Micro.electronics

FOR A BETTER FUTURE

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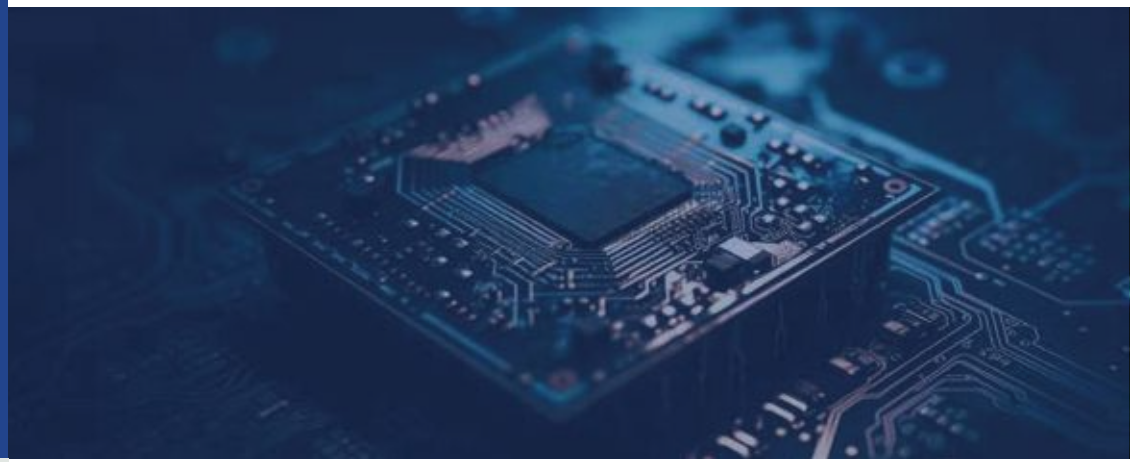


Micro.electronics®
for a better future

Portugal
a Global Player
in the semiconductors market

Research | Production | Innovation | Training | Design | Recycling | Certification | Development

PRR Plano de Recuperação e Resiliência
REPÚBLICA PORTUGUESA
Financiado pela União Europeia NextGenerationEU

ABOUT

The **Microelectronics Agenda** is a structural project supported by a **consortium with relevant players like companies, research and technology organizations and knowledge transfer entities.**

Spanning the complete value chain from **chip design to electronics manufacturing service (EMS), engineering, repair and recycling,** the consortium **will drive technological innovation and productivity while embracing an ecological transition.**

The Consortium, through its different capabilities, **promotes a more effective, efficient, sustainable, intelligent and capable sector to meet the needs of the various industries globally and supporting the digital transformation.**

The **Microelectronics Agenda involves a group of 17 partners** and **seeks to identify and promote sinergies** along the value chain in order to **create opportunities** to add more **innovation, productivity** and **benefits for the economy and society**.

25 New Products, Processes and Services

68 Million Euros of Investment

Businesses

Amkor Technology
Neadvance
SYNOPSYS
EXATRONIC
PICadvanced
TRC
HFA
fi group

Research and Technology Organisations

Universidade de Coimbra
INL International Iberian Nanotechnology Laboratory
universidade de aveiro
Instituto de Sistemas e Robótica
inesc mn
Fraunhofer Portugal

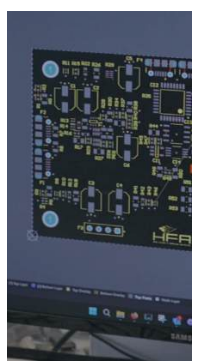
Knowledge Transfer Entities

INOVARIA
AIDA
pci creative science park aveiro region

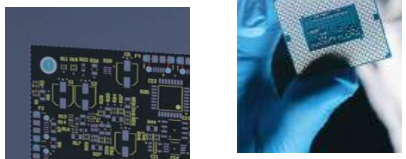
MAIN AREAS

More productivity, quality, capacity and innovation.

Hybrid microelectronics and photonic integrated circuits, design and packaging



Next Generation High-speed optical communications



Advanced Wafer level packaging and test

The semiconductors factories of the future with new technologies

Training, capacity building and qualification of human resources

Hybrid multidimensional microelectronics, photonics, chiplets, antennas, memories and xPUs

Electronics manufactoring services and electonics engineering

Test, Reconditioning, Repair and Recycling

MICRO.ELECTRONICS OBSERVATORY

Discover the potential of the Portuguese sector

The creation of the Microelectronics Observatory will offer a comprehensive overview of the sector. It will identify entities, companies, and Research and Technology Organizations (RTOs), along with their positioning within the microelectronics and semiconductor value chain. Additionally, the Observatory will detail the available skills. This updated and detailed information will assist in making informed investment decisions and identifying potential partnerships.

OUTPUTS

Automotive

Wafer Level Packaging and Test

• Advanced Packaging for High Frequency Radar Sensors for Advance Driver Assistance System (ADAS).

Assembly and Test of SiP (System in Package)

• Advanced Packaging for Pressure Sensor MEMS device, Microcontroller (ASIC) and passive components (inductors and resistances).

• Advanced Packaging for Differential Pressure Sensor IC device, Microcontroller (ASIC) and passive components.

• Advanced Packaging for MEMS Inertial Sensor device, Microcontroller (ASIC) and passive components.

5G devices

Wafer Level Packaging and Test

• Advanced Packaging IC for 5G wireless communications (smartphones, infrastructure, networking) including RF antenna to minimize switching devices in the smartphone.

• Advanced Packaging for Power module IC controller allowing the smallest footprint particularly on 5G smartphones.

Telecommunications, Computing and Connectivity

Wafer-Level Packaging for Next-Generation Devices

• Wafer-level packaging (WLP) needs to evolve in order to enable next-generation devices that will require more computational power and seamless connectivity whether it's edge computing, AI inference or high-speed data transfer. The solution is an enhanced WLP integrating various components directly onto the wafer allowing the connection of hybrid multidimensional microelectronics, antennas, memories, etc, in a more efficient set of solutions.

Solutions for next-generation optical communications

• Development of optical solutions using photonic integrated circuits (PICs) to enhance Passive Optical Networks (PON) and Radio applications, supporting data rates of 25Gbps and 50Gbps. In addition to designing high-performance PICs, this initiative integrates key processes such as chip design, packaging, and automation. These steps are critical in paving the way for an automated transceiver production line, aimed at streamlining the manufacturing of next-generation optical transceivers.

Smart Factory

MES – Manufactoring Execution System

• Flexible and configurable system allowing faster planing setup.

Equipment Lifecycle Manager

• Software solution for tracking the entire life cycle of a particular piece of equipment and related activity, from its installation, through configuration, maintenance, operation and discontinuation, enabling preventive maintenance.

Virtualized Edge Framework

• Framework for orchestrating IIoT (Industrial IoT) aiming to guarantee the configuration, updating and chaining of services in real time. It can be integrated with other systems through the use of standard communications protocols, guaranteeing the solution's interoperability, modularity and scability.

IoT-based image sensing module

• Modular IIoT platform that allows the detection of different physical realities (e.g. movement, magnetic field, temperature, humidity, sound, light, air quality) and their communication via different communication protocols (e.g. Bluetooth, Wi-Fi, NB-IoT, 5G). The development of an image capture module for this platform will make it possible to measure additional realities, both in the visible and invisible light spectrum, with the potential for application in various industrial scenarios.

AI-based Computer Vision framework

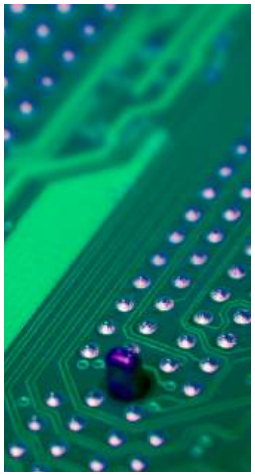
• Highly configurable industrial visual inspection framework facilitating image quality parameterization and acquisition for automatic anomalies detection and reporting.

Automation of systems for the shopfloor of semiconductor manufacturing companies

• Framework, using advanced modelling, digital twins and AI, that includes various components for generating highly advanced solutions, namely: for transporting, storing and loading/unloading materials and products; handling electronic components autonomously and automatically; packaging material with different types of containers, geometric configurations, sizes and weights; continuous location of assets and tracking their movement within the factory floor; guidance solution based on image acquisition, analysis and decision.

Sustainability

Advanced e-waste management processes



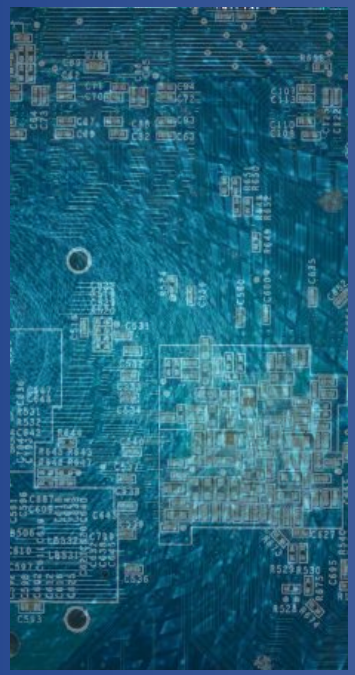
• Hybrid leaching of copper, gold and critical metals from electronic waste with analytical techniques such as ICP-MS and XRF, capable of accurate quantification of the metals at the different steps of the process.

• Selective hybrid cascade method for recovering metals from mixed solutions using biological molecules immobilized on supports with different molecules immobilizing a different metal which is removed with a strong chelating solution. The solutions obtained will be pH balanced, and the metals will be obtained by striping.

Establishment of environmentally conscious processes for eco-design and manufacture of electronic test, reconditioning and repair products

• Processes to support companies in complying with legal norms and regulations in adhering to the principles of eco-design, namely by reducing the presence of hazardous chemical processes, using resources more efficiently, improving the durability of their products, allowing for the possibility of reuse and repair, being energy efficient and reintroducing process waste into the production chain.

Environmental Monitoring



Ocean Data Sensors

• Ultra-low power IoT devices with embedded sensors to collect data related to various parameters such as temperature, electrical conductivity, from which salinity is inferred and pressure, which allows depth estimation, identifying descent and ascent phases or seabed stationary situation to adapt the data sampling frequency and characterize the water at different depths up tp 100 meters.

A timed mechanism returns the device to the surface transmitting it's position and the data collected.