Application of artificial neural network for fatigue life prediction

Abstract

An extensively published and correlated solder joint fatigue life prediction methodology is incorporated by which finite element simulation results are translated into estimated cycles to failure. This study discusses the analysis methodologies as implemented in the ANSYS™ finite element simulation software tool. Finite element models are used to study the effect of temperature cycles on the solder joints of a flip chip ball grid array package. Through finite element simulation, the plastic work or the strain-energy density of the solder joints are determined. Using an established methodology, the plastic work obtained through simulation is translated into solder joint fatigue life [1]. The corresponding results for the solder joint fatigue life are used for parametric studies. Artificial Neural Network (ANN) has been used to consolidate the parametric studies.