

Admont



This project has received funding from the ECSEL Joint Undertaking under grant agreement No 661796.

This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme and Germany, Finland, Sweden, Italy, Austria, Hungary."



ADMONT

ADMONT Essential Capabilities & Services FhG-IPMS Dresden

Information for potential ADMONT pilot line user

Status 07/2015

Advanced Distributed Pilot Line for More-than-Moore Technologies

Who is ADMONT?

Advanced Distributed Pilot Line for More-than-Moore Technologies

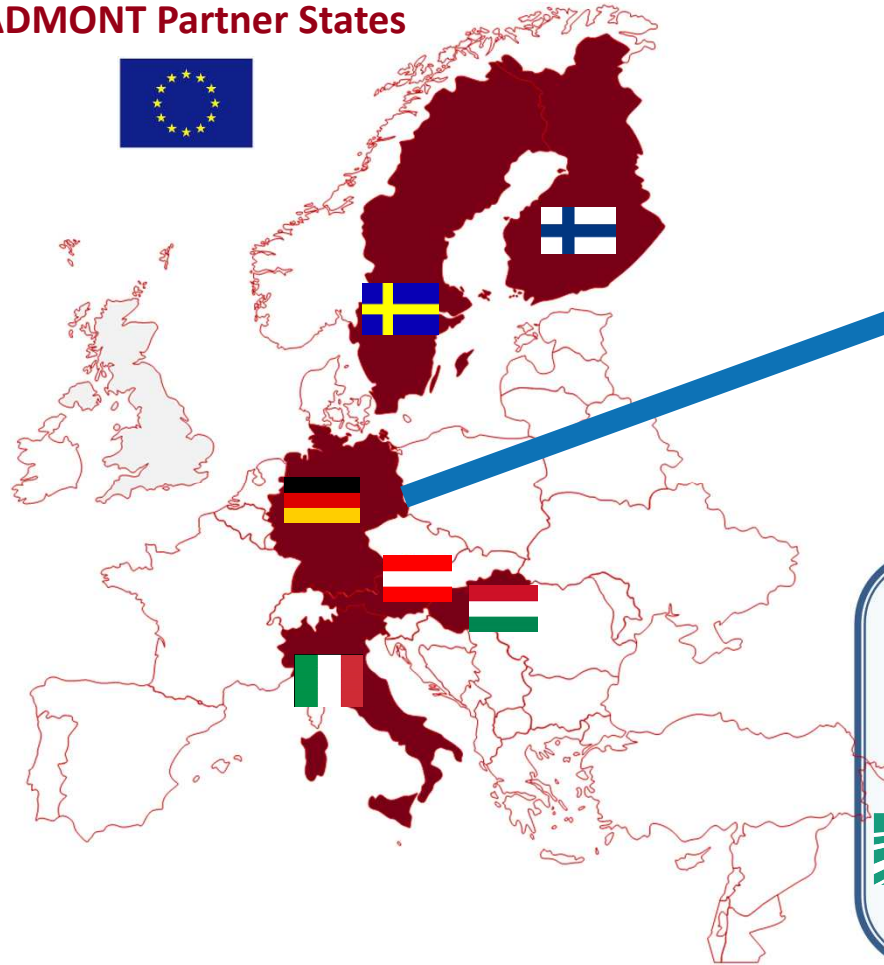
ADMONT is a **multi-KET pilot line** driven by a **combination of technology platforms** in Dresden carried by industry and research institutes serving pilot line clients in Europe


- ADMONT is organised along the **value chain** from wafer material, CMOS wafer, sensor and OLED processing to silicon system integration in one production flow
- ADMONT is an **ECS** (European Electronics Components and Systems) **ecosystem** in **Saxony** for Europe with sustainable impact on economic growth and employment in the European Union
- ADMONT addresses key applications: **smart mobility, smart energy, smart health** and **smart production** in excellent agreement with the **ECSEL Multiannual Strategic Plan**
- ADMONT addresses essential capabilities: **semiconductor process equipment and materials, design technology, smart system integration**

ADMONT as a distributed More-than-Moore pilot line is unique in Europe and worldwide.


Where is ADMONT?

ADMONT Partner States






FAB
MIXED-SIGNAL FOUNDRY EXPERTS




Fraunhofer
FEP

ADMONT Pilot Line



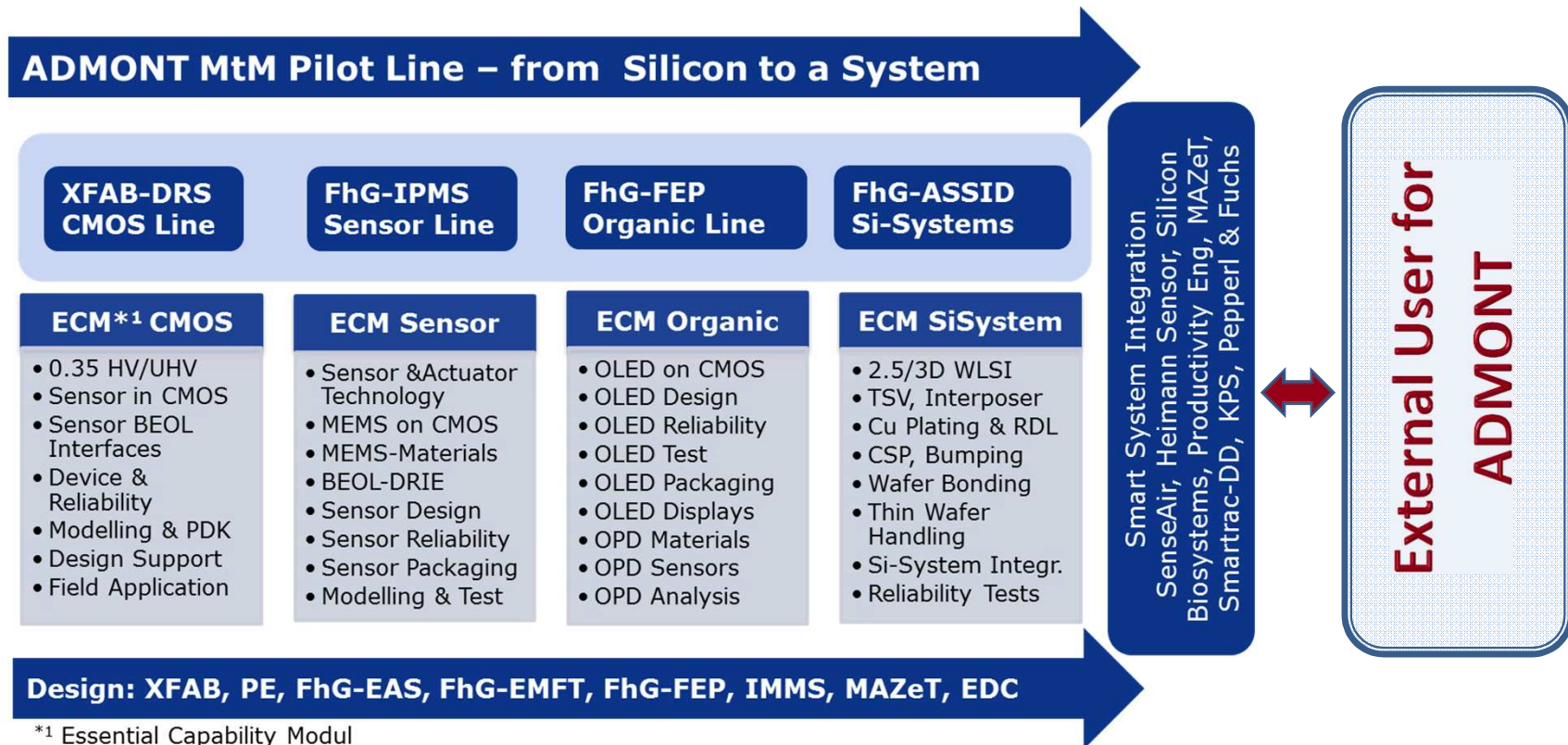
Fraunhofer
IPMS



Fraunhofer
IZM

ADMONT Concept & Capabilities

- ADMONT pilot line concept, structure and excellences



- Detailed Information are available under (Link: XFAB, IPMS, FEP, ASSID)

FRAUNHOFER INSTITUTE FOR PHOTONIC MICROSYSTEMS



Admont



Key figures and facts

Fraunhofer IPMS operates as leading provider of research and development services in the fields of photonic microsystems, microsystems and nanoelectronic technologies as well as wireless microsystems.

Annual budget:

- 2014: ~32 Mio EUR
- 2015: ~36 Mio EUR (forecast)

Employees:

- 2014: ~290
- 2015: ~300 (forecast)

Cleanrooms

- M(O)EMS: 1.500m² ISO 4 (class 10) *
- Nano-Tech: 800m² ISO 6 (class 1000)

* Extension towards 200mm expected to start in 2015



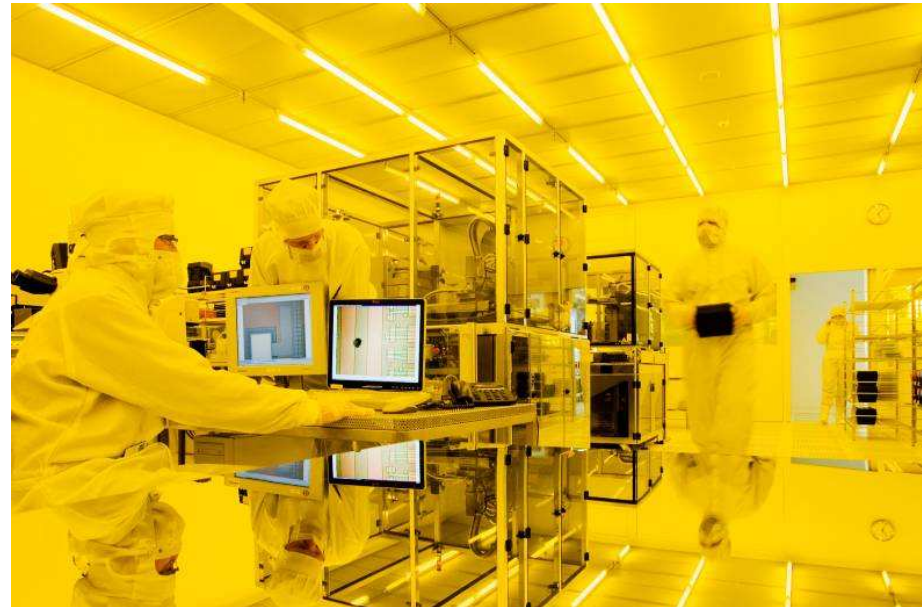
IPMS building



IPMS-CNT building

Our business model: From R&D to Pilot-Fabrication

- Consulting service
- Feasibility tests
- Simulation
- Device and system development
- Complete process development
- Demonstrators and Prototypes
- Characterization & Test
- Pilot-Fabrication
- Foundry Services



Fraunhofer IPMS clean rooms



- 1500 m², class 10
- Sensor-Actuator and integration technologies (SoC)
- 3 shift preparation for R&D and pilot fabrication
- Technological parameter supervising system
- PPS based planning and documentation
- ISO 9001 certification



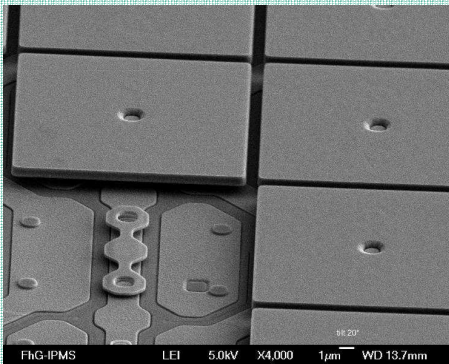
- 800 m² clean room, class 1000 & 200 m² laboratory area
- 40 Tools for Wafer Processing, Patterning, Metrology & Analytics
- Qualification of processes & materials on industrial standard equipment
- Sub-nm characterization and verification
- Full integration into customer process flow in 28 nm technology and beyond

Technology toolset @ Fraunhofer IPMS

MEMS / MOEMS

Surface MEMS Technology

- MEMS on CMOS- Backplanes
- *Application:*
Spatial Light Modulator



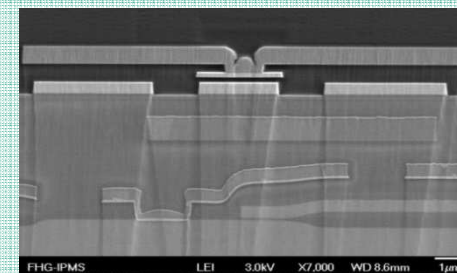
Bulk MEMS Technology

- 3- dim. Structures in Silicon
- *Applications:*
MEMS Scanner, Pressure Sensor



Integration technologies (SoC)

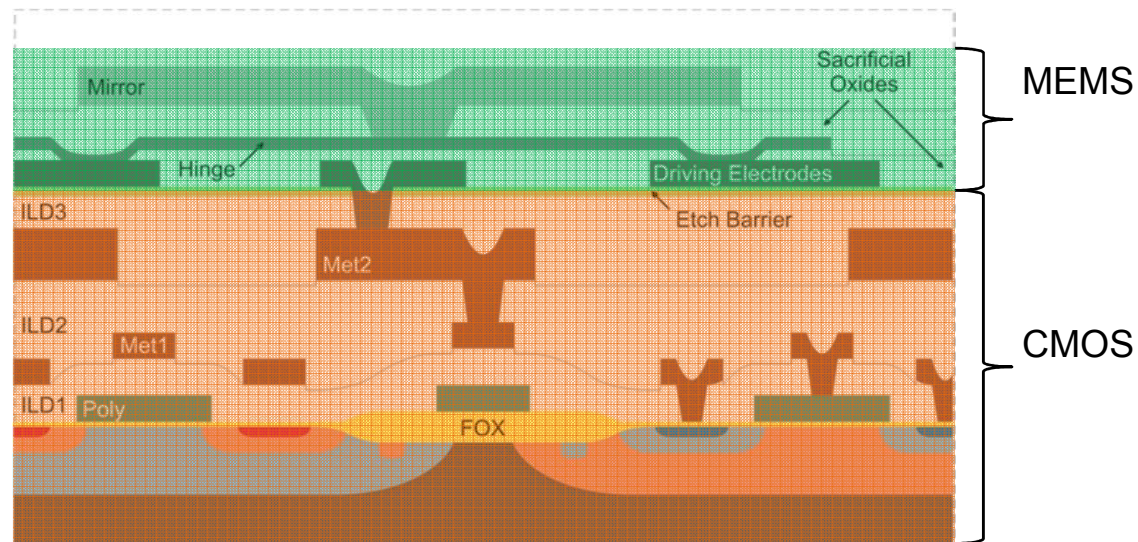
- Monolithic integration technologies
- *Application:*
Spatial Light Modulator
CMUT



Surface MEMS technology at Fraunhofer IPMS

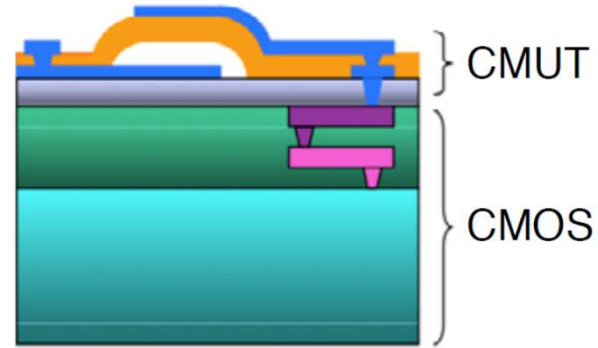
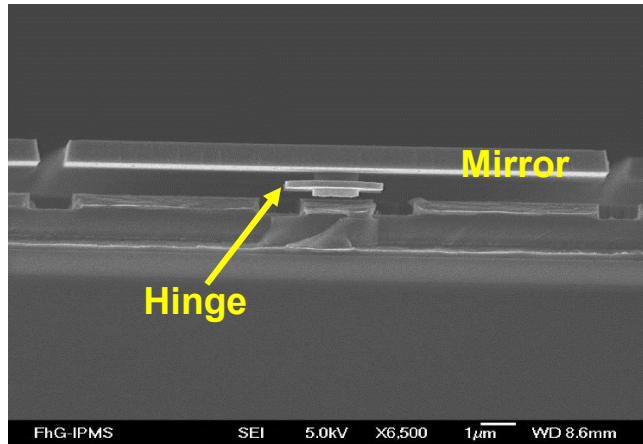
MEMS on CMOS integration (SiC)

- SLM: Spatial Light Modulator
- CMUT: Capacitive Micromachined Ultrasound Transducer

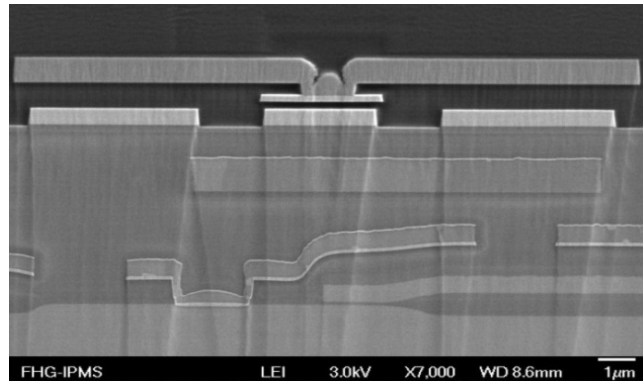


Fabrication of sensors & actors on the wafer surface

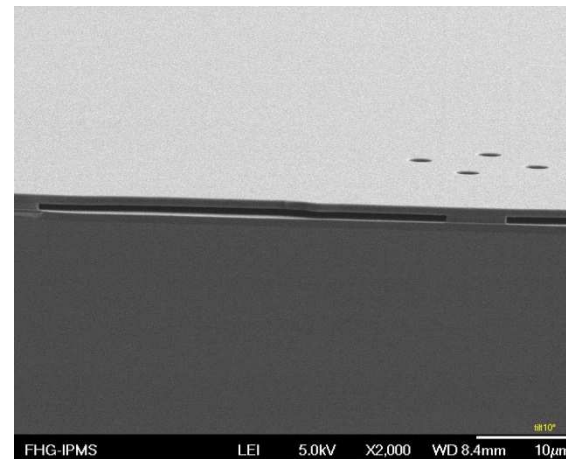
Surface MEMS technology at Fraunhofer IPMS



R. A. Noble, et al, 2002



SLM

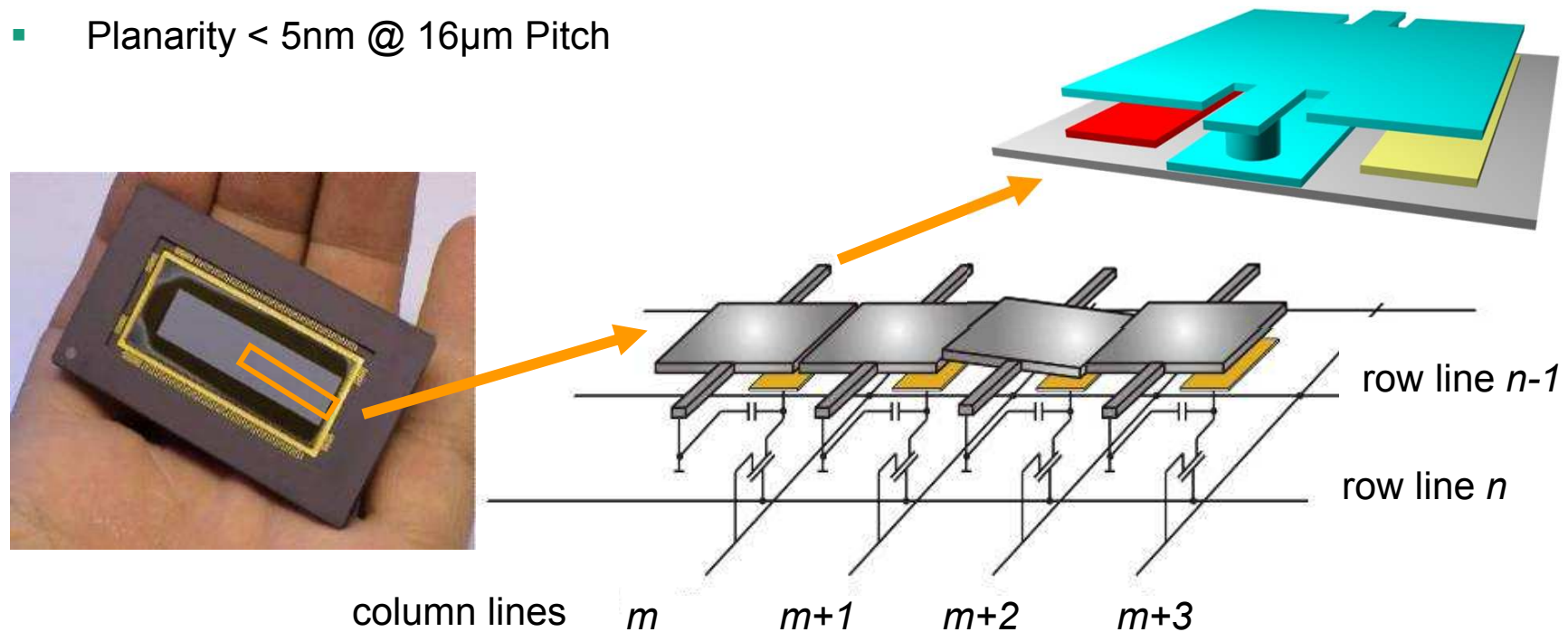


CMUT (Plate)

Surface MEMS technology / Spatial Light Modulator

Characteristic of spatial light modulators at IPMS

- Analogue deflection
- UV application (248nm)
- Planarity < 5nm @ 16µm Pitch



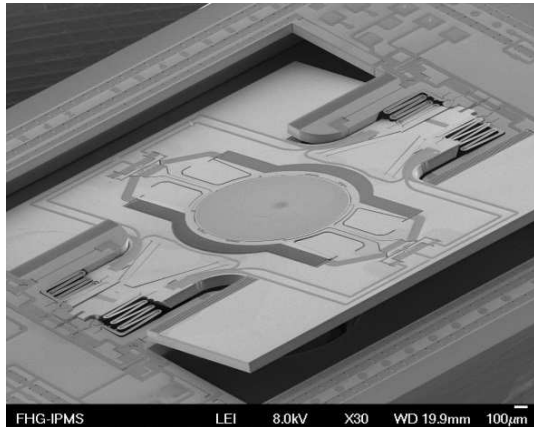
Bulk MEMS technology at Fraunhofer IPMS

- MEMS scanning mirrors at Fraunhofer IPMS
- Pressure sensor
- Precision Silicon Components

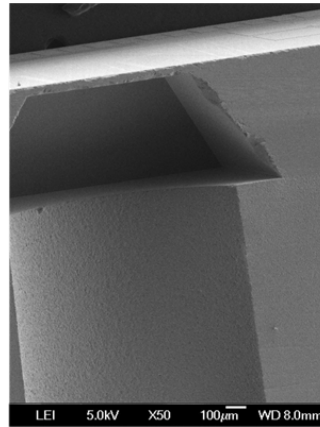


Fabrication of sensors & actors out of the wafer's material (bulk) itself

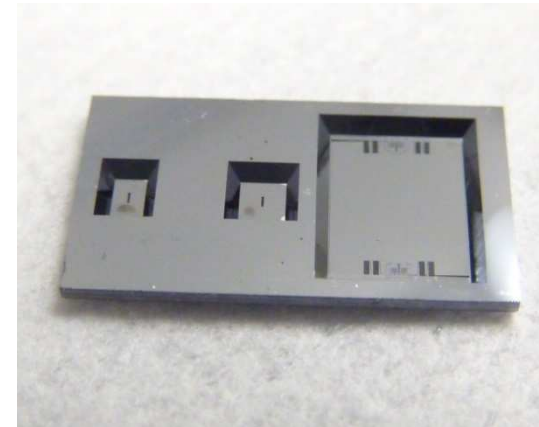
Bulk MEMS technology at Fraunhofer IPMS



2D- MEMS Scanner: rotational, resonant



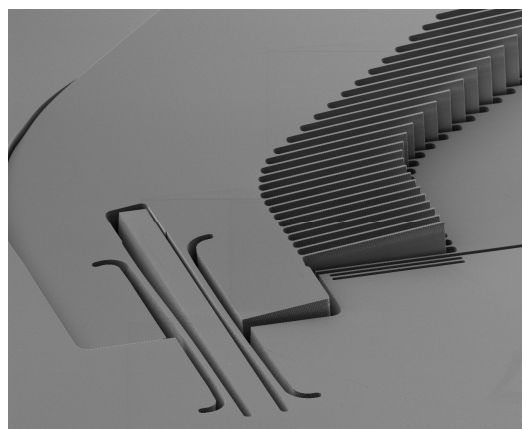
Pressure sensor



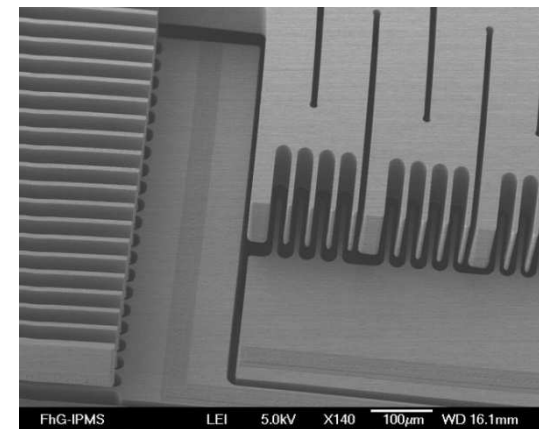
Silicon component for spectrometer



Examples of hinge constructions



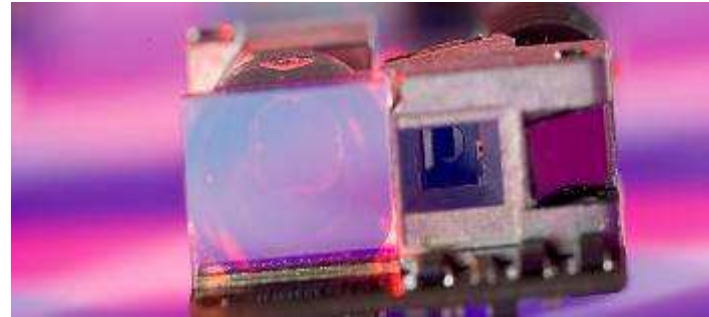
Hinge & Comb Drives



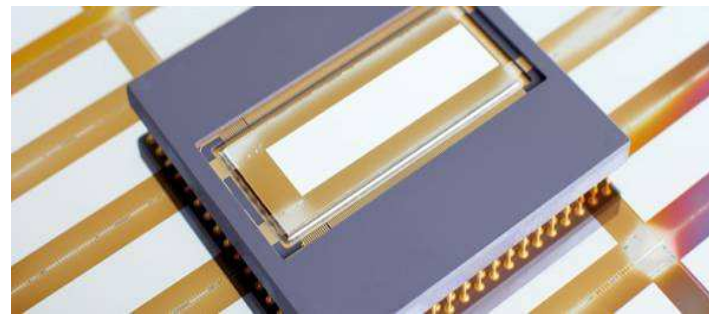
Comb drives

Low - mid volume manufacturing

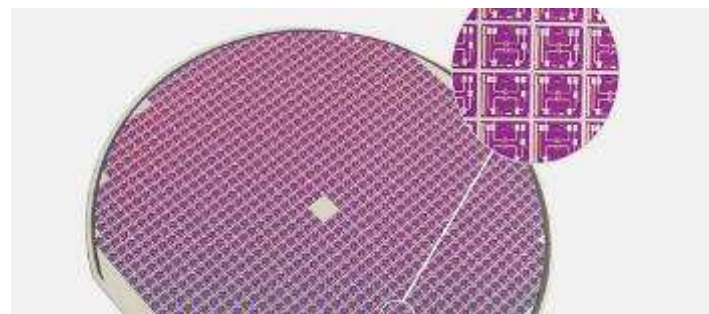
Barcode reading systems based on micro scanning mirrors



Micro mirror arrays as programmable mask



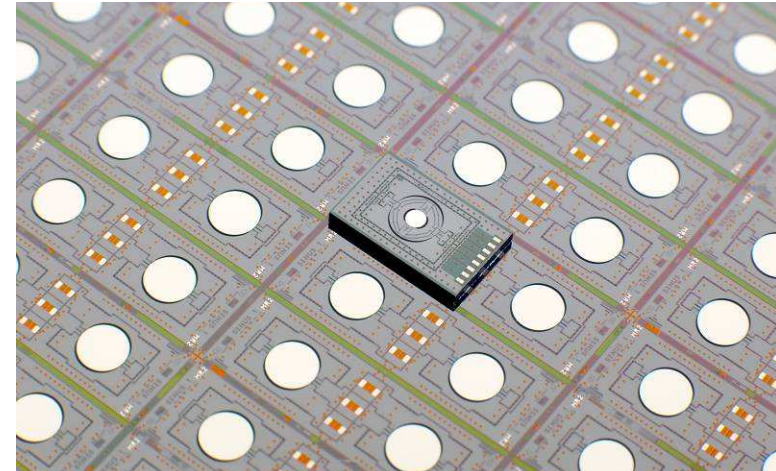
Piezo resistive pressure sensors for automotive applications



Summary

MEMS Technologies at Fraunhofer IPMS

- Bulk micromachining
- Surface micromachining



Fraunhofer IPMS business model

- Full value chain from R&D to pilot fabrication
- Customers have **one partner** for
 - Research
 - Development
 - Manufacturing



THANK YOU FOR YOUR ATTENTION!



Michael Müller

phone: +49-351-8823-130

email: michael.mueller@ipms.fraunhofer.de

ADMONT Grant Agreement No. 661796

“This project has received funding from the ECSEL Joint Undertaking under grant agreement No 661796.

This Joint Undertaking receives support from the European Union’s Horizon 2020 research and innovation programme and Germany, Finland, Sweden, Italy, Austria, Hungary.”

If you need further information, please contact the coordinator:

X-FAB Dresden GmbH & Co. KG

Grenzstrasse 28, 01109 Dresden, GERMANY

Tel: +49 351 40756 214 Fax: +49 351 40756 274

E-Mail: karl-heinz.stegemann@xfab.com

The information in this document is provided “as is”, and no guarantee or warranty is given that the information is fit for any particular purpose. The users thereof use the information at their sole risk and liability.