Reliability Studies in Advanced Electronic Packaging

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Abstract
The new era of big data and artificial intelligence requires future electronic devices with smaller sizes, lower power consumption, lower costs, and especially, higher functionalities. While the continuous scaling of modern Si chips is approaching their physical limits, the advanced packaging technologies, which integrate multiple chips either vertically or horizontally, provide alternative approaches for the development of post-Moore era electronics. The complex packaging structures present the reliability challenges. The vertical stacking of the chips will make the reliability tests difficult to be performed and analyzed. Especially for electromigration tests in advanced electronic packaging, each interface in the packaging structure needs to be tested. With nowadays testing spec and failure analysis techniques, the testing period is too long. The horizontal integration will increase the packaging size, leading to warpage issues, which limits the size of next generation packaging products. These reliability challenges require development in reliability exploration and materials engineering. In this talk, we will talk about the methodology to shorten the electromigration testing period and the design of materials to relieve reliability issues fundamentally.

About the Speaker
Dr. Yingxia Liu is currently a tenure-track associate professor in Beijing Institute of Technology (BIT), working on reliability issues in advanced electronic packaging. Before joining BIT in 2018, Dr. Liu worked in Intel for about two years as a Quality and Reliability R&D Engineer, in charge of solving the challenging issues related to Intel’s latest packaging technology, Embedded multi-die interconnect bridge (EMIB) technology. Dr. Liu received her Ph.D. from the department of Materials Science and Engineering, University of California, Los Angeles in 2016 and bachelor degree from College of Chemistry and Molecular Engineering, Peking University in 2012. The research interest of Dr. Liu includes, systematic reliability tests to predict life-time, and the fundamental studies on the next generation materials in advanced electronic packaging structures. Her work was published in Acta Materialia, Scripta Materialia, Applied Physics Review, etc.