25th International Conference on Electronic Packaging Technology
August 07 to 09, 2024, Tianjin, China
http://www.icept.org

Speech subject： **Advanced 3D Heterogeneous Integration of a 40+ TOP/W AI Core Accelerator**

Speech leader: Farhang Yazdani—CEO, BroadPak Corporation

Speech Description/Objective:

In recent years, the demand for high-performance and energy-efficient AI accelerators has surged, driven by the exponential growth of artificial intelligence and machine learning applications. The integration of chiplets into computing systems has emerged as a pivotal strategy for enhancing inter-process operability. However, traditional methods such as 2.5D interposer integration pose challenges in terms of performance, cost, reliability, and scalability.

3D heterogeneous integration (3DHI) is an innovative approach that addresses the limitations of traditional 2D integration by leveraging vertical stacking and integration of diverse components such as photonics, mixed node devices, etc. While it offers numerous benefits, it also presents significant technical challenges such as Thermal Management, Design Methodology, High-Density Substrate, Testing, and Quality. This presentation explores the advanced 3D heterogeneous integration of a cutting-edge AI core accelerator capable of achieving 40+ TOPS/W (Tera Operations Per Second per Watt). The integration strategy leverages advanced packaging techniques to achieve unprecedented performance metrics.

Introduction of Speaker:

Farhang Yazdani is the President and CEO of BroadPak Corporation, a provider of advanced 2.5D/3D heterogeneous chiplet integration and co-packaged optics design/manufacturing services based in San Jose, California. Through his 23 years in the industry, he has served in various technical, management, and advisory positions with leading semiconductor companies worldwide. He is the author of the book “Foundations of Heterogeneous Integration: An Industry-Based, 2.5D/3D Pathfinding and Co-Design Approach”. He is the recipient of the 2013 NIPSIA award in recognition of his contribution to the advancement and innovations in packaging technologies. He has numerous publications and IPs in the area of 2.5D/3D Packaging and Assembly, serves on various technical committees, and is a frequent reviewer for the IEEE Journal of Advanced Packaging. He received his undergraduate and graduate degrees in Chemical Engineering and Mechanical Engineering from the University of Washington, Seattle.