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PRESS RELEASE

Strengthening Semiconductor Technologies for Europe

Fraunhofer IMS Takes a Key Role in Establishing the APECS Pilot Line

As part of the Research Fab Microelectronics Germany (FMD), the Fraunhofer Institute for Microelectronic Circuits and Systems (IMS) is playing a crucial role in the development of the Advanced Packaging and Heterogeneous Integration for Electronic Components and Systems (APECS) pilot line. By contributing its expertise in advanced technologies and design environments, the institute is receiving funding of 25.6 million euros. The APECS pilot line is a cornerstone of the EU Chips Act, enhancing Europe's innovative strength and technological resilience in semiconductor technologies. As part of a strong European consortium, Fraunhofer IMS is making a significant contribution to securing technological advancement and sustainable value creation in Europe.

Within the scope of the APECS pilot line, Fraunhofer IMS focuses on developing processes and tools that simplify the integration of advanced semiconductor technologies. This includes Process and Assembly Design Kits (P/ADKs) and design flows essential for state-of-the-art 2.5D and 3D integration, as well as quasi-monolithic integration (QMI). These tools ensure seamless compatibility between various manufacturing processes. In addition, high-level models are being developed to facilitate simulation and verification.

Further focal points of development include:

• Complex IPs for optical components (phase shifters), and

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• interface technologies that support high data rates.

Investments in Cutting-Edge Technologies

To achieve these goals, Fraunhofer IMS is investing in state-of-the-art manufacturing equipment designed to produce optical sensors for quasi-monolithic integration (QMI). Additionally, new systems for precise electrical and optical measurement and testing are being implemented. The development of design tools and environments (design IPs and environments) complements these investments, enabling more efficient technology implementation.

Demonstrating Capabilities: Proof of Concept

The technologies and processes developed by Fraunhofer IMS will be validated through multiple demonstrations. The primary focus lies on the development of an optical sensor using QMI technology and a signal processing IC. In collaboration with the Technical Research Centre of Finland (VTT), Fraunhofer IMS is working to enhance interconnect technologies between components. These efforts contribute to showcasing the overall capabilities of the APECS pilot line.

APECS: A Key Project for Europe's Technological Resilience

Europe is home to a vibrant ecosystem of (hidden) champions, from traditional enterprises in vertical markets, to SMEs and start-ups the competitive advantages of which lie in superior semiconductor-based solutions. Nevertheless, many of these companies are currently confronted with limited access to advanced semiconductor technologies, while at the same time these technologies are increasingly becoming the most important factor for innovation and market growth.

The European Commission is investing significant resources under the EU Chips Act to strengthen semiconductor technologies and applications in the European Union. The European Commission is investing substantial funds under the EU Chips Act to strengthen semiconductor technologies and applications within the EU. The pilot line for "Advanced Packaging and Heterogeneous Integration for Electronic Components and Systems" is a



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critical pillar of the EU Chips Act. APECS addresses the challenges posed by limited resources in Europe and reinforces Europe's technological resilience and competitiveness in strategic key industries.

Extensive Funding for Europe's Technological Future

The total funding for the APECS pilot line amounts to 730 million euros over 4.5 years. Of this, 25.6 million euros are allocated to Fraunhofer IMS in Duisburg, which is contributing an additional 2.2 million euros of its own funds. The goal is to provide large industrial companies, SMEs, and start-ups with low-threshold access to cutting-edge technologies.

The APECS pilot line is co-funded through the Chips Joint Undertaking and national funding programs from Belgium, Germany, Finland, France, Greece, Austria, Portugal, and Spain under the Chips for Europe initiative.

For Germany, significant contributions to the financing are made by the Federal Ministry of Education and Research (BMBF) and the participating federal states of Saxony, Berlin, Bavaria, Schleswig-Holstein, Baden-Württemberg, North Rhine-Westphalia, Brandenburg, and Saxony-Anhalt.

The APECS pilot line is coordinated by the Fraunhofer-Gesellschaft and implemented by the Research Fab Microelectronics Germany (FMD). A total of ten partners from eight European countries are involved: Germany (Fraunhofer-Gesellschaft as coordinator, FBH, IHP), Austria (TU Graz), Finland (VTT), Belgium (imec), France (CEA-Leti), Greece (FORTH), Spain (IMB-CNM, CSIC), and Portugal (INL).

Further information can be found on the <u>APECS website</u> and the <u>Research Fab Microelectronics</u> <u>Germany website</u>.

Fraunhofer IMS

Smart Sensor Systems for a safe, secure, and sustainable future: In numerous state-of-the-art research laboratories, Fraunhofer IMS works with more than 200 talented scientific employees and students on



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innovative microelectronic solutions. As a trusted research and development partner for industry, the institutes' goal is to develop customized sensor systems for your specific needs in the areas of biomedical sensors, optical systems, open source semiconductors, embedded AI, technology services, and even quantum technology. The teams in the four business units – Health, Industry, Mobility, and Space and Security – are committed to implementing outstanding and versatile microelectronics that can be utilized across all your projects. For example, these solutions feature high integration capability, enormous energy efficiency and reliable functionality even under harsh conditions.

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