

## Heat Transfer Characteristics of High Power Light-Emitting Diode Packages

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The increased electrical currents used to drive the high power light-emitting diodes (LEDs) have focused more attention on the thermal managements because the efficiency and reliability of the LEDs strictly depend on the junction temperature. To analyze thermal properties of the high power LED package and to propose an efficient heat release method for reliability improvements, heat transfer behavior of the package has been studied in terms of simulation and experiments. The junction temperature of the high power LED package increased linearly with the input current and thus increased the package temperature itself. Particularly, silicone encapsulant and epoxy resin showed a higher temperature distribution due to a heat burden. The thermal stress in the package was increased at intersection edges between the LED chip and silicone encapsulant. The thermal stress of cylinder-shape heat slug was lower than that of other shapes.