高功率 GaN 發光二極體接面溫度之研究

黃文祥、廖豐標

E-mail: 9708117@mail.dyu.edu.tw

摘 要

發光二極體 (Light Emitting Diode；LED) 為P-N半導體材料結合的光電元件之一，由於LED具有體積小、壽命長、耗電量小、反應速率快等特性。因此，發光二極體產品在市場上開始受到重視，除了交通號誌燈與大型戶外看板外，高功率發光二極體也逐漸在LCD背光模組及固態照明等應用中佔有一席之地。 高功率發光二極體需要大電流驅動，相對下發光層的溫度控制在極為重要，因為在發光主動層高溫會使得發光效率大幅降低，也會影響LED的可靠度。因此，在展現LED的高功率與高效率同時，發光層的溫度也得注意，這種「二高一低」的要求原則下，將主導LED照明的進化時程。 為有效評估高功率發光二極體的散熱機制，需要精確量測高功率發光二極體的接面溫度。我們使用順向電壓法量測發光二極體的接面溫度，並開發完成高功率發光二極體的自動化接面溫度量測系統。因此，在本文中將說明接面溫度對高功率發光二極體的重要性及以順向電壓法對LED接面溫度的量測的優點。

關鍵詞 : 接面溫度 ; 順向電壓法 ; 高功率發光二極體

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