Electronic Components and Systems for European Leadership – Austria

Agenda

- Introduction
- ECSEL Austria members’ expertise
- Running and upcoming Projects

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AT&S - A world leading high-tech PCB & IC substrates company

AT&S

High-end interconnect solutions
for
Mobile Devices, Automotive, Industrial, Medical Applications and Semiconductor Industry

Outperforming market growth over the last decade

1
high-end PCB producer worldwide *

Among the top PCB producers worldwide

€ 1bn
revenue in FY 2018/19

Efficient global production footprint with
6
plants in Europe and Asia

~ 10,000
Employees**

* For CY 2018
Source: Prismark
** For AT&S FY 2018/19

Global footprint ensures proximity to supply chain & cost efficiency

AT&S

- AT&S plant & sales office
- AT&S sales office
- AT&S Headquarters

*Staff, Average, FTE, FY 2018/19; 73 employees in other locations

Market Segments & Product Applications served by AT&S

AT&S

Computer, Communications, Consumer Appliances

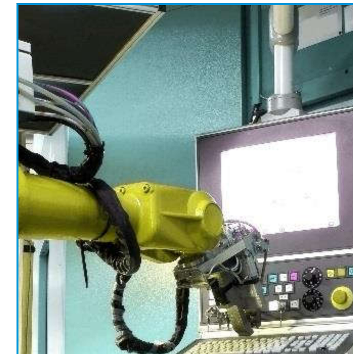
Smartphones, Tablets, Wearables, Ultrabooks, Cameras

IC substrates

High Performance Computer, Microserver

Automotive

Advanced Driver Assistance Systems, Emergency-Call, X2X Communication



Industrial

Machine-2-Machine Communication, Robots, Industrial Computer, X2X Communication

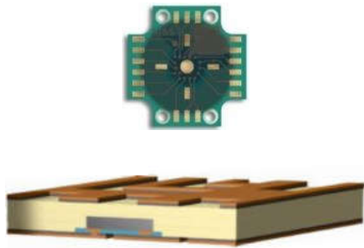
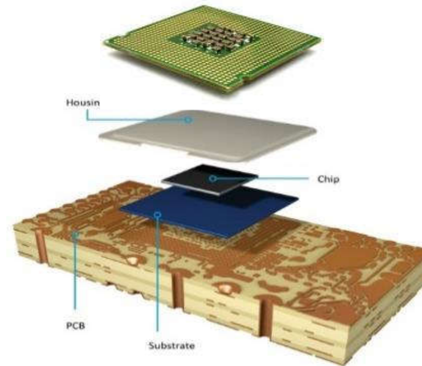
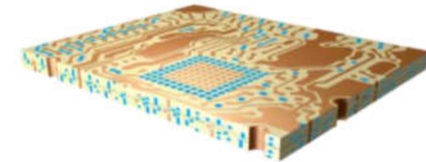
Medical

Patient Monitoring, Hearing Aids, Pacemaker, Neurostimulation, Drug Delivery, Prosthesis

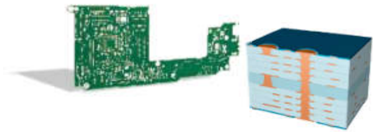
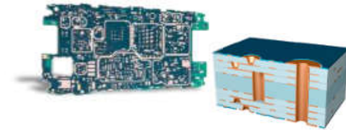
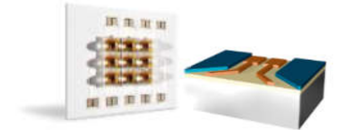
Segment Mobile Devices & Substrates

Segment Automotive, Industrial, Medical

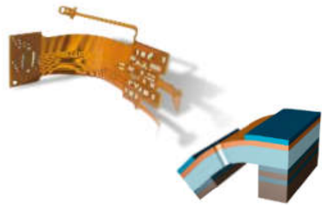
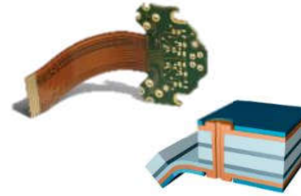
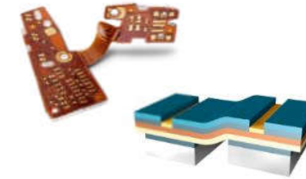
AT&S Product Portfolio – I

ECP®: Embedded Component Packaging	IC substrates	Substrate-like printed circuit boards mSAP
		
Embedded Component Packaging allows to embed active/passive components (e.g. wafer level dies) within the layers of a PCB – contributes to miniaturization.	IC substrates serve as interconnection platform with higher density (Line/Space < 15 micron) between semiconductors (Chips) & PCBs .	Substrate-like PCBs (mSAP technology) are the next evolution of high-end HDI PCBs with higher density: Line/Space < 30 micron.
Production site Leoben, Shanghai	Chongqing	Chongqing, Shanghai
Applications Devices such as smartphones, tablets, digital cameras and hearing aids	High-end processors for Computer, Communication, Automotive, Industrial	Mobile applications like smartphones

AT&S Product Portfolio – II

HDI any-layer printed circuit boards	HDI microvia printed circuit boards – high density interconnect	Multilayer printed circuit boards	Double-sided printed circuit boards	IMS printed circuit boards – insulated metal substrate
				
Further technological enhancement to HDI microvia: All electrical connections in HDI any-layer boards consist of laser-drilled microvias. Advantage: further miniaturization, and higher performance and reliability. AT&S produces HDI any-layer in 4 to 12 layers.	HDI: high density interconnect, meaning laser-drilled connections (microvias). HDI is first step towards miniaturization. AT&S can produce 4-layer laser PCBs up to 6-n-6 HDI multi layer PCBs.	Found in almost every area of industrial electronics. AT&S produces printed circuit boards with 4 to 28 layers, in quantities from individual prototypes to small batches and mass production.	Used in all areas of electronics. AT&S focuses on double-sided printed circuit boards with thicknesses in the range of 0.1-3.2mm.	IMS: insulated metal substrate. Primary function: heat dissipation for use mainly with LEDs and power components.
Production site Shanghai	Shanghai, Leoben	Leoben, Nanjangud, Fehring	Fehring, Nanjangud	Fehring
Applications Smartphones, Tablets, Notebooks	Mobile phones and nearly all electronic applications including automotive (navigation, infotainment and driver assistance systems)	Used in all electronic applications including touch panels, and in products ranging from aircraft to motorcycles, from storage power plants to solar arrays	Primarily industrial and automotive applications	Lighting industry

AT&S Product Portfolio – III

Flexible printed circuit boards	Semi-flexible printed circuit boards	Rigid-flex printed circuit boards	Flexible printed circuit boards on aluminum
			
Used to replace wiring and connectors, allowing for connections and geometries that are not possible with rigid printed circuit boards.	More limited bend radius than flexible printed circuit boards. The use of a standard thin laminate makes them a cost-effective alternative.	Combine the advantages of flexible and rigid printed circuit boards, yielding benefits for signal transmission, size and stability.	Used when installing LEDs in car headlights, for example, where the printed circuit board is bonded to an aluminum heat sink to which the LEDs are then attached.
Production site Ansan, Fehring	Fehring	Ansan	Ansan
Applications Nearly all areas of electronics, including measuring devices and medical applications	Automotive applications	Industrial electronics, such as production machines and industrial robots	Lighting, automotive, building lighting

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ECSEL-Austria is an industry-driven national research, development and innovation platform representing the technology areas of micro and nanoelectronics, embedded systems and systems integration.

- **Founded 2013** based on ARTEMIS-Austria (embedded software and software architecture) and ENIAC-Austria (micro- and nanoelectronics)
- Legal Status: **Association**
- currently **40 Members**

Our mission:

Secure supply of key technologies and critical knowhow in the field of electronic components and systems to support innovation in all major sectors of the economy and society in Europe.

Our vision:

European leadership in electronic based systems

Our strategic goals/objectives

ECSEL Austria

1. **strengthen** the international competitiveness of **Austrian companies in the European EBS funding/innovation** system creating added value

2. **support cooperation, focus and performance of Austrian R&D institutions** and enterprises along the value-chain of EBS

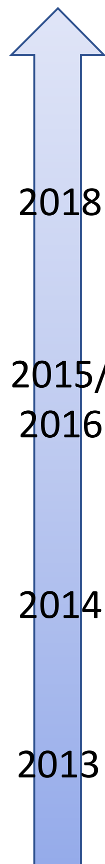
3. develop **inputs for the European and Austrian research programmes** based on the strengths of Austrian EBS eco system

4. increase the **international visibility of Austrian enterprises and R&D facilities** due to leading edge technologies and solutions

5. strengthen Austrian EBS eco system as valuable partner in **large collaborative European projects**

ECSEL Austria

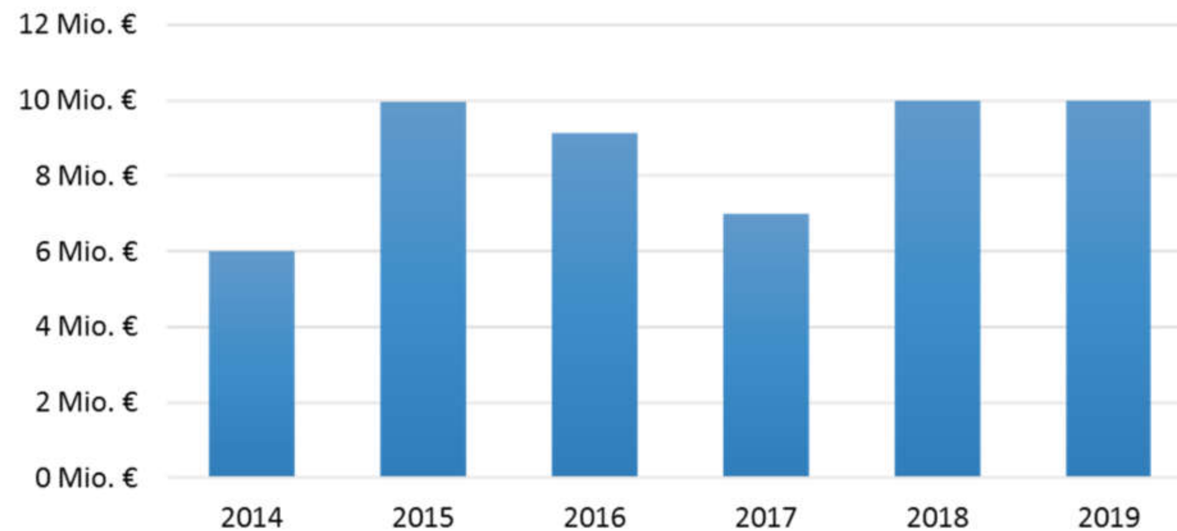
Highlights



- Foundation **Silicon Austria Labs** Dec 2018 - (Signature Framework Agreement – Aug 2018)
- ECSEL II Position Paper
- ECS Roadmaps and start priority setting for Austria – the path towards „**Silicon Austria**“
- 2 Endowment Chairs
- **Roadmap Automated Vehicles**
- EBS-Study: **Electronic based Systems „Technological heroes of the future – Facts & figures“**; technology landscape
- Signature Memorandum of Understanding **CEA-Leti Grenoble** / ECSEL Austria
- Enlarged by the areas of “systems and systems architecture”, “framework conditions and visibility” and “network and network development”
- **Founded** by the former technology platforms ARTEMIS-Austria (embedded software and software architecture) and ENIAC-Austria (micro- and nanoelectronics)

ECSEL Austria

Over 6 years: ECSEL national Funding



National Funding in Austria on continously high level.

Source of information: bmvit/ffg, Apr 2019

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Austrian Stakeholders – Industry, RTO, Universities, BMVIT, FFEI, Clusters

HF Electronics and Communications

Power Electronics

Materials in Electronics

Safety/Security/Privacy

Embedded Software for CPS

Architecture and Tools

Sensor Moduls/Systems

ECSEL
Austria

Technology platform facilitating Austrian value chains in the domain of electronic components and systems

Austrian Clusters and Silicon Alps

BMVIT RDI Framework (ICT, Production,..) and "Silicon Austria" Programm

European RDI Framework, ECSEL, H2020...

Framework & Priorities

Technology areas

Safety/Security/Privacy

Power Electronics

Sensor Modules/Systems

Embedded Software for CPS

Materials in Electronics

HF Electronics & Communications

Architecture & Tools

Electronic Based Systems in Austria

100+

R&D organisations

4000+

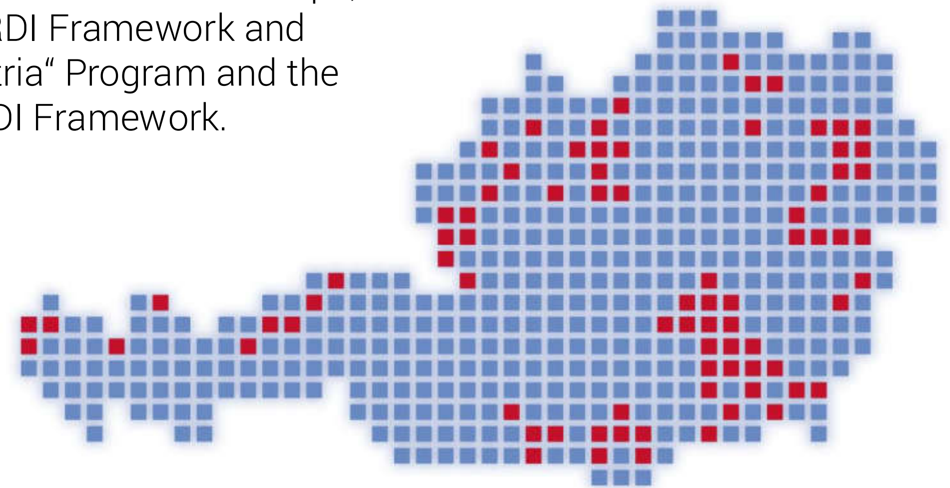
Researchers

70000+

people employed in EBS-relevant companies

Partners & members

The network of ECSEL Austria consists of Austrian Stakeholders, Austrian Clusters and Silicon Alps, the BMVIT RDI Framework and „Silicon Austria“ Program and the European RDI Framework.



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ECSEL Austria

Overview current projects:

- **AI4DI:** Artificial Intelligence for Digitizing Industry
- **APPLAUSE:** Advanced Packaging or Photonics, Optics and Electronics for low cost Manufacturing in Europe
- **Comp4Drones:** Framework of Key Enabling Technologies for Safe and Autonomous Drones
- **MADEin4:** Metrology Advances for Digitized ECS industry 4.0
- **New Control:** Holistic virtualized platforms enabling mobility as a service
- **UltimateGaN:** Research for GaN technologies, devices and applications to address the challenges of the future GaN roadmap
- **Power2Power:** Providing next-generation siliconbased power solutions in transport and machinery for significant decarbonisation in the next decade

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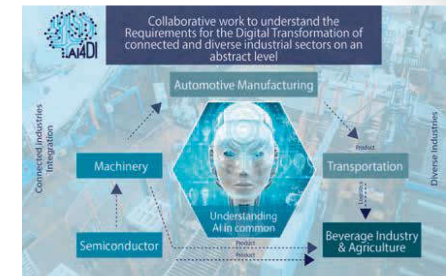
Projects

- AI4DI: Artificial Intelligence for Digitizing Industry

make Europe the leader in Silicon-born-Artificial Intelligence (AI) for accelerated edge processing - bring AI from the cloud to the edge while making it resilient, safe & secure for future manufacturing & process technologies



- APPLAUSE: Advanced Packaging for Photonics, Optics and Electronics for low cost manufacturing in Europe

build European expertise in advanced packaging and assembly to develop new tools, methods and processes for high volume manufacturing.

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Projects

- COMP4DRONES: Framework of Key Enabling Technologies for Safe and Autonomous Drones

will provide a framework of key enabling technologies for safe and autonomous drones

- MADEin4: Metrology Advances for Digitized ECS industry 4.0

develops next generation metrology tools, machine learning methods and applications in support of Industry 4.0 high volume manufacturing in the semiconductor manufacturing industry

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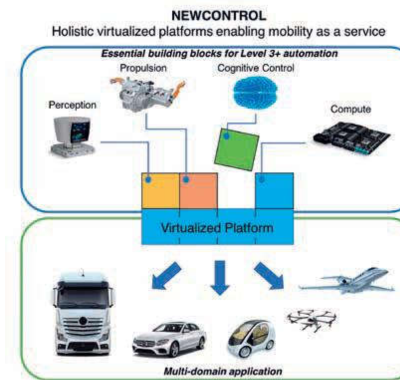
Projects

- NewControl:

will develop and deliver virtualized platforms for each vehicular sub-system essential to autonomous operation at SAE Level 3+.



- UltimateGaN:

Research for GaN technologies, devices and applications to address the challenges of the future GaN roadmap

Power2Power:

Providing next-generation silicon-based power solutions in transport and machinery for significant decarbonisation in the next decade

New ECSEL Projects 2020 (approved)

ECSEL Austria

- CHARM - Challenging environments tolerant Smart systems for IoT and AI
- InSecTT - Intelligent Secure Trustable Things
- iRel4.0 - Intelligent Reliability 4.0
- IT2 - IC Technology for the 2nm Node
- Moore4Medical - Accelerating Innovation in Microfabricated Medical Devices
- ADACORSA - Airborne data collection on resilient system architectures
- ArchitectECA2030 - Trustable architectures with acceptable residual risk for the electric, connected and automated cars
- FRACTAL - A Cognitive Fractal and Secure EDGE based on an unique Open-Safe-Reliable-Low Power Hardware Platform Node
- VALUE3S - Verification and Validation of Automated Systems' Safety and Security

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WIEN

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PCCL
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intel

JKU
JOHANNES KEPLER UNIVERSITY LINZ

DONAU UNIVERSITÄT KREMS

JOANNEUM RESEARCH

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infineon

FH JOANNEUM
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CISC
semiconductor

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SILICON AUSTRIA LABS

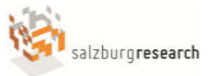
SBA Research

TU
WIEN

SIEMENS

TDK

THALES

TTTech
Ensuring Reliable Networks

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