

## **Cylindrical shape slug heat conduction numerical analysis using copper material**

### **Abstract**

High power light emitting diodes have the edge over the conventional lighting system in terms of efficiency, low energy consumption and long operational lifetime. Nevertheless, the heat dissipation issue of the high power LED bottlenecks the fulfilment of the potential possessed by the LED. The heat dissipation of LED is evaluated in terms of junction temperature. In this work, simulation was carried out to evaluate the heat dissipation of a single chip LED attached to a copper based cylindrical heat slug. The junction temperature and the stress of the LED chip were scrutinized under natural convection condition with applied input power of 0.1 W and 1 W. Ansys version 11 was utilized for the simulation. For input power of 1 W, the maximum junction temperature and Von Mises of 117.44°C and 229.21MPa was exhibited by the GaN based chip. © 2013 AENSI Publisher All rights reserved.

### **Keywords**

Ansys; Cylindrical copper diamond composite heat slug; GaN LED; Junction temperature