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Speech subject： Low melting point solder for high density bonding in 3D IC technology

Speech leader: Liu Yingxia, Assistant Professor, City University of Hong Kong

Speech Description/Objective:

Three-dimensional packaging integration technology uses micro-bumps and through-silicon vias to achieve vertical stacking of multiple chips, which is currently the most feasible technical approach to improve chip integration. Continuously improving chip integration depends on the increasing density of micro-bumps in three-dimensional packaging. However, based on the current micro-bump technology, further reducing the size of micro-bumps and increasing density will face manufacturing process and reliability issues such as short circuits caused by micro-bump protrusions and micro-bump anisotropy. Although copper-copper direct bonding can effectively avoid these problems and is expected to achieve the ultra-small size and ultra-high density interconnection at a scale of 1 micron or even smaller, its high cost and high technical difficulty bring limitations and challenges to its large-scale production. We will report a simple, fast, and cost-effective high-density interconnection manufacturing method. By preparing uniform submicron low-temperature solder particles, we can achieve rapid bonding within 5 minutes of solid-state interface reaction at room temperature, and further realize the preparation of 1 um bumps and 2 um pitch ultra-high density bump arrays.

Speech Outline:

TBD

Who Should Attend:

engineers working in the field of electronic packaging

Introduction of Speaker:

Assistant Professor Liu Yingxia received her bachelor's degree in chemistry from Peking University in 2012 and her doctorate in materials science and engineering from the University of California, Los Angeles in 2016. From November 2016 to August 2018, she worked as a quality and reliability R&D engineer at Intel Corporation in San Jose, USA, studying the reliability of Intel's advanced packaging technology EMIB (embedded multi-die interconnect bridge). From September 2018 to October 2021, she served as an associate professor at Beijing Institute of Technology. She is currently an assistant professor in the Department of Systems Engineering at City University of Hong Kong. Her main research directions include high-density interconnect technology and reliability of advanced packaging, and the development of suitable low-melting-point solders for problems such as severe warping of large-size advanced packaging. In addition, by developing ultra-high-density interconnect technology for three-dimensional integration, the team will also apply this technology to achieve high-density photonic device integration.