MEDIA RELEASE

A*STAR INSTITUTE OF MICROELECTRONICS AND TEZZARON TEAM UP TO DEVELOP 2.5D/3D THROUGH-SILICON INTERPOSER TECHNOLOGY

Singapore, 6 December 2011- The A*STAR Institute of Microelectronics (IME) and Tezzaron Semiconductor, a leader in 3D-ICs, have today announced a research collaboration agreement to develop and exploit advanced Through Silicon Interposer (TSI) technology. The two organizations will improve and refine the design and manufacture of silicon interposers and work to standardize the process, flows, and process design kits (PDKs). Initial early production devices are already in development, based on IME's TSI technology and incorporating 3D-ICs from Tezzaron. Fabrication will be completed in IME's state-of-the-art 300mm R&D Fab.

The resulting TSI technology from the collaboration will form the foundation for the TSI Consortium driven by IME, to be launched in early 2012. The TSI Consortium aims to optimise TSI technology through functional demonstration of 2.5D systems for cost effective and performance-driven applications.

IME and Tezzaron have a history of cooperation dating back to 2001 when IME provided its copper line technologies to Tezzaron for their wafer stacking endeavors. IME has performed important research on many aspects of 3D IC technology including Through-Silicon Vias (TSVs), cooling, interconnects and interposers, while Tezzaron has focused on designing and building wafer-stacked 3D-ICs in its FaStack® process. The new research collaboration builds on the strengths of both organizations.

"This is a strategic partnership aimed at accelerating the full adoption of 2.5D/3D-IC,"commented Professor Dim-Lee Kwong, Executive Director of IME. "To build momentum in customer adoption and technology, IME will launch a TSI Consortium in early 2012, to facilitate greater cooperation between foundry, outsourced semiconductor assembly and test providers (OSATs), equipment vendors and supply chain partners to expedite the integration of the supply chain. In the near future, we plan to develop TSI technology for MEMS and silicon photonics to extend the benefits of 3D-IC technology to a wider range of applications."

"Silicon interposer technology is more than a bridge technology; it is a vital component for heterogeneous system integration. Advanced silicon interposers will be an extremely valuable addition to our 3D-IC offerings," says Robert Patti, CTO of Tezzaron. "This critical collaboration with a leading research institute will allow the technology to reach a broader market quickly and cost effectively."

About 2.5D/3D Integration

In true 3D-IC technology, designers arrange their circuitry across several layers of silicon that are manufactured separately and then stacked and tightly integrated into a single chip. The benefits are enormous, but the design effort is considerable. Interposers, on the other hand, allow designers to integrate existing chips side-by-side on an interconnecting surface, analogous to a circuit card but offering a significant performance advantage. This is generally called "2.5D" technology as it offers some of the key advantages of 3D technology. Even compared to full 3D, active silicon interposers offer attractive advantages: they can accommodate very large circuits that would overwhelm today's 3D capabilities, their larger surface area dissipates heat more readily, and existing chips can be rapidly assimilated into the design.

About Institute of Microelectronics (IME)

The Institute of Microelectronics (IME) is a research institute of the Science and Engineering Research Council of the Agency for Science, Technology and Research (A*STAR). Positioned to bridge the R&D between academia and industry, IME's mission is to add value to Singapore's semiconductor industry by developing strategic competencies, innovative technologies and intellectual property; enabling enterprises to be technologically competitive; and cultivating a technology talent pool to inject new knowledge to the industry. Its key research areas are in integrated circuits design, advanced packaging, bioelectronics and medical devices, MEMS, nanoelectronics, and photonics. For more information, visit IME on the Internet: http://www.ime.a-star.edu.sg.

About Agency for Science, Technology and Research (A*STAR)

The Agency for Science, Technology and Research (A*STAR) is the lead agency for fostering world-class scientific research and talent for a vibrant knowledge-based and innovation-driven Singapore. A*STAR oversees 14 biomedical sciences, and physical sciences and engineering research institutes, and seven consortia & centre, which are located in Biopolis and Fusionopolis, as well as their immediate vicinity. A*STAR supports Singapore's key economic clusters by providing intellectual, human and industrial capital to its partners in industry. It also supports extramural research in the universities, hospitals, research centres, and with other local and international partners.

About Tezzaron®

Tezzaron® Semiconductor (USA and Singapore) specializes in 3D wafer stacking and TSV processes, cutting edge memory products, and wide-ranging collaborations. In 2004 Tezzaron demonstrated the world's first successful wafer-stacked 3D-ICs with TSV including microprocessors, sensors, and SRAM devices. Since that time the company has worked with dozens of customers to create custom 3D-ICs for prototyping and commercialization. The company has produced extremely fast memory prototypes

and builds memory devices for both standalone and stacked applications. Information about Tezzaron is available at http://www.tezzaron.com/

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