Nanotechology in Automotive Aplications

Infineon Technologies Romania

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Infineon at a Glance

The Company

- Infineon provides semiconductor and system solutions, focusing on three central needs of our modern society: Energy efficiency, Mobility and Security
- Revenue in FY 2010: 4,585 billion EUR
- Some 26,000 employees worldwide (as of Sept 2010)
- Strong technology portfolio with about 22,900 patents and patent applications
- More than 30 major R&D locations

Overview Infineon Romania

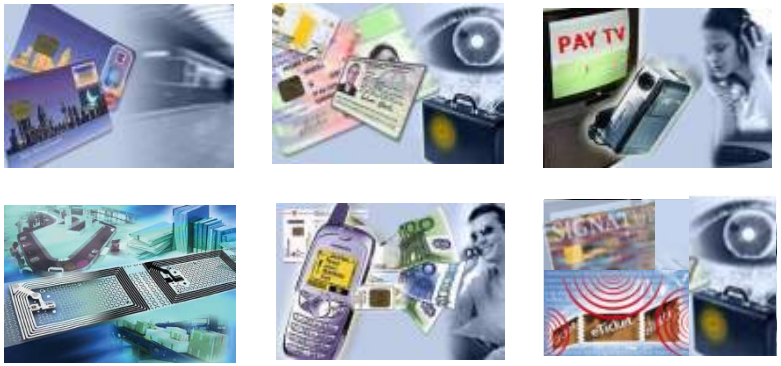
- Founded in April 2005
- Located in northern part of Bucharest
- **250+ employees as of today**
- 4000 m² office, incl. 600 m² research and laboratory area.

- Deeply involved in the Romanian Research Community
  - Technical partnerships
  - Co-fund research projects
  - Education and University relationship

Infineon Romania core competencies

Automotive applications

Chip Cards and Security

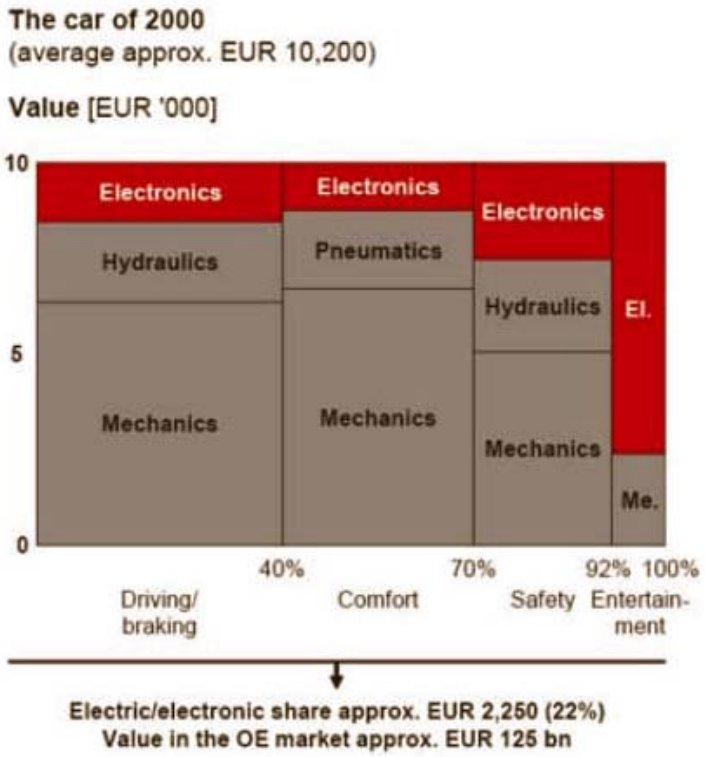


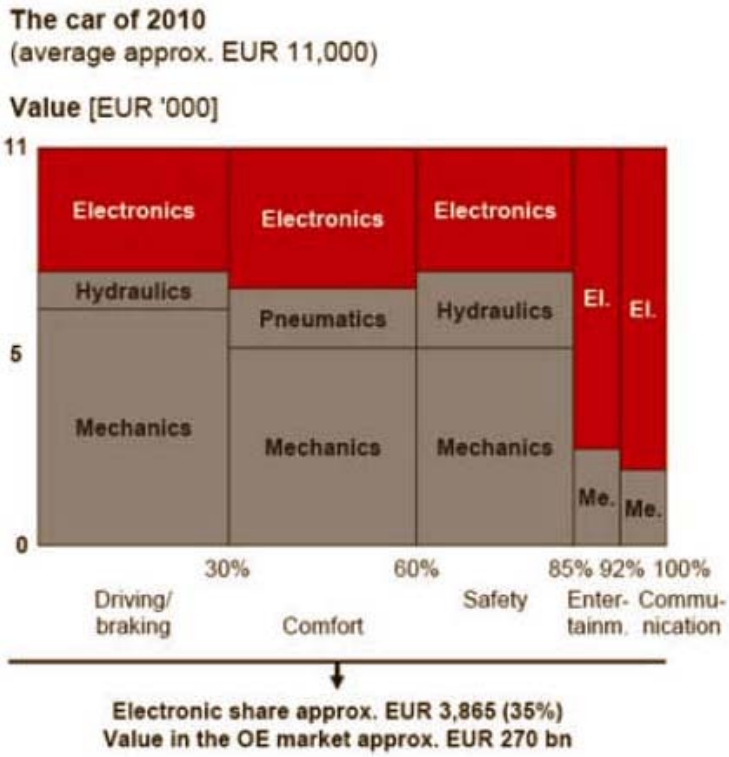
Concept Engineering | Analog Design | Digital Design | Analog IC Layout

Design Flow Support | Test Engineering | Product Engineering | Product Support

Infineon Romania is working over the complete value chain, from concept to product ramp-up for state of the art semiconductors

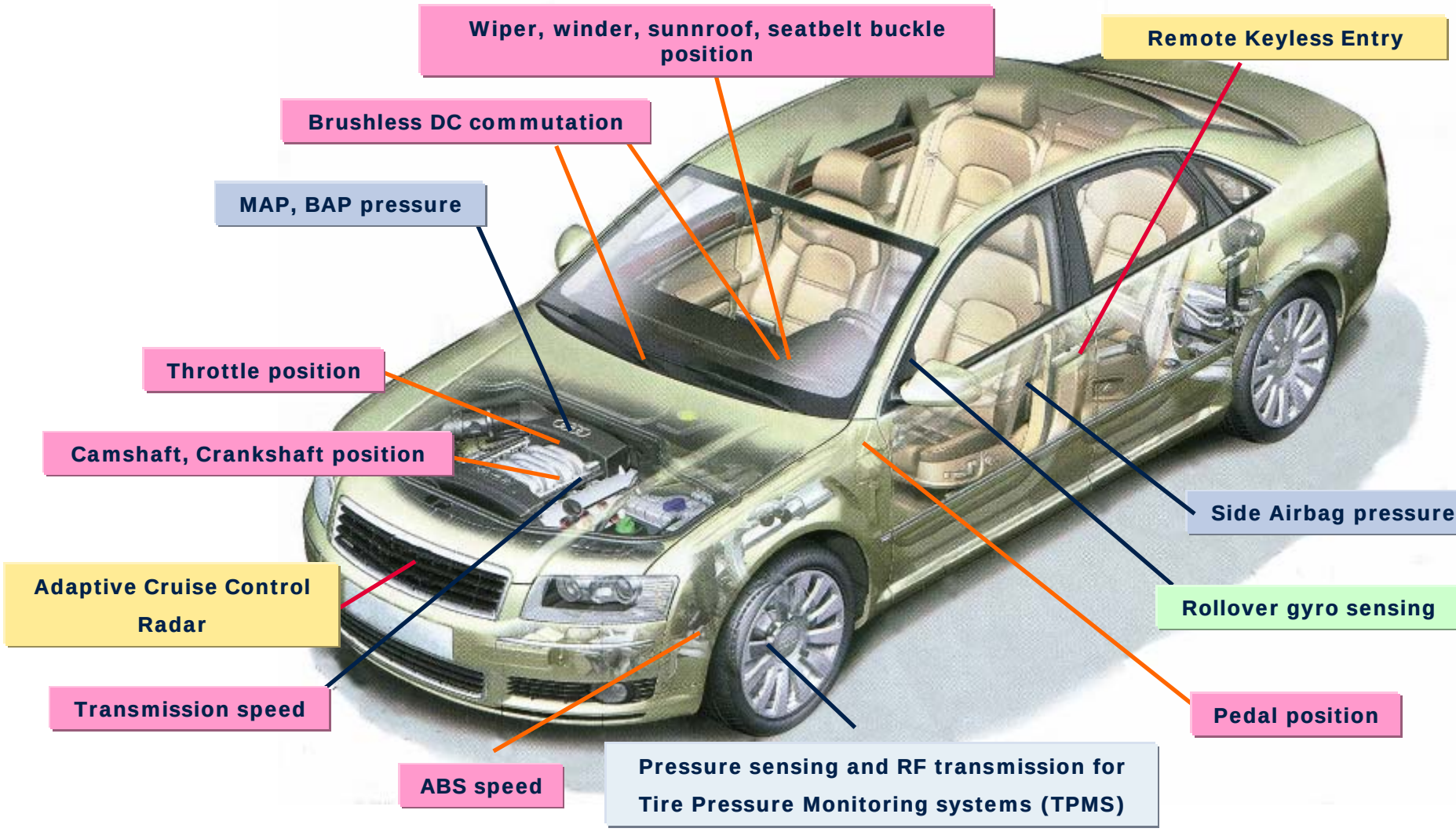
Electronic share within automotive applications





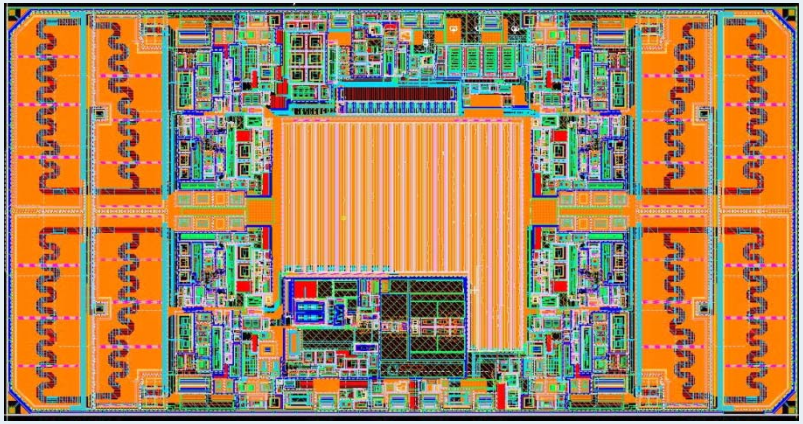
Romania has a good research competence and the complete value chain of the automotive industry is already present => Use the trend of increasing the electronic share within automotive applications! Now!

Chipsets for **powertrain, comfort** and **safety** applications



“More than Moore” for Automotive Electronics

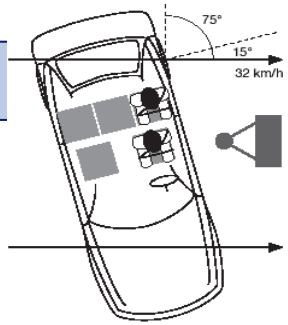
- Increasing application electronics and complexity in the car:
  - ⇨ Use “**Smart Power Technologies**”
- Delivery range of 10-15 years for an automotive technology and failure ppm-requirements (one low digit) are not fitting the Moore’s Law:
  - ⇨ “**More than Moore**”
- The “**Smart Power Technologies**” and “**More than Moore**” for automotive require:
  - ⇨ SOC – System On Chip;
  - ⇨ SOP – System On Package;



Addressed Application:
Pressure Sensor for Side Crash Detection

The point of departure:

New test criteria because of increased accidents with SUV/LTV

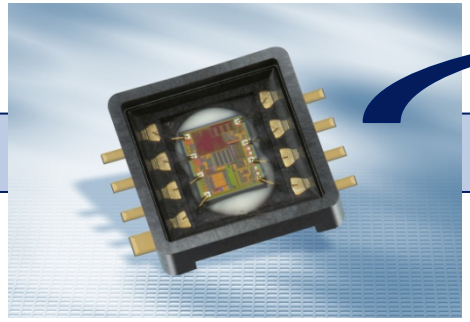


Oblique Pole Impact (FMVSS 214 NPRM)

→ **Pole hits the door and not the B-pillar!**

The job: Find a way to decrease the body injury!

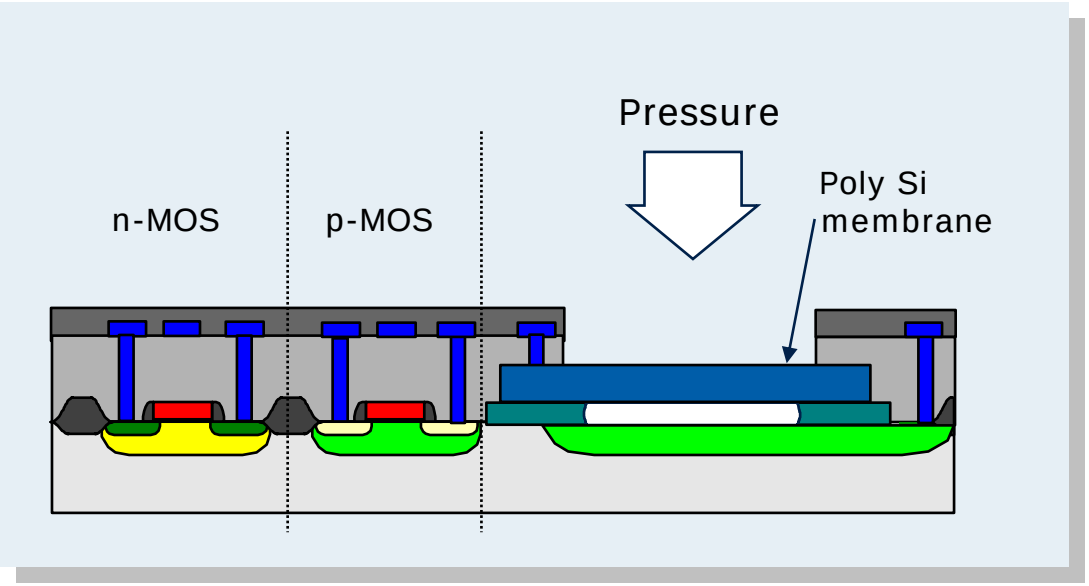
The solution:



Take a pressure sensor…

… and place it inside the door cavity!

Integrated Pressure Sensors – Surface Micromachining Process Flow



Key Features:

- Sensing element is an absolute capacitive pressure sensing device.
- Sensor is a monolithic construction using surface micro machining.
- Production on 8” standard BICMOS front end line.

Wafer

BiCMOS Process + Surface Micromachining

On-Wafer Pressure Calibration

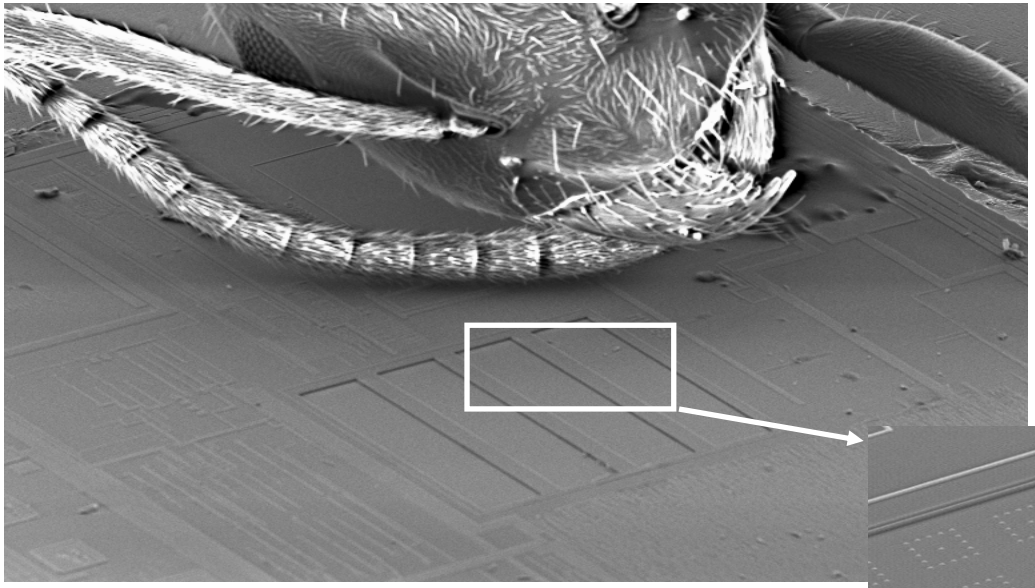
SMD Packaging

Pressure Calibration (parameter stored on-chip)

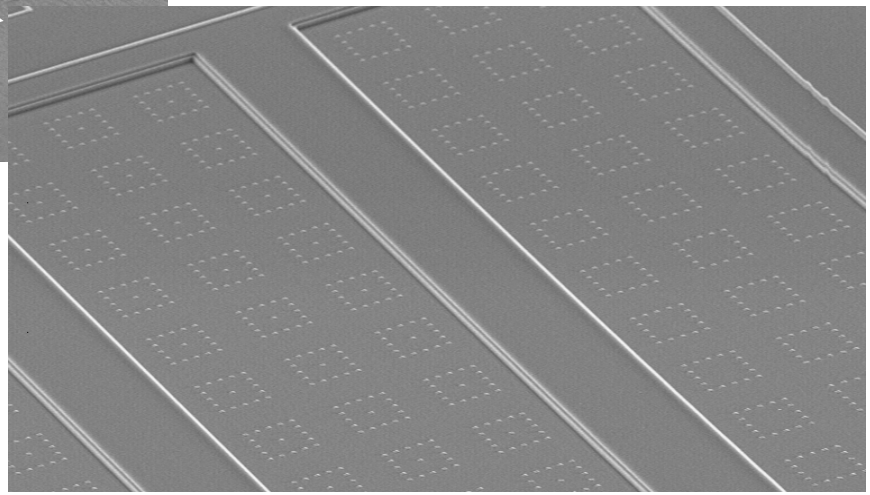
Testing

Product

Integrated Pressure Sensors – Surface Micro Machined Pressure Sensor



- Sensor cells in comparison to a head of an ant

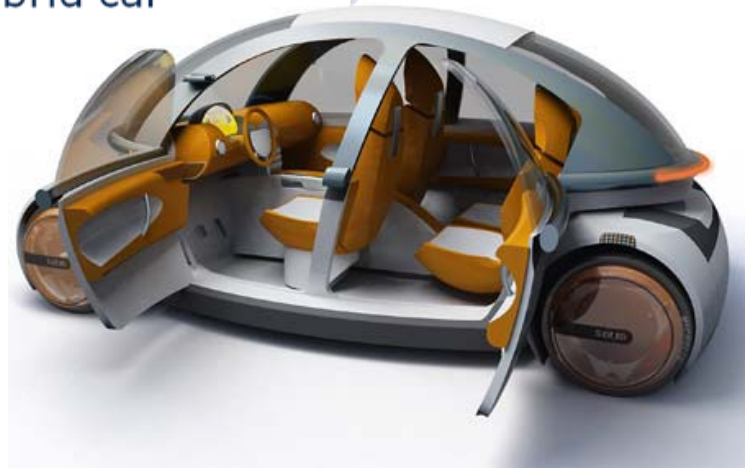


- 42 sensor cells per array
- 2 sensor arrays
- 2 reference arrays

Summary

Increasing electronics in the car

Demand for Hybrid car



Increase the market for Automotive business

Nano - Electronics Solutions

ENERGY EFFICIENCY
MOBILITY
SECURITY

Innovative semiconductor solutions for energy efficiency, mobility and security.