Application of Eutectic Process to High-Power Light-Emitting Diode Packages

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ABSTRACT

In this thesis, the eutectic bonding technology is used in high-power light-emitting diodes (LEDs). After the thin-film process, a layer of Ni-Ag alloy was deposited on the back of the wafer, and then annealed. Finally, the metal bonding technique is used for the LED packaging. The thermal image and luminous flux of LEDs with different bias currents, 350 mA, 500 mA, and 750 mA, were measured to compare the eutectic bonding LEDs with the epoxy encapsulated LEDs. The results show that the temperature of eutectic bonding LEDs is lower than epoxy encapsulated LEDs. In addition, the luminous flux of eutectic bonding LEDs is about 19.3% higher than the epoxy encapsulated LEDs. In summary, the performance of high-power LEDs using eutectic bonding technology is significantly better than the use of epoxy encapsulated LEDs.

Keywords : light-emitting diode (LED)、eutectic bonding、metal alloy、epoxy

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