Global-to-Local Modeling and Experiment Investigation of a HFCBGA Package Board-level Solder Joint Reliability

陳精一,S.C. Wu,D.S. Liu,C.Y. Ni,T. D. Yuan
Mechanical Engineering
Engineering
meching@chu.edu.tw

Abstract

Due to the high speed and high I/O count for semiconductor package requirements, thousands of soldered interconnections are indispensable, and this situation renders the traditional finite element method (FEM) analysis a formidable challenge. This paper presents a 3-D equivalent global model and local submodeling technique to investigate board-level solder joint reliabillity under temperature cyclic loading. The equivalent global model is capable of addressing cirtical solder failure locations. Individual local solder ball is then used to predict number of cycles to failure. A HFCBGA package case was studied with the provided experiment data. According to the FEM result, predicted solder ball life is close to the experiment data. Therefore, Global-to-Local modeling technique can be concluded to provide an efficient methodology for evaluating very high pin count HFCBGA package reliability.

Keyword：Finite element method, HFCBGA package, solder joint reliability, fatigue life