

Enhanced thermal conductivity in heat path connected system

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In recent years, effective heat dissipation for the electronic devices has become important as the recent trends for the electronic devices have been miniaturization and high integration. Previously, materials for the effective heat dissipation was usually made of polymer and solid particles such as Al_2O_3 , BN and AlN to achieve high thermal conductivity (k) and good processibility. However, k of composite was relatively low compared to high k of solid powder.

In this research, we suggest heat path connected system and theoretically calculate k of the system as a function of k , size and fraction of bridging particles located between the other solid particles. Through this, we compare k in heat path connected system to k in two particles dispersed system and show design principles for making heat path connected system. In addition, this could result in dramatic increase of k compared to dispersed system.