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Interconnect Reliability in Advanced Packaging and Heterogeneous Integration

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IEEE Distinguished Lecturer and Fellow

Location: Birck Nanotechnology Center, 1205 W State St, West Lafayette
Time: Thursday, August 31, 2023,11:30 AM-1:00 PM (Pizza and drinks will be served prior to the talk)
Also viewable via **Zoom** at Noon (select option, when you register)
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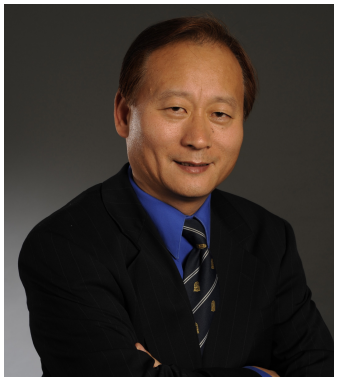
In advanced packaging, as newer forms of interconnects emerge to meet the demand for high density and high performance, interconnect reliability is becoming more complex and more critical. Finer pitch interconnects in advanced packaging are more susceptible to failures due to electromigration, interfacial reactions etc. Wafer level packaging, Cu direct bonding and other advanced packaging technologies, present new considerations in interconnect reliability. At the same time, the growing adoption of heterogeneous integration leads to increased diversity of interconnects (with different geometries, materials, and interfaces) in the same package, with complex (and often interactive) reliability failure modes and mechanisms. As electronic products become more pervasive in application, interconnect reliability must be considered holistically with regard to environmental conditions, from thermal, mechanical, and thermomechanical, to electrical and electrochemical. High frequency applications demand considerations of interconnect materials for signal integrity. High thermal density and high current density can have increased impact on interconnect reliability. These considerations will impact reliability engineering for semiconductor devices, from design for reliability, to accelerated testing and analysis. Meanwhile, sustainability of electronic products demands environmentally friendly materials and processes. Understanding of the failure mechanisms for different interconnect materials at various levels (wafer, chip, package, and system) of the semiconductor package is of great importance to interconnect reliability in advanced packaging and heterogeneous integration.



Dr. Dongkai Shangguan, IEEE Fellow, is President of Thermal Engineering Associates (TEA) and a Strategic Advisor to innovative companies in the global semiconductor and electronics industry. Previously, he served as Corporate Vice President for Advanced Technology & Engineering at Flex and as Chief Marketing Officer at STATSChipPAC (currently JCET). Early in his career, he worked on automotive electronics at Ford Motor Co. and Visteon.

Dr. Shangguan has served on the iNEMI Board of Directors, the IEEE EPS Board of Governors, and the IPC Board of Directors. For his contributions to the industry, he has received several awards from professional associations including IEEE EPS, IPC, IMAPS, and SME. Dr. Shangguan has published two books, authored/co-authored over 200 technical papers and articles, and has been issued over 30 U.S. patents.

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