

Soitec's engineered substrates for edge computing



Paul BOUDRE
CEO of SOITEC

Global CEO Summit, November 5th, 2020
Shenzhen, China



soitec

About Soitec

Our mission: we design and deliver innovative substrates to enable our customers' products shaping everyday life

Number 1
Largest manufacturer
of engineered
substrates

Global presence
1,600 employees
worldwide



**Multi-site industrial
footprint**
France, Belgium,
Singapore, China



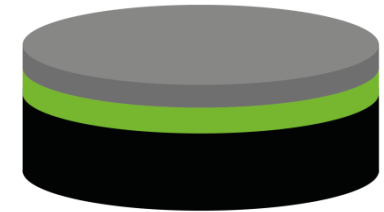
Total production capacity
150 mm – 500K/year
200 mm – 1300K/year
300 mm – 800K/year

**High volume
manufacturing**
of 200 mm
and 300 mm
wafers

Industry standard
Our RF-SOI
substrate is in 100%
of smartphones

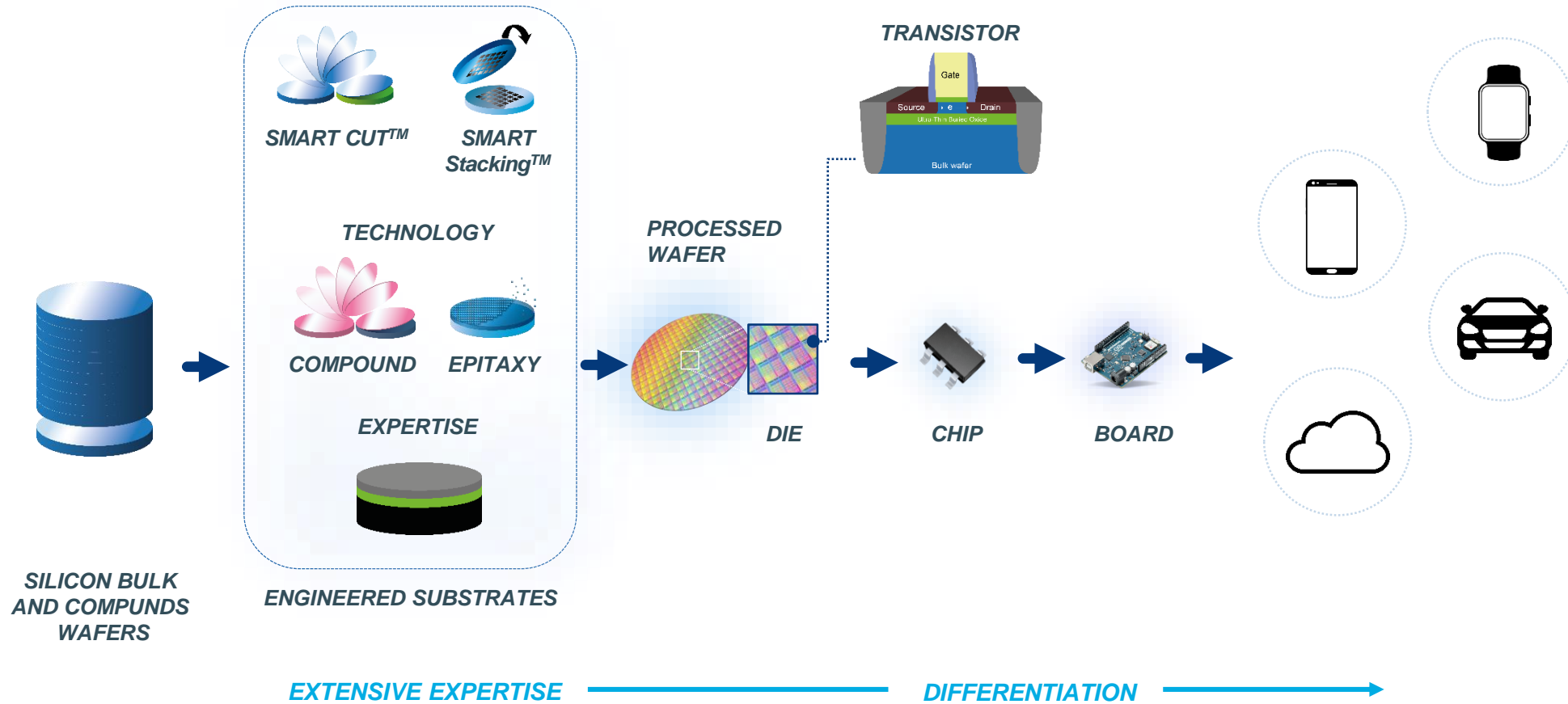


Engineered substrates



- Device Layer:
Silicon, Strained Silicon, SiC, Germanium, InP,
GaAs, GaN, InGaN, LiTaO3, LiNbO3...
- Buried Insulator: SiO2, ONO...
- Handle Substrate:
CZ Silicon, High-resistivity Si, Sapphire, Glass,
GaAs, Ge, SiC

A unique competitive position in the value chain



Soitec engaged in China for over a decade

Since 2005



Since 2010



May 2014



Partnership with Simgui/ NSIG
Signature ceremony with Dr Wang Xi

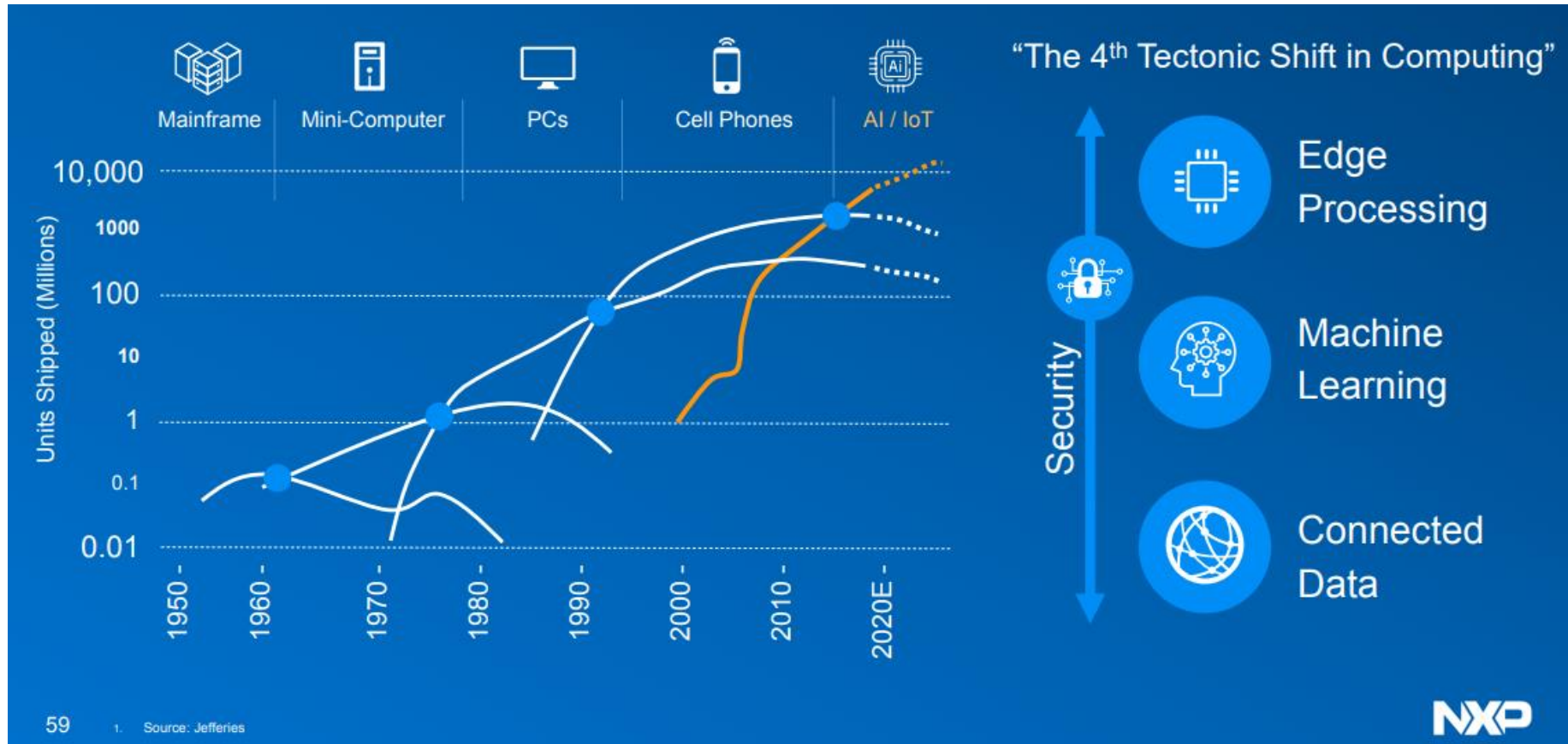
Since 2016



Since 2018



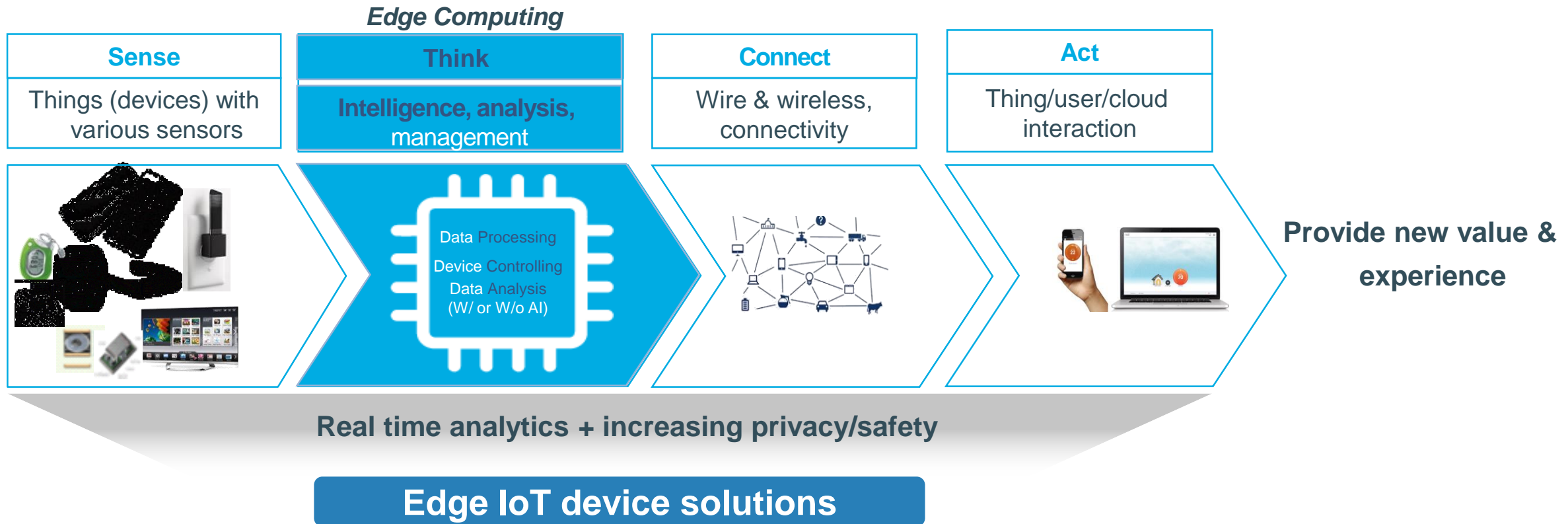
Edge computing: a new semiconductor revolution



Source – NXP, 2018

Edge computing

- › Intelligence analysis **with minimal or no interaction with a cloud**
- › The device evolution enabling smart home/city/industry when combined with AI



Computing trend

[Before: cloud computing]

AI training & inference in cloud =
Cloud Computing



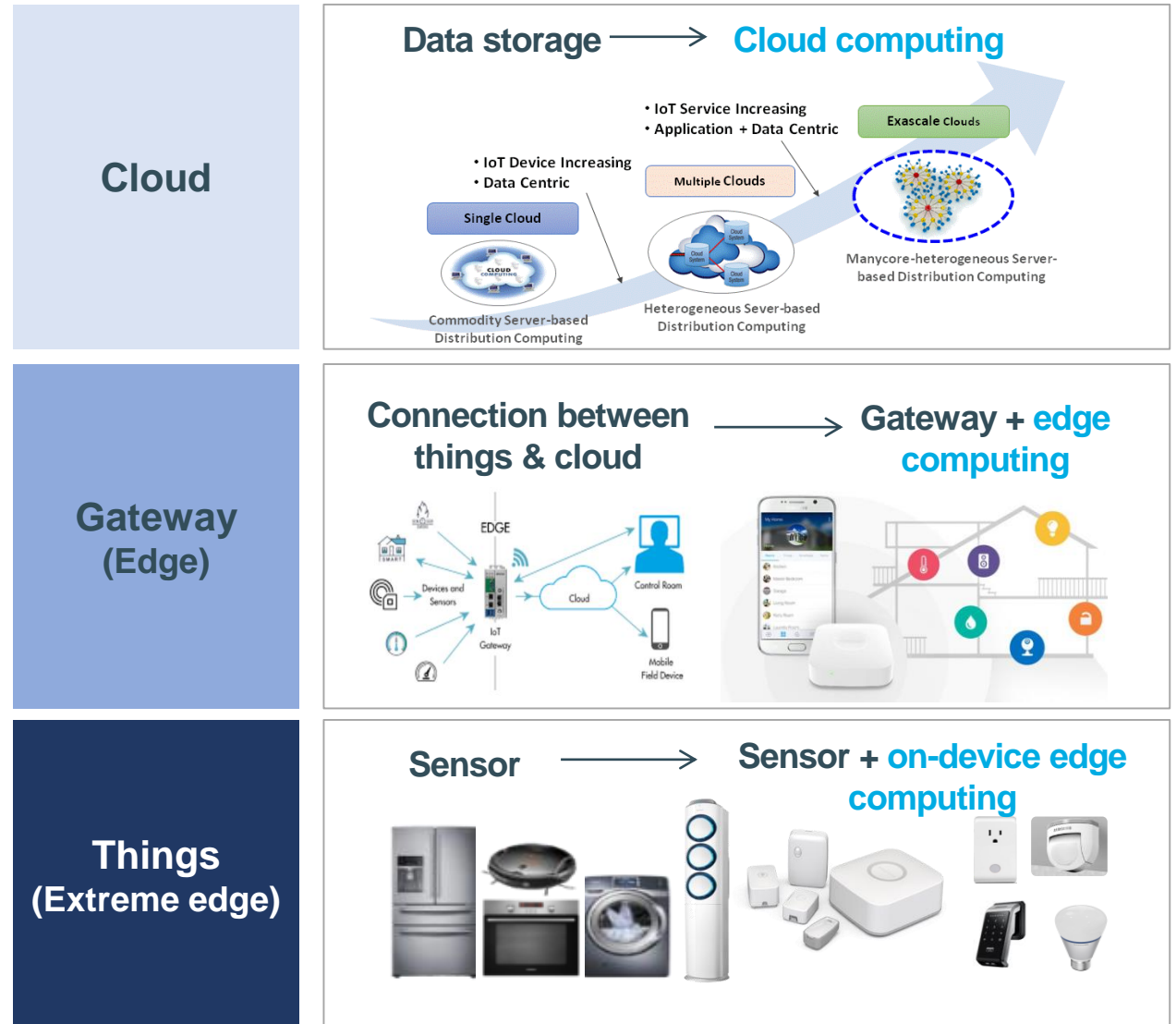
[Now: edge computing]

AI training in cloud & AI inference in edge =
Edge computing



[Future: Advanced edge computing]

AI training & inference in edge =
On-device edge computing



Edge computing segmentation

Towards Zero Power

Ultimate Energy Efficiency

Smart sensor



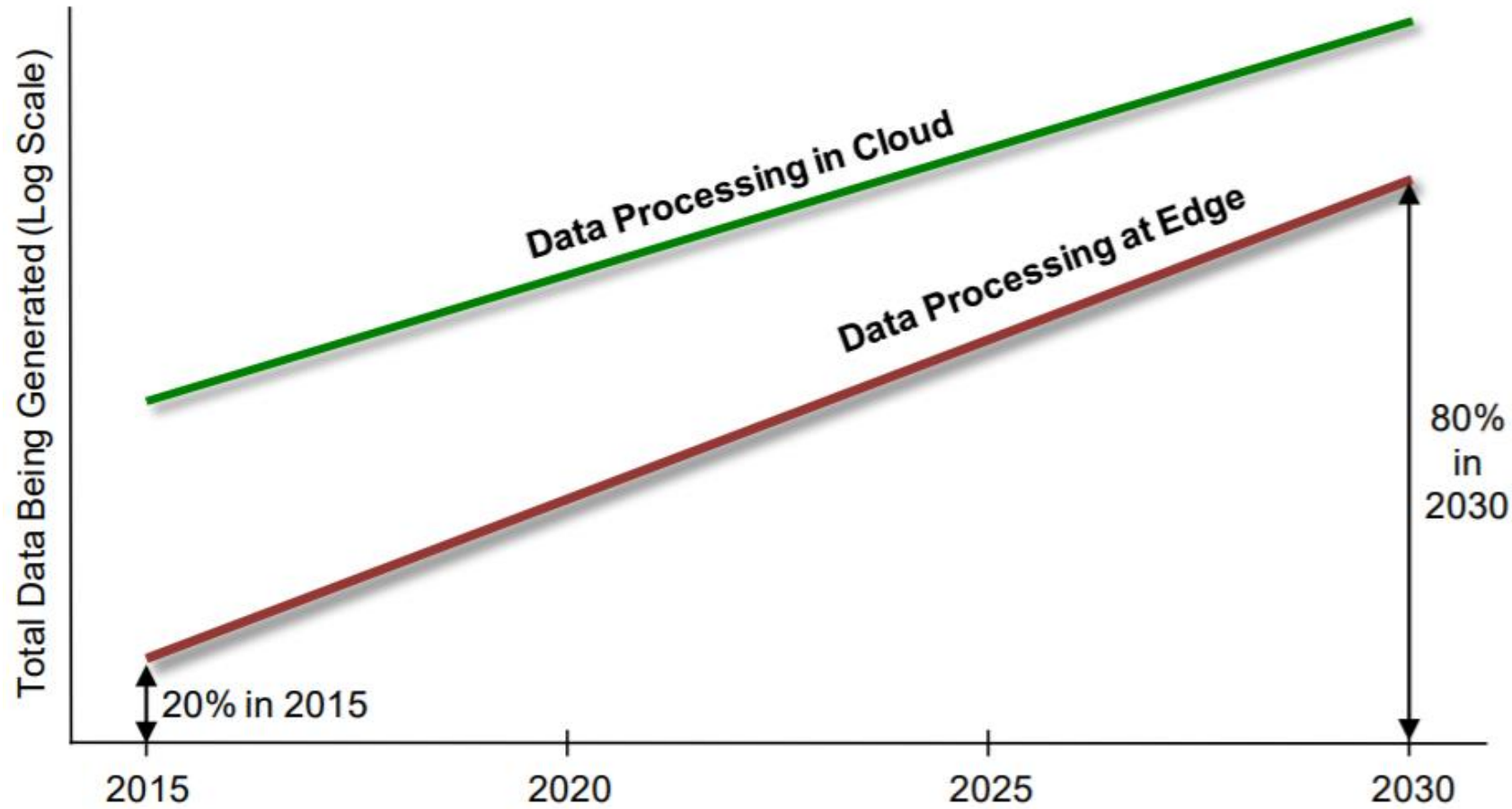
- › **One** sensor / Device
→ Smart sensor for home/industry/city
- › Always-ON / Small form factor
→ Low power consumption

Smart device



- › **Multiple** sensors / Device
→ Smart devices like Wearable, Smartphone
- › High performance / Reliability
→ Power efficiency computing

Towards balanced amount of Edge and Cloud computing



Source - IBS, 2020

Edge computing – Mass market opportunity if challenges can be overcome!



5 Key Challenges



Low latency



Data privacy



Reliability



Energy efficiency

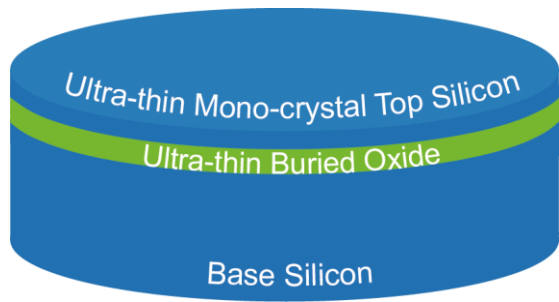


Scalability

FD-SOI

A power efficient & flexible digital technology with easy analog/RF integration for edge computing

FD-SOI substrate



Ultra-thin top silicon & box enabling fully-depleted transistor operation

Value proposition

- ✓ Better Energy Efficiency
- ✓ Higher Reliability
- ✓ Digital / Mixed Signals Integration
- ✓ RF – Best CMOS mmWave
- ✓ Fastest eMemory
- ✓ Lower manufacturing cost

Markets

Wired infrastructure



AIoT



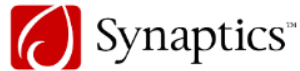
Automotive



Connectivity



FD-SOI – powering the Edge Computing already today!



Next Human Machine Interface [based on 22FDX](#)



Home Security Camera [based on 28FDS](#)



ADAS level 3 [based on 28FDS](#)



...

Built with 28 and 22nm FD-SOI technology



Toybrick USBN an AIoT [based on 22FDX](#)



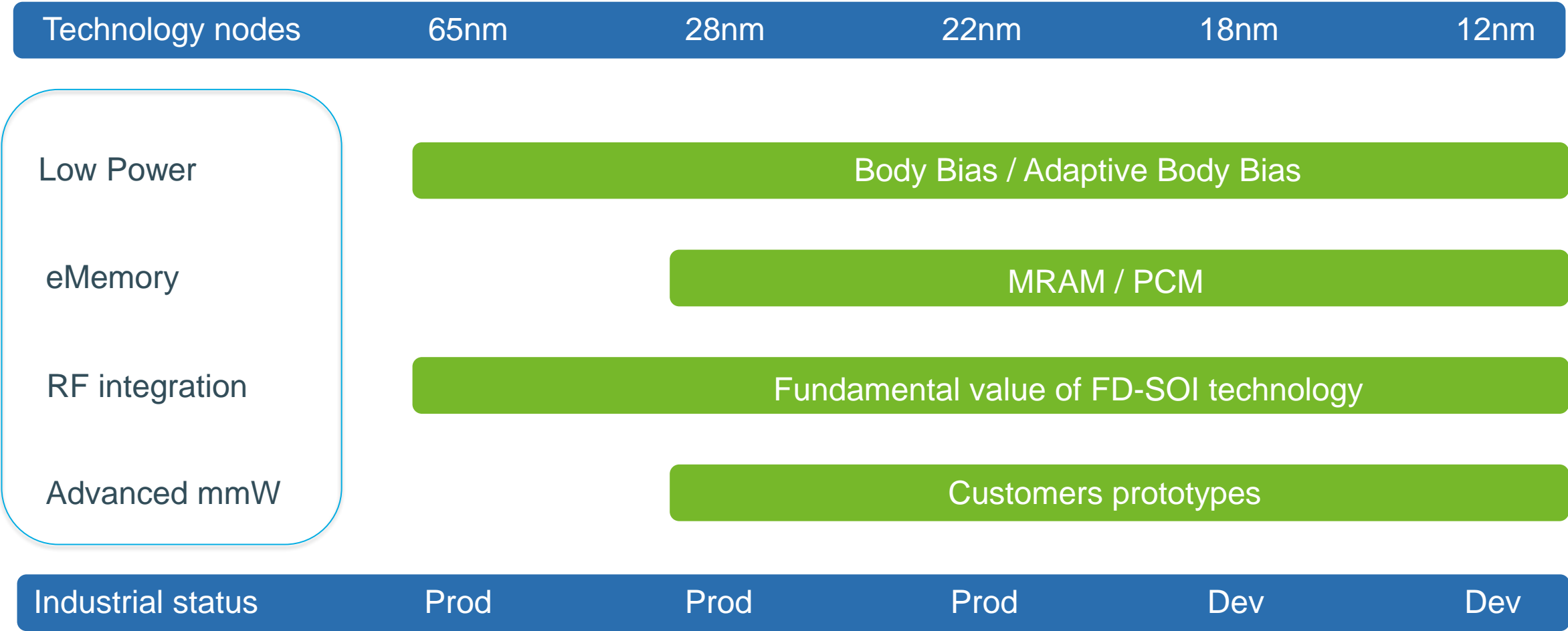
New Renesas R7F0E embedded energy harvesting chipset, opening a self-powered future for IoT devices [based on SOTB \(65nm FD-SOI\)](#)



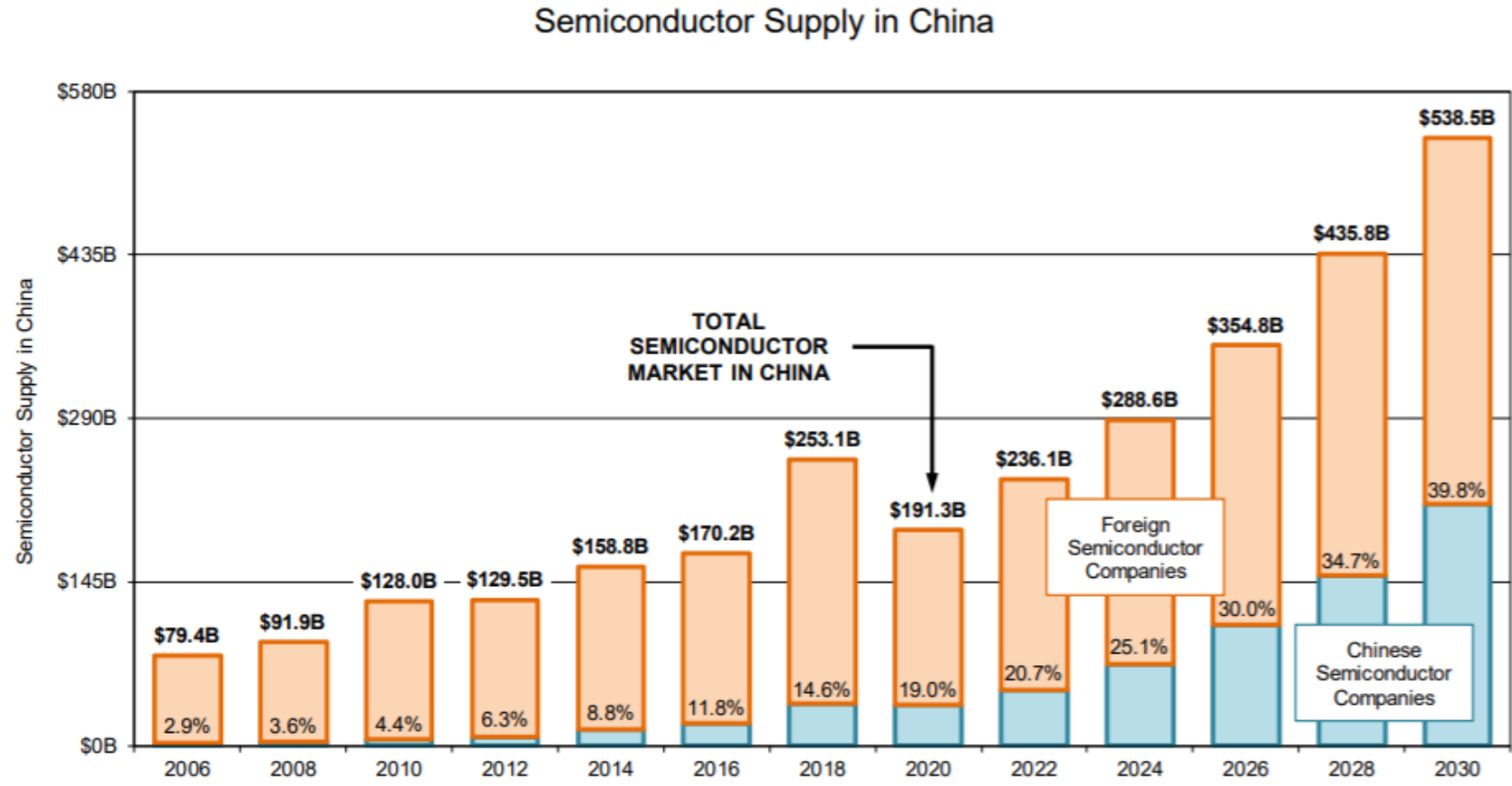
New Nest Mini [based on 22FDX](#)



FD-SOI – a platform with flexibility and long run

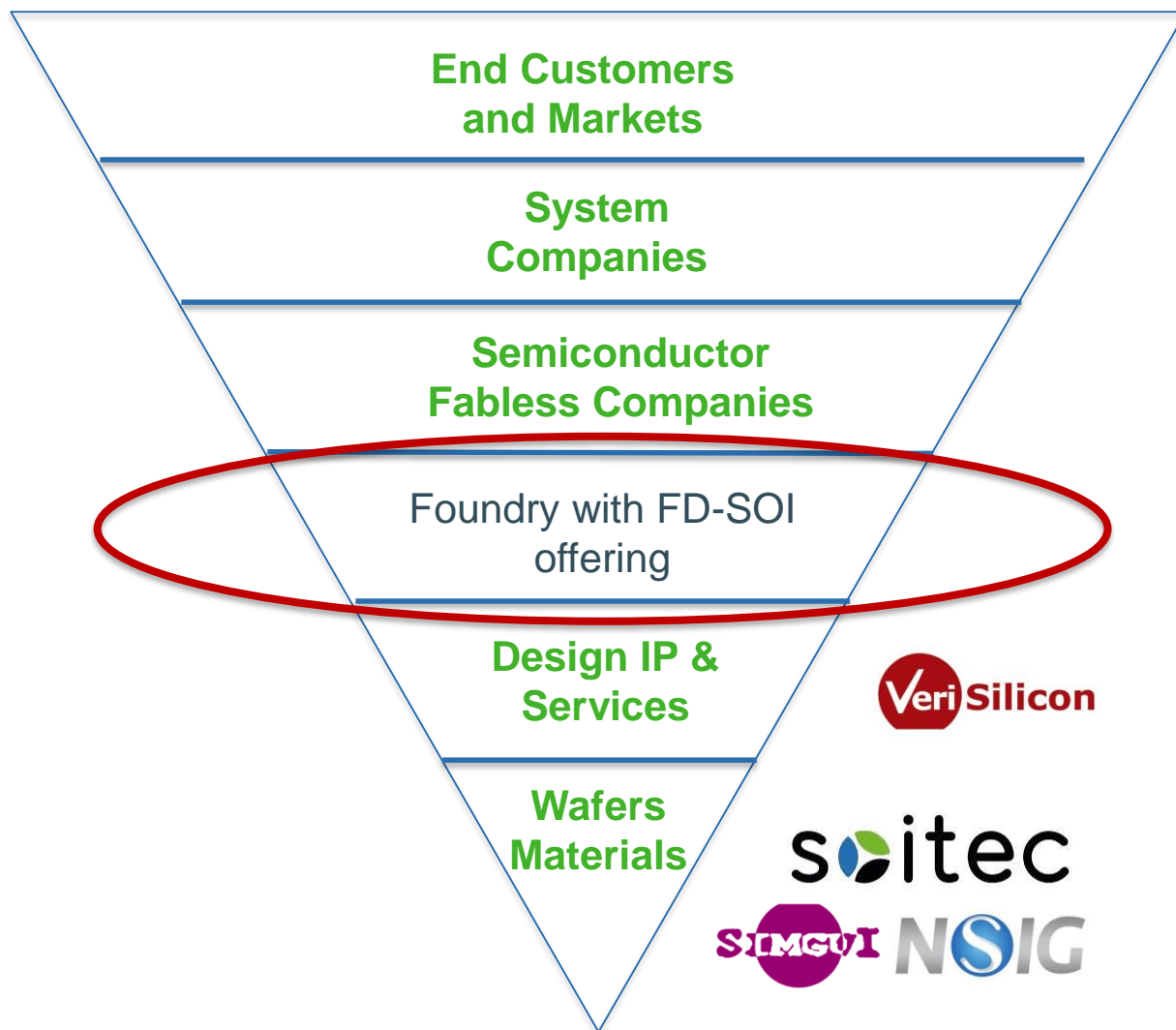


What about China – the biggest market and ecosystem in the world?



Source - IBS, 2020

Semiconductor value chain in China



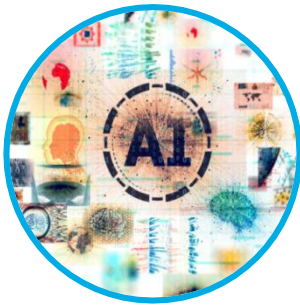
[SW (AI) Solution]



[Fab-less]



Key messages



- › Edge computing is one of the pillars of digital transformation, becoming one of the biggest markets in next decade
- › FD-SOI is a “perfect” technology platform to address Edge Computing mass adoption
- › China can play a leadership role in creating Edge AI standards in 28-22nm planar technology only if China has in place a full domestic ecosystem including a competitive foundry

Soitec's engineered substrates for edge computing



Wanpeng Zhang
Head of China - Strategic Development

Global CEO Summit, November 5th, 2020
Shenzhen, China



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FD-SOI case studies

FD-SOI 案例

› Low Power AIoT Processor (瑞芯微)

- › Built-in high performance (3TOPS) NPU
- › Low power consumption
- › Cost-effective in terms of NRE and die

Rockchip
RK1808
22nm FD-SOI

Source: Rockchip, CES 2019



› Vision Processor for ADAS (英特尔)

- › Most advanced vision computing ASIC on the market
- › Multi-camera (up to 8) sensor processing plus radar and LiDAR
- › Intel EyeQ®4 shipping in automobiles since late 2017

Mobileye Eye®Q4
Vision processor
28nm FD-SOI

Source: Mobile Eye, 2020



› Automotive radar

- › FD-SOI yields state-of-the-art radar (RF) performance
- › Embedded radar (DSP) at lower-power footprint
- › Enhances detection via highly-linear data conversion

Arbe Robotics
4D imaging radar
22nm FD-SOI

Source: Arbe Robotics, 2020



› Ultra Low Power Application Processor

- › Feature and performance scalable multi-core platform
- › FD-SOI improves system reliability and robustness

NXP
i.MX8
28nm FD-SOI

Source: NXP, Oct 2019



Soitec's strategic role in China

Soitec在中国的战略地位

- › Soitec's business in China is increasing year after year. We are reinforcing our local organization and presence with sales, field support and communication. We are engaging with direct customers but also with end customers to help solve the ecosystem problems.
- › Soitec中国业务在不断增长，我们不断强化本地的技术和销售团队，不仅与直接的客户合作，也帮助终端和系统设计客户解决生态问题。
- › Soitec has already one strategic partner in China - NSIG and one business partner - Simgui. In coming years Soitec will continue to develop its business in China to support our customers.
- › Soitec 和沪硅产业集团建立了战略合作关系，和新傲科技是商业合作伙伴。未来我们会继续在中国深化业务发展，持续服务我们的客户。
- › 5G, AI, EV are the key drivers of growth of semiconductor industry - engineered substrates play strategic role and China is playing leadership role.
- › 5G、人工智能和电动汽车是未来半导体产业发展的主要驱动力。优化衬底具有战略性地位，我们相信中国正在领导这场变革。

Thank you

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