

5mm × 5mm sized slug on high power LED stress and junction temperature analysis

Abstract

Conventional incandescent lamps are being replaced by high power light emitting diode as a lighting source due to its ascendancy in terms of physical size, performance, output and lifetime. Nevertheless, the reliability and efficiency of the LED is dependent on the junction temperature. This study presents the thermal simulation of single chip LED package with 5mm×5mm× 1mm aluminum heat slug. The junction temperature and stress of LED chip were evaluated using Ansys version 11. Input power of 0.1 W and 1 W were applied to the LED. The simulation results showed that at input power of 1W, the maximum junction temperature and stress of the LED chip is 112.91°C and 263.82Mpa respectively.

Keywords

5mm × 5mm heat slug; Aluminum heat slug; Ansys; Single chip LED; Thermal analysis