

Contributions to the APECS Pilot Line: Fraunhofer EMFT

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Fraunhofer EMFT is one of 14 German research institutes involved in the implementation of the APECS pilot line. As one of the 12 Fraunhofer institutes, Fraunhofer EMFT conducts applied, cutting-edge research across a broad technology spectrum, ranging from semiconductor processing and MEMS technologies to foil electronics, circuit design, and the testing and analysis of electronic components and systems. These nano- and micro-scale process technologies provide the foundation for solutions in diverse research fields, including quantum technologies, neuromorphic computing, trusted electronics, and chiplet innovation.

The role of Fraunhofer EMFT in the APECS pilot line

Within APECS, Fraunhofer EMFT and the Graz University of Technology jointly conduct a research project. The work focuses on developing sensor-based setups to quantify ESD events during the assembly process, as well as optimized test environments for robustness testing and chiplet qualification. Beyond this collaboration, Fraunhofer EMFT drives innovation in APECS across multiple technological fields, including:

- Chiplet integration: Developing and implementing technologies and methods for assembling multilayer heterogeneous chiplet systems on advanced substrates such as Flex-Polymer and RF Glass interposers
- CTR: Developing new test and characterization methods for ESD stressing and failure analysis of complex 3-dimensional systems to ensure reliability, availability, and serviceability (RAS) of the integrated system as a whole
- STCO: Simplifying the design of chiplet-based systems by providing foundational chiplet building blocks, e.g., for voltage references, high-accuracy ADCs and ultrasonic sensors, as well as providing methods for chiplet selection

Design of high speed ADC for automotive Radar SoC.

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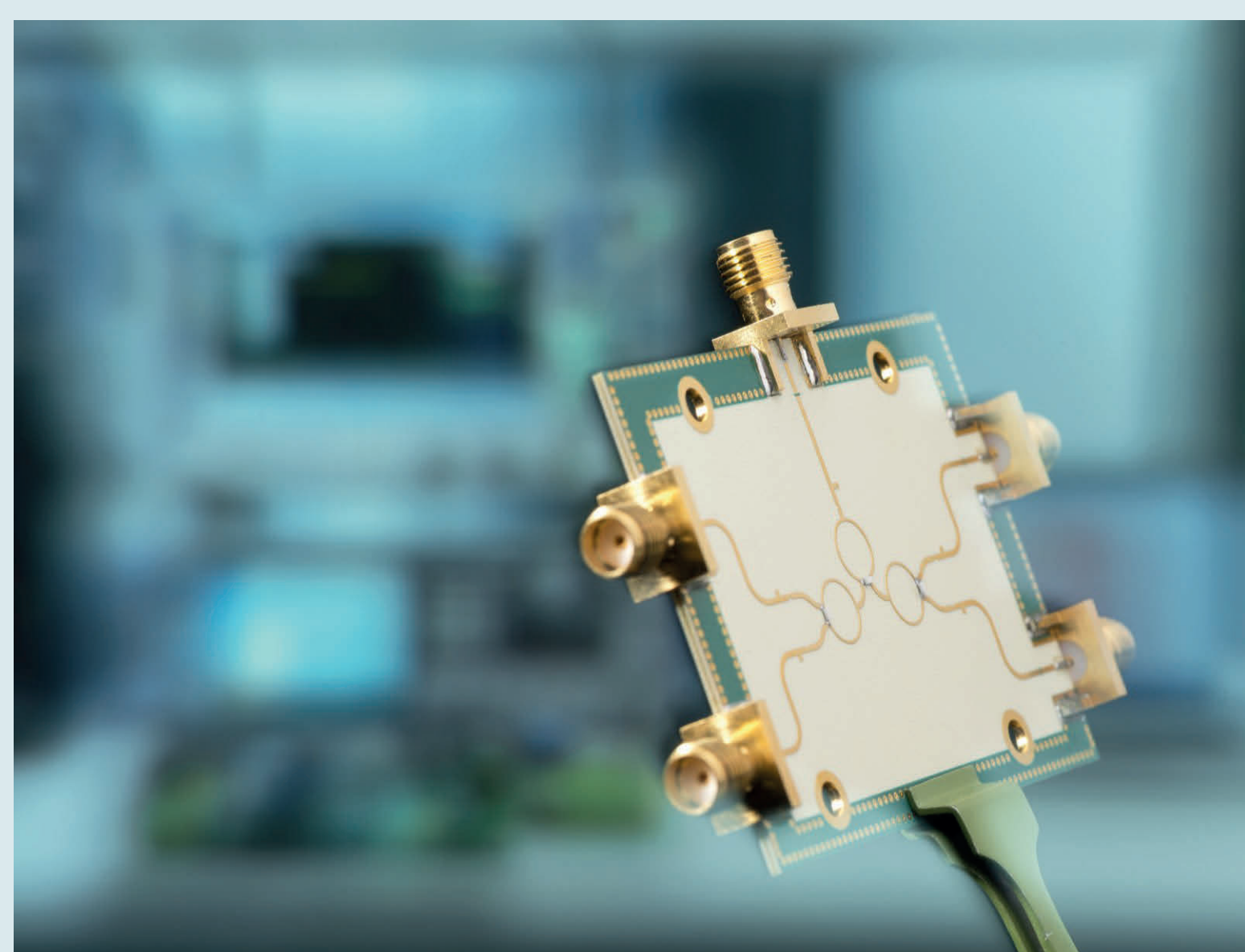
CC-TLP: Original probe for Capacitively Coupled CDM-like TLP stress test at wafer level

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RF Power Divider on PCB 1

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Contributions to the APECS pilot line

Fraunhofer EMFT contributes to the APECS pilot line with its extensive competences in the areas of circuit design, heterogeneous 2.5/3D integration, flexible hybrid electronics and test and analysis:

- RF Demonstrator: Heterogeneous integration of high-performance mmWave and sub-THz RF chiplets, including a D-band SiGe BiCMOS radar transceiver mounted on an RF-glass interposer and integrated on a flexible polymer bridge with a communication interface

What is APECS?

APECS (Advanced Packaging and Heterogeneous Integration for Electronic Components and Systems) is one of 5 European pilot lines established under the EU Chips Act. APECS is the foundation for Europe's competitive position in heterogeneous system integration and advanced packaging. It plays a vital role in enhancing Europe's strategic autonomy by reducing dependence on foreign suppliers and strengthening Europe's capabilities in critical technology areas.

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Additional information

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