Microcontrollers & Digital ICs Group Presentation

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Capital Markets Day 2020

Forward looking information

Some of the statements contained in this release that are not historical facts are statements of future expectations and other forward-looking statements (within the meaning of Section 27A of the Securities Act of 1933 or Section 21E of the Securities Exchange Act of 1934, each as amended) that are based on management's current views and assumptions, and are conditioned upon and also involve known and unknown risks and uncertainties that could cause actual results, performance, or events to differ materially from those anticipated by such statements, due to, among other factors:

- *changes in global trade policies, including the adoption and expansion of tariffs and trade barriers, that could affect the macro-economic environment and adversely impact the demand for our products;*
- *uncertain macro-economic and industry trends, which may impact end-market demand for our products;*
- *customer demand that differs from projections;*
- *the ability to design, manufacture and sell innovative products in a rapidly changing technological environment;*
- *changes in economic, social, public health, labor, political, or infrastructure conditions in the locations where we, our customers, or our suppliers operate, including as a result of macroeconomic or regional events, military conflicts, social unrest, labor actions, or terrorist activities;*
- *unanticipated events or circumstances, which may impact our ability to execute our plans and/or meet the objectives of our R&D and manufacturing programs, which benefit from public funding;*
- *the Brexit vote and the impact of the withdrawal of the U.K. may adversely affect business activity, political stability and economic conditions in the U.K., the Eurozone, the EU and elsewhere. The U.K. withdrawal from the EU took place on January 31, 2020 and the UK majority government is expected to complete Brexit even if no formal withdrawal agreement is in place with the EU by the end of the transition period running until December 31, 2020. The specific terms of the U.K. withdrawal from the EU are still uncertain and while we do not have material operations in the U.K. and have not experienced any material impact from Brexit on our underlying business to date, we cannot predict its future implications;*
- *financial difficulties with any of our major distributors or significant curtailment of purchases by key customers;*
- *the loading, product mix, and manufacturing performance of our production facilities and/or our required volume to fulfill capacity reserved with suppliers or third party manufacturing providers;*
- *availability and costs of equipment, raw materials, utilities, third-party manufacturing services and technology, or other supplies required by our operations;*
- *the functionalities and performance of our IT systems, which are subject to cybersecurity threats and which support our critical operational activities including manufacturing, finance and sales, and any breaches of our IT systems or those of our customers or suppliers;*
- *theft, loss, or misuse of personal data about our employees, customers, or other third parties, and breaches of global and local privacy legislation, including the EU's General Data Protection Regulation ("GDPR");*
- *the impact of intellectual property ("IP") claims by our competitors or other third parties, and our ability to obtain required licenses on reasonable terms and conditions;*
- *changes in our overall tax position as a result of changes in tax rules, new or revised legislation, the outcome of tax audits or changes in international tax treaties which may impact our results of operations as well as our ability to accurately estimate tax credits, benefits, deductions and provisions and to realize deferred tax assets;*
- *variations in the foreign exchange markets and, more particularly, the U.S. dollar exchange rate as compared to the Euro and the other major currencies we use for our operations;*
- *the outcome of ongoing litigation as well as the impact of any new litigation to which we may become a defendant;*
- *product liability or warranty claims, claims based on epidemic or delivery failure, or other claims relating to our products, or recalls by our customers for products containing our parts;*
- *natural events such as severe weather, earthquakes, tsunamis, volcano eruptions or other acts of nature, the effects of climate change, health risks and epidemics such as the novel coronavirus COVID-19 in locations where we, our customers or our suppliers operate;*
- *industry changes resulting from vertical and horizontal consolidation among our suppliers, competitors, and customers; and*
- *the ability to successfully ramp up new programs that could be impacted by factors beyond our control, including the availability of critical third party components and performance of subcontractors in line with our expectations.*

Such forward-looking statements are subject to various risks and uncertainties, which may cause actual results and performance of our business to differ materially and adversely from the forward-looking statements. Certain forward-looking statements can be identified by the use of forward looking terminology, such as "believes," "expects," "may," "are expected to," "should," "would be," "seeks" or "anticipates" or similar expressions or the negative thereof or other variations thereof or comparable terminology, or by discussions of strategy, plans or intentions.

Some of these risk factors are set forth and are discussed in more detail in "Item 3. Key Information — Risk Factors" included in our Annual Report on Form 20-F for the year ended December 31, 2019, as filed with the SEC on February 26, 2020. Should one or more of these risks or uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those described in this release as anticipated, believed, or expected. We do not intend, and do not assume any obligation, to update any industry information or forward-looking statements set forth in this release to reflect subsequent events or circumstances.

Introduction

Jean-Marc Chery

President & CEO

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Capital Markets Day 2020

Our value proposition

For our **shareholders**

Return value in line with our sustainable, profitable growth objective

Sustainable and profitable growth

For our **customers**

Provide differentiating enablers

Independent, reliable & secure supply chain

For other **stakeholders**

Committed to sustainability

Our values: Integrity – People – Excellence

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Our strategy stems from key long-term enablers

Smart Mobility

ST provides innovative solutions to help our customers make driving **safer, greener and more connected** for everyone

Power & Energy

ST technology and solutions enable customers to increase **energy efficiency** everywhere and support the use of renewable energy sources

Internet of Things & 5G

ST provides **sensors**, **embedded processing solutions**, **connectivity**, **security and power management**, as well as **tools and ecosystems** to make development fast and easy for our customers

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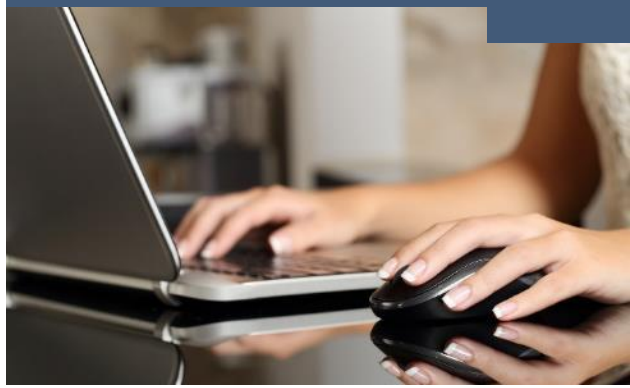
We address four end markets

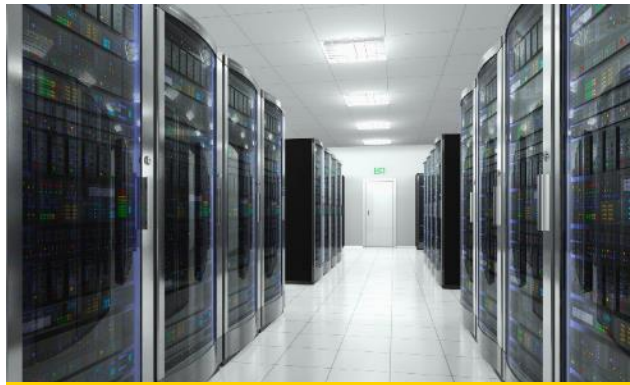
Automotive

Industrial

Personal electronics

Communications equipment, computers & peripherals





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ST product portfolio enabling strategic trends

Dedicated Automotive ICs	Discrete & Power Transistors	Analog, Industrial & Power Conversion ICs	GP, Connected MCU, MPU Secure MCU, EEPROM	MEMS & Optical sensing solutions	ASICs based on ST proprietary technologies
SPC5	STPOWER	STSPIN	STM32	iNEMO	RF-SOI
Stellar	SIC	VIPerPlus	STSECURE	Flight Sense	FD-SOI
ADAS	IGBT		ST25		BiCMOS

Smart Mobility | **Power & Energy** | **Internet of Things & 5G**

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Our strategic objectives

Automotive

- Lead in **car electrification**
- Lead in **car digitalization**

Industrial

- Lead in **embedded processing**
- Accelerate growth in **analog & sensors**
- Expand in **power & energy** management
- Accelerate growth with **industrial OEMs**

Personal electronics

- Lead in **selected** high-volume **smartphone** applications with differentiated products or custom solutions
- Leverage **broad portfolio** to address high-volume applications

Communications Equipment, Computers & Peripherals

- Address **selected** high-volume **applications** with differentiated products or custom solutions
- Address selected applications in **cellular** and **satellite communication** infrastructure
- Leverage **broad portfolio** to address high-volume applications

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Microcontrollers & Digital ICs Group

Claude Dardanne

President, Microcontrollers & Digital ICs Group

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Capital Markets Day 2020

28%
of ST 2019 revenues

MDG group at a glance
Key financial data by subgroup

2019 Revenue

$ 2.64B
Microcontrollers & Digital ICs Group

$2.01B
Microcontrollers,
Memories and
Secure MCUs
MMS

$0.63B
Radio **F**requency
Communication
RFC

CAGR 2016 - 2019

+4.9%
MDG

MMS **+6.8%**

RFC* **- 0.5%**

* Including discontinued set-top box business

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Microcontrollers & Digital ICs Group

MMS

Leadership in Embedded Processing

STM32
General Purpose
Microcontroller

#2

STM32
Industrial
Microprocessor

New

Leadership in Secure Solutions

Embedded
Security
Smartcards

#3

Leadership in EEPROM

ST25
RF EEPROM
Serial Wired

#1

RFC

Focus in RF Communication

ST Advanced
RF
Technologies

- LEO satellite constellations
- 5G
- High speed communication infrastructure

Source : Omdia CLT, March 9th 2020.

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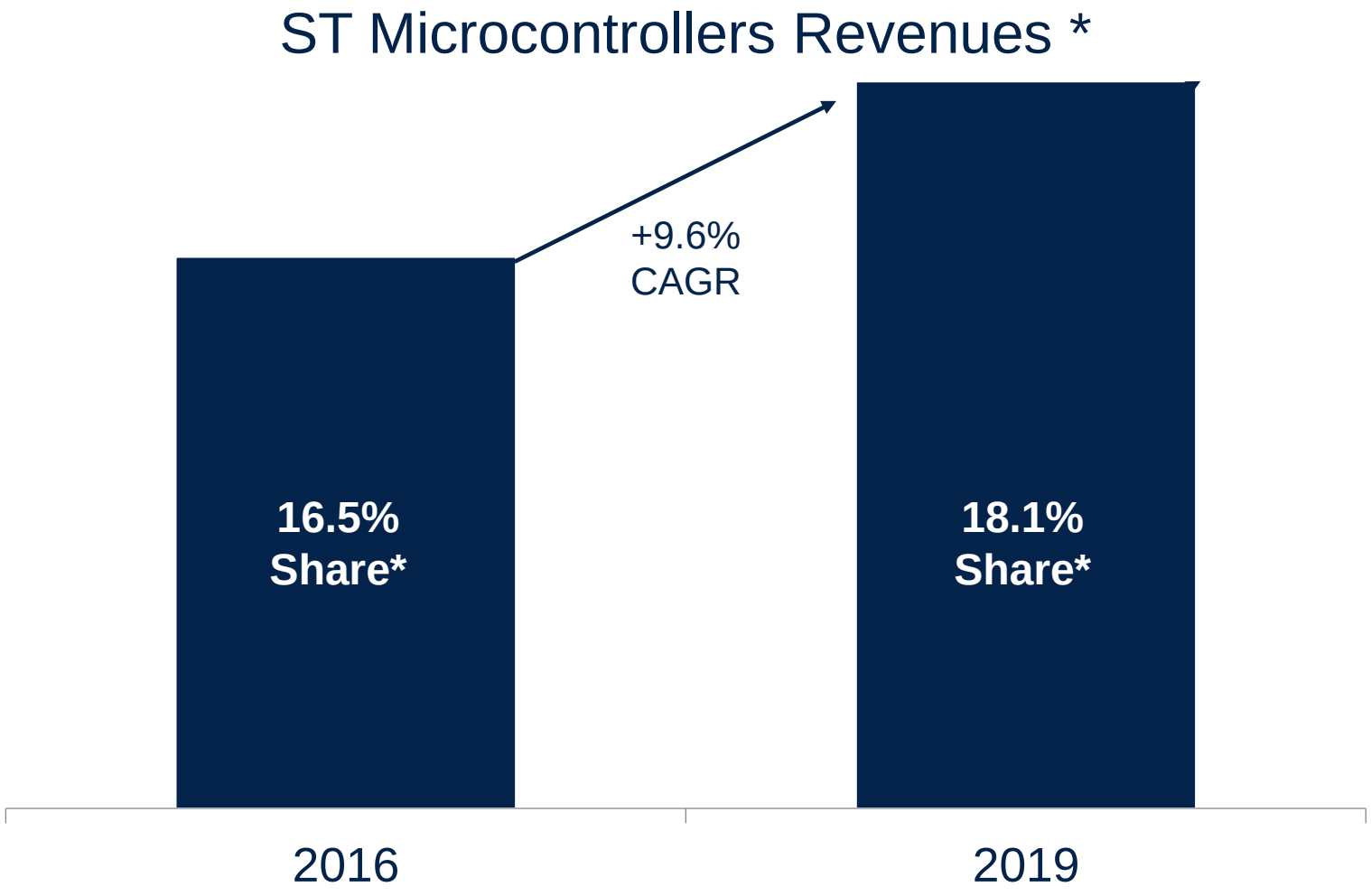
ST embedded processing position excl. automotive



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* Excluding Automotive MCUs Source: WSTS, 2020

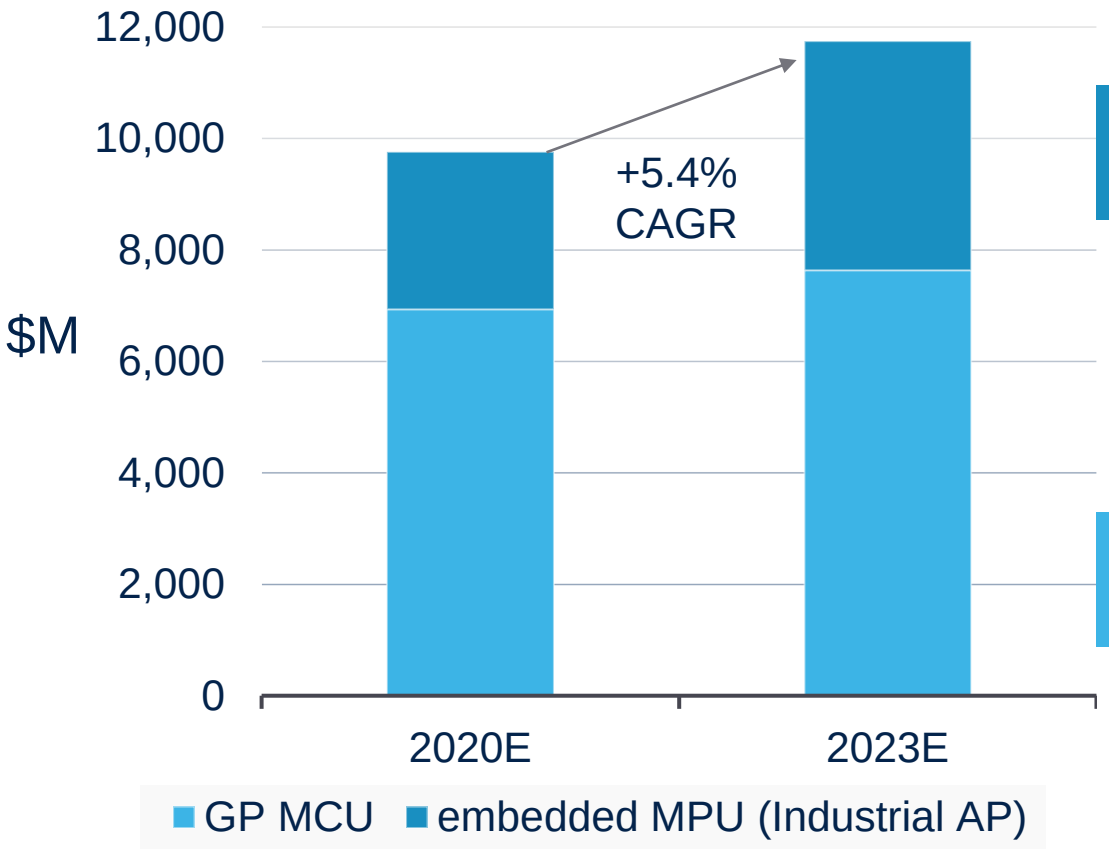
General purpose microcontrollers* ranking trend

Rank	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1	Renesas +	Renesas	Renesas	Renesas	Renesas	Renesas	Renesas	Microchip	Microchip	Microchip	Microchip
2	Panasonic	Atmel	Atmel	Atmel	Microchip	Microchip	Microchip +	Renesas	Renesas	ST	ST
3	Microchip	Microchip	Microchip	Microchip	Atmel	Atmel	ST	ST	ST	Renesas	Renesas
4	NEC	Samsung	TI	TI	TI	ST	NXP	TI	TI	TI	TI
5	Toshiba	Toshiba	Toshiba	ST	ST	TI	Atmel	NXP	NXP	NXP	NXP +
6	Atmel	TI	Freescale	Fujitsu	Freescale	Freescale	TI	Cypress	Cypress	Infineon	Infineon +
7	Samsung	Freescale	Cypress	Freescale	Cypress	NXP +	Cypress	Infineon	Infineon	Cypress	Cypress
8	Freescale	Fujitsu	Fujitsu	Toshiba	Spansion	Spansion	Infineon	Silicon Lab	Silicon Lab	Toshiba	Nuvoton
9	TI	Panasonic	ST	Cypress +	NXP	Cypress	Silicon Lab	Toshiba	Nuvoton	Silicon Labs	Toshiba
10	Fujitsu	ST	Samsung	NXP	Toshiba	Infineon	Toshiba	Nuvoton	Toshiba	Nuvoton	Sil Lab
11	ST	NXP	NXP	Samsung	Infineon	Toshiba	Nuvoton	Cobham	Cobham		*Marvel*

* ST General Purpose MCU perimeter excluding automotive MCUs
* General Purpose Microcontrollers = Omdia's Consumer MCU + Computers & Peripherals MCU + Wireless Communications MCU + Wired Communications MCU + General Purpose MCU

Source: Omdia, August. 2020

Embedded processing market trend



STM32 Microprocessors

STM32

STM32 Microcontrollers

Key Applications

- Appliances & Smart Home
- Wellness & fitness & Personal healthcare
- Industrial & Power tools
- Smart Metering
- & Industry 4.0 / Factory Automation

* Excluding Automotive MCUs
Source: WSTS May 2020, and ST estimates

Embedded processing growth drivers - Industry 4.0

Growth Drivers	Industrial Example
Wireless Connectivity	Asset Tracking
End-to-end Security	Authentication
AI at the Edge	Predictive Maintenance
Ultra Low Power	Asset Tracking
Motor control and Power system digitalization	BLDC Motors

(*) GP MCUs, excluding Automotive

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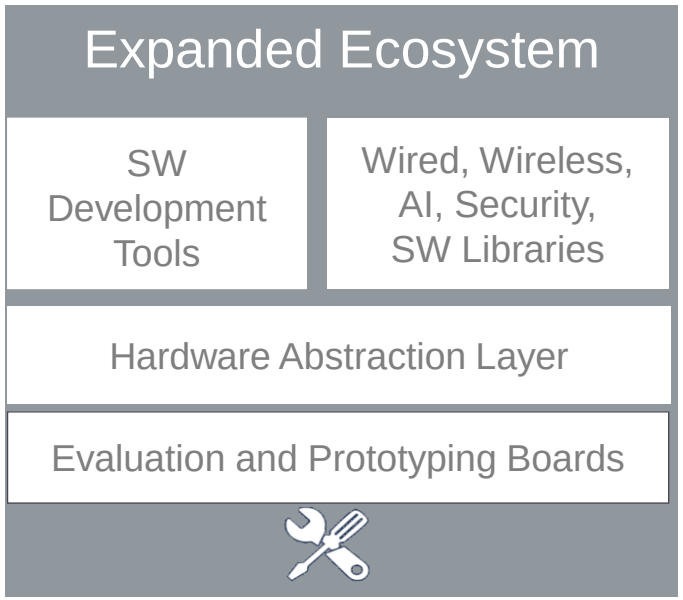
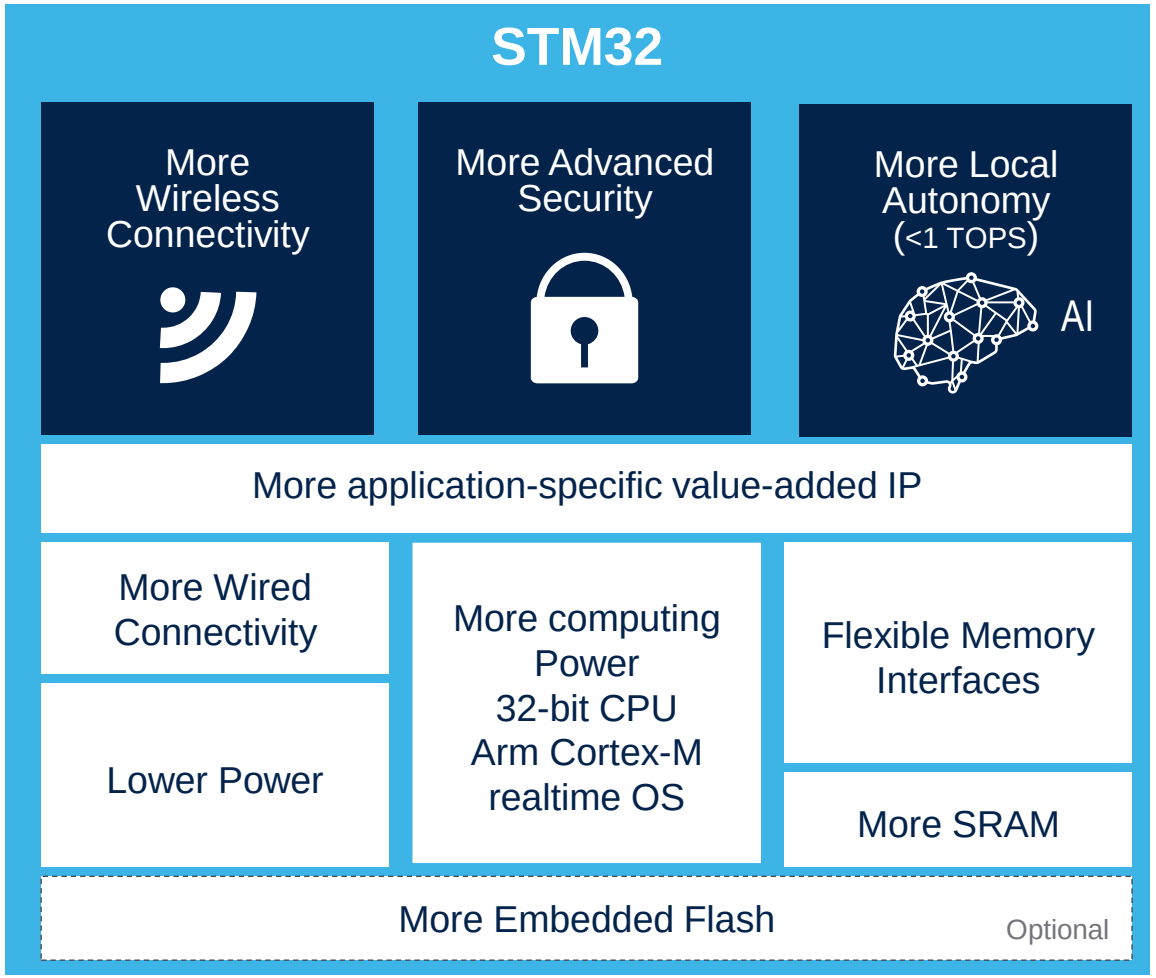
STM32 product family
Strengthening embedded processing





Advanced Non-Volatile Memory technology : 18nm FD-SOI

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More Wireless Connectivity

STM32 wireless connectivity offer

Network

BlueTooth		In Development
ZigBee Thread		
Wi-Fi IoT		
LoRa SigFox		
LTE Cat-M NB IoT		

Point-to-point

Near Field Communication		In Development
Ultra-Wide Band		

From reference design solution to STM32 SoC solution

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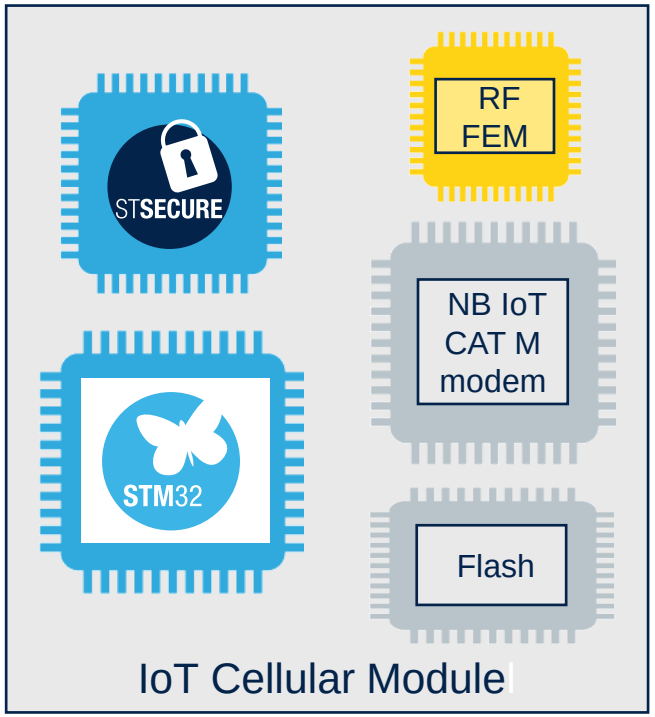
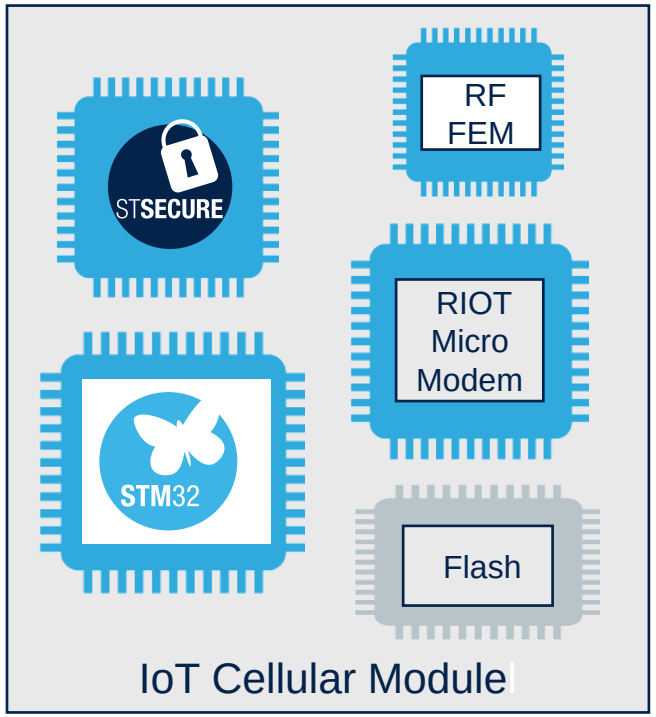
More Wireless Connectivity

IoT cellular connectivity Go to market strategy

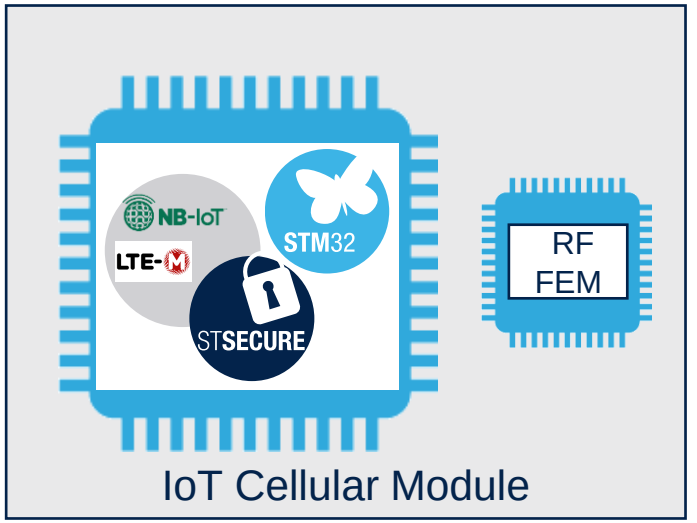
Turnkey cellular solution leveraging RF, ST SIM technology and the STM32 foundation



Certification managed by module maker or end customer



Low power turnkey solution
Certification **managed by ST**



Fully integrated turnkey solution
Certification **managed by ST**

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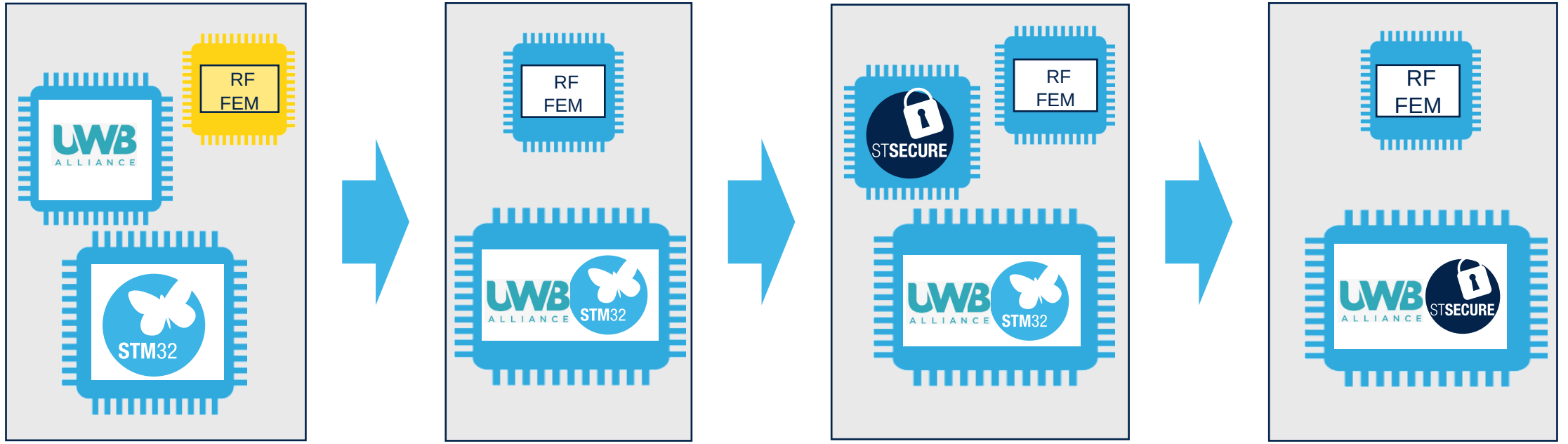
ST Solution

Ultra Wide Band
Go to market strategy



Industrial Module

Industrial chipset
IoT Solution

Smartphone solution
Automotive Secure solution

Smartphone chipset

omlox

omlox

IEEE 802.15.4.z POM

IEEE 802.15.4.z POM

UWB ALLIANCE

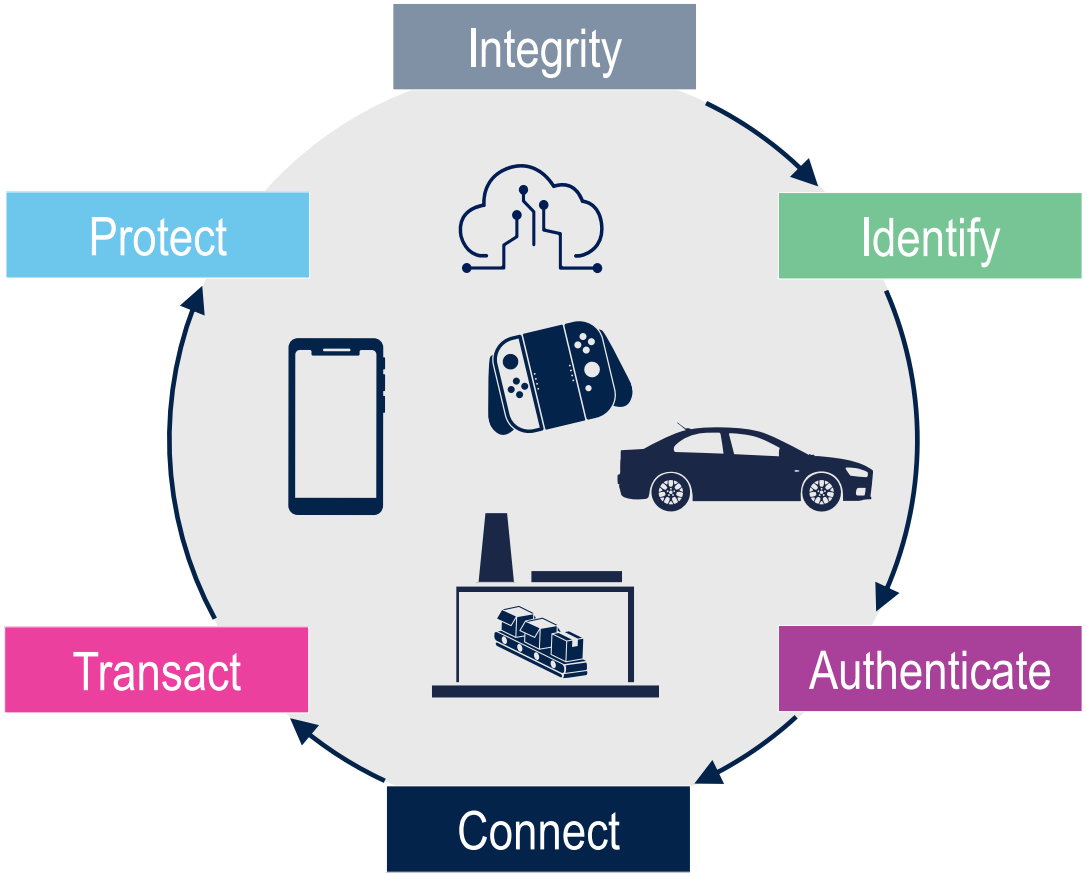
CARCONNECTIVITY consortium

fira

ST Solution

More Advanced Security

End-to-end security for embedded processing



STSECURE → **12 Security building blocks** → STM32 Trust

Secure Boot	Abnormal Situation Handling	Silicon Device Lifecycle
Secure Install / Update	Crypto Engine	Software IP protection
Secure Storage	Audit/Log	Secure Manufacturing
Isolation	Identification, Authentication, Attestation	Application Lifecycle

Strong Certification

psacertified™ SESIP3 Common Criteria EAL5+

PSA = **P**latform **S**ecurity **A**rchitecture, by ARM
SESIP = **S**ecurity **E**valuation **S**tandard for **I**oT Platforms, by Global Platform

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More Local Autonomy (<1 TOPS)

AI

Edge AI
STM32 enabling ever smarter objects

tvm

TINY ML Community

TensorFlow Lite

STM32 Cube.AI

Advanced Cube.AI

Condition monitoring
Computer Vision
Sound Analysis

Partner Program

Qeexo

Nalbi

OpenMV

sensory

CARTESIAM.AI
ARTIFICIAL INTELLIGENCE AT THE EDGE

EDGE IMPULSE

STM32

STM32 SoC with proprietary NPU*

* Neural Processing Unit

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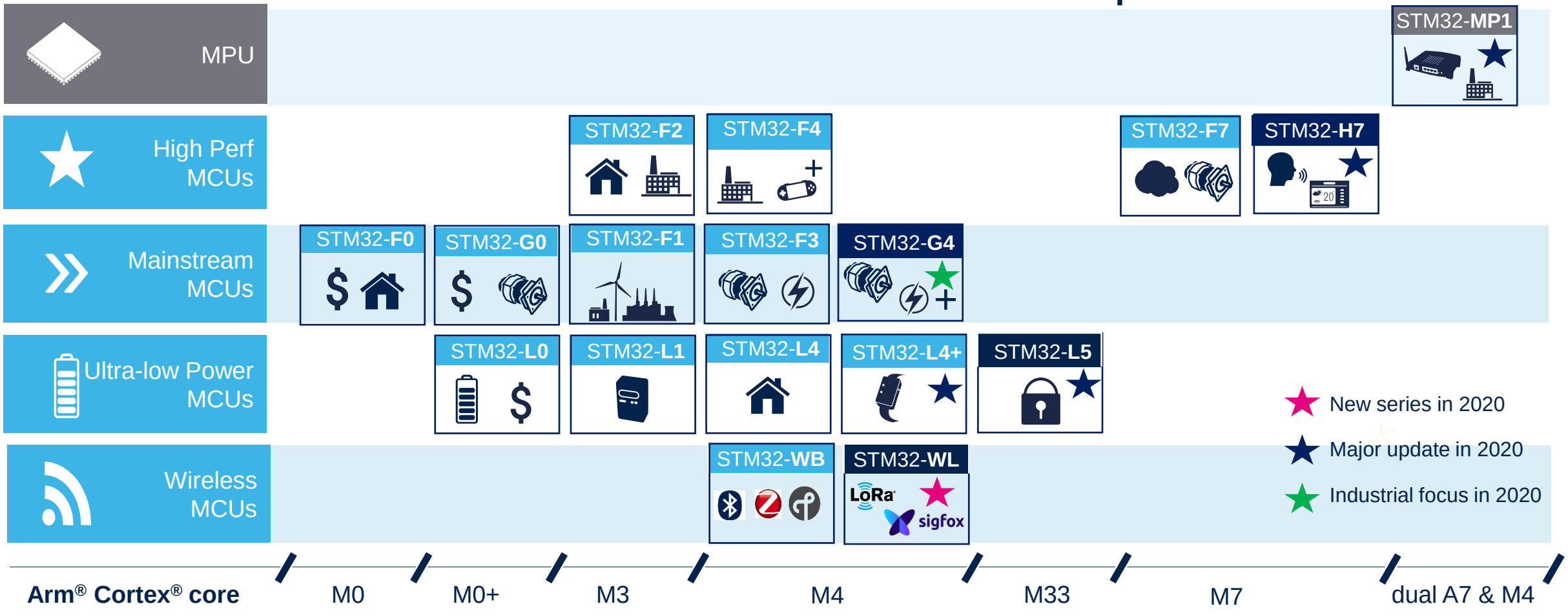
Relentlessly growing portfolio
Industrial & consumer markets focus

Leader in Arm® Cortex®-M 32-bit General Purpose MCU



Over **6 Billion** STM32 shipped

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State-of-the-Art STM32 ecosystem
Key for OEMs to chose an MCU/MPU

Expanded Ecosystem

SW Development Tools

Wired, Wireless, AI, Security, SW Libraries

Hardware Abstraction Layer

Evaluation and Prototyping Boards

User Application

Sensors & Actuators

AI Libraries

Cloud connectors to cloud service providers

TouchGFX Graphics

Audio

Motor Control

Wired Communication

Wireless Communication

Industrial Protocols

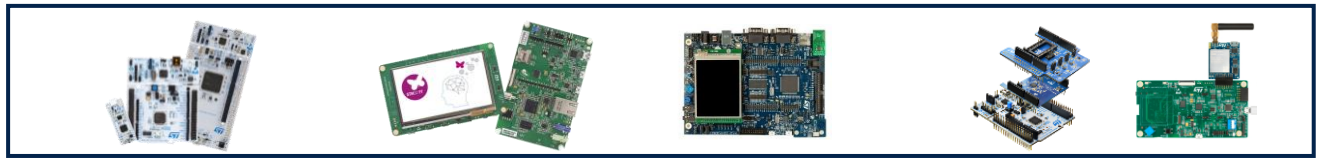
STM32 Trust **Security**

Safety

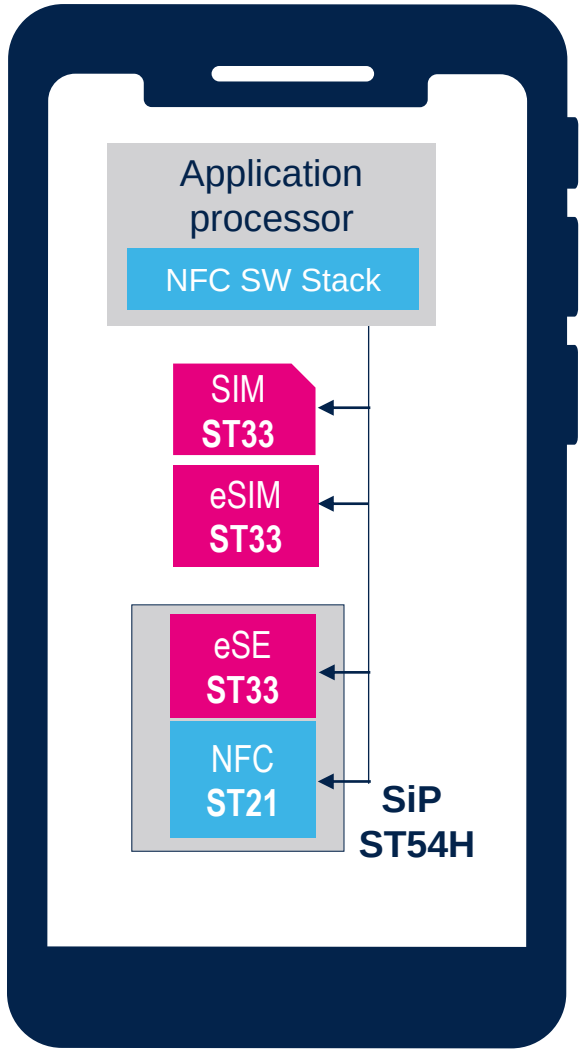
MCU
RTOS / File System / USB / TCP/IP
Azure RTOS

MPU
Linux OS

STM32 Hardware Abstraction Layers (HAL/LL)



Secure solutions for personal electronics



Network Authentication

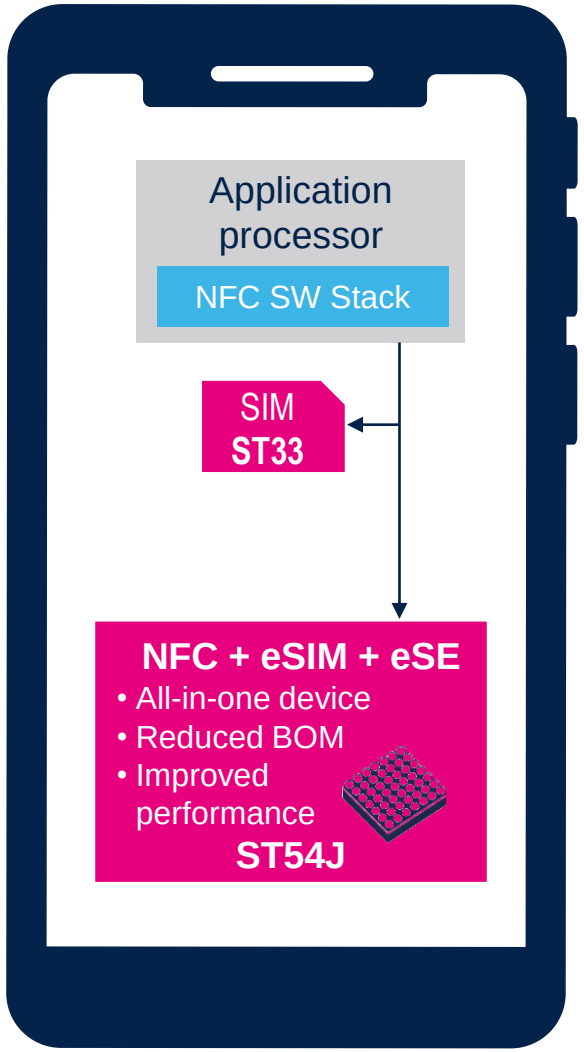
Basic SIM

eSIM → #1 WW Supplier

Mobile transaction

- Secure element
- NFC controller (*)

(*) Power efficiency & dynamic antenna tuning ST patented technologies



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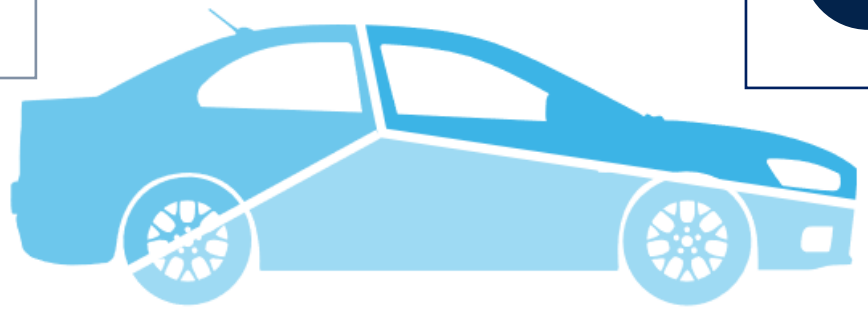
Secure solutions
Automotive market

Secure Connectivity for safety & maintenance

eCall (*)
Telematics
ST4SIM-A
eSIM for automotive

(*) Mandatory emergency Call feature



Device Integrity for Engine Control

Tamper resistant device
SW Integrity checks
Secure storage of confidential data
ST33-A Secure element

Common Criteria

AEC-Q100

Authentication for door lock-access : CCC V2

NFC Digital key
Door handle & center console

ST25R3920 NFC reader

ST33-A Secure element

NFC Secure car access
Connected Car Consortium compliant

ST54 Secure Element, NFC Controller

ST31 Secure element, NFC card emulation

Authentication for door lock access : CCC V3

STM32WU UWB Controller

STM32WB BLE Controller

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Contactless Market : Booming opportunities
ST25 NFC tags & readers pervasion

Comprehensive portfolio :
Short range – Long range

Growing contactless markets :
Personal electronics, Automotive, Industrial, Healthcare
> 10% CAGR 2018-2023

Complete ecosystem to ease adoption

Readers
ST25R

Tags
ST25T

Dynamic tags
ST25D

ST25

Best-in-class RF performance

Near Field Communication CERTIFIED

- Lighting
- Metering
- Payment
- Transportation
- Consumer electronics
- Consumer brands
- Automotive
- Healthcare

Active member

CARCONNECTIVITY consortium

ZHAGA Consortium

NFC FORUM

ISO

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Source: ABI / NFC Forum

Wireless communication trends
More bandwidth everywhere

User expectations

- Improved global coverage from dense areas to rural areas
- Very high data rate
  > 1 Gbps
- Reduced latency
  < 1 ms

- High density of connected nodes
  > 10^6 / km^2

5G

> 24 GHz	• Disruptive innovation • mmWave frequency • Massive beamforming & MIMO • Data Rate > 10Gbps
< 6 GHz	• 4G continuity • Data rate >1 Gbps • Latency <1 ms • Improve mobility/security
< 1 GHz	• Massive IoT market

STM32

LEO satellite constellations

> 12 GHz

- Disruptive innovation
- mmWave frequency
- Massive beamforming & MIMO
- Data Rate > 1 Gbps

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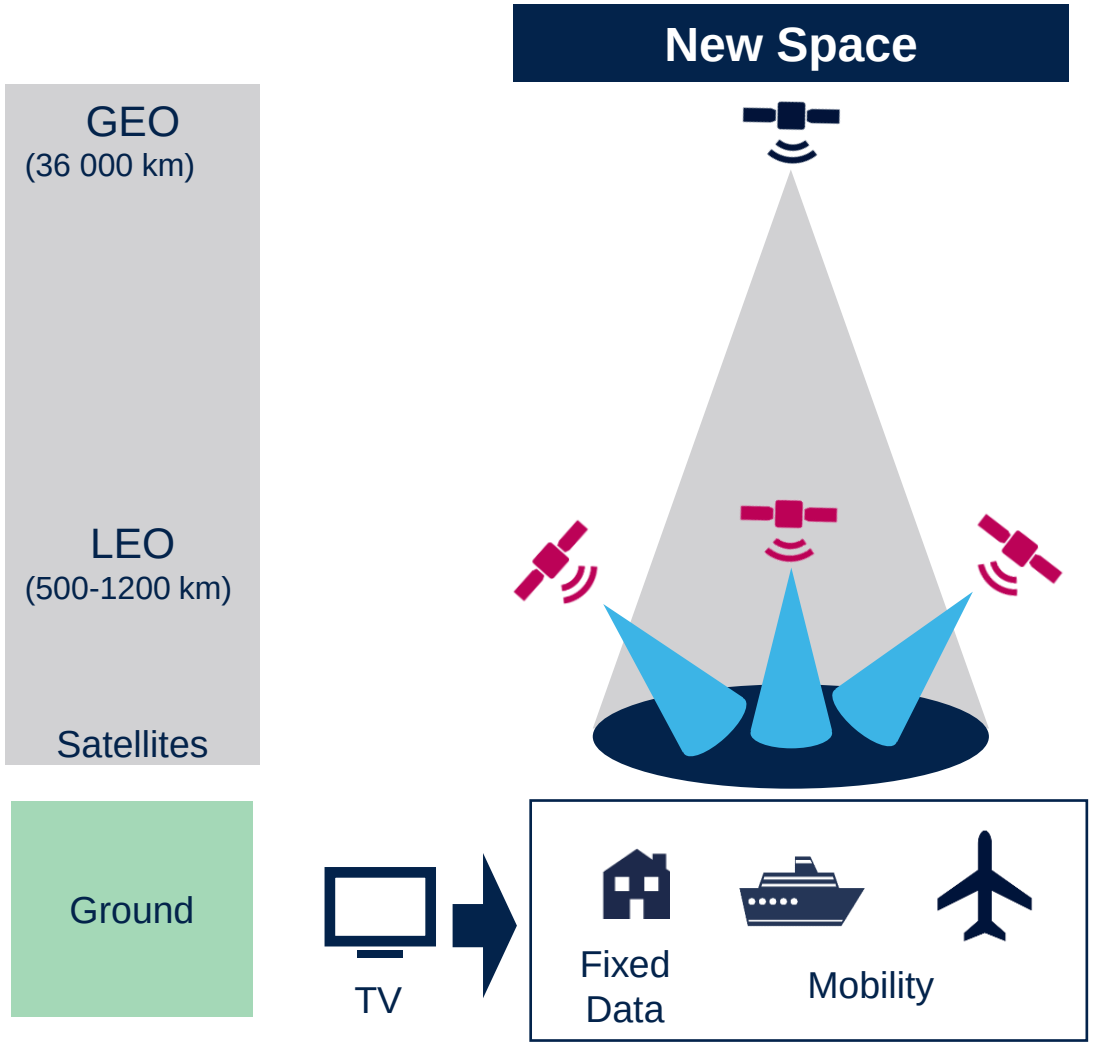
LEO satellite constellations



ST knowhow

- Proprietary advanced Radio Frequency Silicon technologies : 130nm SiGe & 28nm FD-SOI
- Phased Array antenna design (Beam forming)

ST activities

- Enabling low-power, high-bandwidth integrated solutions for the booming LEO SAT constellation market including satellite & associated user terminals
- Volume production in 2020

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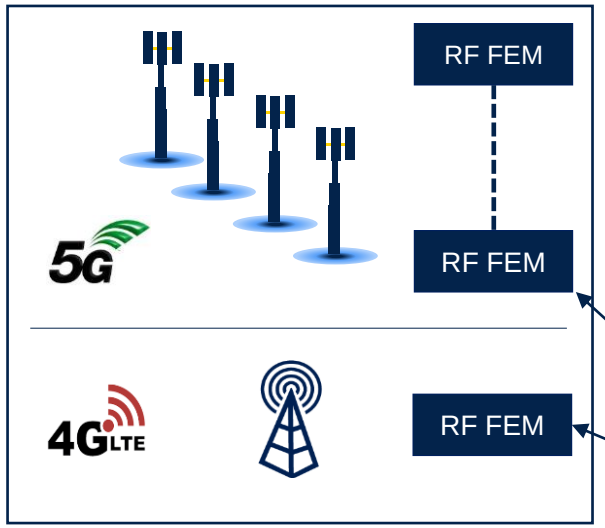
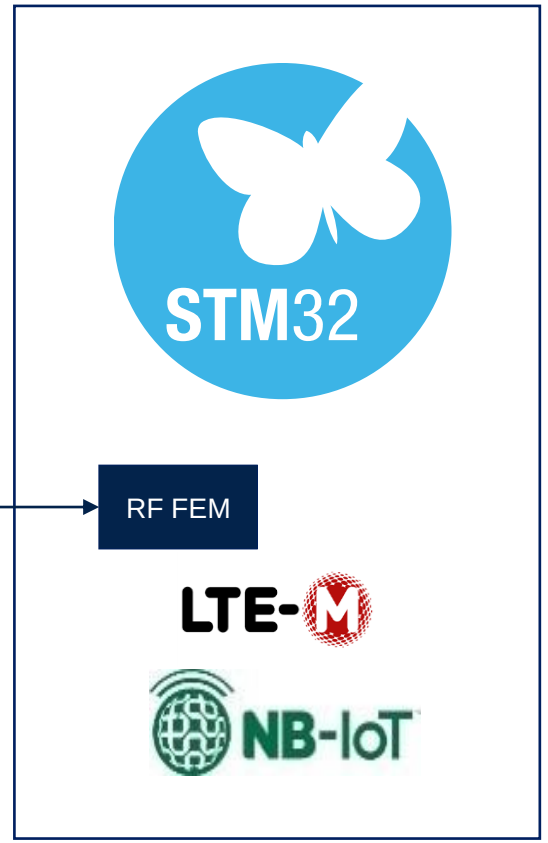
Technologies for Front-End Modules

Communications Infrastructure



- ST supports an increasing number of functions in RF-FEM
- We serve our customers in COT (wafers) and ASSP (modules) business models
- ST leverages its proprietary technologies to optimize performance, form factor & cost

IoT Smart Object



Smartphone

RF Front-End Module (RF FEM)

Channel selection

Filtering

Switching

Signal Amplification

	4G	5G < 1GHz	5G < 6GHz	5G mmW
130nm RFSOI	Production	Production	Production	
65nm RFSOI			Production	Prototype
55nm SiGe				Production

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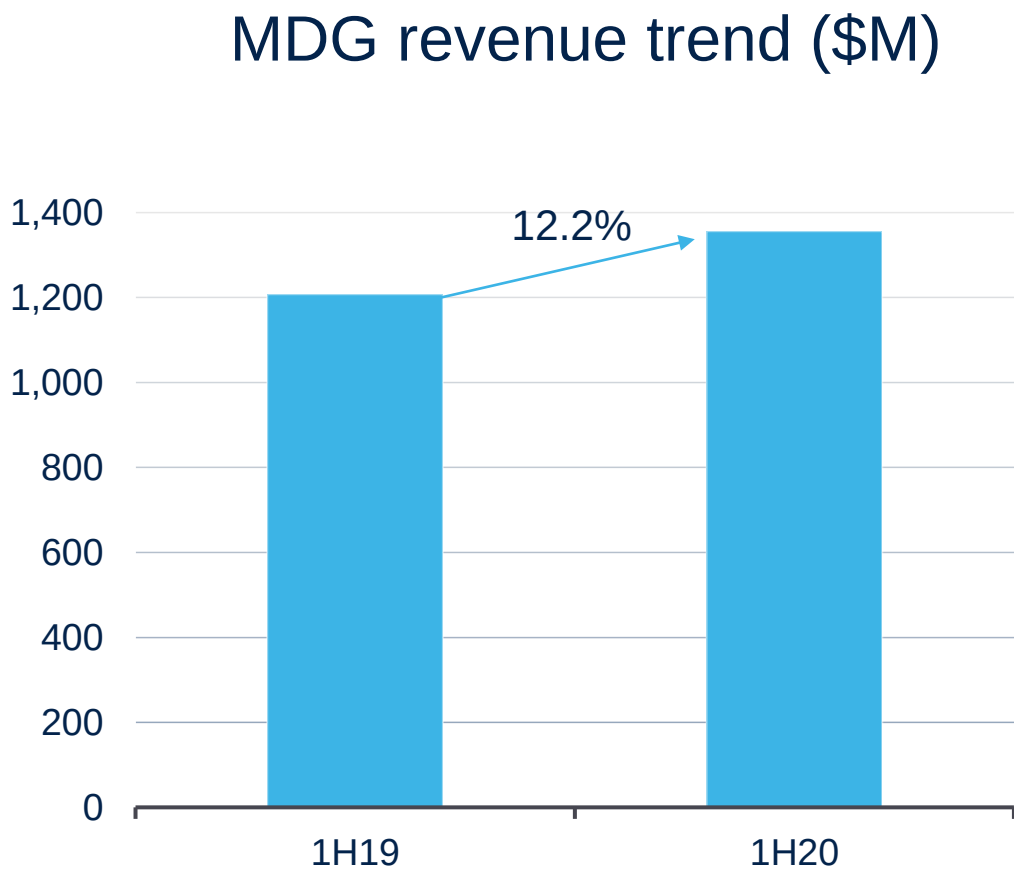
Takeaways



- Reinforce our Embedded Processing leadership position
- Consolidate Leadership position for Secure solutions
- Directly address RF communication infrastructure and IoT, capitalizing on proprietary technologies

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Thank you

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