

Heat Transfer Analysis of High Power LED packages

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Light emitting diodes (LEDs) conventionally have been used for indicators. The introduction of high brightness LEDs with white light and monochromatic colors have led to a movement towards specialty and general illumination applications. The increased electrical currents used to drive the LEDs have focused more attention on the thermal managements of LED power packaging due to the efficiency and reliability of LEDs strictly depend on the junction temperature. In this work, we calculated the temperature distribution of LED power packaging as a function of input currents, used materials, and package geometry for a thermal design of high power LED. The temperature of high power LED package increased with the input current, particularly in glass silicon and epoxy resins. The temperature of high power LEDs package decreases with the thermal conductivity of thermal paste and heat slug size. The decrease in temperature is explained by increasing the heat flux through heat slug and heat conduction.