



# Your **highway** from idea to process

Boost your silicon idea to a smart silicon product

---



# IMEC'S CMORE PLATFORM

Accelerates semiconductor process development towards innovative smart products

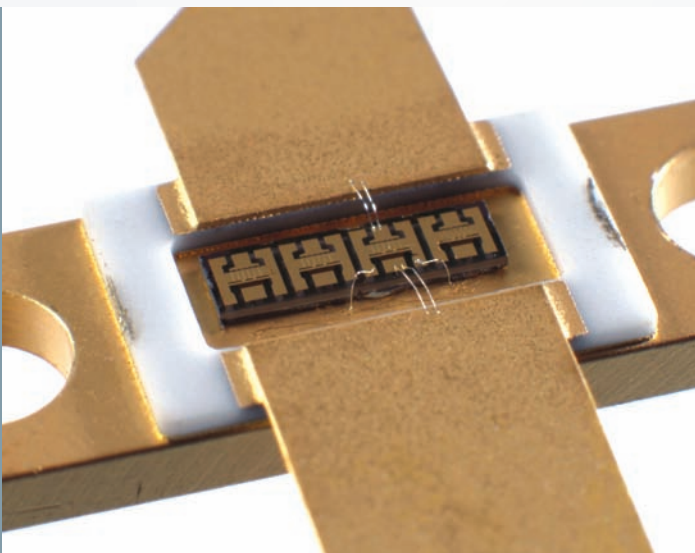
## CMOS surpassing standard capabilities

CMOS processes currently used in manufacturing for logic and/or DRAM show the promise of a whole new future industry driver. They can be used to develop new devices and systems such as integrated smart sensors, power devices, CMOS MEMS and NEMS devices, biochips etc. Such smart devices and systems will be developed using a CMOS baseline process integrating sensor and actuator functions, or modified for optimized power handling capacity, operation voltages and drive currents, or using above IC thin-film technology for integrated passives and MEMS. Key is the combination of an increasingly wider set of expertise, ranging from CMOS process and design technology, over packaging and interconnect technologies to the bio-nano convergence domain.

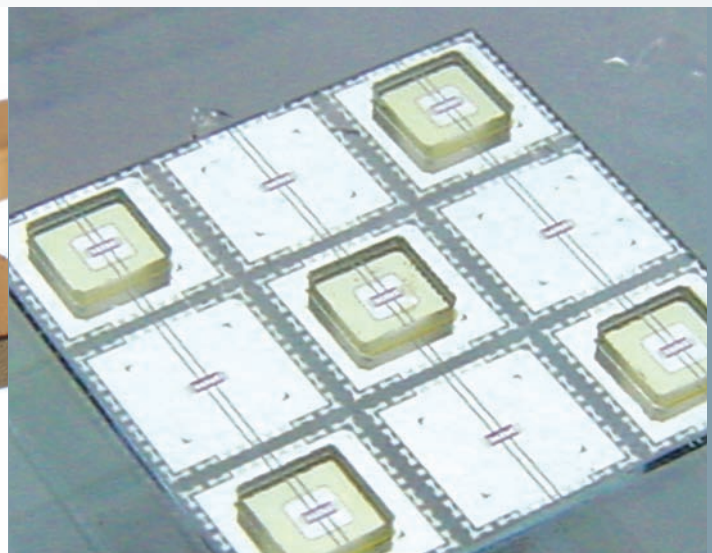
## Joint R&D from idea to process

Building on its world-renown experience in semiconductor process scaling and using its state-of-the-art infrastructure, IMEC opened its silicon processing facility for R&D on Si processes or process modules for integrated systems. IMEC's CMORE platform offers R&D programs accelerating development and commercialization of emerging semiconductor-based process technologies. R&D focuses on Si-technology based manufacturing processes or process modules targeting novel functions and performances surpassing those of standard CMOS processes. The CMORE platform builds upon the existing 130nm/90nm CMOS baseline process and the 200mm CMOS clean room infrastructure. This line is extended with dedicated 200mm equipment for complementary wafer processes such as bulk and surface MEMS, metal plating, wafer thinning and bonding. IMEC's experienced scientists and engineers using state-of-the-art equipment, deliver cost-effective R&D resulting in innovative products and applications with a shorter time-to-market.

## Heterogeneous process realizations



System-in-a-package assembly of AlGaN/GaN HEMT power bar using a dedicated power package with direct heat sink.



Capacitive RF-MEMS switches packaged with 300µm-thin glass caps with BCB seal.

# IMEC'S CMORE R&D COLLABORATIONS

## Objective

To develop semiconductor process flows or process modules leading to a commercially viable product. The process robustness will be demonstrated by device prototyping. Finally, the process or process modules can be transferred to a manufacturing environment for volume production.

## Offering

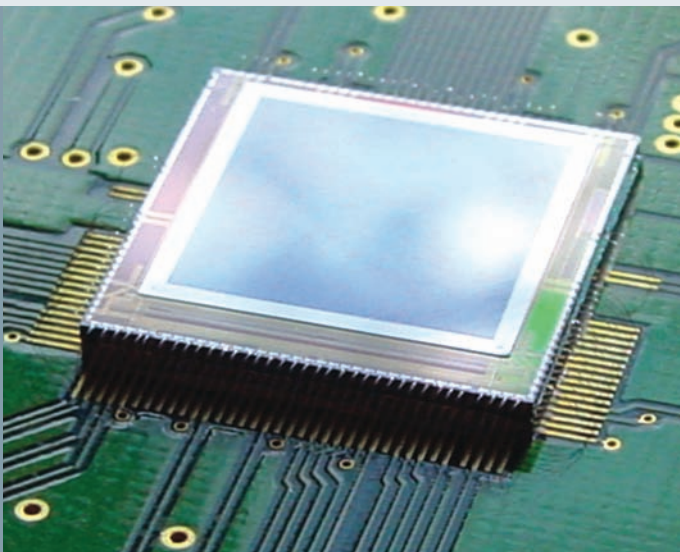
- **CMOS-based R&D for heterogeneous process development:**
  - Steps, modules and integrated processes;
  - Device prototyping;
  - Demonstration of process latitude;
  - Transfer of process or process steps to production environment.
- **Access to 200mm facility for proprietary R&D**
- **Joint development projects with equipment and material suppliers**

## Know-how and realizations

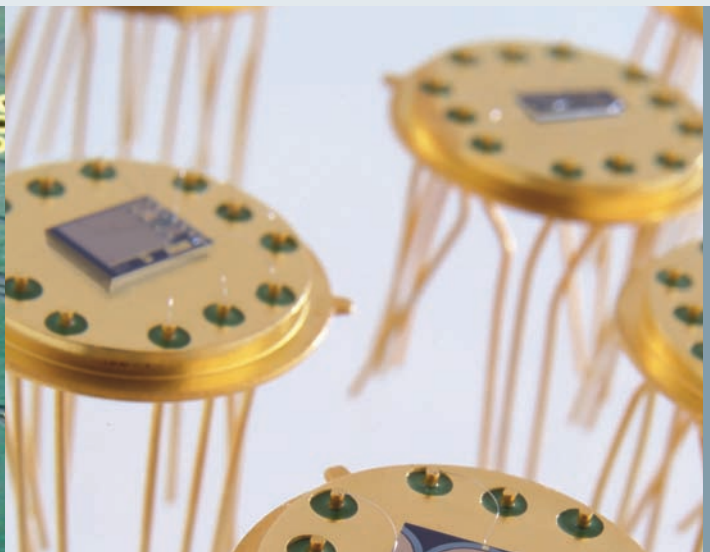
IMEC has already developed several CMOS-based process technologies with extra functionality.

- **SiGe-based integrated CMOS MEMS devices and technologies for applications such as:**
  - Micro-mirrors, gyroscopes, new type of memories
- **CMOS-integrated sensor systems:**
  - CMOS blood gas sensors, cell-IC interfaces, neuroelectronics
- **Thin-film based technologies:**
  - Above IC integrated passive devices (High-Q inductors), RF MEMS, FBAR
- **Silicon photonics:**
  - Photonic integrated circuits based on submicron optical waveguides in silicon-on-insulator, wavelength filters and fiber interfaces
- **GaN on silicon:**
  - Wafer technology

The CMORE R&D programs not only will build further on this expertise, but expand into new areas.



Thinned CMOS image sensor integrated on a chip with readout electronics, which is connected to the test board by wired bonding.



First AlGaN-on-silicon test detector samples for study of the sun.

# WHY IMEC?

## State-of-the-art semiconductor processing

- 130nm/90nm CMOS platform process;
- SiGe post-processing of MEMS on CMOS;
- Above IC thin-film technology for integrated passives;
- Process modification and optimization capabilities;
- Use of other starting material than Si wafers if compatible.

## State-of-the-art infrastructure

- 200mm facility with state-of-the-art equipment supported by strategic partnerships with many leading equipment and material suppliers;
- Semi-industrial operation: 24hrs/7days, process monitoring, ultra-short cycle time;
- Long-term perspective through 300mm R&D facility.



## Benefits of working with IMEC

- No upfront investment in new infrastructure, reducing financial and technical risk and resulting in faster project implementation;
- No loss of manufacturing capacity in the fab;
- Support by IMEC experts in specific process modules;
- Efficient technology transfer by onsite company staff firmly integrated in the project team;
- More than 20 years of experience in process development, industrial interaction and technology transfer;
- Cross-fertilization between process development and application-oriented R&D on systems-in-a-package, RF materials, nano-bio convergence, photonics, photovoltaics, heterogeneous system design,...;
- Extensive know-how in advanced packaging technologies:
  - 3D packaging;
  - Zero-level packaging;
  - Hermetically sealed packaging;
  - IC cooling technologies.

# JOIN IMEC'S CMORE PLATFORM

Tailored solutions  
to your specific needs

## Potential partners

Companies involved in manufacturing of smart semiconductor products:

- Integrated device manufacturers;
- System houses with or without in-house Si processing capabilities;
- Fabless IC manufacturers;
- Si foundries;
- Start-ups.

### Semiconductor equipment manufacturers and material suppliers:

Joint development projects to make new equipment and processes available at IMEC.

### Back-end companies:

Early collaboration on packaging, test and qualification of heterogeneous products to accelerate time-to-market.

### Design houses

## Collaboration model

IMEC offers technology solutions tuned to specific needs of the industrial partner. At the start of a collaboration project, a suitable intellectual-property (IP) ruling is worked out. IP can be generated together with the partner as part of a collaboration project. Selected IMEC-owned IP blocks, design flows and technologies can also be licensed or transferred to companies involved in the R&D project.

## Contact us

### Lou Hermans

Strategic Business Director  
IMEC vzw  
Kapeldreef 75  
B-3001 Leuven – Belgium  
Phone: +32 16 281 972  
Fax: +32 16 281 501  
E-mail: Lou.Hermans@imec.be

### USA contact

Raffaella Borzi  
IMEC, Inc.  
960 Saratoga Ave, Suite 206  
CA 95129 – San Jose  
California – USA  
Phone: +1 408 551-4502  
Fax: +1 408 551-4505  
E-mail: Raffaella.Borzi@imec.be

### China contact

Teng Gao  
IMEC Shanghai Office  
Units C60-C66, 11/F  
Shanghai Mart  
2299 Yan'an Road West  
Shanghai 200336 – P.R. China  
Phone: +86 21 6236-0700 ext. 18  
Fax: +86 21 6236-0706  
E-mail: Gao.Teng@imec.be

### IMEC representative Japan

Akihiko Ishitani  
IMEC Representative in Japan  
c/o Rokubancho Kyodo Bldg. 1F - 6 Rokubancho  
Chiyoda-ku - Tokyo 102-0085 - Japan  
Phone: +81-3-5210-5882  
Fax: +81-3-5210-5883  
E-mail: Akihiko.Ishitani@imec.be

---

[www.imec.be](http://www.imec.be)

