IPCEI
on Microelectronics

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Infineon

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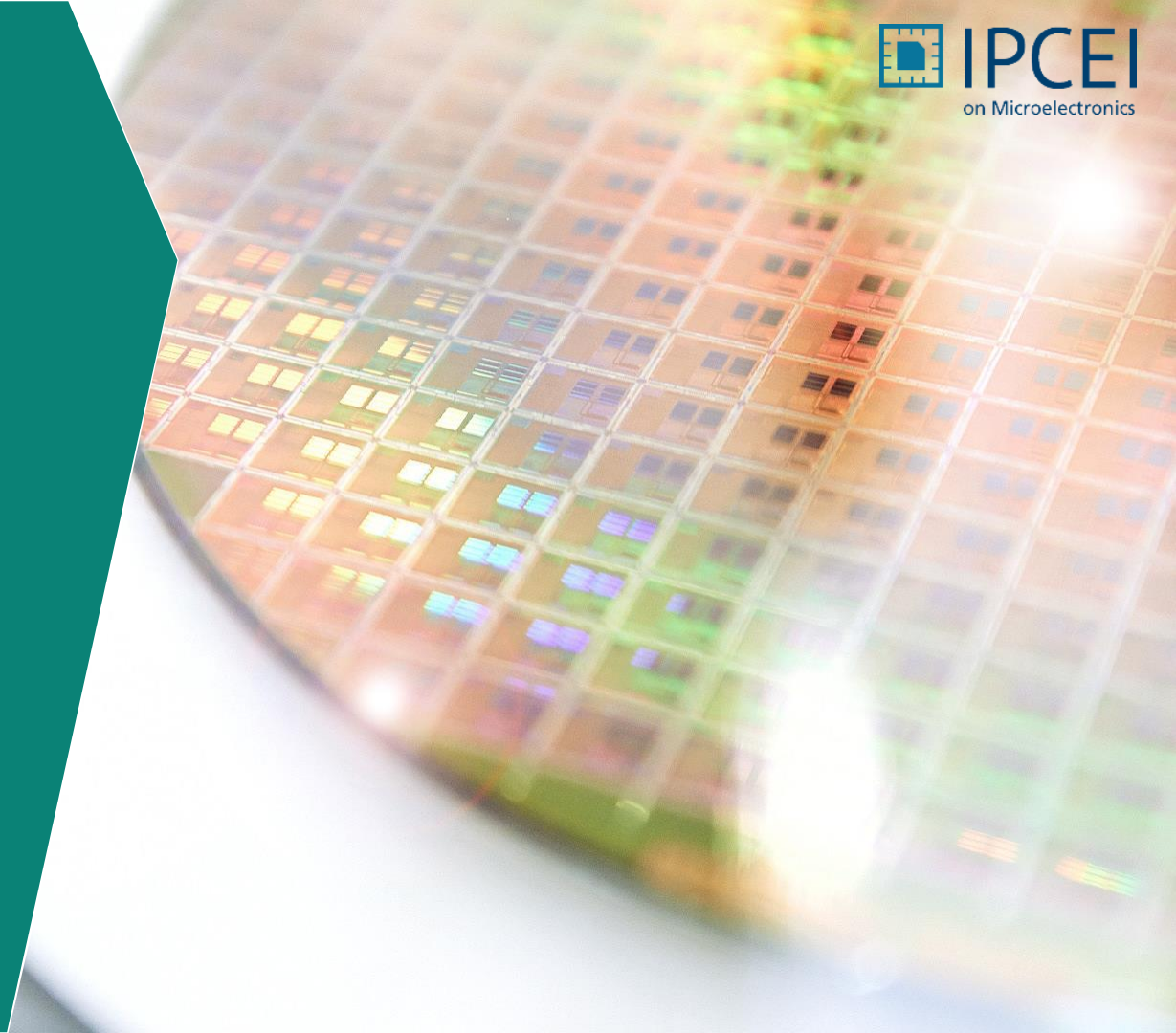


Semiconductors on the global geopolitics agenda

Chips are at the center of the global technological race. They are the bedrock of our modern economies and essential for the goods that we use on an everyday basis – we have them in our smartphones… Or now…with the energy topic, they are in the electric grids. So the chips are crucial in almost every device."

Ursula von der Leyen, President of the European Commission at the State of the Union
– European Chips Act, 8 February 2021

"These chips, these wafers… It's all infrastructure….We need to build the infrastructure of today, not repair the one of yesterday."

Joe Biden, President of the US at the CEO Summit on Semiconductors
– 12 April 2021

Semiconductors on the global geopolitics agenda

- Growing global demand for semiconductors due to accelerated pace of digitization and electrification
- The shortage of semiconductors has concrete consequences
- Accelerated investment across the world in microelectronics education, research and manufacturing to secure supply security, including the EU Chips Act.

IPCEI Microelectronics: partners and technology fields

Energy Efficient Chips

- CEA-Leti
- Cologne Chip
- Globalfoundries
- NXP Semiconductors Austria
- *RayICs*
- Soitec
- ST Microelectronics
- X-FAB

Power Semiconductors

- 3-D Micromac*
- AP&S International
- AT&S
- CEA-Leti
- Elmos Semiconductors
- Infineon
- Infineon Austria ★
- MURATA
- Robert Bosch
- SEMIKRON
- ST Microelectronics
- X-FAB

Smart Sensors

- CEA-Leti
- *CorTec*
- Elmos Semiconductors
- Fondazione Bruno Kessler
- Infineon
- Robert Bosch
- ST Microelectronics
- TDK-Micronas
- LYRED
- X-FAB

Advanced Optical Equipment

- AMTC*
- Carl Zeiss

Compound Materials

- AZUR Space Solar Power
- CEA-Leti
- Integrated Compound Semiconductors
- IQE
- Newport Wafer Fab
- SPTS Technologies
- OSRAM
- SYNRED
- Soitec
- ST Microelectronics

Austrian consortium: AT&S, Infineon, NXP

SMEs: in "*italic*"
Associated partners:*

IPCEI Microelectronics in a nutshell

Strategic European project

- Contributing to EU Green Deal and Technological Sovereignty
- 4 EU members states & UK, 30+ partners
- Approved in December 2018, Austria joined in March 2021

Funding

- Funding per national governments, approval by the EU Commission
- State aid instrument
- Activities beyond R&D are funded | First Industrial Deployment

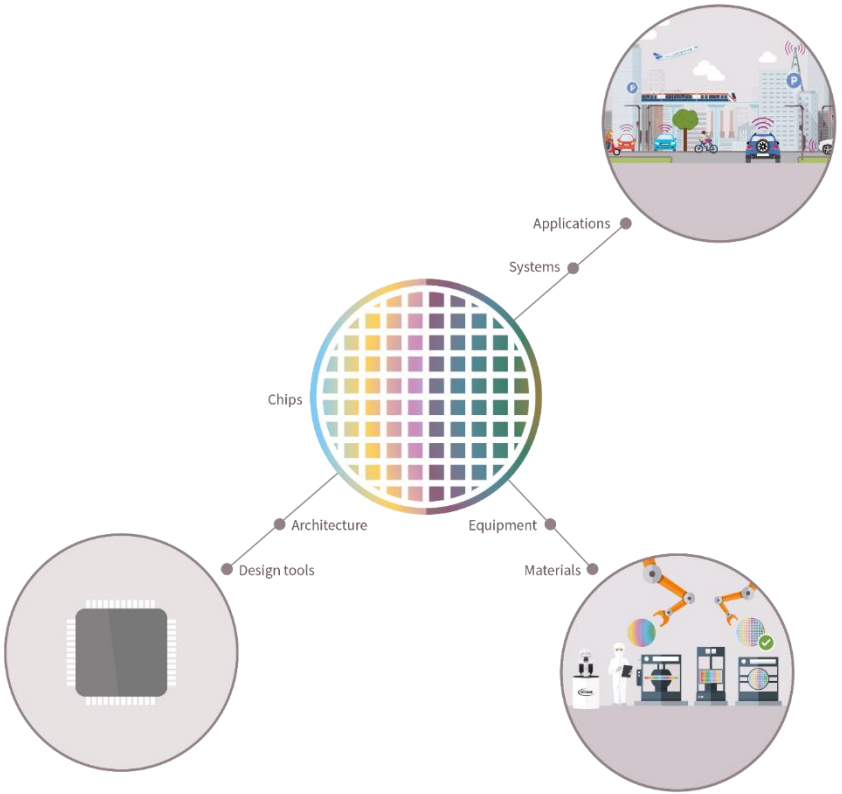
Technology fields

- Energy-efficient chips, power semiconductors, sensors, advanced optical equipment and compound materials

Positive spillover effects

- Knowledge generated will be disseminated via spillover activities
- Supporting EU STEM Talent and universities
- Spillover activities are not publicly funded

IPCEI: From R&D&I to First Industrial Deployment (FID)



Enabling strategic value chains in Europe

– Energy, automotive, smart manufacturing…

Building on pre-competitive research

– Complementing EU/national R&D&I funding, ECSEL JU, Eureka, *etc*.

First Industrial Deployment

– Stabilizing next generation products and processes

Infineon Austria in IPCEI Microelectronics

R&D&I

- Technology Development and First Industrial Deployment in
  - Energy Efficiency (Si, SiC, GaN)
  - Electro Mobility (Charging, Sensing)
  - TARGET: Bring innovative technologies „Made in Europe“ fast to volume production & to market

Spillover Activities

- Dissemination of R&D&I
- New collaborations with universities, STEM Talents and industry
- Focus on Eastern and Southeastern European countries
- TARGET: Strengthen cooperation Industry/Industry & Industry/Academia

Collaboration Projects

- With 12 Companies
  - Raw Wafer Engineering
  - Equipment & Process Innovation
  - Chip Embedding & Assembly Packaging

IPCEI on ME subtasks

OptiMOS 6™

CoolSiC™

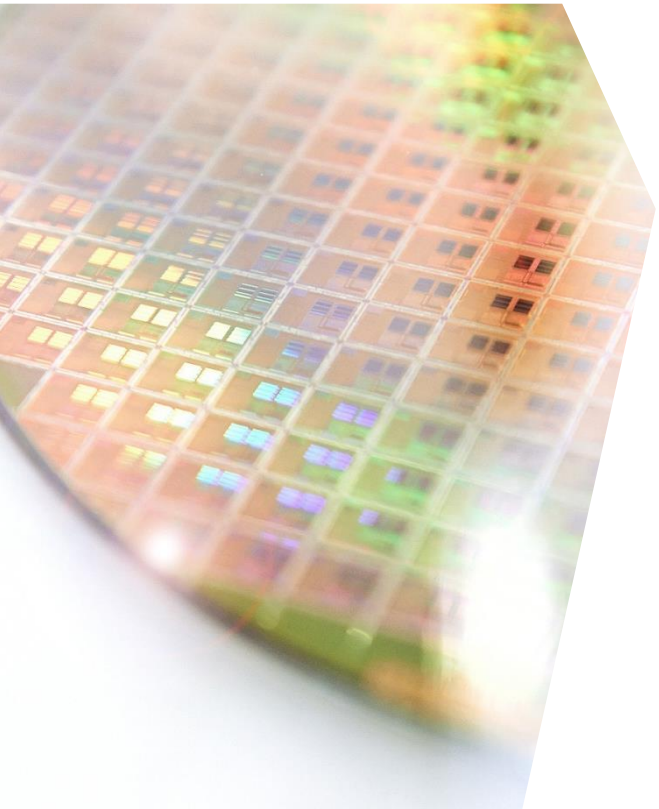
CoolGaN™

Active Rectifying Diode

Future Smart

XENSIV TPMS & Trapped Ions

OptiMOS™ 6 Technology
IPCEI on ME subtask



- Silicon (Si)-based Technology in 100V
- Reliability of up to +75 times longer lifetime depending on the application
- Less heat production during operation
- More energy efficient than its predecessors
- Saves electricity consumption of
  170 households within 1 year for telecom applications
  (*considering average yearly household energy consumption in EU)*

OptiMOS 6™ 100V in your daily life

Telecom

5G

eBike

Power tools

Solar

– **OLED TV**
Makes watching your favorite TV show more energy efficient.

Wireless charging

– **Wireless Charging**
Cutting cables necessary for charging everything from smartphones and laptops to kitchen appliances and cars.

SiC Technology
IPCEI on ME subtask

- Silicon carbide (SiC)
- Providing higher power levels in an extremely effective and efficient way
- Reliability of up to +75 longer lifetime
- System size reduction providing smaller products
- Infineon has expertise in SiC technology for over 20 years

CoolSiC™ in your daily life

UPS

Energy storage

EV charging

Renewables

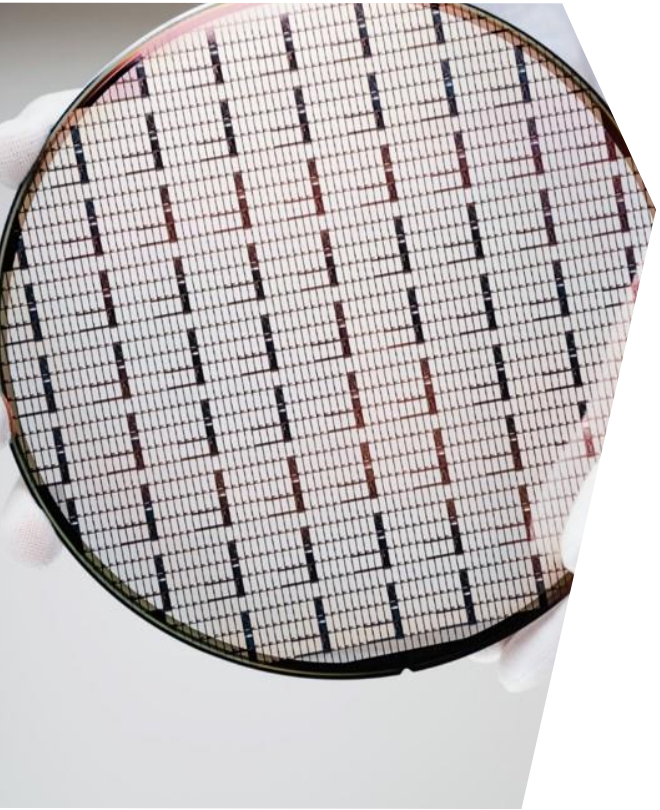
Traction

- **Traction**
  Highly efficient components that reduce energy losses in trains…

eMobility

- **eCars**
  … as well as in electric cars.
  So you get more comfortable and greener to your destination!

GaN Technology
IPCEI on ME subtask



- Gallium nitride (GaN)
- Next-generation power semiconductors with a ten times lower carbon footprint
- Operates at higher voltages, temperatures and frequencies
- System size reduction providing smaller products
- Infineon’s CoolGaN™ chips focus on high performance and robustness with lifetimes beyond 15 years

CoolGaN™ in your daily life

5G

Wireless charging

Charger

Motor control

Server

Telecom

– **Data and server center**
CoolGaN™ products lead to:

  – lower power consumption
  – lower temperature while operation
  → reducing cooling affords of servers
  – environmental friendly digitalization
  Global Internet data traffic grew more than 40% in 2020 alone, while the energy consumption remains almost the same due to power electronics.

InnoRec Technology
IPCEI on ME subtask

- Less fuel consumption due to increased generator efficiency up to 8%
- Qualification as eco-innovations, defined by the European Union
- CO2 emissions reduction of a car by up to 1.8 g/km

Alternators

- **Light vehicle generators**
  In a conventional car, the generator produces the electric energy for charging the battery and supplying a growing number of safety and comfort features such as driver assistance systems, air conditioning and infotainment.

XENSIV™ tire pressure monitoring system (TPMS)

- Protects from tire failures which are caused by under-inflation and slow leaks
- Eliminates the need to manually check the air pressure
- Automatically issues a warning message on the display
- Correct tire pressure safes you fuel and therefore money
- Get to your destination, safer, greener and more comfortable
- Fast growing market: 2-wheelers (e-bikes/e-scooters)

MEMS
IPCEI on ME subtask

Trapped ions enabling supercomputers of the future

- Accelerate the development of quantum computers
- Solve complex tasks faster and more efficient than today's computers
- Infineon has leading expertise in this research field, taking ion traps to the next level:
  From prototypes to volume production
- Founding member of QUTAC, the Quantum Technology & Application Consortium

Trapped ions enabling supercomputers of the future

- In future quantum computers can make a significant contribution e.g. to:
  - Chemistry:
    Research and faster development of polymers, a material used in every household
  - Logistics:
    Optimizing route planning
  - Drug development:
    Extensive laboratory experiments may be reduced in the future

FUTURE SMART Technology
IPCEI on ME subtask

- Energy-efficient functions in as little space as possible
- Smart switches increasing performance and reliability of your car’s control unit, responsible for processing and communicating information

Lane assist

- **Driver assistance systems**
  helps to enable CO2 reduction as well as driver assistance systems up to fully autonomous cars. So you feel more safe while driving to your destination.

Questions & answers

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on Microelectronics.

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Infineon

Spillover activities

IPCEI investment in EU microelectronics R&D&I creates new opportunities

Unlocking nearly €8 billion new public-private investment and fueling the growth of European microelectronics industry (Source: EU Commission)

Jobs and skills

Raising new job opportunities in the EU microelectronics industry,
requiring advanced knowhow and skills

Growth

Reinforcing collaborations with SMEs, startups, and large enterprises along the microelectronics value chain with downstream and upstream players

Innovation

Enabling new R&D collaborations across Europe

Let‘s stay in contact!

Find out more about Infineon Austria and IPCEI Microelectronics **www.infineon.com/ipceimeaustria** or send an email to ipcei.me.austria@infineon.com