



INVESTOR CONFERENCE

# SMART DEVICES

January, 2022





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"This document is provided by Soitec (the "Company") for information purposes only.

The Company's business operations and financial position are described in the Company's 2020-2021 Universal Registration Document (which notably includes the 2020-2021 Annual Financial Report) which was filed on July 5, 2021 with the French stock market authority (Autorité des Marchés Financiers, or AMF) under number D.21 0681. The French version of the 2020-2021 Universal Registration Document and an English courtesy translation for information purposes are both available for consultation on the Company's website ([www.soitec.com](http://www.soitec.com)), in the section Company Investors Financial Reports.

Your attention is drawn to the risk factors described in Chapter 2.1 of the Company's 2020-2021 Universal Registration Document.

This document contains summary information and should be read in conjunction with the 2020-2021 Universal Registration Document.

This document contains certain forward-looking statements. These forward-looking statements relate to the Company's future prospects, developments and strategy and are based on analyses of earnings forecasts and estimates of amounts not yet determinable. By their nature, forward-looking statements are subject to a variety of risks and uncertainties as they relate to future events and are dependent on circumstances that may or may not materialize in the future. forward-looking statements are

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Securities Act of 1933, as amended (the "Securities Act"). The Company's shares have not been and will not be registered under the Securities Act. Neither the Company nor any other person intends to conduct a public offering of the Company's securities in the United States."

# AGENDA

#01 SOITEC AT A GLANCE

#02 MEGATRENDS FOR SMART DEVICES

#03 PRODUCT PORTFOLIO

# 01

# SOITEC AT A GLANCE

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# SOITEC DESIGNS SEMICONDUCTOR MATERIALS TO MAKE THE WORLD...



**MORE  
CONNECTED**

**100% OF SMARTPHONES  
EMBED SOITEC  
PRODUCTS**



**MORE  
ENERGY EFFICIENT**

**SAVING THE YEARLY  
DOMESTIC ENERGY  
CONSUMPTION OF A  
1 MILLION INHABITANTS CITY\***



**MORE  
INTELLIGENT**

**INTELLIGENT OBJECTS  
AUGMENTING OUR LIFE,  
FROM HEALTHCARE  
TO SAFETY**

\* Based on 2020 revenue

# FOCUSING ON 3 STRATEGIC MARKETS TO EXPAND OUR PRODUCT PORTFOLIO

## MOBILE COMMUNICATIONS



### MAIN DRIVERS

- 5G mmW
- 5G sub-6 GHz
- Mobile infrastructure
- WiFi 6

### SOITEC PRODUCTS

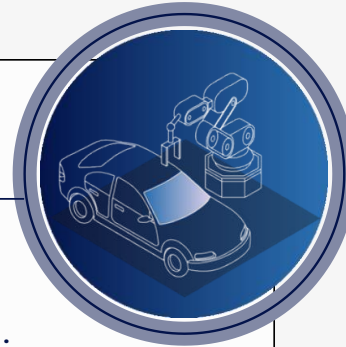
RF-SOI

FD-SOI

POI

GaN

## AUTOMOTIVE & INDUSTRIAL



### MAIN DRIVERS

- Autonomous cars
- Vehicle electrification
- Infotainment
- Industry 4.0

### SOITEC PRODUCTS

Power-SOI

FD-SOI

SiC

GaN

## SMART DEVICES



### MAIN DRIVERS

- Edge computing
- 3D sensing & Healthcare
- Smart home & Smart cities
- Data centers

### SOITEC PRODUCTS

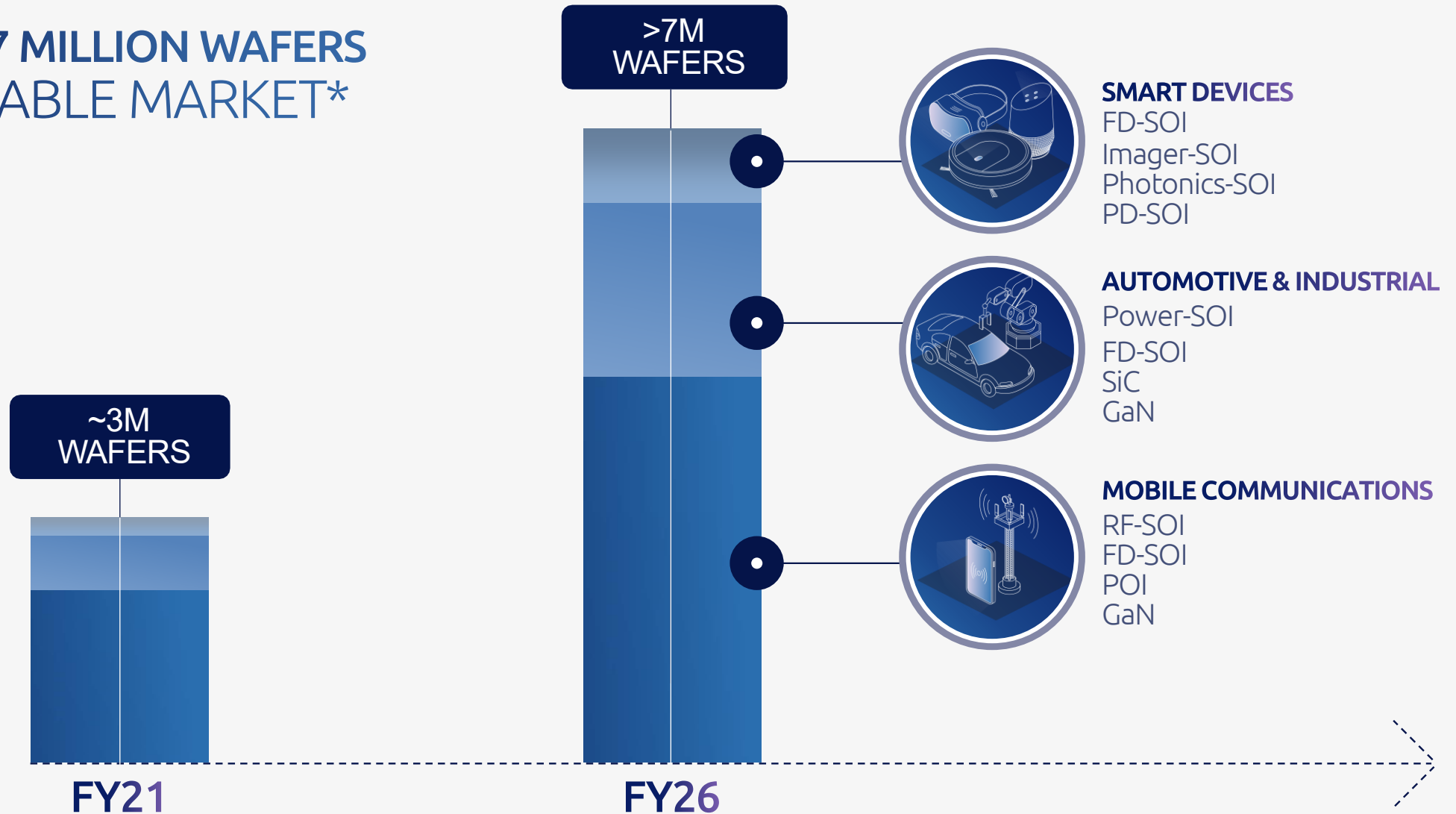
FD-SOI

Imager-SOI

Photonics-SOI

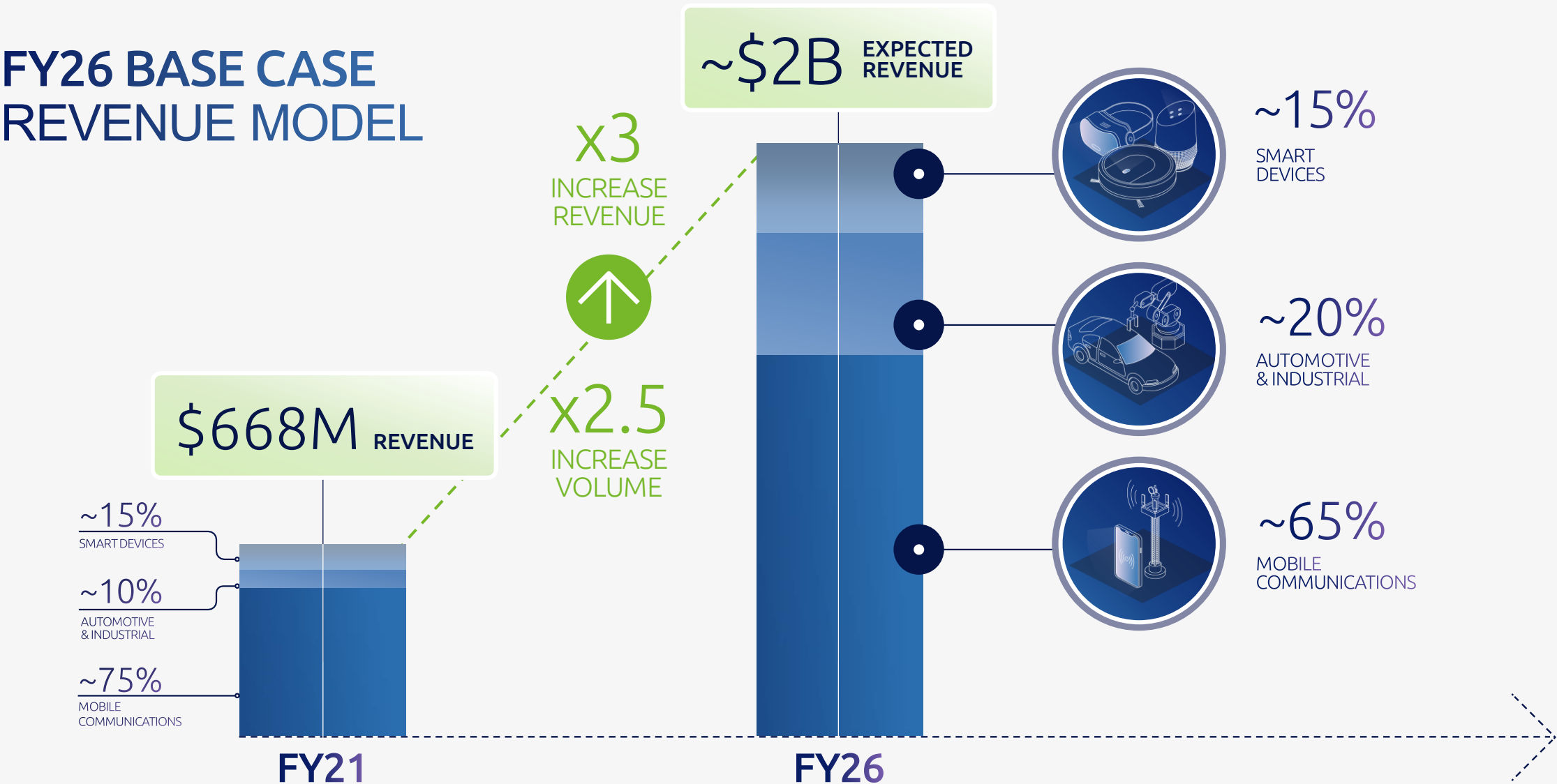
PD-SOI

# SERVING >7 MILLION WAFERS ADDRESSABLE MARKET\* BY FY26



\*Engineered substrates market opportunity

# FY26 BASE CASE REVENUE MODEL





# DELIVERING ON OUR ESG COMMITMENTS SHARING VALUE CREATION WITH ALL STAKEHOLDERS

Our corporate purpose voted in July 2021 perpetuates our engagements towards sustainability and all our stakeholders

Soitec is taking action for the  
United Nations Sustainable Development Goals



## GROUP PRIORITIES



### GROWTH

Expand and protect  
the core business



### PROFITABILITY

Protect into  
adjacent markets



### PEOPLE

Adjust the  
operating model



### SUSTAINABILITY

Support our value  
creation strategy

# 02 MEGATRENDS FOR SMART DEVICES

# INTELLIGENCE AT THE EDGE

## IoT

- 2D sensor
- Home range connectivity (WiFi/Bluetooth)
- Low power computing (MCU)



- Edge computing
- 3D sensing
- Wide area network

## AIoT

- New human-machine interface
- 2D/3D sensor
- Wide range connectivity (UWB, LPWAN)
- Mid-power computing (MCU/SoC with AI)



- High power edge computing
- High speed network
- Next generation display

## VIRTUALIZATION

- High brightness/Fast response display
- New human-machine interface
- High speed connectivity (5G)
- High power computing (SoC with high power GPU)
- 2D/3D sensor

2020

>2025

1

2

MEGATRENDS

3

# AI - FROM CLOUD TO DEVICE

## WHY EDGE COMPUTING?



### DATA SECURITY

Data safety in local process



### ECONOMY

Energy saving



### ROBUSTNESS

Real-time computing



### PRIVACY

No personal data sharing



#### BEFORE

CLOUD  
COMPUTING  
ONLY

AI TRAINING IN THE CLOUD  
INFERENCE IN THE CLOUD



#### NOW

ADDING  
EDGE  
COMPUTING

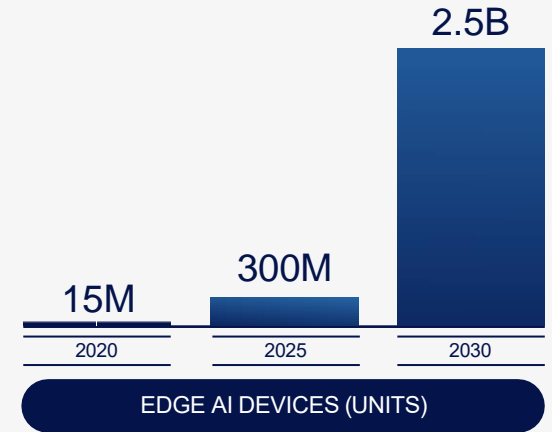
AI TRAINING IN THE CLOUD  
INFERENCE AT THE EDGE



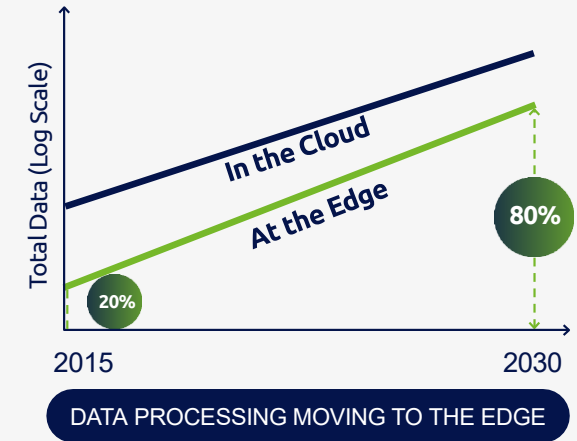
#### FUTURE

ADDING  
ON-DEVICE  
COMPUTING

AI TRAINING AT THE EDGE  
INFERENCE AT THE EDGE



Source: ABI research 2021



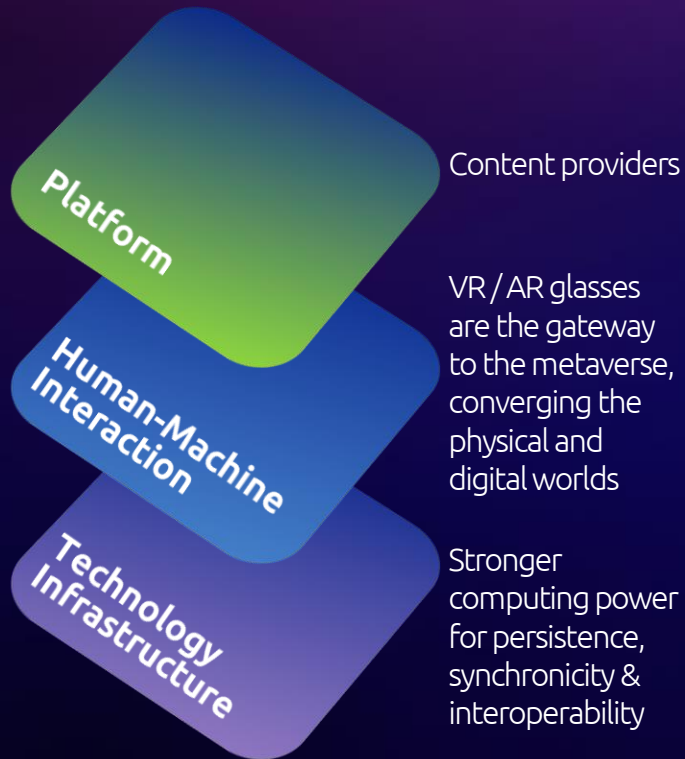
Source: IBS 2020



# METaverse

## ANOTHER GROWTH DRIVER FOR SEMICONDUCTORS

### 3 layers power the Metaverse ecosystem



### Leveraging the Smart Device cycle



### Opportunities for Engineered substrates

#### DRIVERS

- High performance computing
- Edge AI
- Efficient and powerful data centers
- Device miniaturization and customization
- Energy efficiency

#### SOITEC PRODUCTS COULD ENABLE

- WiFi 6 and 5G modem
- Sensors
- Data Centers
- microLED displays

Source: UBS, ABI Research

# BIOSENSORS

## OPENING UP A NEW FIELD OF HEALTHCARE APPLICATIONS

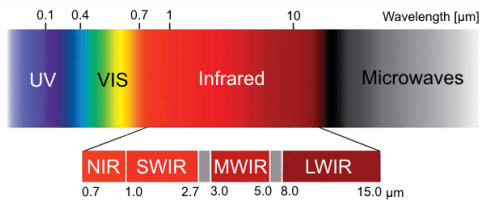
### Silicon Photonics for biosensors

#### Current Technology used for Basic biomarkers

- › **Limited set of markers:** oxygen, heartbeat
- › Visible or near-infrared wavelengths ( $<1.2\mu\text{m}$ ) **LED bulk optics**

#### Silicon photonics transport infrared light for advanced biomarkers

- › **Wider set of markers:** glucose, hydration, alcohol, lactate, carbon monoxide, blood pressure, hemoglobin, neoplastic cells...
- › **Broadest spectral region** ( $>250\text{ nm}$ )
- › **Integrated spectroscopic analysis:** NIR (Near infrared) and SWIR (Short wavelength infrared)



### Real-time healthcare monitoring at consumer fingertips

#### Main drivers behind Silicon Photonics adoption

Small form factor and wearability

Non-invasive biomarkers monitoring

Large biomarkers panel

High accuracy and reliability

Low cost and HMV-able

#### Silicon Photonics Competitive advantages

- › **High uniformity**
- › **Non-invasive** health monitoring
- › **Full integration** of complex optical functions
- › **Easiest integration** of both passive and active devices
- › **Low-cost HVM** capability (CMOS ecosystem in 200 / 300mm)
- › **Advanced packaging** solutions from CMOS ecosystem
- › Device **miniaturization** for **low-power** consumption

Fitness  
Tracking

2022

Basic biomarkers  
monitoring

2024

Advanced bio-monitoring  
& cancer screening

# TinyML – BRINGING AI ONTO SMART SENSORS

Foundation bringing together a full range of companies related to Edge Computing

## TinyML Value Proposition

### Low bandwidth

No permanent cloud connection is required as processing is performed on-device

### Low power consumption

ML processing on battery-powered devices or systems powered by energy harvesting

### Real-time processing

On-device processing allowing low latency

### Privacy

No raw data is sent to the cloud, guaranteeing a higher level of privacy



## TinyML applications

- › Healthcare & wearable sensors
- › Always on devices (e.g., voice recognition)
- › Industry 4.0 sensors for predictive maintenance
- › Smart sensors for agriculture

## Soitec & Dolphin products

- › Wearable sensors
- › Automotive: safety, energy consumption
- › Smart lock: authentication
- › Drones: AI, autonomy

# IoT APPLICATION PROCESSOR

## EDGE-BASED INTEGRATED CIRCUITS USING FD-SOI

### Transforming rich sensor data on battery powered devices...

- › People & Object **detection, classification and identification**
- › Noise removal / reduction
- › Spoken language understanding
- › **Gesture recognition, abnormal sound detection...**



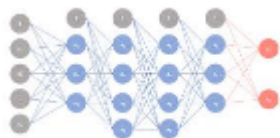
### ...at ultra low power

- › Interpretation and analysis
- › Neural Network and Digital Signal Processor tasks
- › Ease of programmability

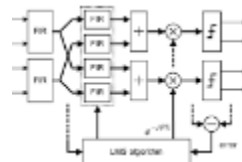
#### Optimized power consumption

- **Sleep Mode:**  $\mu$ Ws
- **Average operation:** 100s  $\mu$ W to mWs
- **Peak computing power:** few 10s mW

NN Tasks



DSP Tasks



### Use Cases

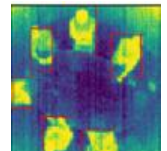
#### Hearables next generation features

- Acoustic Scene Identification, based on Neural Network
- NN based Noise Reduction, reduces background noise, and performs source separation to extract unwanted voice & sound
- RISC V Architecture



#### Occupancy Monitoring

- Wireless sensor with embedded AI / Neural Networks + IR camera
- Presence detection, people counting, social distance...



#### Human detection for ultra low power Video Surveillance

- Image processing + human detection
- Security surveillance, safety systems, alarm systems
- Identifying people and their location



#### Smart Door Lock

- Contactless
- Long battery life
- Reduces cost





# 03

## PRODUCT PORTFOLIO

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# SOITEC PRODUCT PORTFOLIO

## SMART DEVICES

### APPLICATIONS

- 3D sensors/Facial recognition
- Data centers
- Healthcare monitoring
- Smart home & Smart cities
- Wearables



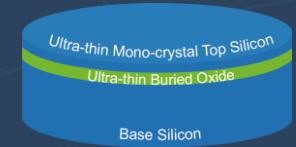
### SOITEC PRODUCTS ENABLE

- Artificial intelligence at the Edge
- Healthcare monitoring for wearables
- High speed data centers



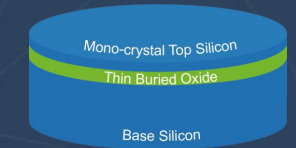
#### FD-SOI

Crossover MCUs,  
connected MCUs,  
scalable FPGAs



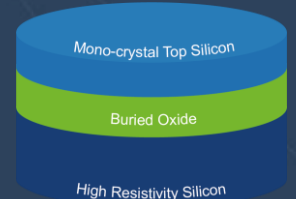
#### Imager-SOI

For improved imager  
performance in NIR



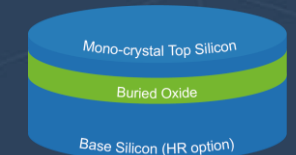
#### Photonics-SOI

Optical transceivers  
and bio-sensing



#### PD-SOI

High performance  
computing



# SMART DEVICES: FD-SOI



## EXISTING AND FUTURE APPLICATIONS

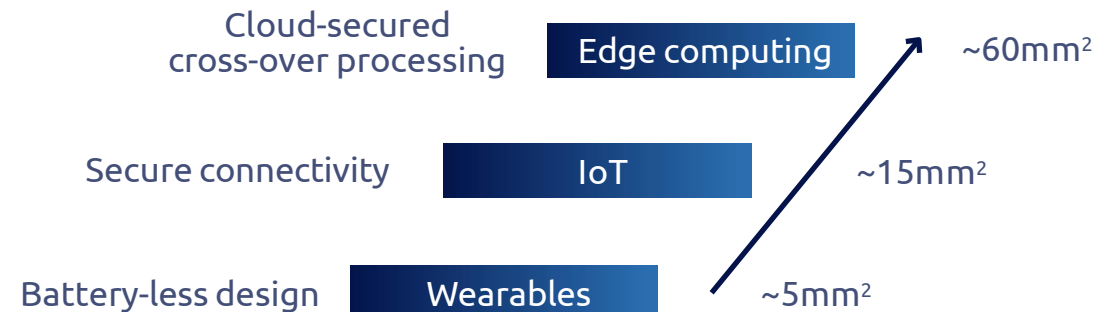
- Smart home devices
- Smart meters / smart grid
- Environmental monitoring
- Medical IoT
- Smart sensors for agriculture
- Wearables

## VALUE PROPOSITION

- Lower active power consumption - Always ON
- Performance on demand
- Ultra-low leakage with ultra-low  $V_{DD}$
- Robust energy harvesting 'zero power' capabilities
- Lowest-cost processing (inferences-per-Watt-per-\$)

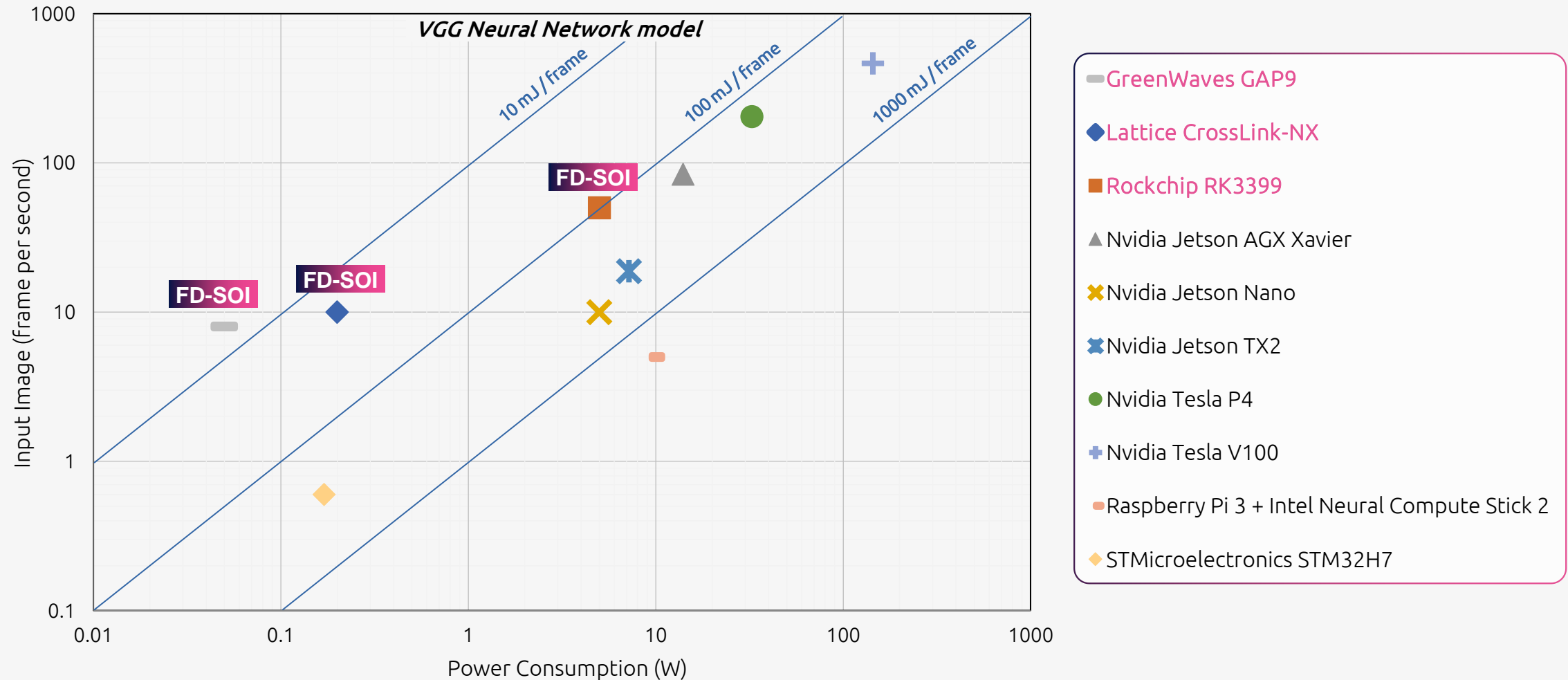
## TYPICAL DIE SIZE PER APPLICATION IN $\text{mm}^2$

Extending low-power paradigm from smart devices to edge-connected processing solutions



## EDGE COMPUTING

# FD-SOI is the ideal platform for edge inference



Source: Soitec, industry data



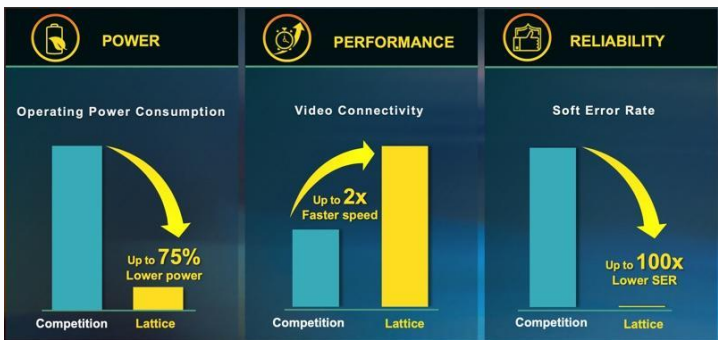
# EDGE COMPUTING

## Edge-based Integrated Circuits using FD-SOI



### Low Power FPGA

CrossLink-NX™ built on the 28FDS Lattice Nexus platform for Vision Processing Applications

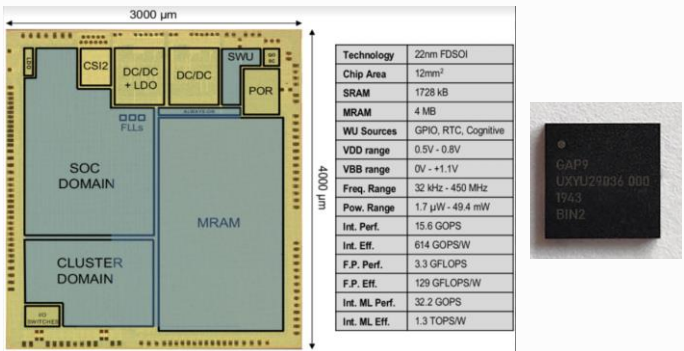


Source: Lattice Semiconductor



### IoT Application Processor

GAP9 IoT, *state-of-the-art* Application Processor in 22FDX for the Next Wave of Intelligence at the Very Edge



Source: GreenWaves Technologies



### Edge Inference Processor

Ergo delivers 4+ TOPS sustained and 55 TOPS/W, capable of processing large neural networks in 20mW, in 22FDX



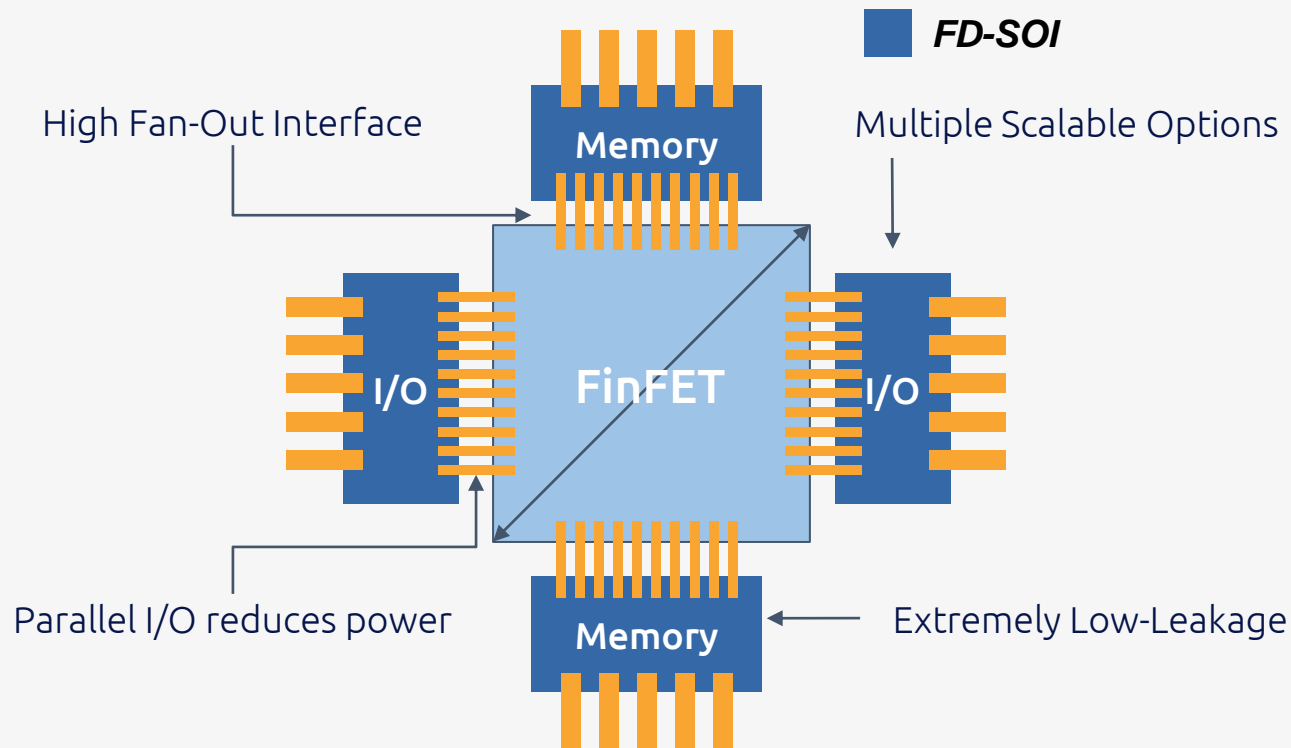
Source: Perceive



# Edge-based Integrated Circuits using FD-SOI

**FD-SOI** delivers thermal & power efficiency

**FinFET** delivers performance

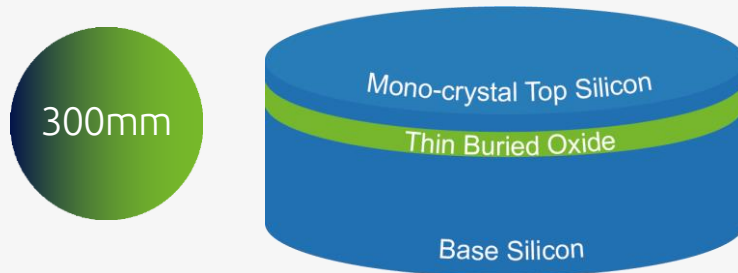


## Heterogeneous packaging offers

- › Improved thermal efficiency
- › Scalable architectures via a chiplet-based design
- › Enhanced cost utilization with FinFET
- › Lower power budget potentials
- › Architecture renewal for bandwidth vs energy trade-off
- › More competitive cost structure
- › Better production yield

Source: Soitec

# SMART DEVICES: Imager-SOI



## EXISTING AND FUTURE APPLICATIONS

- 3D image sensing for facial recognition on the edge in smartphones and AR/VR devices

## VALUE PROPOSITION

- Reduced cross talks among pixels
- Lower near infrared illuminator power
- Reduced noise, increased signal-to-noise ratio
- Dedicated layer deposition for innovative stacking
  - Better fill factor
  - Optimized performances per functional block

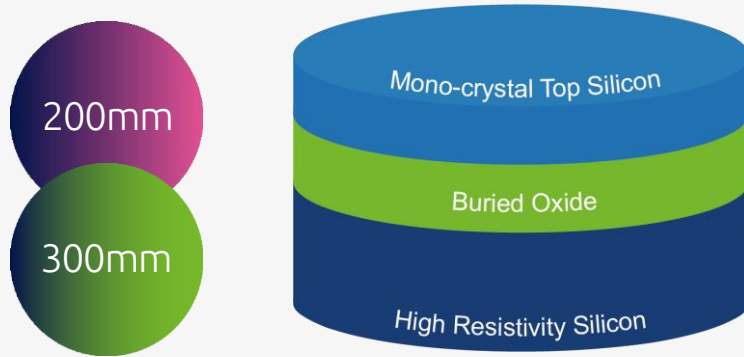
## NIR IMAGER (NEAR INFRA-RED)

Front side  
NIR imager



NIR / colored  
Imager

# SMART DEVICES: Photonics-SOI



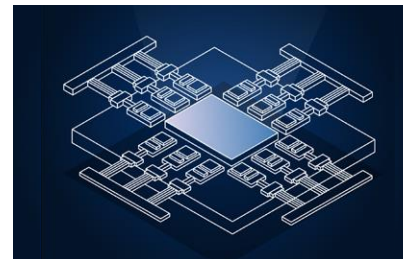
## EXISTING AND FUTURE APPLICATIONS

- Optical transceivers for data centers
- Health sensors

## VALUE PROPOSITION

- SOI as standard substrate for waveguides
- Single die integration (simpler packaging)
- Chip scale integration of optical function in CMOS fab
- High speed modulation compliant and low-loss waveguide
- Easy design for bio sensing and healthcare

## TYPICAL DIE SIZE PER APPLICATION IN mm<sup>2</sup>



Datacom transceivers  
~60mm<sup>2</sup>



Bio-sensing  
~50mm<sup>2</sup>



# DOLPHIN DESIGN: ACCELERATE ENERGY EFFICIENT SoC DESIGNS

**DOLPHIN**  
DESIGN



## VALUE PROPOSITION

- Ready to use AIoT platform with ultimate energy efficiency through pre-optimized IP platforms
- Adaptive Body Biasing (ABB) for FD-SOI technologies
- Ready to use Audio CODEC including AI based KWS (Key Word Spotting)
- State-of the art proven ASIC design & supply chain



## END APPLICATIONS



Wearables



Smart home



Medical



Smart city



Industrial



Connected car

## DOLPHIN DESIGN SOLUTION OVERVIEW

### SPEED: SYSTEM PLATFORMS FOR ENERGY EFFICIENT DESIGN

SPIDER	BAT	CHAMELEON	RAPTOR	PANTHER
Available	Available	Available	Q1 2022	Q2 2022
<b>Power Management platform</b>	<b>Audio platform</b>	<b>ULP MCU fabric with optional AI accelerator</b>		<b>Multi-Core Processor</b>
Mixed-Signal IP platform- Vregs, Osc, PMU, PorBor, Pwr Gating, BodyBiasing...	A/D, D/A, Filtering, ANC, VAD (voice detection), KWS (key word spotting)...	Always -Ready / Instant-On architecture, CPU Core-Agnostic, Multi-core capability...		Conventional DSP including AI dedicated Accelerator





SMART DEVICES

THANK YOU

