Application of planarization process technique in GaN LEDs

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ABSTRACT

In the past, LEDs were used only for indicator lights and produced a low amount of heat. Today, the introduction of high brightness LEDs with white light and monochromatic colors has led to a movement towards specialty and general illumination applications. This has brought the thermal challenges to the designers ’ attentions. On the other hand, the most obvious challenge with LED lighting is its high initial purchase price tag. However, the cost is expected to eventually decrease to a more competitive level. In order to solve thermal issue and reduce cost, a LED structure with BCB passivation and planarization in this thesis was proposed. A LED with planarization surface is easy to conduct flip-chip package. Flip-chip package can be used to reduce the junction temperature. BCB passivation can be used to save the epoxy package for cost reduction. Comparing with conventional LEDs, a 43.15oC low of junction temperature has been seen from the flip-chip packaged LEDs with BCB passivation.

Keywords : Light Emitting Diode、Junction Temperature、Surface planarization process、Flip Chip

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