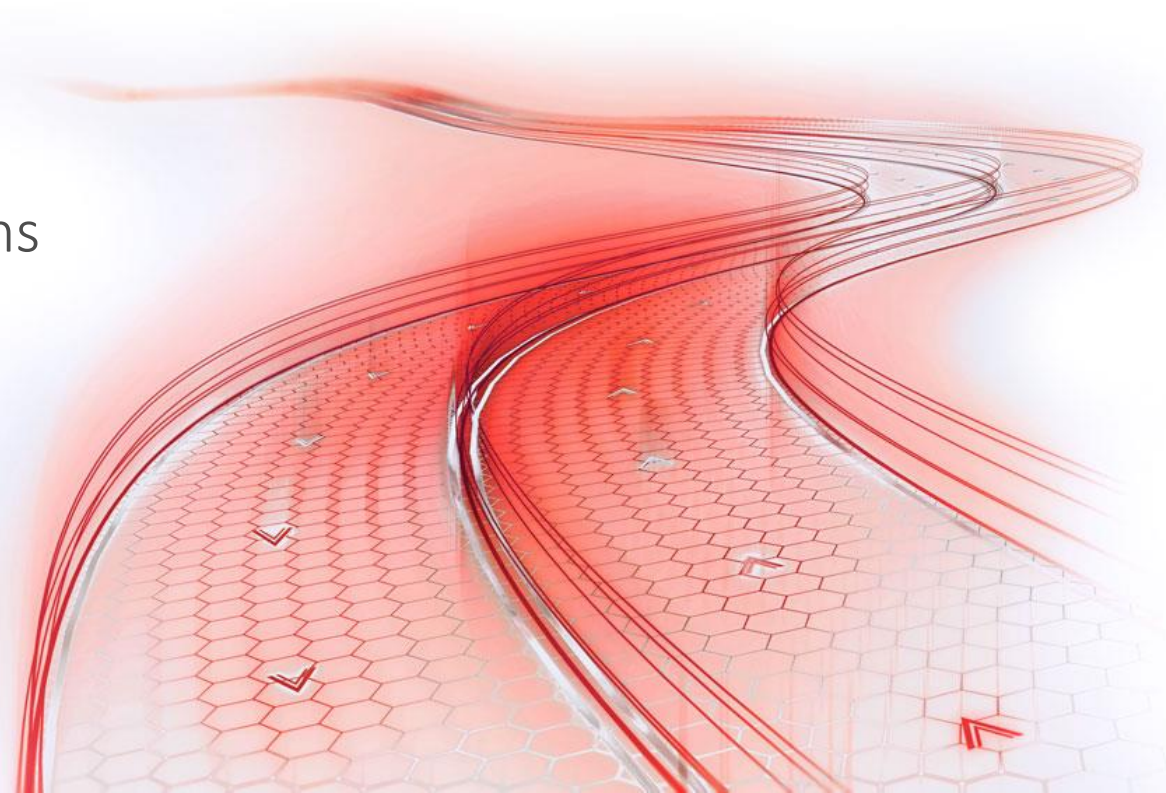




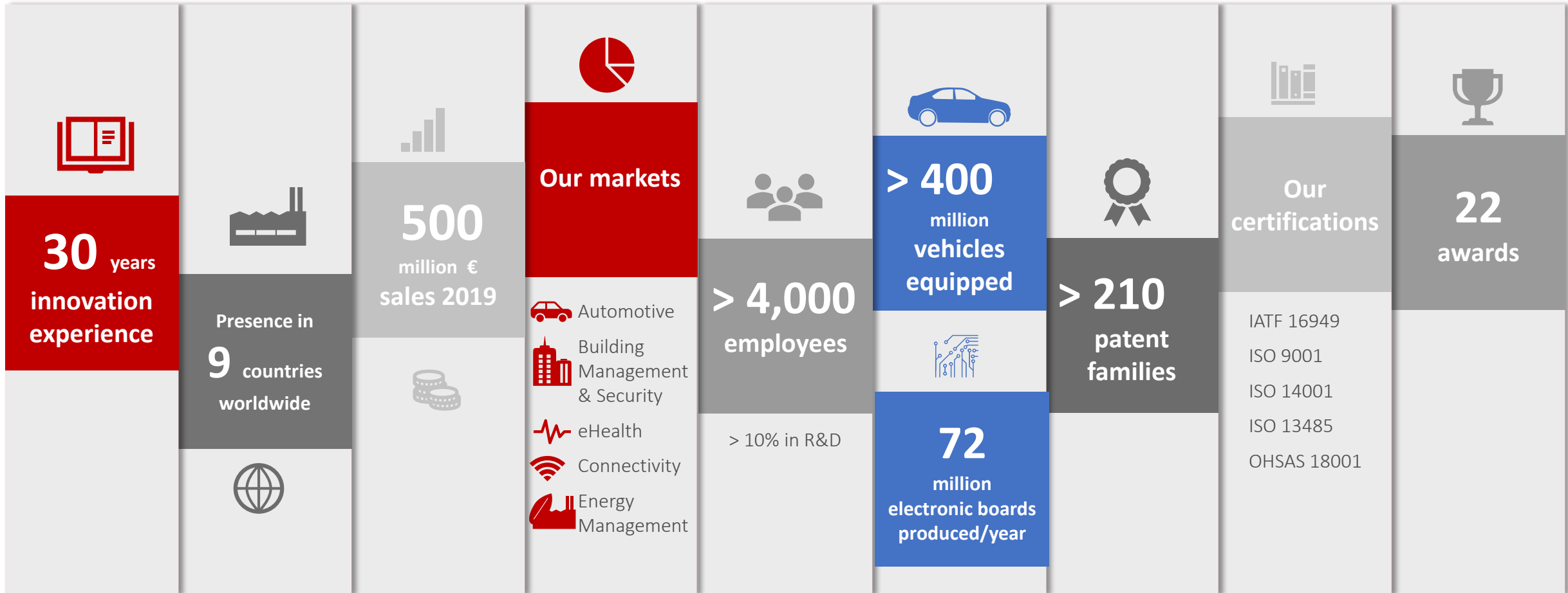
IEE Group

Global Player in Innovative Sensing Solutions
and Electronics Manufacturing Services

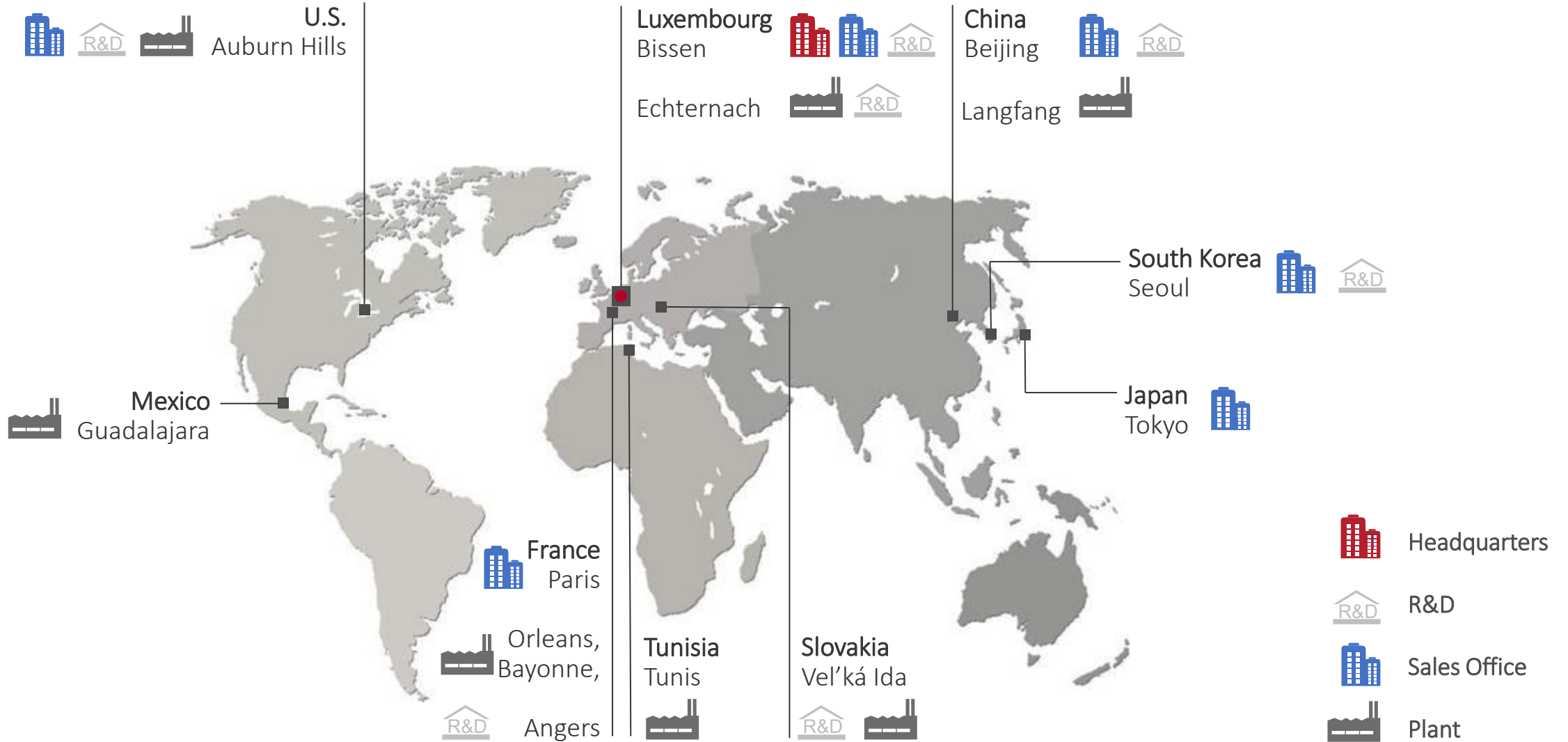


The IEE Group at a Glance

A few key facts about us



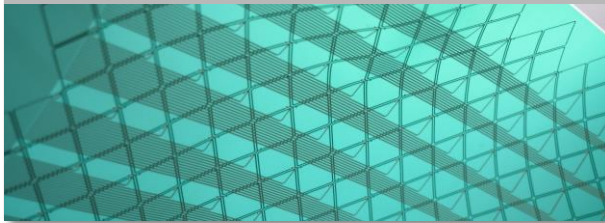
Our Global Footprint



Innovation Driven Company with Strong Technology Know-how

Our competencies

Screen Printed Large Area and Hybrid Electronics



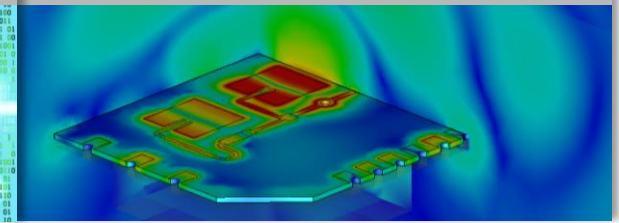
Electronics and Semiconductor Design



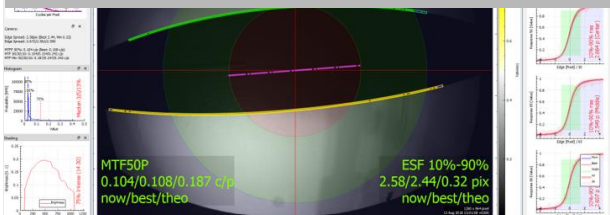
Algorithmic and Embedded Software



Radar Systems Engineering



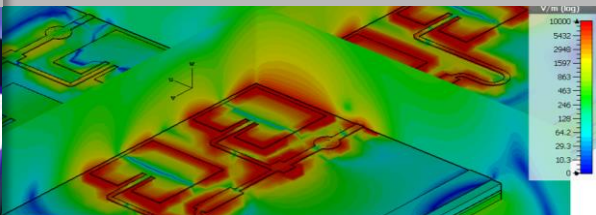
3D Camera Systems Engineering



Materials Sciences



Mathematical Modeling
Virtual Testing



Electronics Manufacturing Services



Latest Awards Recognizing Our Product Innovation Capabilities

<p>Hands Off Detection (HoD) System</p> 	<p>Automotive News PACE Award Driving Systems & Safety Category 2018</p> 	<p>CLEPA Innovation Award Co-operation Category Third prize 2016</p> 	<p>Fedil Innovation Award System Category 2014</p> 		
<p>VitaSense™</p> 	<p>CLEPA Innovation Awards Safety Category 2017</p> 	<p>Fedil Innovation Award 2016</p> 			
<p>TDflex™</p> 	<p>Merlion Awards Safety & Security Asia Access Control Category 2011</p>	<p>Sponsored by: ISC WEST SIA ISC West New Product Showcase SIA, Best Access Control Products Category 2011</p>	<p>security essen Security Essen Innovation Category 2010</p>	<p>Fedil Innovation Award 2010</p> 	<p>2010 WINNER GSN - Government Security News Homeland Security Awards GSN Homeland Security Award 2010</p>

Core Market: Automotive

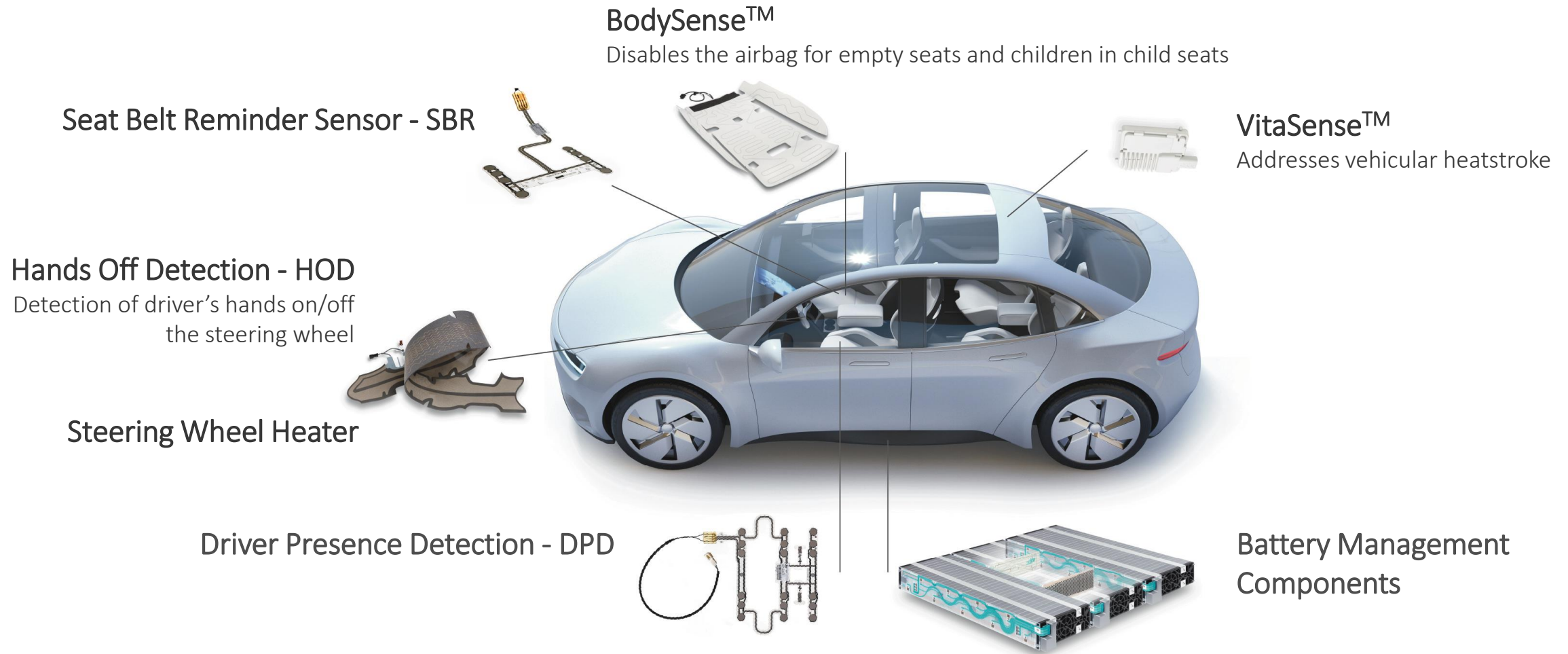


Vehicle Safety & Comfort

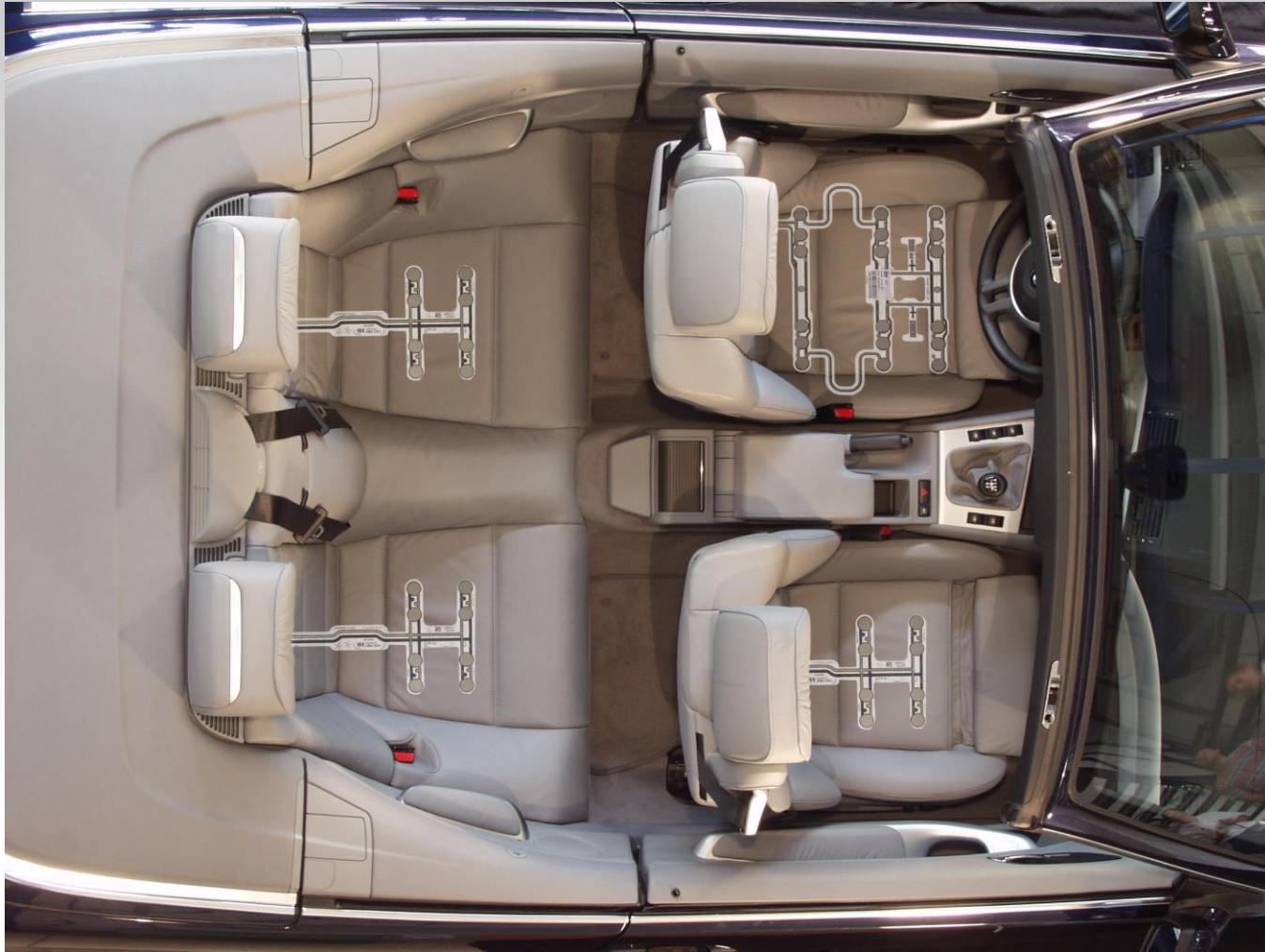
Vehicle Automation

Vehicle Electrification

Our Solutions



Occupant Detection Sensors – Front and Rear Seats



Effective way to enhance vehicle's assistance functions

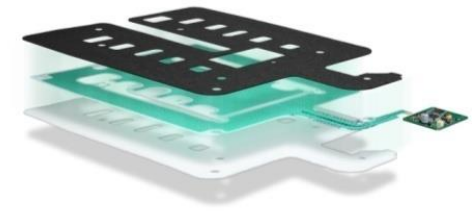
Seat Belt Reminder (SBR) sensor

- Effective way to save lives by increasing seat belt usage
- Activates warning signal to fasten seat belt
- Worldwide NCAP incentives for SBR

Driver Presence Detection (DPD)

- Supports Advanced Driver Assistance Systems (ADAS) (e.g. electric parking brake, stop and go, etc.)

BodySense™



Occupant Classification System for automatic airbag disabling

- Meets OCS requirements for
 - US FMVSS 208 semi low risk deployment
 - Euro NCAP incentive for child safety score
- Airbag deactivation for children in child seats and empty seats
- Ensures airbag deployment for adult occupants



Detects occupants and addresses heatstroke deaths in vehicles

- Left-behind children are detected, based on their movement or breathing, **even when they are sleeping**
- Optional occupant detection for advanced rear seat SBR
- NCAP incentives for advanced SBR and Child Presence Detection
- Robust low-power radio technology
- Invisibly installed behind the headliner

Hands Off Detection (HOD) System

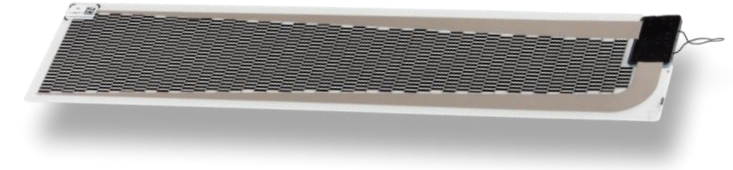


Detection of driver hands on/off a steering wheel

- Allows Advanced Driver Assistance Systems (ADAS) to alert the driver to take back control
- Functions even if the driver is not actively steering, e.g. in traffic jam situations
- Can be combined with heating function
- Supports UN R79 hands-off detection requirement



Battery Management Components



Maximise battery power potential with sensing, monitoring, balancing and heating solutions

- Customised battery module connection systems based on lightweight printed foil technology
- Compact, flat and can be sandwiched between cell blocks or battery cells
- Designed for simplifying assembly processes and meeting automation needs
- Product examples:
 - Sensor to monitor cell temperature
 - Battery connection unit to monitor voltage of battery cells
 - Cell discharging for passive cell balancing
 - Balancing resistor elements
 - Adaptive cell heating



People Counting

Access Control



People Counter



Accurately counts and tracks the number of people to optimize building safety and security

- Key applications:
 - Occupancy monitoring
 - Flow management
 - Queue management



TDflex™ - Tailgate detector



Prevents unauthorized access to secure areas

- Detects tailgating or piggybacking in one or both directions
- Suitable for single/multiple doors, mantraps, airlocks, e-gates, turnstiles, or access points without doors

eHealth and Other Markets



Smart Footwear Sensors

Customized Input Sensing Solutions

In-shoe sensors

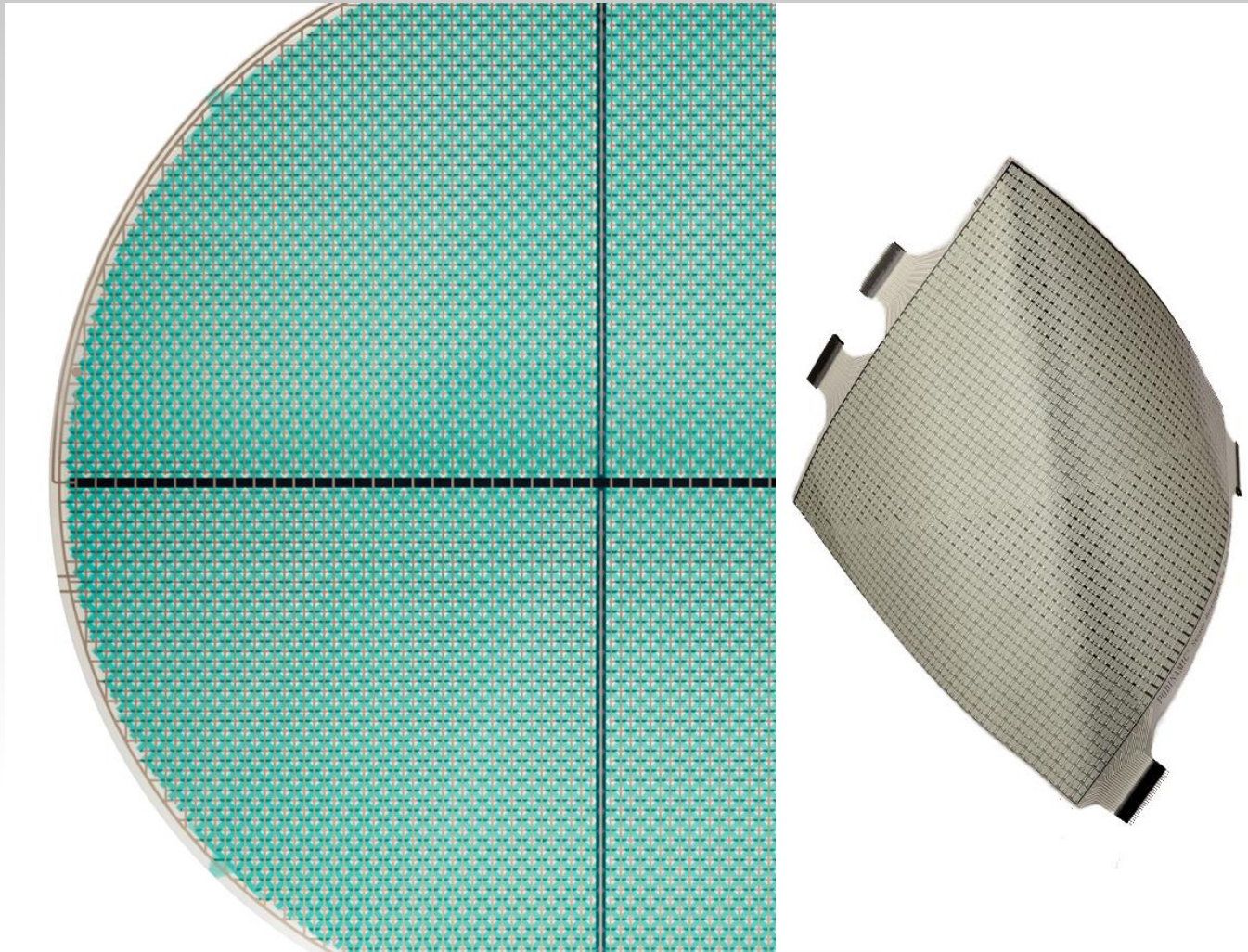


In-shoe sensors for sports performance and medical measurement

- Provide real-time gait analysis for enhanced sports performance and medical evaluation
- Perform continuous plantar pressure profile measurement
- Industrial solutions with high dynamic range



Customized Input Sensing Solutions



Pressure sensing solutions for multiple applications

- Thin, flexible and robust foil-based pressure sensing solutions for
 - devices that require on/off signals or touch-sensitive and intuitive navigation
 - innovative interactive products with new value creation for the end users (gaming, virtual training tools etc.)
 - real-time monitoring tools

Thank you for your attention!

Follow us on:



Contact us

IEE S.A.

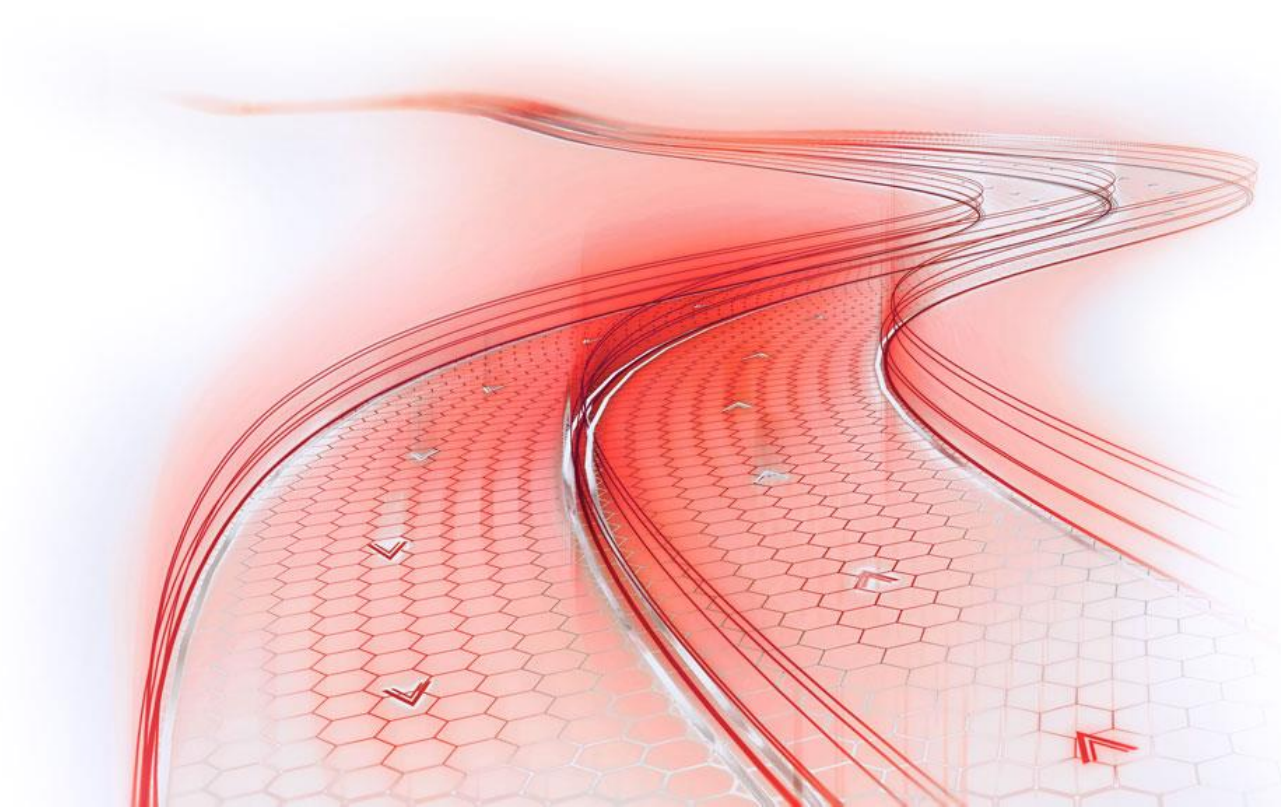
1, rue du Campus
L-7795 Bissen

Phone: + 352 2454-1

Fax: + 352 2454-3200

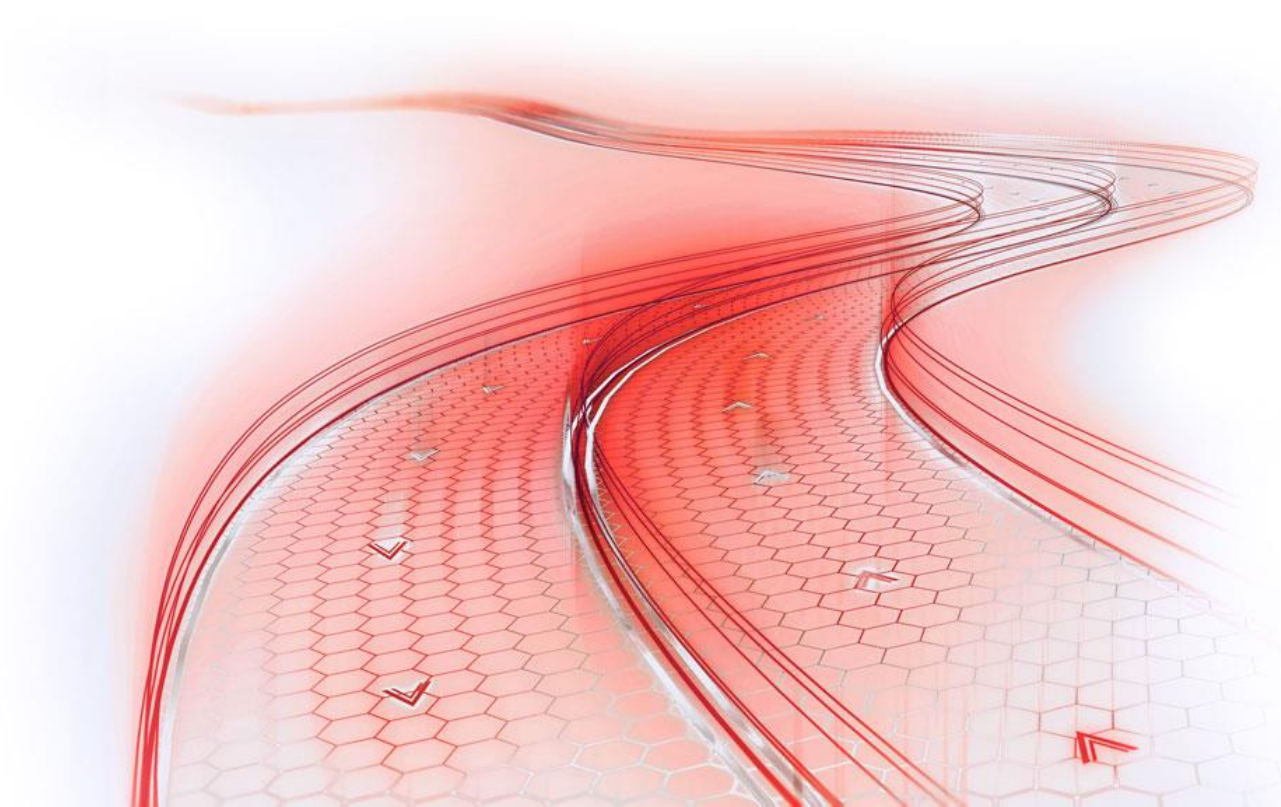
E-mail: iee@iee.lu

Website: www.iee-sensing.com

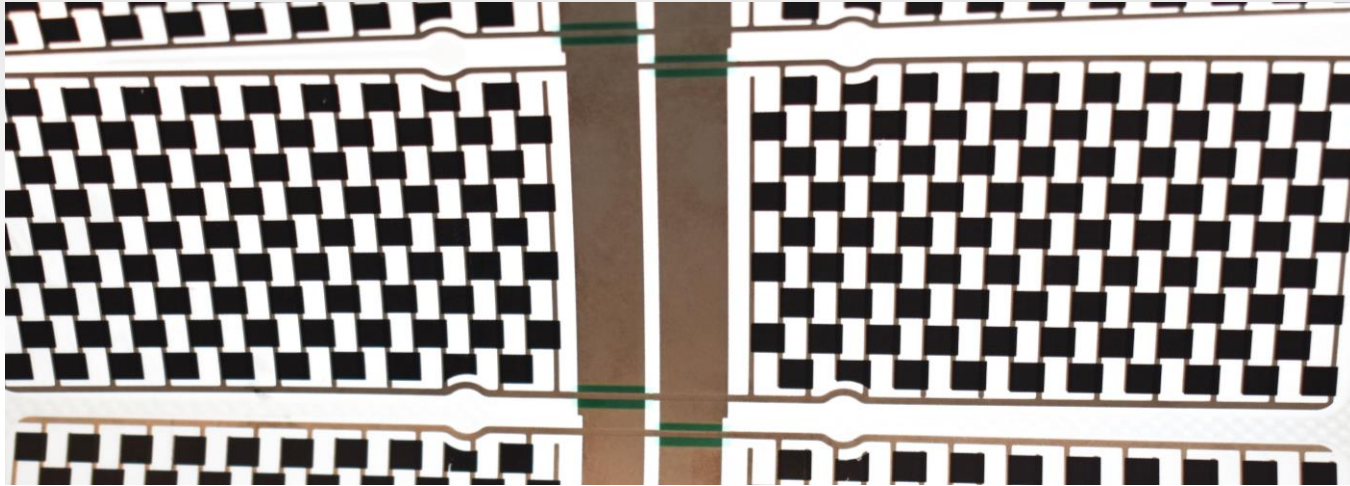
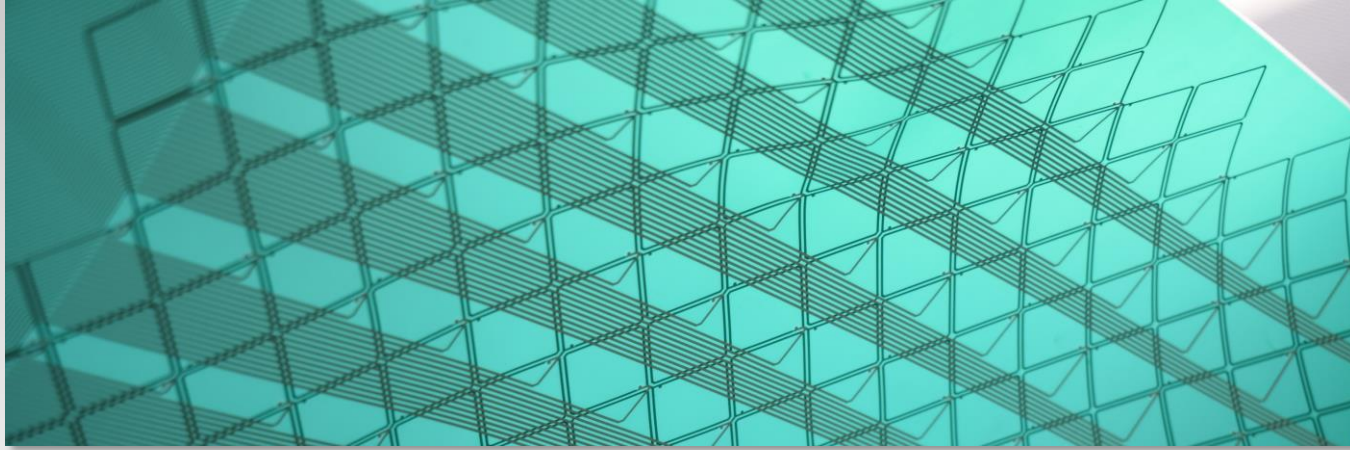


Appendix

Our competencies



Screen Printed Large Area and Hybrid Electronics



Industrial scale development and production of large area printed electronics

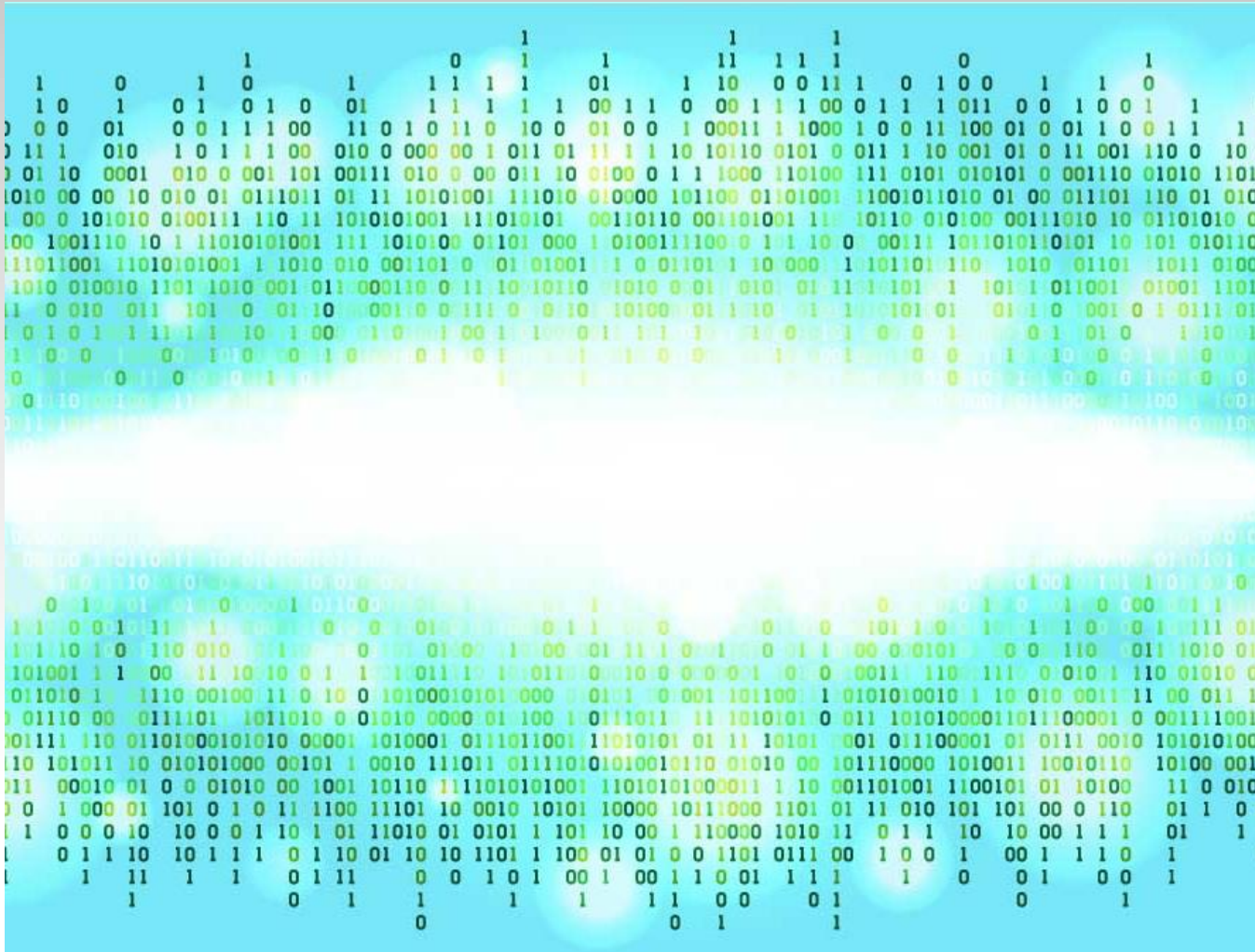
- High design flexibility and benefit of a large processable material portfolio
- Screen printing inks with specific functionality
- Full functioning final product with hardware and software development
- Industrial production for different markets (eg.: automotive, building, healthcare)
- Hybrid-electronics with inhouse serial pick & place SMD process

Electronics and Semiconductor Design



- Development of hardware, software, including algorithm, and Digital Signal Processor (DSP) software
- Development of Application Specific Integrated Circuits (ASIC), including transponders, 3D time-of-flight imager chips, and 3D image processing ASICs

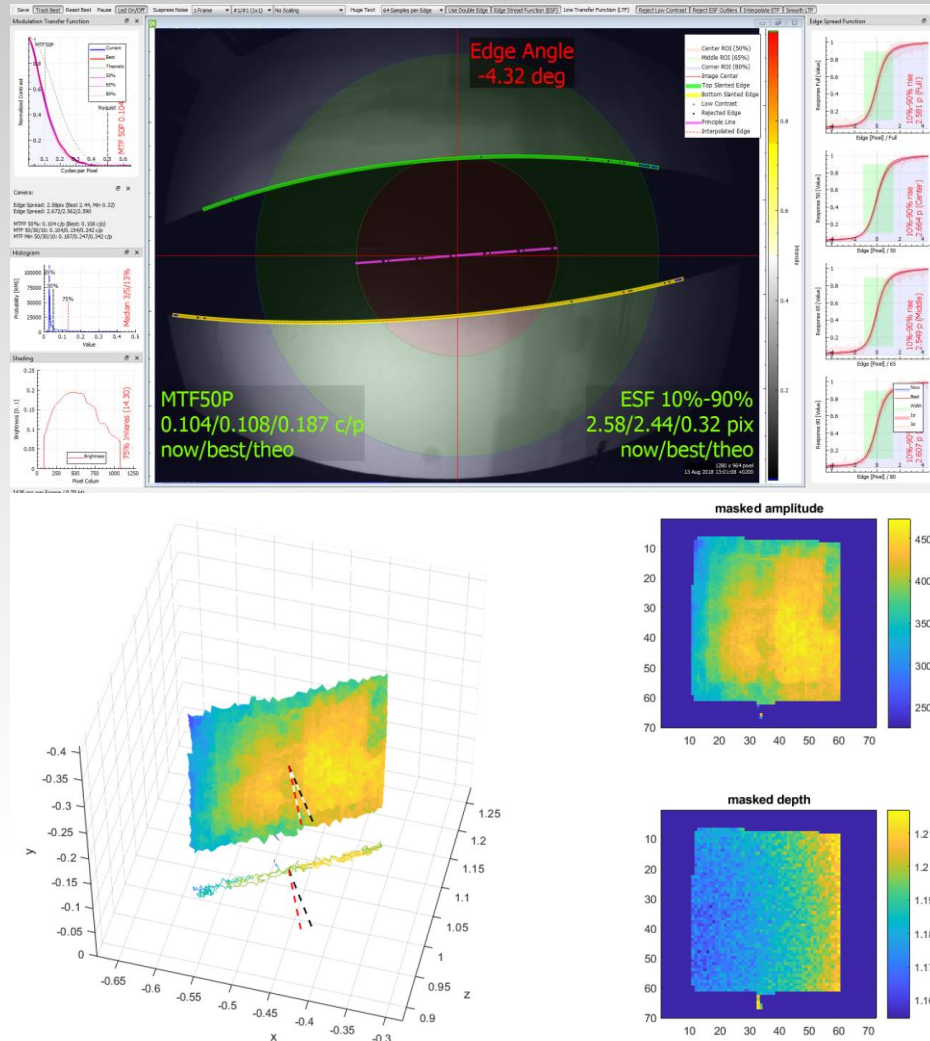
Algorithmic and Embedded Software



State-of-the-art development of algorithms and embedded software

- Development of pattern recognition, signal processing and real-time algorithms in 3D computer vision
- Automotive SPICE certified software development process and compliance with ISO 26262 functional safety
- High performing algorithms fulfilling reliability requirements of highest automotive safety standards
- Strong research collaborations, patented methods and publications in leading journals and conference proceedings

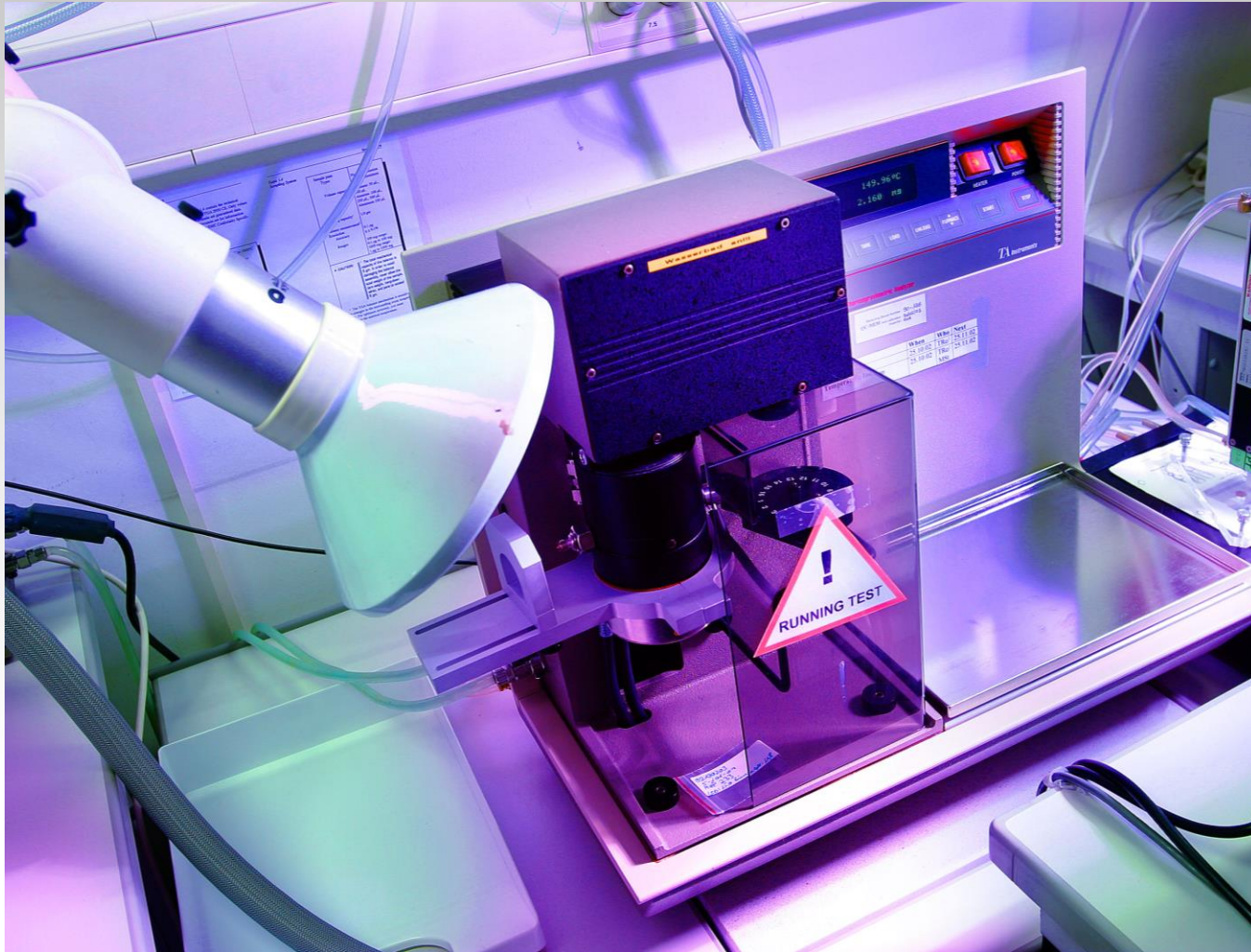
2D and 3D Camera Systems Engineering



Total performance optimization along the complete image-processing pipeline

- 2D camera systems
- 3D camera systems (Time-of-Flight, Stereo Vision, Structured Light)
- Optimization of camera performance down to quantum level
- Interdisciplinary understanding of optics, imaging technologies, image processing and algorithmic requirements
- Design validation and performance characterization of camera-based systems.

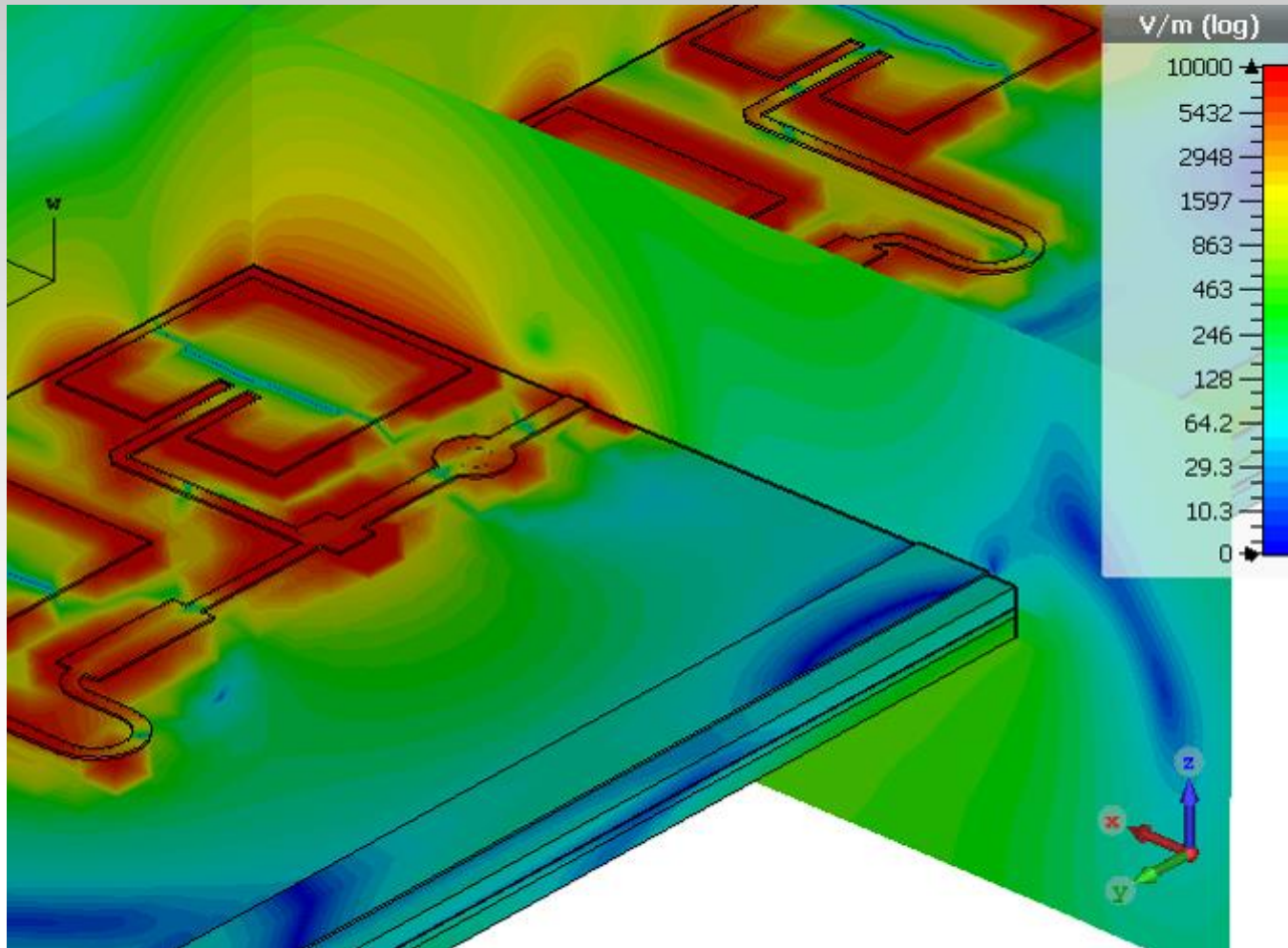
Materials Sciences



Advanced R&D and qualification of novel functional materials

- Printed and hybrid electronics for large scale industrial processes for
 - electronic sensors (textile, foil based)
 - heater technologies
- State of the art material test infrastructure
 - in-house qualification test according to automotive standards and customer requirements
 - strong collaboration with specific institutes worldwide
- Broad international collaborations with academia for future material technologies

Mathematical Modelling - Virtual Testing

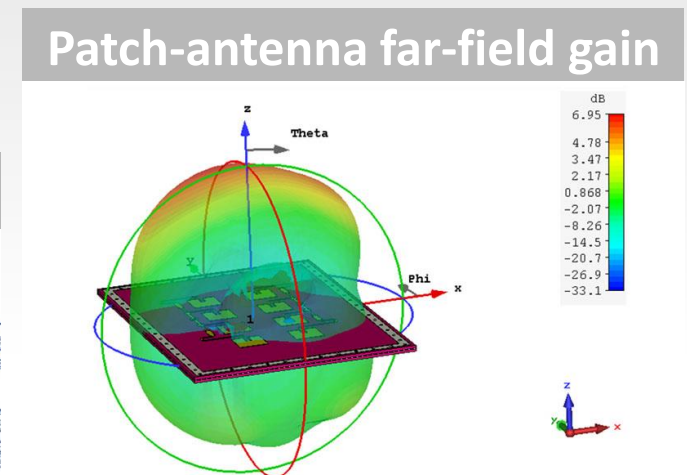
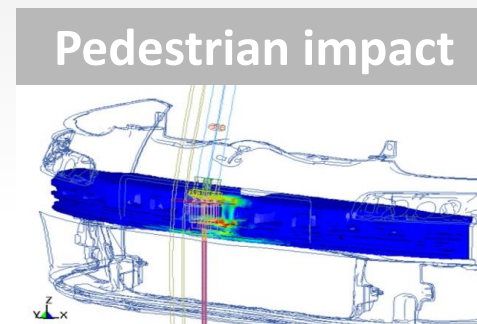
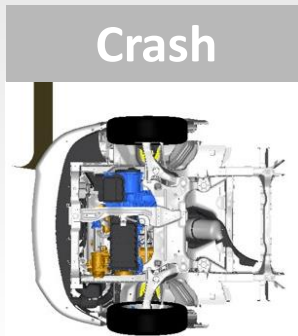
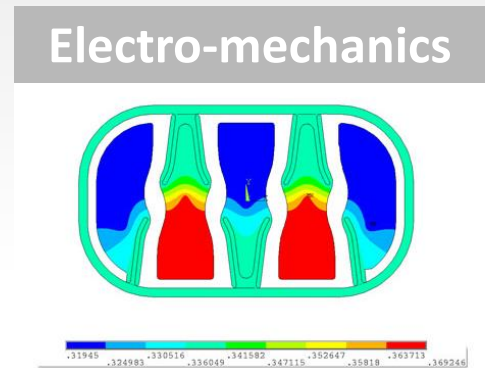
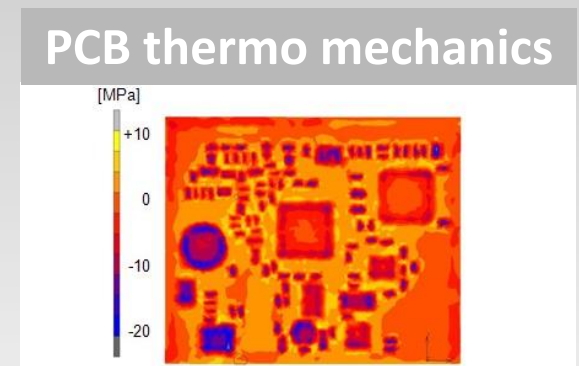
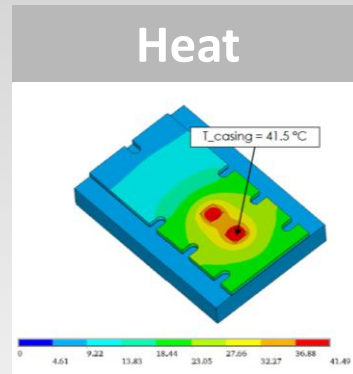
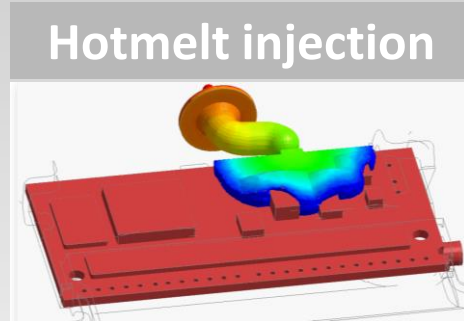
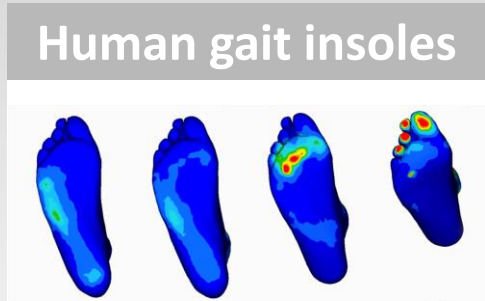


Virtual prototype evaluation - virtual development chain services

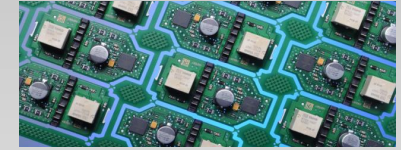
- Non-linear material modelling (vs. environmental conditions) for automotive and sensor materials
- Multi-physics simulation based on various simulation tools (non-linear and thermo mechanics, fluid- & electrodynamics)
- Mathematical modelling (image / signal processing & algorithms)

Broad Application Field for Mathematical Modeling - Virtual Engineering Services

Some examples:



Electronics Manufacturing Services from our Alliance Partner



Markets

We address a large variety of applications with strong competences. We offer flexibility and reliability in building a very diversified set of electronic systems from low to very high volumes, from PCBA to complete packaged solutions to serve our customers' demand.



Automotive and Transportation



Industrial and Energy



Communication and IoT



Medical and Silver Economy

Solutions

Our commitment is to design, industrialize and manufacture high-quality electronics, assisting our customers from the design phase through to the project management and mass production with efficient procurement, integrated logistics and high quality standards



Design



Engineering



Production



Supply Chain

sales@allcircuits.com

Customer Program Engineering



- Customer-focused program management, product engineering and validation
- On-time introduction of customer projects – meeting cost, quality and functional requirement targets
- Strong project teams in place for each customer that lead all engineering activities related to their programs