

Beyond Moore's Law: Semiconductor Packaging in the Chiplet Revolution

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Abstract

In this presentation, we will explore the innovative role of chiplet technology in the semiconductor industry and its potential for the future. By surpassing the limitations of traditional monolithic chip design and combining different process technologies and functionalities, chiplet technology enables performance enhancement, cost optimization, and design flexibility, driving a paradigm shift in semiconductor design. We will explain how this technology is transforming the semiconductor industry and its impact on next-generation devices, as well as discuss its future applications and possibilities.



Yasumitsu Orii received the B.S. in Material Science from the Osaka University, Japan in 1986 and the Ph.D. from the Osaka University, Japan in 2012 as well. He joined IBM Japan in 1986 and was a leading expert on Flip Chip organic packages, which had contributed to the performance improvements and miniaturization of such products as servers, laptop computers, and HDDs. The packaging technology is becoming more important for next generation server products as Moore's Law

reaches its limits. His flip chip expertise extended into many related areas. Initially, he was a pioneer of flip chip on FPC (Flexible Printed Circuit) for HDDs, which allowed the read/write amplifier ICs to be mounted on the suspension and much closer to the GMR head. Later, he developed the C2 (Chip Connection) technology that supported low-cost 50- μm -pitch flip chip bonding for the commodity consumer electronics market and it was licensed to a company in Taiwan. At IBM Research Tokyo, he was leading the next generation flip chip organic package, 3D-IC projects and Neuromorphic Computing for IBM Servers and creating new technologies under a Joint Development Program involving many leading Japanese materials companies. He left IBM in 2014 and joined NAGASE & CO., LTD. He established "New Value Creation Office" under the direct control of the president and launched the material informatics software as a service in 2020. He left NAGASE and he joined Rapidus Corporation in 2022/Dec. Now he is the senior managing executive officer, head of engineering center.