Prediction of temperature in silicon chip with non-uniform power: a Lagrangian interpolation approach

Abstract

This paper describes a generalized method of predicting the temperature distribution of the silicon chip with non-uniform power dissipation patterns using Lagrangian interpolation function. A simplified heat sink thermal design was modeled to simulate a typical thermal design of microprocessor. Key thermal design parameters investigated are the heat source placement distance and level of heat dissipation. Verification of the proposed method was carried out by comparing the results with FEA predictions. Results of the verification show that the proposed method is reasonably accurate for practical purposes. A successful attempt has been made to predict the junction temperature of silicon chip with non-uniform power distribution in a simple way.