PRESS RELEASE

Revolutionary chips for materials research

Fraunhofer IPMS closes gap in the characterization of organic semiconductors

The Fraunhofer Institute for Photonic Microsystems IPMS has developed innovative chips that are revolutionizing the characterization of organic materials and accelerating the development of new electronic applications. A newly developed measuring adapter allows for the first time simultaneous contact with up to eight interdigital electrode pairs, setting new standards in precise material analysis. In the context of the growing demand for flexible and efficient technologies, these high-precision measurement methods will be instrumental in improving the performance of future electronic systems.

Fraunhofer IPMS has made a significant breakthrough in materials research. The newly developed chips, which use interdigital electrodes, enable sensitive and innovative materials to be analyzed much more efficiently. These materials include those used in organic light-emitting diodes (OLEDs), organic solar cells, organic field-effect transistors (OFETs), and metal oxide-based gas sensors. This greatly simplifies the testing process, shortens development times, and represents a significant advancement in next-generation electronic technology development.

To tailor this performance to different applications, Fraunhofer IPMS has collaborated closely with partners and clients over the past few years. Project manager Henry Niemann explains, "We have continuously refined the chips, for example, by introducing new electrode geometries and materials and making adjustments to the gate oxide material and thickness." Until now, the simple and parallel contacting of multiple electrodes has been a particular challenge. However, with the new measurement adapter, Fraunhofer IPMS has succeeded in closing this gap. The adapter enables the parallel contact of multiple interdigital electrode pairs, significantly increasing the efficiency and quality of the testing process.
Group leader Alexander Graf adds: "Our customized chips allow materials researchers to accurately measure and optimize important parameters, such as conductivity, field effect, contact resistance, and charge carrier mobility." This lays the foundation for developing, optimizing, and reproducing materials and processes for customized solutions that meet industry's specific requirements.

A selection of interdigital electrode chips and the new measurement adapter will be presented at Analytica 2026 at the Fraunhofer booth A3 - #312. There, interested visitors will gain insights into specific application possibilities. Individual appointments

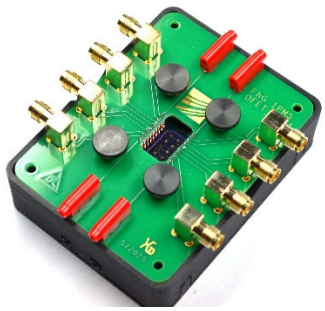
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can be arranged in advance via the website of the Fraunhofer Institute for Photonic Microsystems IPMS.

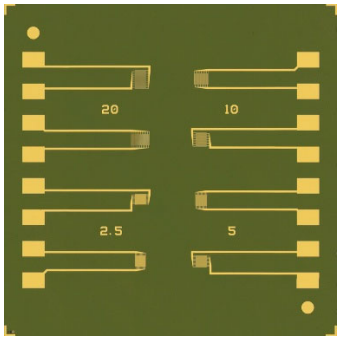
About Fraunhofer IPMS

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 production.

Images

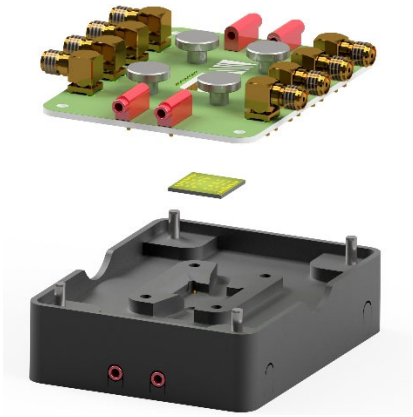


New measurement adapter for simultaneous contacting of up to eight interdigital electrode pairs
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Chip AX1580, 15x15 mm², with 8 gold interdigital electrode pairs with a channel width of 10 mm and channel lengths of 2.5, 5, 10, and 20 µm. The chip itself can be used as a gate electrode; the gate oxide between the gate and the interdigital electrodes is typically SiO_2 with a thickness of 230 nm.
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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. Since its founding as a nonprofit organization in 1949, Fraunhofer has held a unique position in the German research and innovation ecosystem. With nearly 32,000 employees across 75 institutes and legally independent research units in Germany, Fraunhofer operates with an annual budget of €3.6 billion, €3.1 billion of which is generated by contract research — Fraunhofer's core business model.



Exploded view of the measurement adapter showing the position of the AX1580 chip. The red sockets connect to the gate, while the SMA sockets each connect to a source-drain pair.
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