

Thermal Performance of Radial Heat Sinks for LED Applications

Authors : Jongchul Park, Chan Byon

Abstract : In this study, the thermal performance of radial heat sinks for LED applications is investigated numerically and experimentally. The effect of geometrical parameters such as inner radius, fin height, fin length, and fin spacing, as well as the Elenbaas number, is considered. In addition, the effects of augmentation of concentric ring, perforation, and duct are extensively explored in order to enhance the thermal performance of conventional radial heat sink. The results indicate that the Elenbaas number and the fin radius have a significant effect on the thermal performance of the heat sink. The concentric ring affects the performance much, but the degree of affection is highly dependent on the orientation. The perforation always brings about higher thermal performance. The duct can effectively prevent the bypass of the natural convection flow, which in turn reduces the thermal resistance of the radial heat sink significantly.

Keywords : heat transfer, radial heat sink, LED, Elenbaas

Conference Title : ICAFM 2015 : International Conference on Advances in Fluid Mechanics

Conference Location : Bali, Indonesia

Conference Dates : October 11-12, 2015