IC'ALPS
Beyond Mountains

Enabling Smart MD with Custom Integrated Circuit (ASIC)

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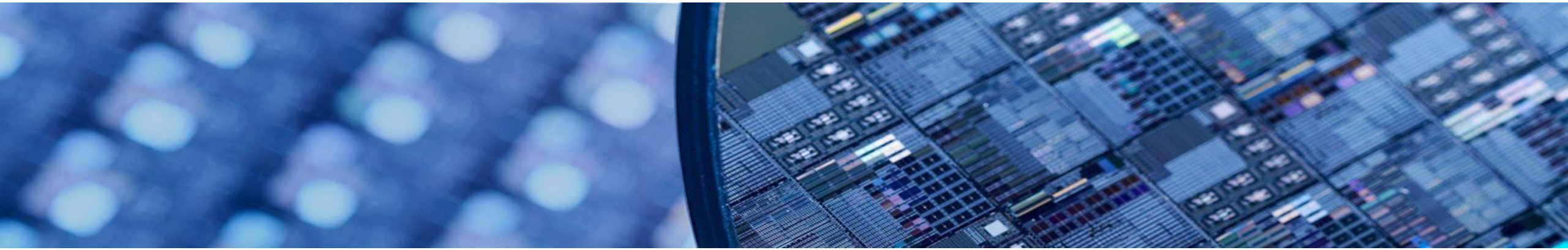
SMART MedTech Forum



Agenda

1. Active Implantable Medical Devices
   - Market overview
   - ASIC as enabler

2. Use case
   - ASIC as enabler for Active Implantable Digital Stethoscope
   - Benefit of ASIC approach

3. Introduction to MOPIC (Multi sensor Optimized Platform Integrated Circuit)
   - Advantages of MOPIC for Proof-of-Concept

4. About IC'Alps
   - The company
   - Markets served
   - Why partnering with us

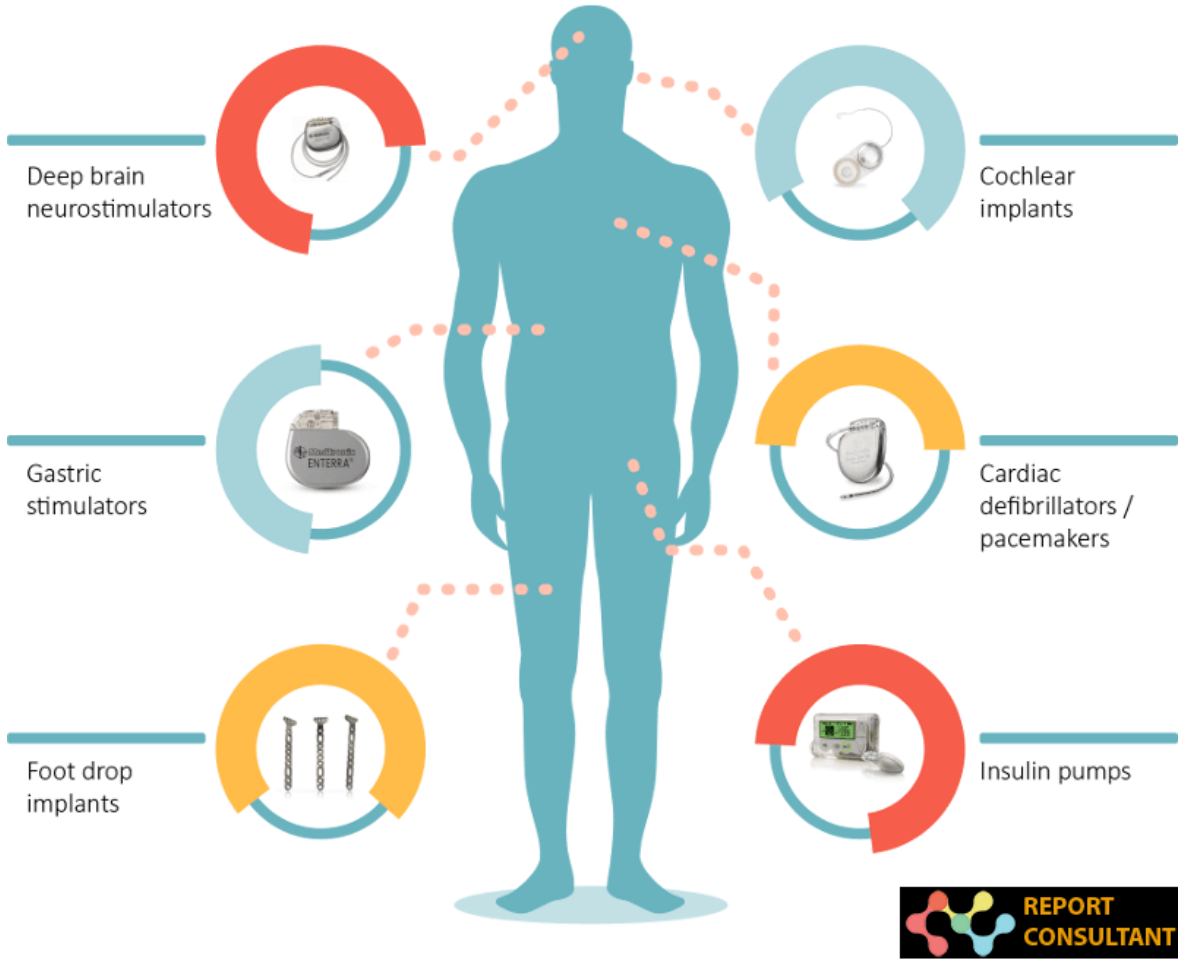
Introduction to Active Implantable Medical Devices (AIMD)

- AIMD: medical device embedding electronic to measure or interact with the human body functioning on a source of electrical energy

  - For diagnostic or therapeutic purposes

  - Intended to be totally or partially introduced, surgically or medically, into the human body or by medical intervention into a natural orifice

  - Intended to remain after the procedure



Market overview

Market size of AIMD

Expected to grow from USD 15.21 Billion in 2017 to USD 30.42 Billion by 2025

9.24% CAGR

(source Fior Markets)

Market drivers

Increasing cardiovascular and neurological diseases

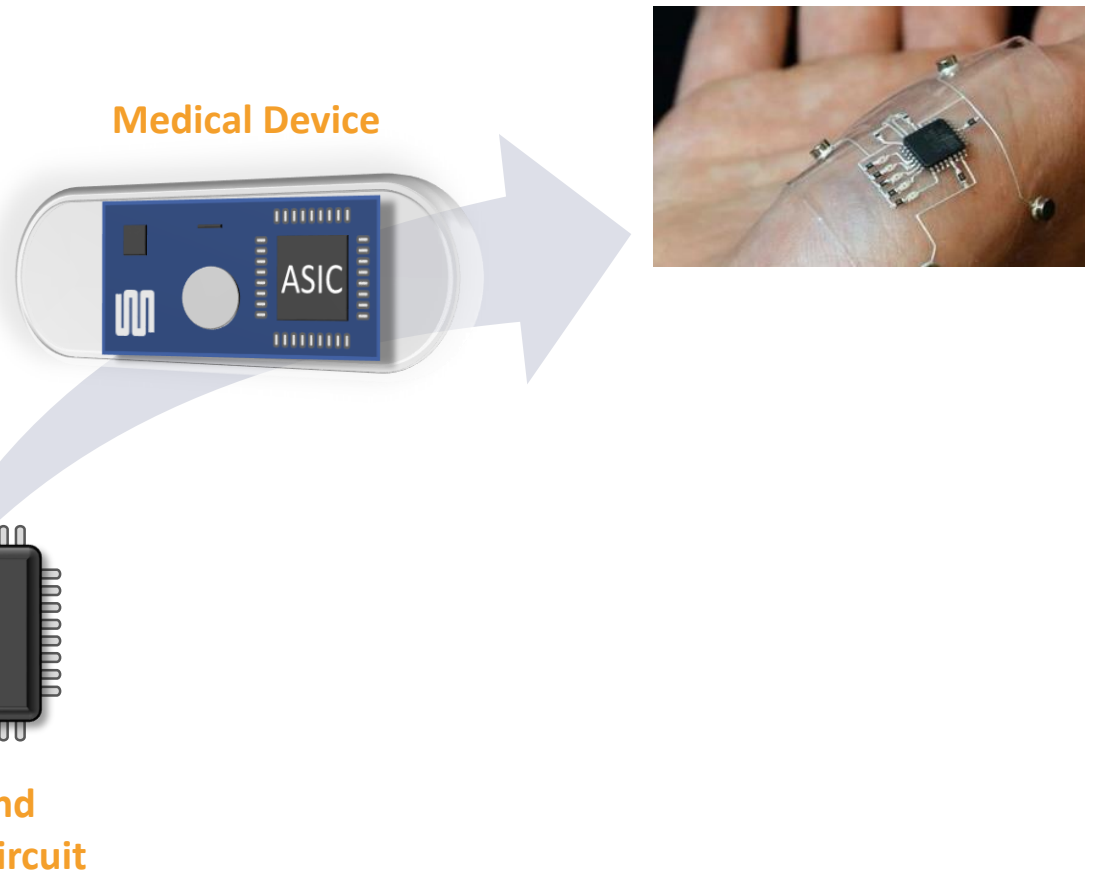
Growing elderly population

Technological advancements in procedures

Enhanced applications of neurotransmitters

ASIC in Active Medical Devices

- Would your product benefit from smaller size, lower power consumption, and more features?
- Are you spending more than $2M per product line on electronic components in a year?
- Can your product be copied easily?
- Can your product be sensitive to component obsolescence?



ASIC as enabler for Active Implantable Medical Devices

Miniaturization

To reduce impact of implanted device on patient life & comfort

Low Power consumption

To enable continuous patient monitoring for years

High signal processing

To guarantee the accuracy of physiological parameters collected

ISO13485

Traceability of the supply chain and quality of ASIC design

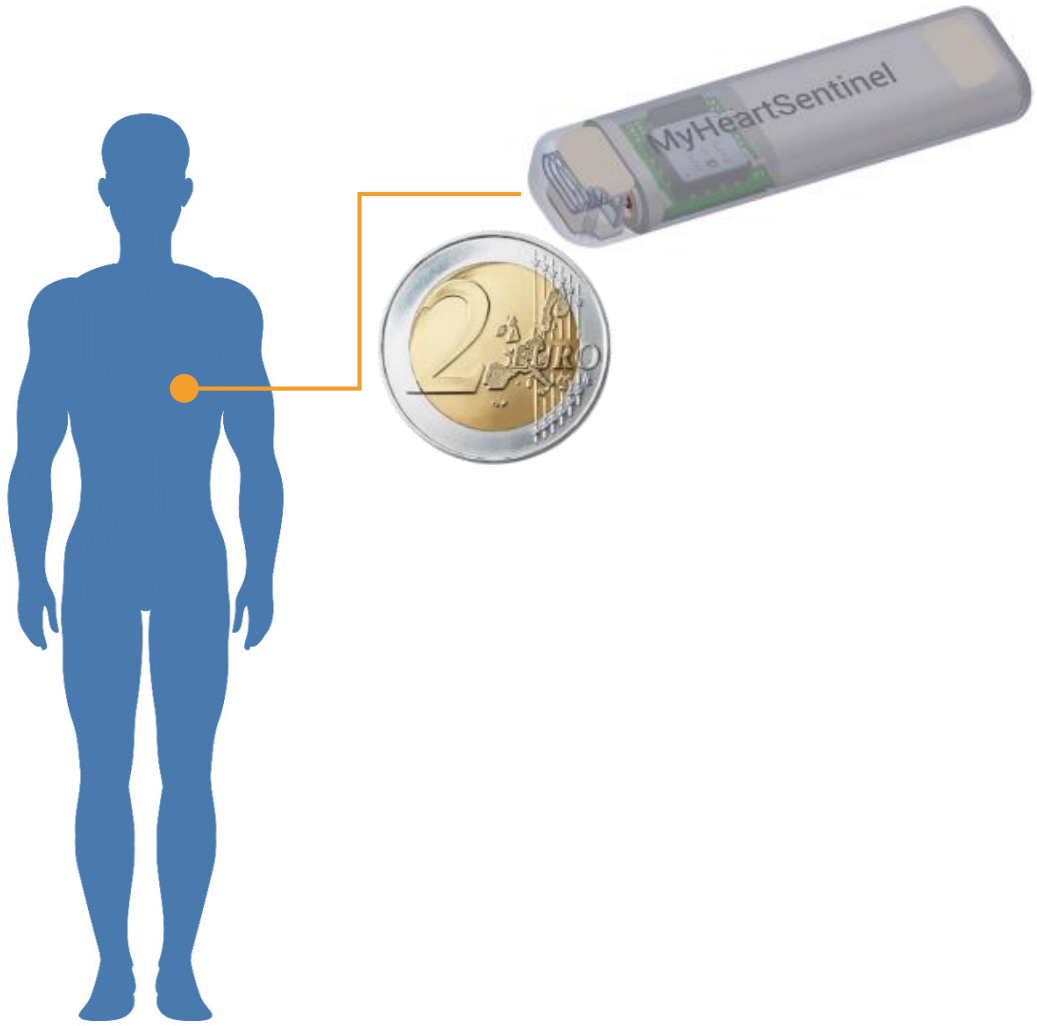
Secured functions

To secure and protect data collection and communication

Use Case: an implanted digital stethoscope

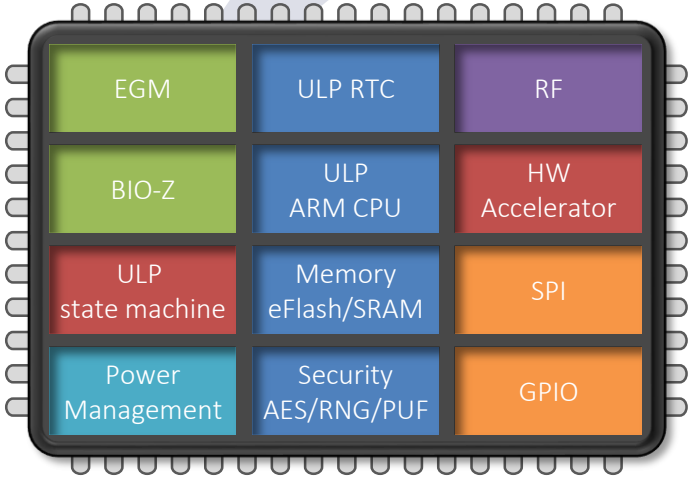
Heart failure risk management

- Implantable medical device
- Battery operated
- ECG & Bio-Z continuous monitoring
- Home point of care



ASIC architecture for implantable digital stethoscope

- Customer exclusive and custom-made
  - analog Front End for EGM and Bio-Z
  - Embedded ARM ULP processor + memories
  - Temperature sensor interfaces
  - Secured elements (AES/TRNG)
  - Wireless communication



Benefits towards ASIC for implantable digital stethoscope

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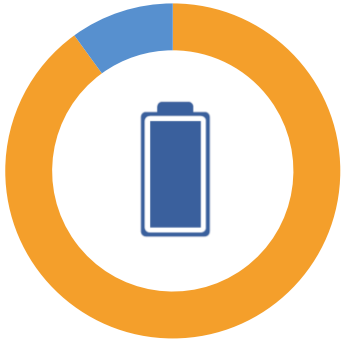
PCB Size



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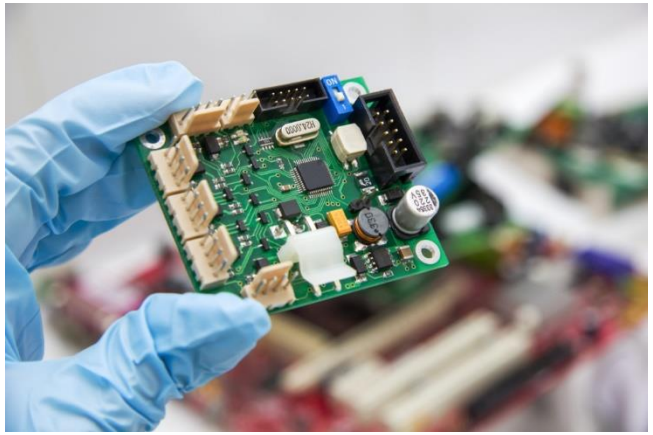
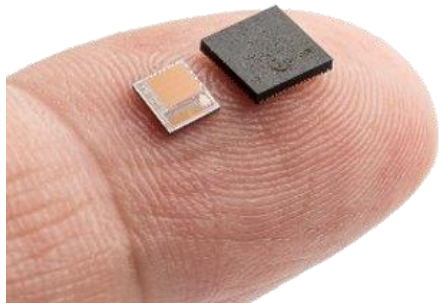
Power consumption

x5

computing efficiency



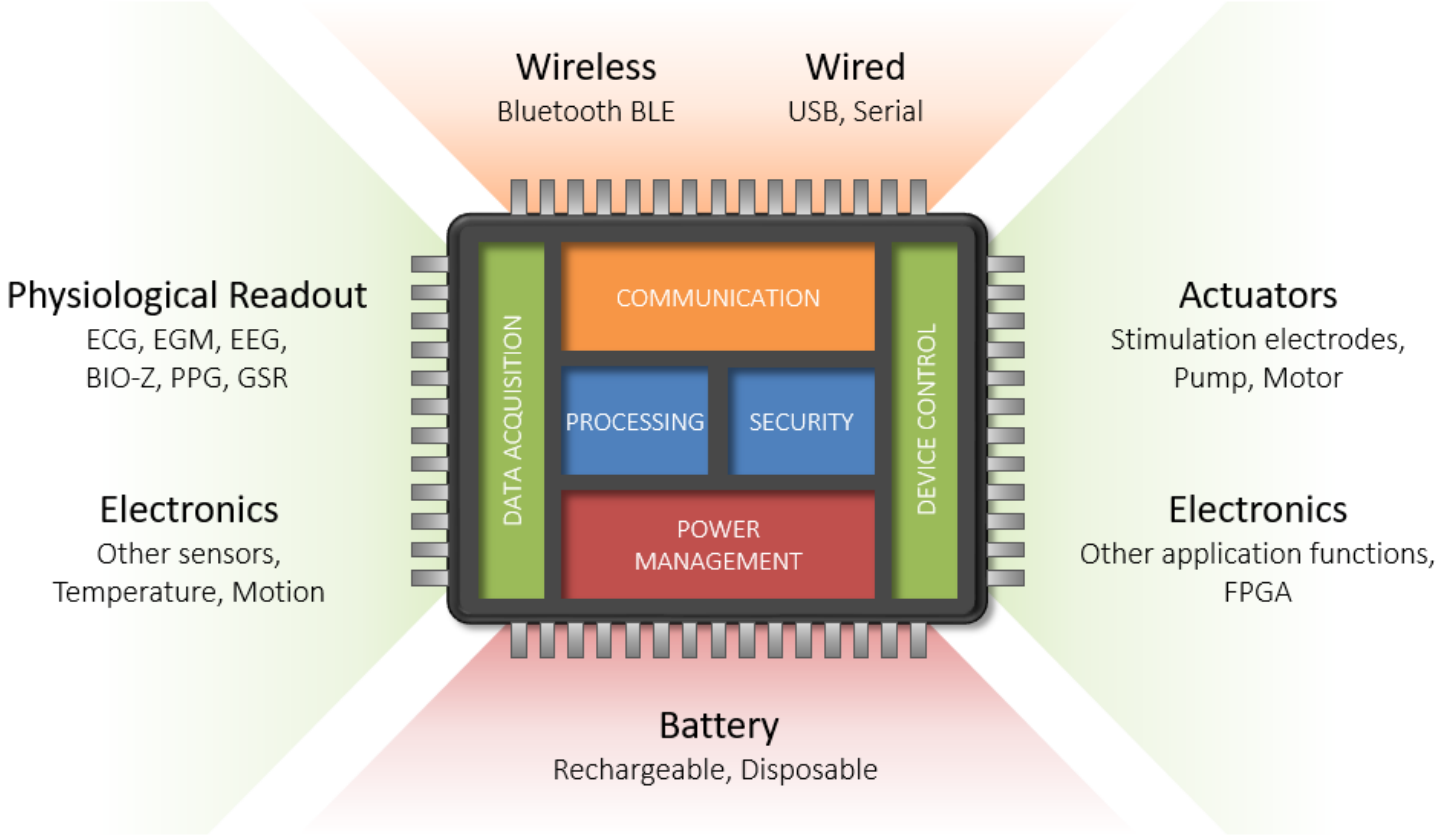


How to help further AIMD makers in initial project phase?

Key needs with respect to electronics

- To shorten the time to get a representative Proof-of-concept (POC)
- To reduce technical risk
- To reduce financial risk

Proof-of-Concept with MOPIC



Size & Power optimization

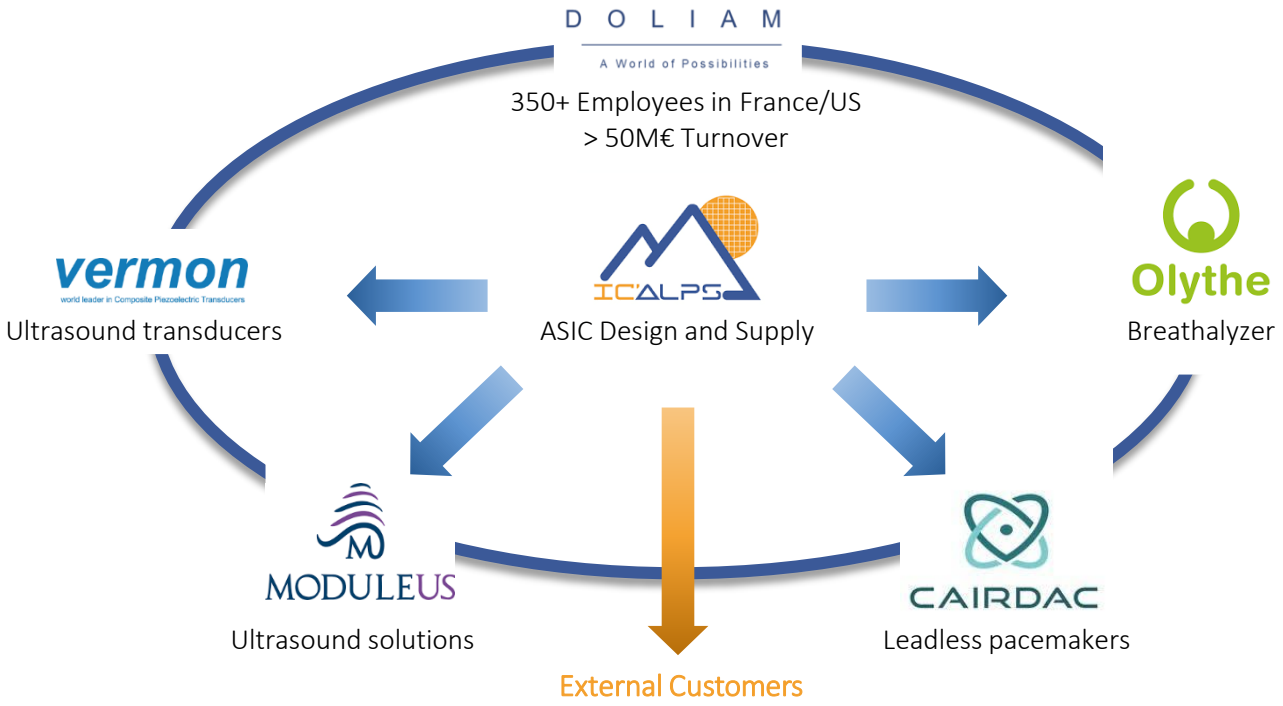
Reduced TTM by 18 months to preclinical tests

Development costs divided by 15

Simplified path towards CE marking (ISO13485)

About IC'Alps

- European fabless semiconductor company
- Subsidiary of the DOLIAM group
- Offering custom ASIC and SoC design and supply
- Team of 35+ passionate experts



Markets served

Mil/Aero

- Defense
- Aeronautic
- Space

IoT

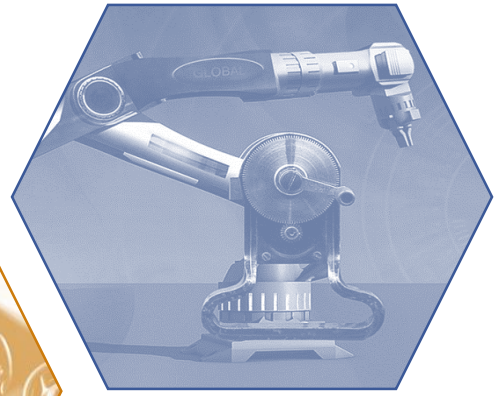
- Smart Things
- Smart City
- Industry 4.0

Healthcare

- Monitoring
- Medical Aid
- Imaging
- Diagnostics

Transport

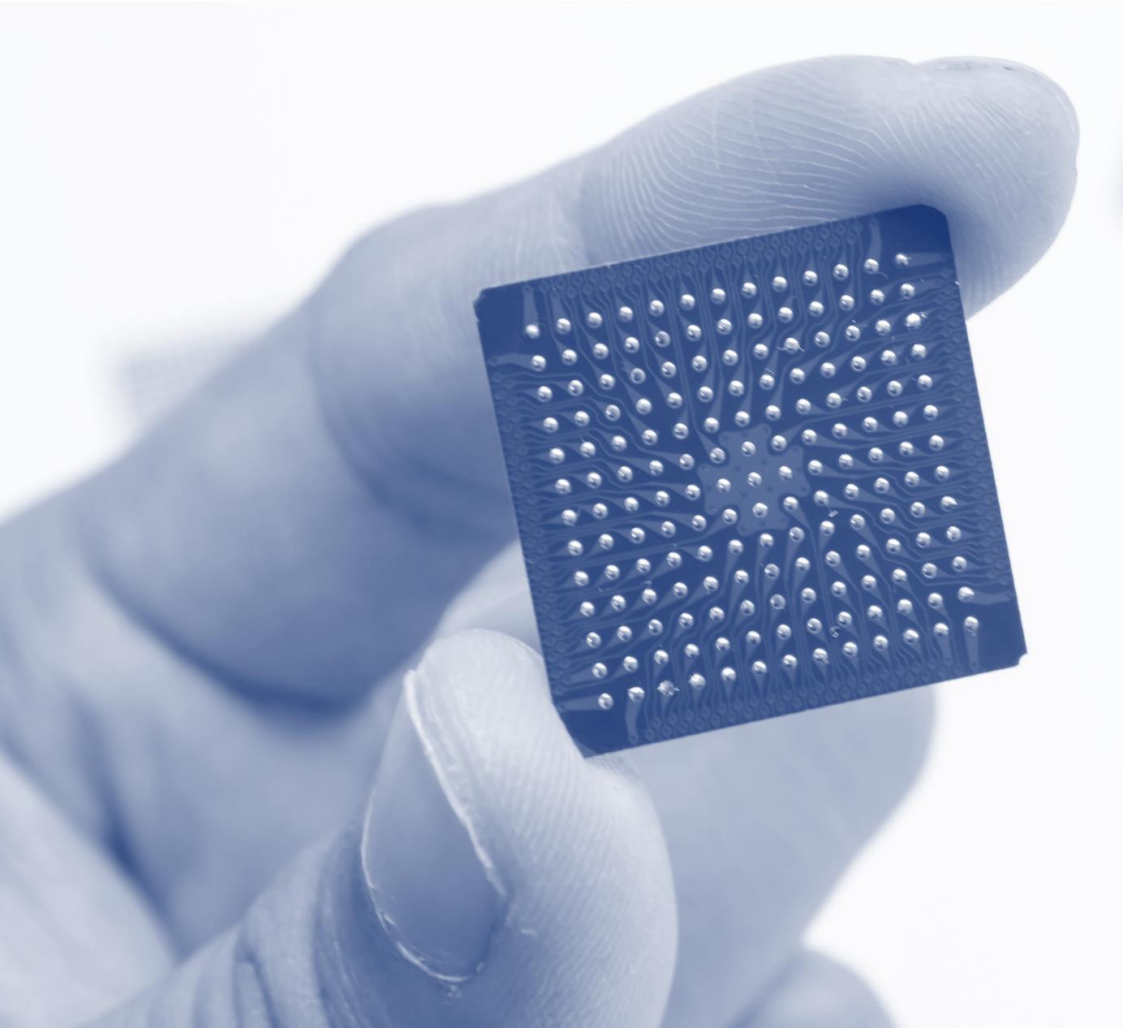
- Automotive
- Railway



Industry

- Electronics
- Engineering
- Equipment

Why partnering with us

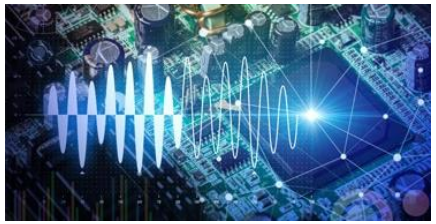


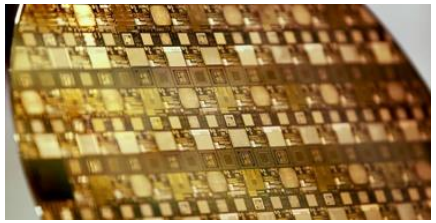
In-house expertise for analog, digital and mixed-signal ASIC developments

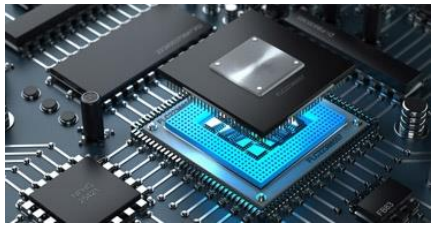
Global supply chain for ASIC prototyping, industrialization and production

ISO9001, ISO13485 and EN9100 Quality Management System

Flexible cooperation models







Meet us in the Technology Demo Zone (Hall B2) to discuss your ASIC project

IC'ALPS

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