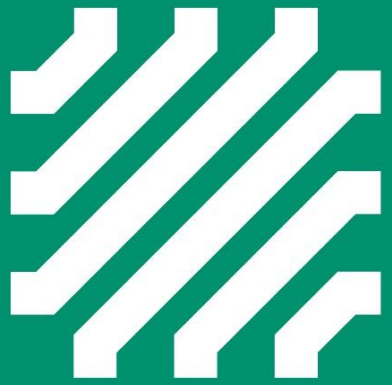
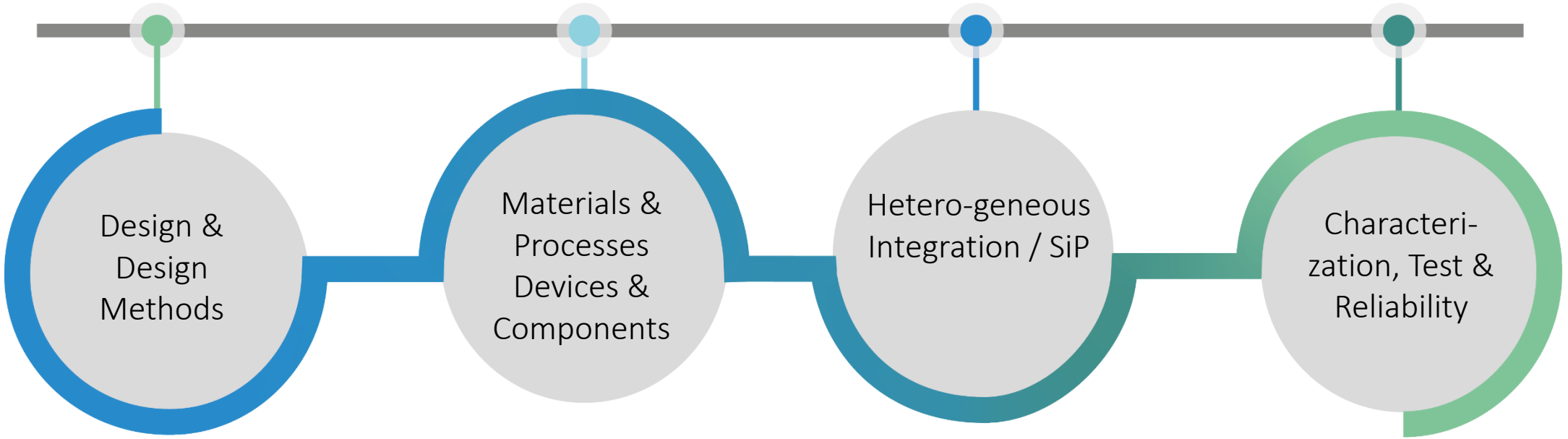


Forschungsfabrik Mikroelektronik Deutschland

Fraunhofer Group for Microelectronics in Cooperation with Leibniz Institutes FBH and IHP

MEMS Actuators along the value chain



- Component Design
- Package & System Design
- Prototyping
- Design Methods

- Materials
- Processes
- Desices and Components

- Heterogeneous Integration

- Materials & Devices
- Analysis & Test
- Reliability

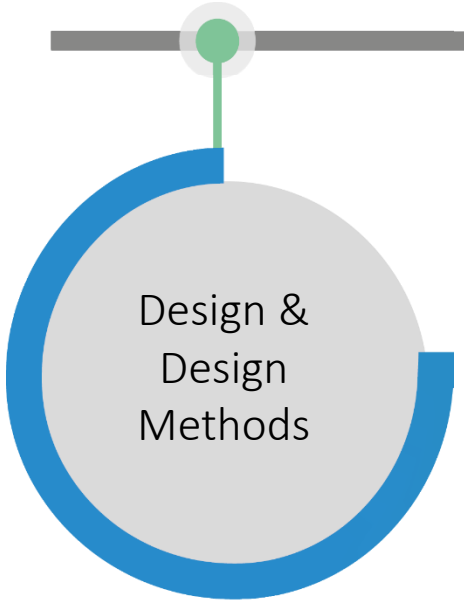
A cooperation of

Fraunhofer MIKROELEKTRONIK

Leibniz Ferdinand Braun Institut

ihp

MEMS Actuators along the value chain



Component Design

- Design of 2,5-D and 3-D integrated systems, Analog and mixed-signal design

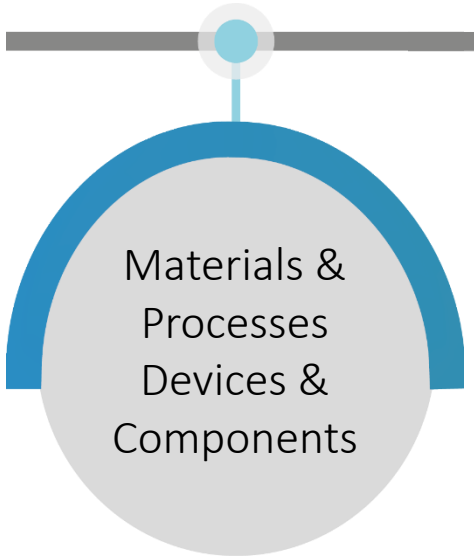
Package & System Design

- Design under constraints – functional safety, reliability, harsh environment

Design Methods

- Automated design tools for component, module and system development

MEMS Actuators along the value chain



Materials

- Si, SiGe, Piezo Materials

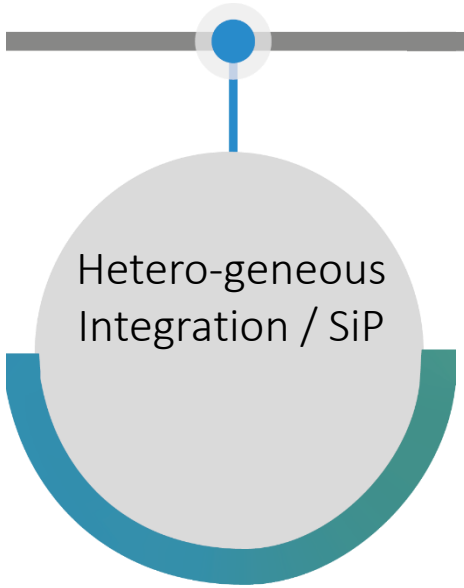
Processes

- 200mm MEMS lines and foundry
- Bulk Micromachining, Surface Micromachining
- Si/Ge Epitaxy, advanced Silicon etching

Devices and Components

- Spatial Light Modulators, Acoustic Actuators, Microfluidic, Optical Scanners

MEMS Actuators along the value chain



MEMS Actuator Packaging

- MEMS/NEMS integration on CMOS
- Packaging – advanced packaging
- Wet processing, Chip on chip
- Hermetic glass packaging, Wafer level capping
- Microfluidic channels

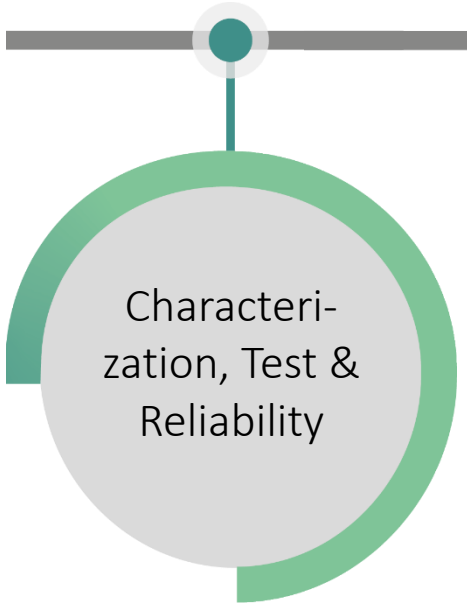
Display/RFID/Flex – Packing

- Low temperature processing, extiles and stretchable

Advanced Substrates/ Interposer

- Rigid and flex organic,
- Fan-out molding, PCB embedding

MEMS Actuators along the value chain



Materials and Devices

Nondestructive and destructive examination of materials and devices, General test of MEMS/NEMS, MEMS test on wafer level, Dynamical/High frequency characterization of MEMS and MOEMS, Device degradation

Analysis and Test

automated in-line process monitoring, test of Analog-mixed signal circuits and digital circuits, Characterization of hetero-integrated systems,

Reliability

Device and system/package test under multiple stress scenarios, combined load testing, lifetime assessments, thermal cycling, Wafer level reliability tests, Electromagnetic compatibility tests, thermo-electrical and thermo-mechanical reliability.