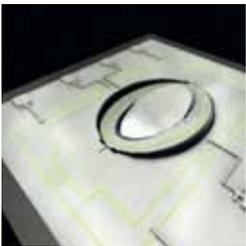
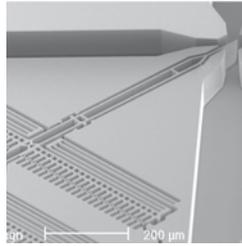


Heterogeneous Technology Alliance



Less Risk
wide base of
expertise and
solutions

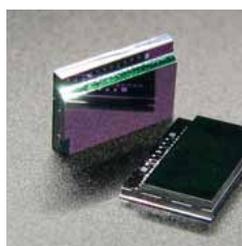
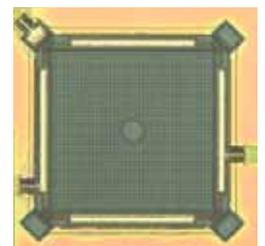
Lower Cost
utilizing existing
equipment base



**More Innovative
Solutions**
access to wider
technology
portfolio

**One-Stop
Shop**
effective
industrialization
and production
capability

Faster
optimized use of
existing process
modules

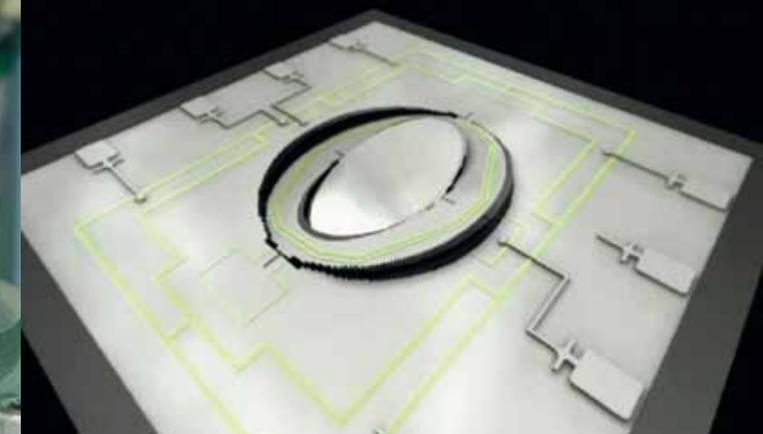
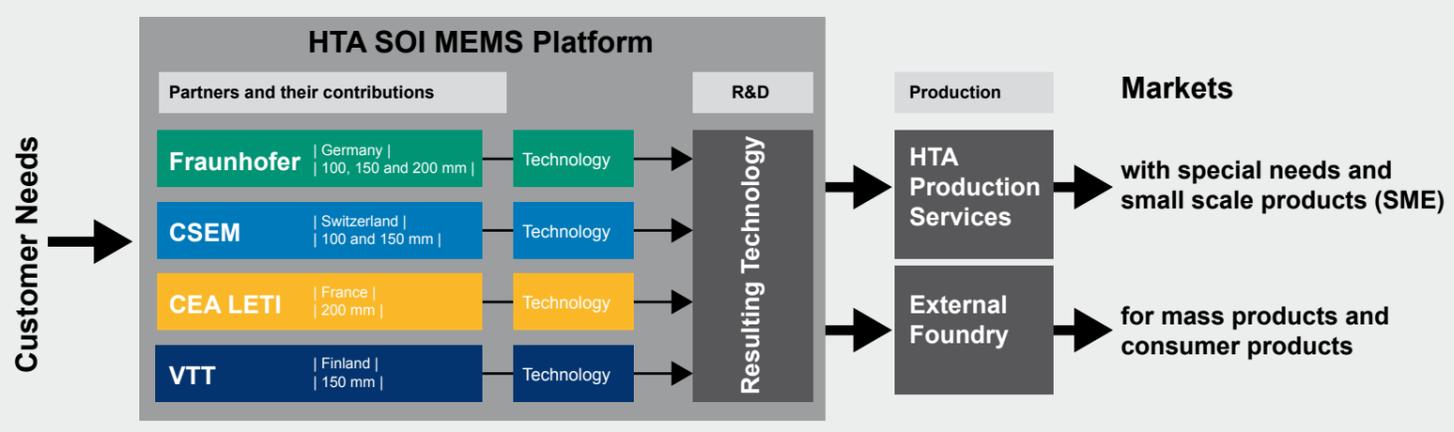


SOI MEMS Platform



energie atomique • énergies alternatives





SOI MEMS Platform

Europe is leading in the field of microsystem technologies both in research and industrial development. To strengthen this position four major European research institutes are linking their expertise and facilities. The objective is to meet the general trend of increasing complexity and multidisciplinary for a variety of different branches of the industry. The HTA partners – CEA (France), Fraunhofer-Gesellschaft (Germany), CSEM (Switzerland) and VTT (Finland) – have concluded an agreement to join their competences. They will carry out joint research projects to create innovative solutions for the European industry. Our scientific and technological skills as well as our infrastructure are devoted to the development of new products for the benefit of European economy.

The SOI MEMS platform is a technological platform of the HTA and covers Silicon-on-Insulator (SOI) MEMS fabrication capabilities of all HTA partners. SOI MEMS is typically used for Silicon oscillators, microphones, speakers, compass, navigation, motion sensors, sensors and actuators, energy harvesting, micro fuel cells, microfluidics and other deep reactive-ion etched micro structures.

The HTA partners are:

Fraunhofer Group for Microelectronics

The Fraunhofer-Gesellschaft with its more than 20,000 employees is one of the leading European institutions for contract and advanced research. Its Fraunhofer Group for Microelectronics VμE brings together the activities of sixteen institutes working in the fields of micro- and nanoelectronics and microsystems. Strongly industry driven, more than 2,700 employees are working on the development and implementation of innovative concepts of miniaturized, highly integrated micro systems. Thus Fraunhofer VμE bridges the gap between semiconductor technologies and its applications. The focus is on creating new technical solutions for advanced systems integration, design and process technologies. Additionally, interdisciplinary research projects are prepared and coordinated, studies conducted and strategies identified.

CSEM Centre Suisse d'Electronique et de Microtechnique SA

CSEM (Swiss Center for Electronics and Microtechnology), founded in 1984, is a private research and development center, specialized in micro- and nanotechnologies, microelectronics, systems engineering and communications technologies. It offers its customers and industry partners tailor-made innovative solutions based on its technological expertise from applied research. Approximately 400 highly qualified and specialized employees from various scientific and technical disciplines work for CSEM in Neuchâtel and the four regional centers in Zurich, Alpnach, Basel and Landquart.

Commissariat à l'Énergie Atomique et aux Énergies Alternatives

CEA (alternative energies and atomic energy commission) is a French government-funded technological research organisation with 15,000 professionals involved in research, development and innovation. CEA is active in three main fields: energy, information and health technologies and defense and national security. In Grenoble CEA provides world-class R&D for both public and industrial clients through the activities of more than 1,600 researchers and engineers at Leti in micro and nanotechnologies and 700 at Liten in the fields of new and renewable energies.

VTT Technical Research Centre of Finland

VTT is a globally networked multitechnological contract research organization. VTT provides high-end technology solutions and innovation services. Our aim is to increase the competitiveness of our customers' position, promote the creation of new business, and improve and speed up the productivity of R&D. VTT offers access to the cross-disciplinary expertise of 2,900 professionals, unique research infrastructure and comprehensive partnership networks. Approximately 300 VTT experts are specialized in microsystems and microelectronics. Our other technological focus areas are applied materials, bio and chemical processes, energy, ICT, industrial systems, services and the built environment and business research.

Technical Contribution

MEMS

- Full processing capability for SOI MEMS
- SOI or cavity-SOI, epi-poly-SOI
- 100, 150 and 200 mm wafer size
- I-line lithography (0.4 μm), wafer stepper lithography, mask aligner
- Double side wafer stepper lithography (0.4 μm)
- High-aspect ratio structures by DRIE
- Wet and dry etching capabilities
- Wide range of wafer bonding processes also for SOI substrates (glass-frit, eutectic, direct, anodic bonding, metal thermo-compression, temporary bonding)
- Through silicon and through glass vias
- Wafer grinding, polishing and dicing
- Extensive characterization capabilities

And beyond

- Wafer level packaging (vacuum package, also with getter material)
- Multi wafers assembly
- Wafer level test
- High temperature 1.0 μm CMOS process based on thin film SOI for 250 °C
- Smart Power (600 V) process based on thin film SOI
- Single crystalline diodes based on SOI for micro bolometers
- 3D integration with electronics
- Interposers
- Thin film packaging

Output

- Device wafers or diced device wafers
- Integrated systems (MEMS and electronics)

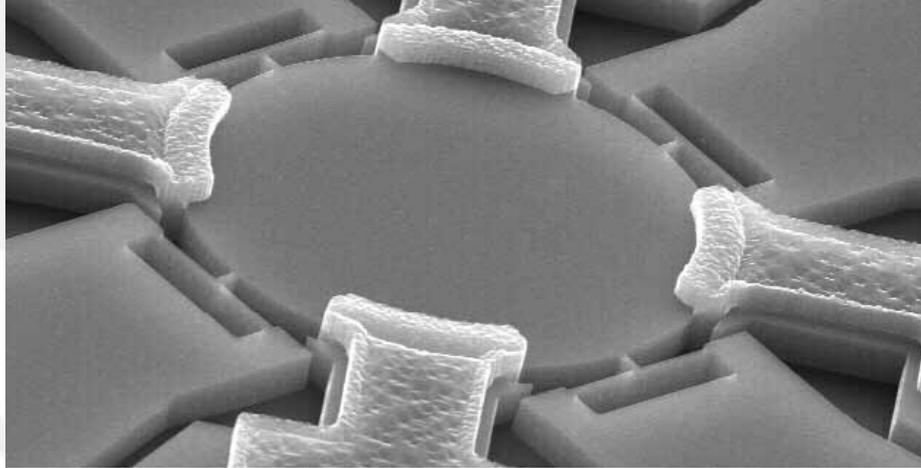
Standards

- ISO 9001 certified and ISO/TS 16949 conformal (depending on the institute)



Locations of the HTA partners:

Fraunhofer in Germany
 CSEM in Switzerland
 CEA Leti in France
 VTT in Finland



Complete HTA Offer

Integrated Solutions

SOI MEMS Platform

- Design of
 - IC
 - RF
 - MEMS
 - 3D
 - System
 - System building
 - Testing & reliability
- Other Processing:
 - CMOS
 - Roll-to-roll
 - Laser machining
 - Polymer electronics
- Packaging and 3D Integration
 - Wafer-level
 - Chip-level
 - LTCC
 - Flexible substrates
 - Polymers

Operation of the HTA SOI MEMS Platform

- One-stop shop
- In case of multiple offers the partner who supplies the best offer from customer point of view will be used (delivery time, experience, cost, suitability of processing equipment)

Platform Manager's role

- Acts as a one-stop shop for the customer
- Contact person and coordinator
- Acts as a matchmaker between the specialists
- Know-how of design rules
- Know-how of processing capabilities and limitations
- Pricing, scheduling, and resourcing

Platform Managers

Fraunhofer-Gesellschaft

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A complete process and equipment list is available and is distributed by the platform managers.