBR samples with different pairs. From the measured results, a reflectivity of 91% at wavelength range of 450 ~ 470 nm was obtained from the DBR samples with 7.5 pairs. The light intensity emitted from top surface of the LED with DBR was reduced about 82%. Oppositely, the light intensity emitted from substrate side surface was enhanced about 30%.

Keywords : DBRs、GaN、LED

Table of Contents

封面內頁 簽名頁 授權書	iii	中文摘要	iii
. iv	英文摘要	v	誌謝
. vi	目錄	vii	圖目錄
. ix	表目錄	xi	第
第一章 緒論 1.1 前言	1	1.2 研究背景及動機	1
. 2	第二章 理論介紹 2.1 P-N 接面原理	6	2.2 發光二極體之發光機制
. 8	2.3 發光二極體之工作原理	9	2.4 布拉格反射鏡原理
. 11	第三章 實驗設備及流程 3.1 蒸鍍系統	13	3.2 橢圓偏光儀
. 15	3.3 反射率量測	17	3.4 光強度(L-I)量測
. 18	3.5 元件製作	19	第四章 結果與討論 4.1 二氧化矽及二氧化鈦製備
. 25	4.2 布拉格反射鏡量測分析	26	4.3 LED 特性分析
. 30	第五章 結論	35	參考文獻
. 36			

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