



Electronic Cooling/Packaging Seminar Series



Dr. Chia-Pin Chiu
Manager of the Thermal Core
Competency group, Intel

Chia-Pin Chiu is leading Packaging Pathfinding at Intel Corporation in Chandler, Arizona, where he is responsible for packaging technology research and development. His major research included thermal interface materials, thermal characterization metrology, and the development of new cooling solutions. He received his B.S from National Taiwan University, and M.S. and Ph.D. degrees in Mechanical Engineering from the University of Minnesota. He joined Intel's Assembly & Test Technology Development department in 1992 and he was a key developer of thermal solutions for many Pentium-family microprocessors. He has held engineering management positions in many areas including Thermal Characterization Lab, Thermal Core Competency Group, and Thermal Technical Competency Team. He was recognized as a Principal Engineer in Intel's Technical Leadership Program in 2006. He currently holds 31 US patents, 21 pending patent applications, and has published over 70 technical papers. He is a member of ASME, IEEE, and the JEDEC JC15 committee.

Thermal Management for Advanced Microprocessors

Increasing microprocessor performance has historically been accompanied by increasing power and increasing on-chip power density both of which present a cooling challenge. In this presentation, the historical evolution of power is traced and the impact of power and power density on thermal solution designs is illustrated. With the transition to multi-core microprocessor architectures, Thermal Design Power (TDP) is well managed and the design-architecture advancements are pursued to address power efficiency. However, thermal designers still need to account for areas of thermal non-uniformity caused by a non-uniform distribution of power dissipation on the die. In addition to the die, thermal management is also required on interconnect, package substrate, as well as socket contacts. Thus thermal modeling tools and measurement metrology is critical to predict thermal issue in the early-stage of package designs. Industrial and academic researchers have correspondingly increased their focus on developing innovative and cost-effective solutions in devices, circuits, architectures, packaging and system level heat sinking. Examples of some of the current packaging and system thermal solutions are provided to illustrate the strategies used in their design. This is followed by a brief discussion of some of the future trends in demand and solution strategies that are being developed by academic and industrial researchers to meet these demands.

Date: October 22

Rm: 1-390 at 1pm

Hosted by: ME MLK Visiting Prof. Agonafer

MIT Department of Mechanical Engineering