

PRESS RELEASE

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CEASAX presents pioneering 300 mm technologies - From research to pilot manufacturing

"From Lab to Fab" – Innovative front-end and advanced packaging technologies for the semiconductor value chain

The Fraunhofer Center for Advanced CMOS and Heterointegration Saxony (CEASAX) is driving forward the development of pioneering technologies for microelectronics and has established itself as a key player in the European semiconductor value chain. Through its participation in the APECS pilot line, a core project of the EU Chips Act, and in the TEF project PREVAIL as part of the Digital Europe Program, CEASAX ensures access to cutting-edge technologies and supports stable supply chains in the field of advanced packaging at the 300 mm industry standard. Innovations in chiplet integration offer unique opportunities for smaller, more powerful and more efficient packages at the wafer level.

To achieve these advantages, CEASAX is developing key technologies for the next generation of chips. A particular focus is on functional interposers for high-density integration and state-of-the-art assembly and packaging technologies that enable maximum connection densities and minimum stack height. These technologies are essential for the integration of modular chiplets, which are combined in complex systems to increase their efficiency and flexibility.

These technological developments are based on an infrastructure that is unique in Europe: CEASAX, funded by the Free State of Saxony and the BMFTR, is the only 300 mm pilot manufacturing line in Germany that combines front-end and back-end technologies. It was specially designed for the development and integration of semiconductor and microsystem technologies and provides European industry with a powerful research partner. "With 300 mm wafers, CEASAX operates at the level of the international industry standard for wafer production. As a joint initiative of Fraunhofer IPMS and Fraunhofer IZM-ASSID, CEASAX provides a central platform for research and development of large-scale wafer technologies. This supports the microelectronics of tomorrow already today," says Dr. Wenke Weinreich, one of the heads of CEASAX and division director at Fraunhofer IPMS.

CEASAX's innovative strength is based on the close collaboration between two Fraunhofer Institutes:

Editor

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FRAUNHOFER INSTITUTE FOR PHOTONIC MICROSYSTEMS IPMS

Fraunhofer IPMS, with its **Center Nanoelectronic Technologies (CNT)**, plays a key role in the development of innovative front-end technologies. With its expertise in CMOS processes, device, memory, and interconnect technologies, the institute is laying the foundation for the high-density integration of next-generation chiplet systems and functionalized interposers. An additional focus is on the development and integration of ferroelectric memory technologies, which are being scaled for FD-SOI technology in the FAMES pilot line project coordinated by the French RTO CEA-Leti, among others.

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Fraunhofer IZM-ASSID (Center for All Silicon System Integration Dresden) acts as a technology driver for advanced wafer-level packaging and 2.5D/3D system integration. It plays a leading role in CEASAX in chiplet integration based on advanced connection technologies such as hybrid bonding and fine-pitch μ Bump connections using interposer technologies, Si-bridges, and high-density wiring technologies. IZM-ASSID's integrated 200/300 mm process line enables double-sided processing at the wafer level and the integration of vertical silicon through-silicon vias (TSVs). This state-of-the-art infrastructure supports the implementation of complex integration strategies for chiplets and the development of innovative 3D packaging architectures that can be directly transferred to industrial applications.

With this combined expertise and infrastructure, CEASAX is part of the Research Fab Microelectronics Germany (FMD) and thus part of an extensive network in the European semiconductor industry. This platform, which is unique in Europe, sustainably strengthens the competitiveness of the German and European semiconductor market and promotes the transfer of scientific excellence into industrial value creation.

"Technological sovereignty begins where we not only master technology but also shape it. With CEASAX, Europe, Germany, and especially the Free State of Saxony have a strong research partner that combines the key technologies of Fraunhofer IPMS and Fraunhofer IZM-ASSID, covering the entire semiconductor value chain from front-end to advanced packaging at the 300 mm wafer level," explains Dr. Manuela Junghänel, second head of CEASAX and site manager of Fraunhofer IZM-ASSID.

From November 18 to 21, 2025, interested trade visitors to Semicon Europa in Munich will have the opportunity to learn about CEASAX's innovative technologies. CEASAX will be represented at the Silicon Saxony joint booth in Hall B1, Booth 221/1. Individual appointments can be arranged in advance via the Fraunhofer Institute for Photonic Microsystems IPMS [website](#).

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About Fraunhofer IPMS

Fraunhofer IPMS is a leading international research and development service provider for electronic and photonic microsystems in the application fields of Smart Industrial Solutions, Bio and Health, Mobility as well as Green and Sustainable Microelectronics. Research focuses on customer-specific miniaturized sensors and actuators, MEMS systems, microdisplays and integrated circuits as well as wireless and wired data communication. The institute develops systems and components on 200 and 300 mm wafers in their state-of-the-art clean rooms. Services range from consulting and design to process development and pilot series production.

About Fraunhofer IZM-ASSID

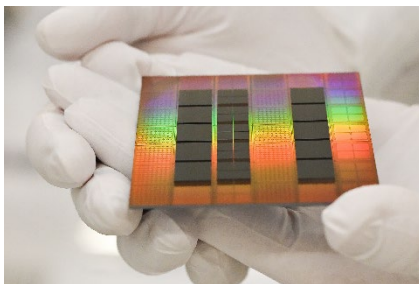
Fraunhofer IZM-ASSID (All Silicon System Integration Dresden) develops leading wafer-level packaging and system integration technologies for 3D integration using silicon through-silicon vias (TSVs) and translates these into products. It has a complete 300 mm process line for TSV formation and the realization of 3D structures. The range of services offered by Fraunhofer IZM-ASSID includes customized developments, prototyping, and small-scale series production as well as technological process transfer.

Images

Work in the 300 mm cleanroom at Fraunhofer IPMS. ©Fraunhofer IPMS



APECS pilot line – chiplet innovations for Europe. ©Fraunhofer Microelectronics



Hybrid bonding (die-to-wafer) at Fraunhofer IZM-ASSID. ©Fraunhofer IZM / Silvia Wolf

The Fraunhofer-Gesellschaft, headquartered in Germany, is one of the world's leading organizations for applied research. It plays a major role in innovation by prioritizing research on cutting-edge technologies and the transfer of results to industry to strengthen Germany's industrial base and for the benefit of society as a whole. Founded in 1949, the Fraunhofer-Gesellschaft currently operates 75 institutes and research units throughout Germany. Its nearly 32,000 employees, predominantly scientists and engineers, work with an annual business volume of 3.6 billion euros; 3.1 billion euros of this stems from contract research.