

Computational Analysis on Thermal Performance of Chip Package in Electro-Optical Device

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Abstract : The central processing unit in Electro-Optical devices is a Field-programmable gate array (FPGA) chip package allowing flexible, reconfigurable computing but energy consumption. Because chip package is placed in isolated devices based on IP67 waterproof standard, there is no air circulation and the heat dissipation is a challenge. In this paper, the author successfully modeled a chip package which various interposer materials such as silicon, glass and organics. Computational fluid dynamics (CFD) was utilized to analyze the thermal performance of chip package in the case of considering comprehensive heat transfer modes: conduction, convection and radiation, which proposes equivalent heat dissipation. The logic chip temperature varying with time is compared between the simulation and experiment results showing the excellent correlation, proving the reasonable chip modeling and simulation method.

Keywords : CFD, FPGA, heat transfer, thermal analysis

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