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

- ÷5 PCB Size
- ÷10 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)

Physiological Readout
- ECG, EGM, EEG, BIO-Z, PPG, GSR

Electronics
- Other sensors, Temperature, Motion

Battery
- Rechargeable, Disposable

Wireless
- Bluetooth BLE

Wired
- USB, Serial

Actuators
- Stimulation electrodes, Pump, Motor

Electronics
- Other application functions, FPGA
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

**IoT**
- Smart Things
- Smart City
- Industry 4.0

**Mil/Aero**
- Defense
- Aeronautic
- Space

**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

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