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TechSearch International Analyzes High-Performance Package Trends

A variety of alternatives are challenging silicon's role in advanced packaging interposers for high-performance applications. The first applications using silicon interposers with through silicon vias (TSVs) were field programmable gate arrays (FPGAs), followed by graphic processor units (GPUs). Though unit volumes have been small, the vast knowledge gained from these early pioneers is being applied to new generations of products. This year will see expansion into applications including networking systems and artificial intelligence applications. Future applications could include servers and datacenters, automotive electronics such as Advanced Driver Assistance Systems (ADAS), and virtual reality. However, shipments are lower than previously expected because lower cost alternatives are emerging.

The high cost of silicon interposers with TSVs has driven companies to develop alternatives that do not include the expensive process for TSVs. For example, Xilinx developed the Silicon-less Interconnect Technology (SLIT) solution. Amkor has introduced its version of the technology called Silicon Interposer-less Integrated Module (SLIM™). Intel's Embedded Multi-die Interconnect Bridge (EMIB) uses a small silicon bridge embedded in an organic substrate, eliminating the need for a large silicon interposer with TSVs. Several companies are investigating the use of fan-out wafer level package (FO-WLP) for data centers and other high-performance applications.

The analysis is provided in the latest Advanced Packaging Update, a 42-page report with full references and an accompanying set of more than 40 PowerPoint slides. A forecast for silicon interposers is provided in units and wafers. The report also examines trends in memory packaging, including the future for top memory packages in the package-on-package (PoP) configuration and DRAM stacks with TSVs. Flash memory trends such as the joint Micron/Intel non-volatile memory architecture (3D XPoint™) and Toshiba's Flash memory stack with TSVs are described. New developments in FO-WLP panel processing are discussed, including activities at Nepes, Powertech Technologies, Samsung Electro-Mechanics, and Unimicron. OSAT financial trends are also analyzed.

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