IOWA STATE UNIVERSITY
Department of Mechanical Engineering

Mechanical Challenges in Semiconductor Packaging Development

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Abstract

To form a microelectronics device, an active silicon chip requires mechanical and electrical connections to surrounding components as well as protection from operating environments. The technology dealing with these requirements is called “Semiconductor Packaging”. The components and systems involved in high-end electronics face ever-increasing demand for enhanced functionality, yet, their sizes are continuously shrinking for portability. More complex mechanical challenges are encountered during development of advanced semiconductor packaging technologies.

The seminar will present an overview of semiconductor packaging, with an emphasis on the mechanical challenges. Development and implementation of advanced experimental and numerical tools to tackle the mechanical challenges will be followed.

Biography

Dr. Bongtae Han is Keystone Professor of Engineering at the University of Maryland; and is currently directing the LOMSS (Laboratory for Optomechanics and Micro/nano Semiconductor/Photonics Systems) of CALCE (Center for Advanced Life Cycle Engineering).

Dr. Han has co-authored a text book entitled "High Sensitivity Moiré: Experimental Analysis for Mechanics and Materials", Springer-Verlag (1997) and edited two books. He has published 12 book chapters and over 250 journal and conference papers in the field of microelectronics, photonics and experimental mechanics. He holds 2 US patents and 4 invention disclosures.

Dr. Han received the IBM Excellence Award for Outstanding Technical Achievements in 1994. He was a recipient of the 2002 Society for Experimental Mechanics (SEM) Brewer Award for his contributions to development of photomechanics tools used in semiconductor packaging. Most recently, he was named the 2016 ASME Mechanics Award winner in Electronic and Photonic Packaging Division for his contributions to structural mechanics of electronic systems. He has received several publication awards including IEEE *Transactions on Components and Packaging Technologies*. He served as an Associate Technical Editor for *Experimental Mechanics*, from 1999 to 2001, and also served as an Associate Technical Editor for *Journal of Electronic Packaging, Transaction of the ASME* from 2003 to 2012. He is currently serving as an Associate Editor for *Microelectronics Reliability*.

He was elected a Fellow of the SEM and the ASME in 2006 and 2007, respectively.

This seminar counts towards the ME 600 seminar requirement for Mechanical Engineering graduate students.

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