

PRESS RELEASE

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Efficient MEMS tests on wafer level with active probe

A new MEMS active probe characterizing MEMS components will be presented at the Sensor + Test – The Measurement Fair – 2014 in Nuremberg, Germany. Fraunhofer ENAS and the Center for Microtechnologies (ZfM) of TU Chemnitz developed a probe which measures very low currents dynamically.

The characterization of micro electro mechanical systems fabricated in batch processing is challenging. The electrical output signals of the MEMS transducer elements are usually very low. The mechanical motion is measured to test the device functionality on wafer level. Until now, extensive optical methods were used for their characterization. Capacitance to voltage conversion (C/V conversion) is a cheap and practical alternative solution. Researchers at the Fraunhofer ENAS and the Center for Microtechnologies (ZfM) of TU Chemnitz developed and built up a MEMS Active Probe for reliable 100-percent testing of components on wafer and chip level. The probe measures very low currents in the pico and nano ampere range dynamically. The new active probe can be positioned very close to the MEMS elements to achieve an optimal signal-to-noise ratio. So the in-plane motion of the micro electro mechanical systems can be electrically detected and characterized. The probe is designed for a frequency range up to 200 kHz and a sensitivity up to 90 mV/nA. The output impedance is matched to 50 Ohm. Therefore the probe can be directly connected with a spectrum analyzer. Moreover it has to be mentioned that it can be fixed to the wafer prober with common positioners. The MEMS Active Probe was primarily developed for the internal use at the Fraunhofer ENAS and ZfM and is proved in practice.

The MEMS Active Probe is introduced at the Sensor + Test – the Measurement Fair – for the first time. It is shown at the joint booth of the Fraunhofer Gesellschaft in hall 12, booth number 537, from June 3 to 5, 2014.

IN COOPERATION WITH

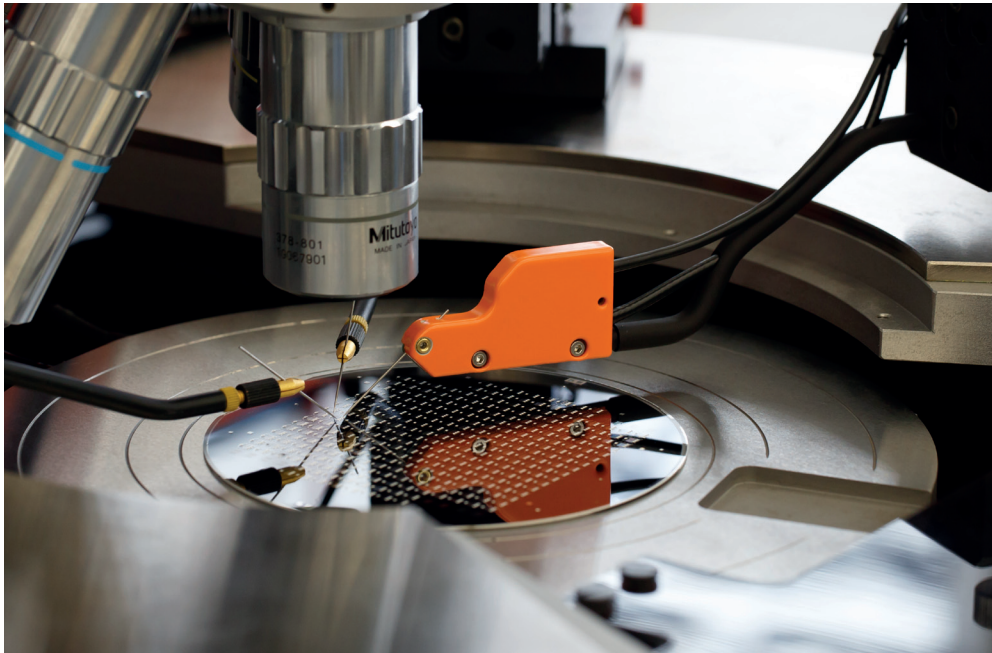
ZfM
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Editorial notes

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The MEMS Active Probe is developed for dynamic measurement of very low currents on wafer and chip level. Therefore the C/V conversion is a cheap and commonly used method. The orange probe has to be as close as possible to the MEMS for measuring currents in the pico and nano ampere range. It can be fixed to the wafer prober with common positioners.

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Furthermore, the researches present smart systems for condition monitoring of processes and equipment. An autonomous sensor network for condition monitoring of power lines was developed together with the Fraunhofer IZM and further partners. The working principle is demonstrated with a sensor node at the booth. Moreover Fraunhofer ENAS shows a MEMS based NIR spectrometer, which is applied in biogas plants.

The **Fraunhofer-Gesellschaft** is the leading organization for applied research in Europe. 67 institutes and independent research units work at present in Germany. More than 23,000 staff work with an annual research budget of €2 billion. Of this sum, more than €1.67billion is generated through contract research. More than 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. Affiliated international research centers and representative offices provide contact with the regions of greatest importance to present and future scientific progress and economic development.

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