IBS - Ion Beam Services

- Profile
- Technologies
- Devices & sensor fabrication
- Participation to R&D programs
- Researched partnership
Profile: Products and services

Products and services for microelectronics
- Custom Ion Implantation
- Equipments
- Services on equipments
- Devices Fabrication

To the following markets
- Integrated devices and power components
- Optoelectronics and radiation detectors
- Chemical sensors and Microsystems ... and biosensors
Profile & Turnover

- SME
- Founding: 1987
- Capital: 840 k€
- Staff: 49

PRODUCTS distribution
IBS S.A. 2002

- Services: 32%
- Equipments: 15%
- Custom devices: 21%
- Ion implantation: 19%
- Other: 13%

GEOGRAPHICAL distribution

- France: 34%
- Germany: 24%
- Great Britain: 28%
- Miscellaneous Europe: 9%
- World: 5%
Technologies

- Plasma and ion beam treatments
- Semiconductors doping
- Ion beam equipments
- Microelectronics Processing
- Power devices
- Sensors
Products and services

- Ion implantation
- Equipments and services
- Custom devices
Custom devices fabrication

A versatile subcontracting solution
- Individual process steps
- Technological block
- Small and medium size production of custom devices

Microelectronics technologies
- Ion implantation doping and thermal processing
- Thin film coating by PVD and PECVD
- Photolithography
- Wet, plasma and ion beam etching

Specific innovative processes
- Ion beam Surface engineering
- CMOS compatible anisotropic etching (TMAH based)
Reduce the cost of your custom devices

The interest of an external small foundry

- Fulfill the lack between laboratory and big industrial foundry
- independency and confidentiality
- services for companies that want to produce custom devices without prohibitive investment
- Reduced development time
- Reduced price in comparison with self technological maintenance even for medium size production
- Risks sharing
- Respect of industrial properties
Conception Fabrication & Test

CONCEPTION
- Process integration
- Electrical simulation
- Mask Designing

Fabrication
- Clean room
- Front end fabrication & control
- Back-end laboratory

Test & Characterisation
- Electrical probing
- Optical characterisation
Production facilities

Front End
- Clean room : 350 m²
- Classe 10, 100 et 1000
- Wafer size from 2” to 6”
- Production Equipments
  - Wafer cleaning
  - Wet etching
  - Ion implantation
  - Sputtering (DC and RF)
  - Dry etching (RIE)
  - Ion beam etching
  - Photolithography
  - Oxidation and diffusion
  - LPVCD and PECVD
Applications

- Discrete devices with junctions
  - diodes
  - MOS et bipolar transistors
  - UV et visible detectors

- Sensors
  - mechanical
  - chemical, biochemical & environmental

- Passives and interconnection
  - capacitors & resistors
  - inductors

- Optical micro-components by our partner SILIOS Technologies
Examples: Sensors & discrete devices

Process steps for small and medium size production
- Anisotropic etching of 15/20 dies lots
- Pressure sensors (600/week)
- Doped substrates for analogic integrated devices

Full processes for small and medium size production
- Solar cells prototyping: 5 mask levels
- PIN photodiodes: 3 mask levels
- Chemical sensor electronic base
- MOSFET for gamma dosimetry
- Integrated addressing diodes for ink jet printers
- MOS for electron spin studies
Example: Power devices

- Si et SiC Diodes (up to 4kV)
- HV MOSFET (up to 2,4 kV)
- Bipolar transistors (1kV, 30 A)

Characterisation and failure analysis
- Electrical characterisation
- Physical analysis
- Aging and reliability studies
- Electrical behaviour simulation
Example: Wafer level packaging

- CMOS compatible
- Postprocessing
  - Multilevel cavities
  - Microcaloducs
  - Devices on suspended membranes
- Passive devices
  - Implanted resistors
  - Thin film resistors
  - Inductances
  - Capacitors
Participation to R&D consortiums

European:
- 4th PCRD : MULTISTRESS (tailoring stress of multilayers)
- 5th PCRD : ESCAPEE (SiC power devices)
- 6th PCRD : NANOCMOS (next generation of MOS devices)
- PIDEA : WALPACK (wafer level packaging)

National:
- RMNT : CANAST (carbon nanotubes)
- DGA : Power devices
What can we offer as a partner in a R&D program for bio-sensor development

Technology transfer to further production:
- Consortium example:
  - R&D lab bringing a development idea
  - R&D lab for biological characterization
  - Industrial END-USER for final integration and system commercialization
  - IBS for industrial expertise, technological transfer, prototyping and final chip production

Innovative technology for bio-active surfaces
- Surface Engineering by ion implantation
  - Anti bacterial (Ag implantation)
  - Tailoring of wettability and surface adhesion
  - Modification of optical characteristics
  - Catalytic surfaces
  - ...

Présentation activité composant 15 Frank TORREGROSA le 21/04/2004
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