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Thermal management of electronic components by using computational fluid dynamic (CFD) software, fluent™ in several material applications (epoxy, composite material & nano-silver)

Abstract

This paper presents the thermal management of electronic components, microprocessor by using three dimensional numerical analysis of heat and fluid flow in computer. 3D model of microprocessors is built using GAMBIT and simulated using FLUENT software. The study was made for four microprocessors arranged in line under different types of materials, inlet velocities and package (chip) powers. The results are presented in terms of average junction temperature and thermal resistance of each package The junction temperature is been observed and it was found that the junction temperature of the microprocessors is not exceed 70° C. It also found that the (chip) powers and inlet velocities are the most important elements to control and manage the junction temperature. The strength of CFD software in handling heat transfer problems is proved to be excellent.

Keywords

Average junction temperature; Microprocessors; Nanomaterial; Thermal Management