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Get Connected! Explore Bluetooth, 802.15.4 and SubGHz System-On-Chip Solutions

Colin Ramrattan

MCD Product Marketing

STM32

BlueNRG

STMicroelectronics' IoT focus

- ST is the only semiconductor company that can provide the full solution set for IoT devices
- Through all areas we have solutions for customers' needs in IoT

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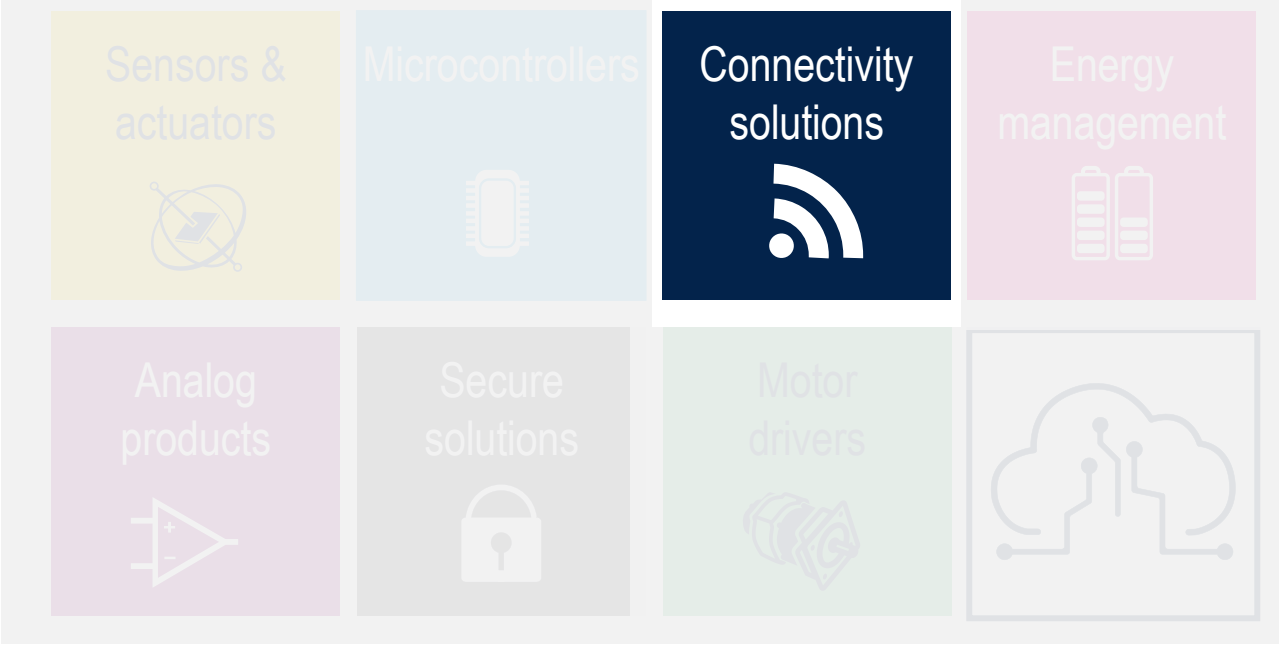
STMicroelectronics' IoT focus

- We will focus on connectivity of SoC solutions
  - Bluetooth LE
  - 802.15.4, 2.4GHz
  - SubGHz system-on-chip solutions



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Why system on chip

- Connectivity and computing in one solution
  - IoT security enabled
  - High computing power
- Scalable
  - Start with a lower featured device
  - Replace with advanced feature device in the same family without changing footprint
- Reduction of BOM cost
  - Integration means less sourcing, reduced placement cost
- Reduction in size
  - Integration means less required PCB space leading to better RF design

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Where are system-on-chip solutions best suited

- Any connectivity solution that requires high integration
- Any IoT device that requires security
- Any IoT solution that is low cost
- Any IoT device that is space constrained

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2.4GHz wireless markets

Wearable, healthcare, smart appliances

- Security
- Interoperability
- BT SIG Standard

Toys, gaming, remote controllers

- Open radio
- Low latency
- High throughput

Sensor networks, home appliances, industrial

- Mesh topology
- Large scale
- BT SIG Standard

Sensor networks, home appliances, industrial

- Mesh topology
- Large scale
- Open Standard

Sensor networks, industrial, home automation

- Mesh topology
- Large scale
- Zigbee Compliant

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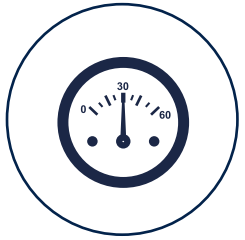
Sub-1 GHz wireless markets

Agriculture

Low value object tracking



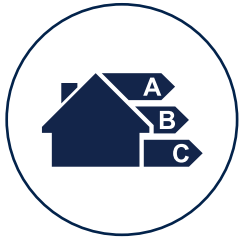
Smart Metering

Smart grid

Lighting

Utilities Maintenance

Smart parking



Smart Building

Supply Chain

Connected Cars

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STMicroelectronics 2.4GHz SoC’s

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2.4GHz Wireless markets

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STM32

Bluetooth 5	2.4 GHz proprietary	Bluetooth Mesh	THREAD	Zigbee
				
Wearable, healthcare, smart appliances	**Toys, gaming, remote controllers**	**Sensor networks, home appliances, industrial**	**Sensor networks, home appliances, industrial**	**Sensor networks, industrial, home automation**
• Security • Interoperability • BT SIG Standard	• Open radio • Low latency • High throughput	• Mesh topology • Large scale • BT SIG Standard	• Mesh topology • Large scale • Open Standard	• Mesh topology • Large scale • Zigbee Compliant

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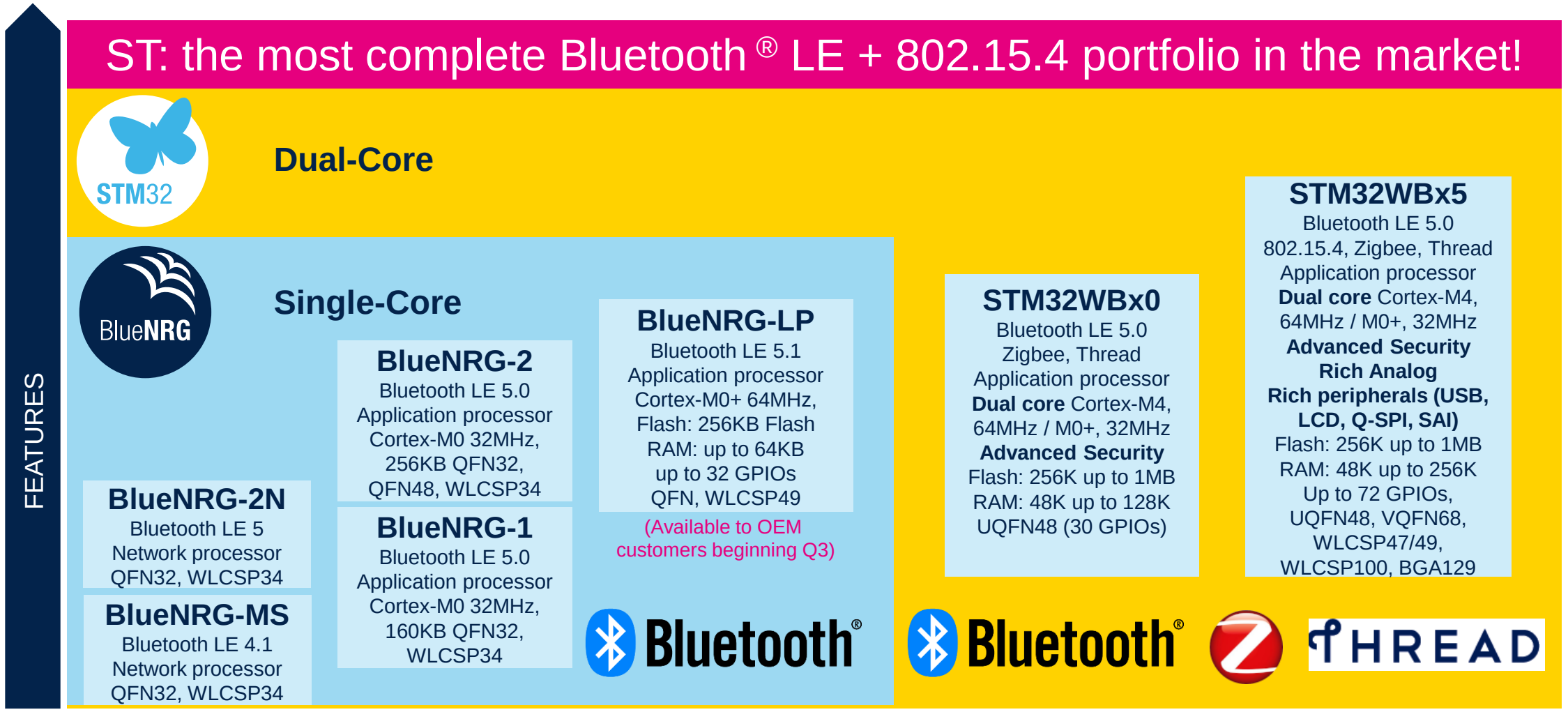
2.4GHz Wireless portfolio



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Focus on STM32WB series

FEATURES

ST: the most complete Bluetooth ® LE + 802.15.4 portfolio in the market!

STM32

Dual-Core

STM32WBx0
Bluetooth LE 5.0
Zigbee, Thread
Application processor
Dual core Cortex-M4,
64MHz / M0+, 32MHz
Advanced Security
Flash: 256K up to 1MB
RAM: 48K up to 128K
UQFN48 (30 GPIOs)

STM32WBx5
Bluetooth LE 5.0
802.15.4, Zigbee, Thread
Application processor
Dual core Cortex-M4,
64MHz / M0+, 32MHz
Advanced Security
Rich Analog
Rich peripherals (USB, LCD, Q-SPI, SAI)
Flash: 256K up to 1MB
RAM: 48K up to 256K
Up to 72 GPIOs,
UQFN48, VQFN68,
WLCSP47/49,
WLCSP100, BGA129

Bluetooth®

THREAD

BlueNRG

Single-Core

BlueNRG-2
Bluetooth LE 5.0
Application processor
Cortex-M0 32MHz,
256KB QFN32,
QFN48, WLCSP34

BlueNRG-LP
Bluetooth LE 5.1
Application processor
Cortex-M0+ 64MHz,
Flash: 256KB Flash
RAM: up to 64KB
up to 32 GPIOs
QFN, WLCSP49
(Available to OEM customers beginning Q3)

BlueNRG-2N
Bluetooth LE 5
Network processor
QFN32, WLCSP34

BlueNRG-1
Bluetooth LE 5.0
Application processor
Cortex-M0 32MHz,
160KB QFN32,
WLCSP34

BlueNRG-MS
Bluetooth LE 4.1
Network processor
QFN32, WLCSP34

Bluetooth®

ULTRA-LOW POWER

Bluetooth LE CONNECTIVITY

ADVANCED CONNECTIVTY - MULTI-PROTOCOL

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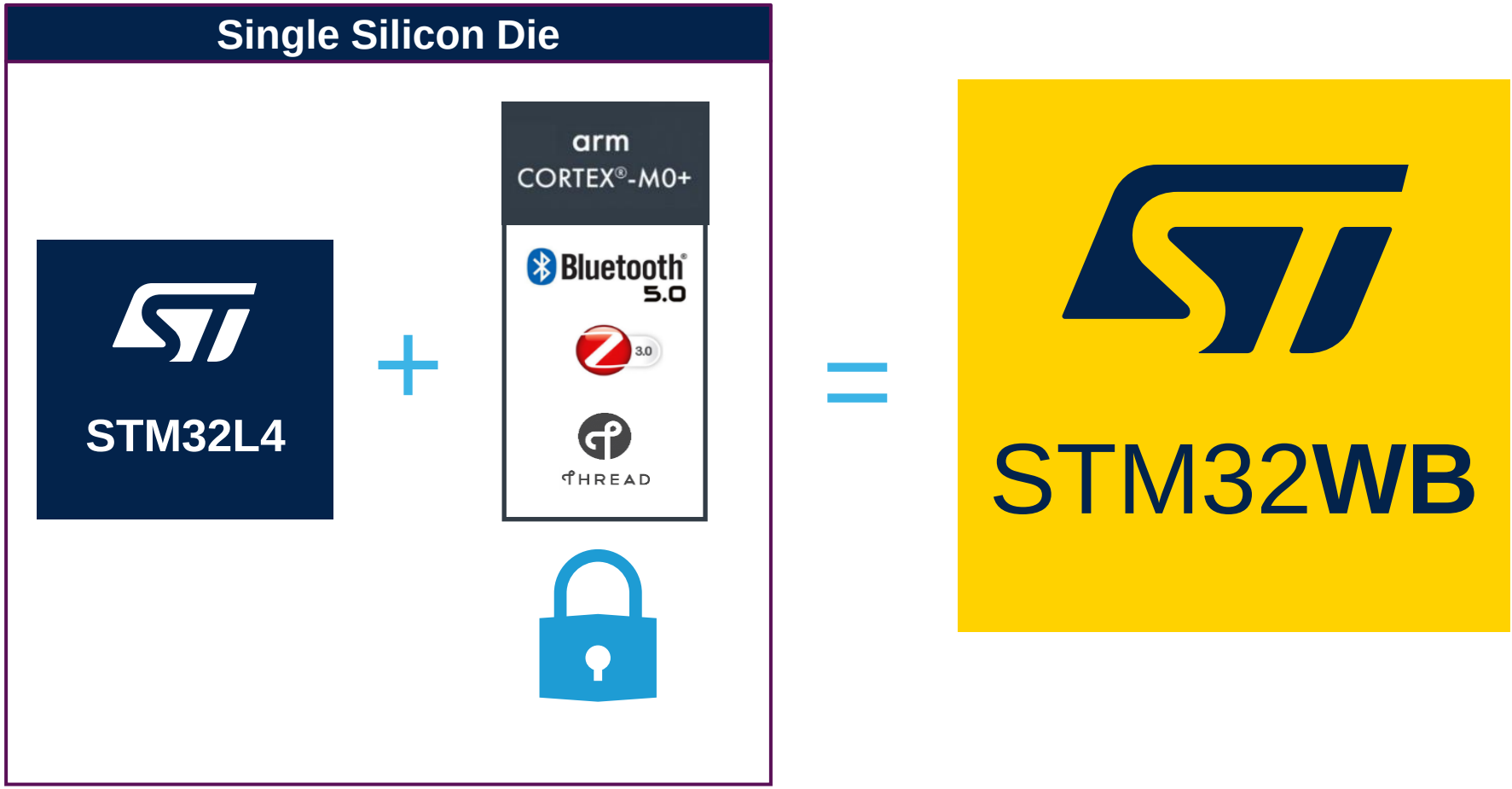
Bluetooth dual core system-on-chip

Low power, versatile, M4 & M0+, Bluetooth + 802.15.4 radio and IoT security



Make the choice of STM32WB series

The 7 key points that will make the difference

Bluetooth 5

OPENTHREAD released by Google

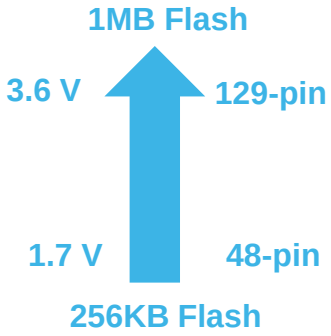
Zigbee 3.0

Open 2.4 GHz radio
Multi-protocol

Dual-core / Full control
Ultra-low-power

IoT Protection ready

Massive integration
Cost saving



A large offer

STM32 Cube

STM32 CubeMonitor-RF

Advanced RF tool, Energy control with C code generation

LONGEVITY 10 YEARS COMMITMENT

No matter what!

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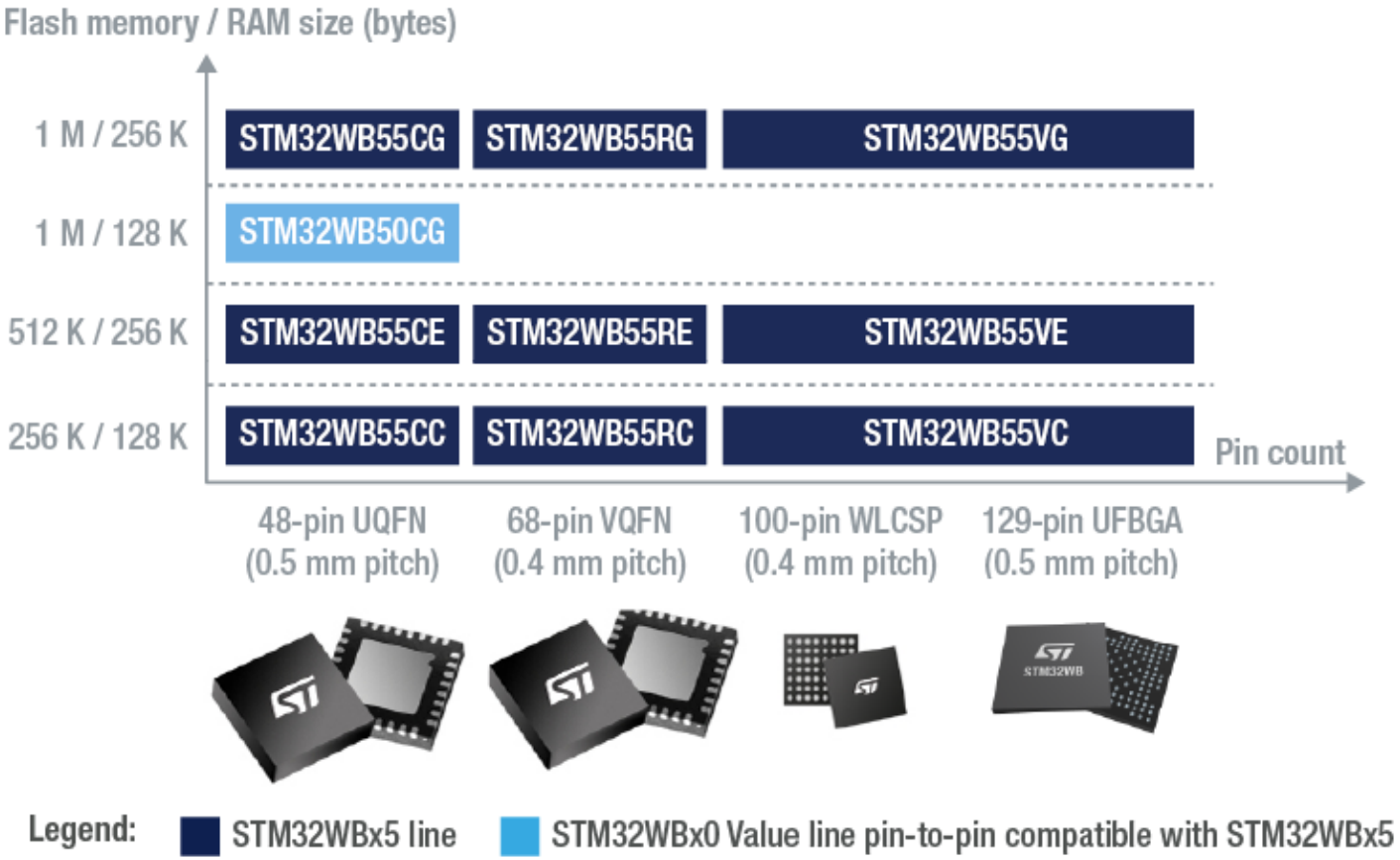
STM32WB - a large offer

Bluetooth 5.0, OpenThread, ZigBee 3.0 and proprietary protocol capable



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STM32WB ecosystem

Software Tools

- **Configure**: STM32 CubeIDE, STM32 CubeMX
- **Develop**: IAR SYSTEMS, STM32 CubeIDE, STM32 CubeWB, arm KEIL, arm MBED, Zephyr™
- **Program**: STM32 CubeIDE, STM32 CubeProgrammer
- **Monitor Measure**: STM32 CubeMonitor-RF, STM32 CubeMonitor-Power

Embedded Software and Apps

STM32CubeWB

Bluetooth® 5

Zigbee 3.0 OPENTHREAD released by Google

STM32Cube Expansions and Function Packs

STM32 Open Development Environment

Apps

BLE Profile | BLE Sensor | BLE StarNet | BLE Mesh

GET IT ON Google Play | Download on the App Store

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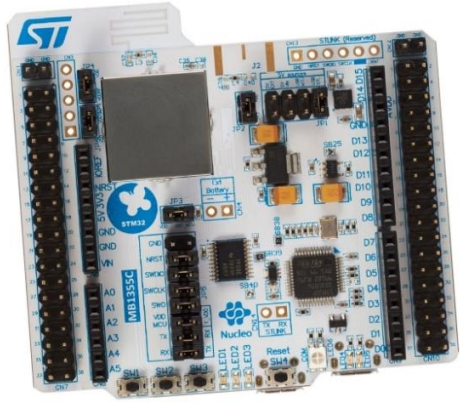
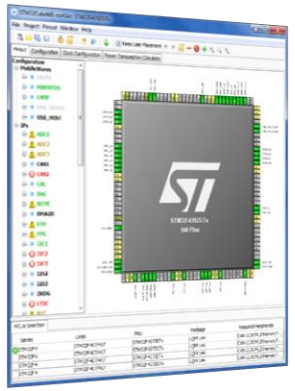
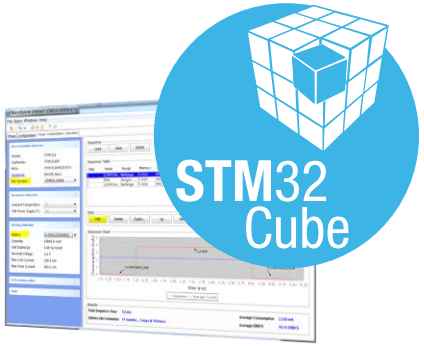
Prototyping made as easy as 1,2,3



Hardware
Evaluation Pack

STM32**WB**





STM32
CubeMonitor-RF

GET IT ON Google Play

Download on the App Store

STM32CubeMX
STM32CubeWB
Code generation
Power calculation
STM32CubeMonRF

STMicroelectronics Sub 1GHz SoC’s

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Sub-1 GHz wireless markets

SPIRIT

STM32

Wi SUN Alliance | KNX | LoWPAN | M-Bus wireless | SubGHz proprietary | sigfox | LoRa | LoRaWAN

Agriculture

Low value object tracking

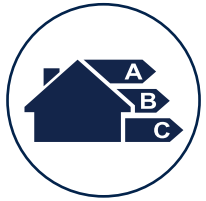
Smart Metering

Smart grid

Lighting

Utilities Maintenance

Smart parking



Smart Building

Supply Chain

Connected Cars

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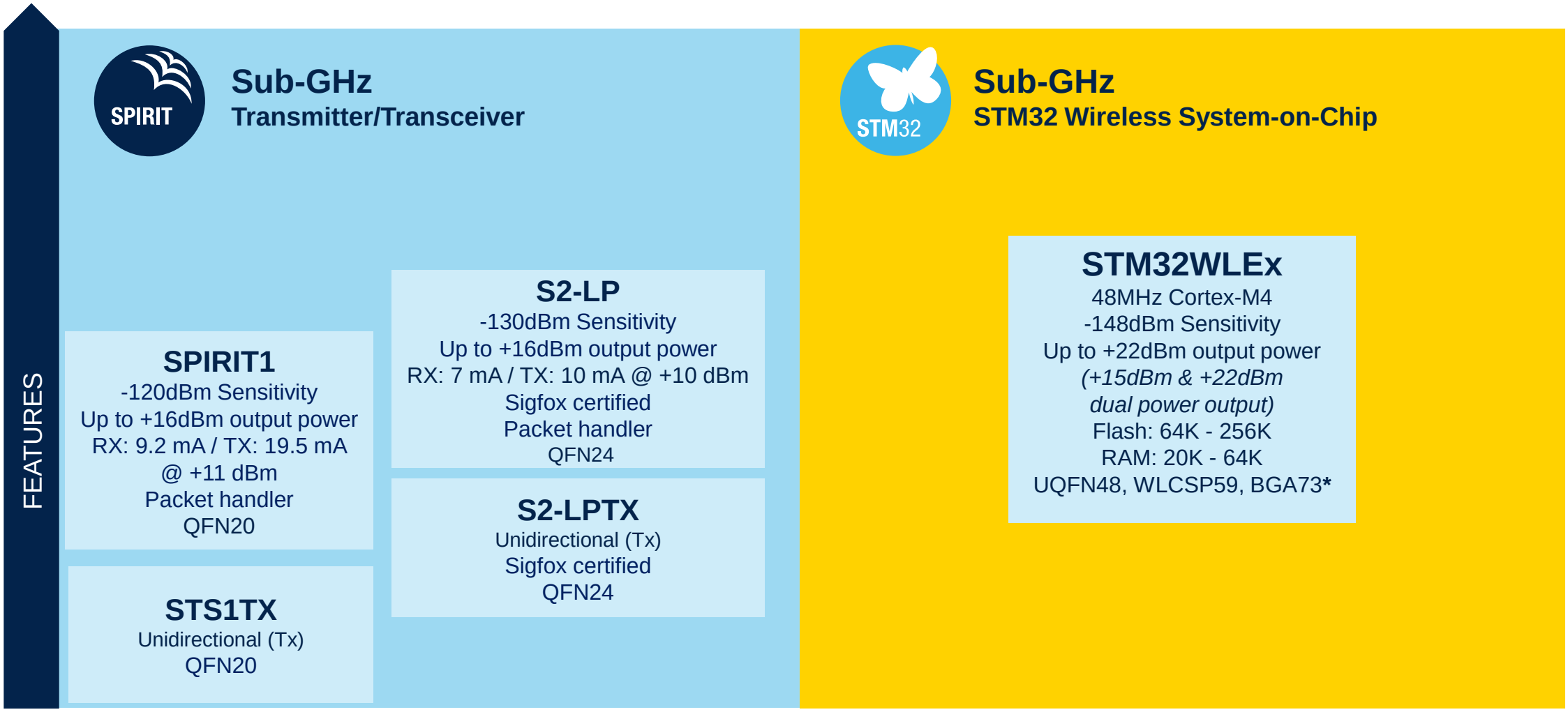
Sub-1 GHz wireless portfolio



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Focus on Sub 1GHz SoC's

FEATURES

Sub-GHz
Transmitter/Transceiver

SPIRIT1
-120dBm Sensitivity
Up to +16dBm output power
RX: 9.2 mA / TX: 19.5 mA
@ +11 dBm
Packet handler
QFN20

S2-LP
-130dBm Sensitivity
Up to +16dBm output power
RX: 7 mA / TX: 10 mA @ +10 dBm
Sigfox certified
Packet handler
QFN24

S2-LPTX
Unidirectional (Tx)
Sigfox certified
QFN24

STS1TX
Unidirectional (Tx)
QFN20

Sub-GHz
STM32 Wireless System-on-Chip

STM32WLEx
48MHz Cortex-M4
-148dBm Sensitivity
Up to +22dBm output power
(+15dBm & +22dBm dual power output)
Flash: 64K - 256K
RAM: 20K - 64K
UQFN48, WLCSP59, BGA73*

ULTRA-LOW POWER

TRANSMITTER / TRANSCEIVER

SYSTEM ON CHIP

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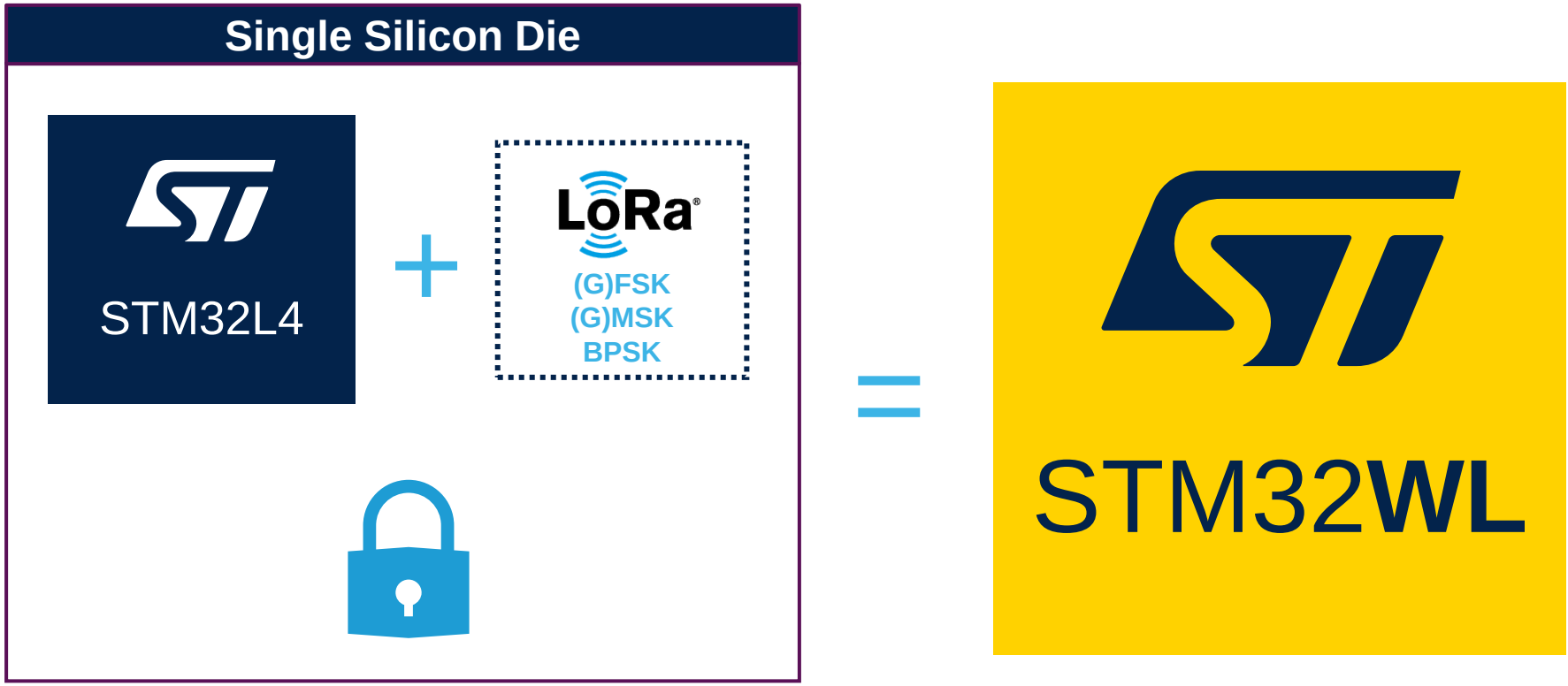
System-on-chip made for versatility

A Long-Range Wireless Microcontroller:
one die, many IoT possibilities

World First!



Make the choice of STM32WL series

The 7 key points that will make the difference

(G)FSK
(G)MSK
BPSK

Multi-modulation

Massive integration
Cost saving

Open platform

Ultra-low-power

STM32 Security

256KB
3.6 V
73-pin
1.8 V
48-pin
64KB Flash

A large offer is coming

LONGEVITY
10
YEARS
COMMITMENT

No matter what!

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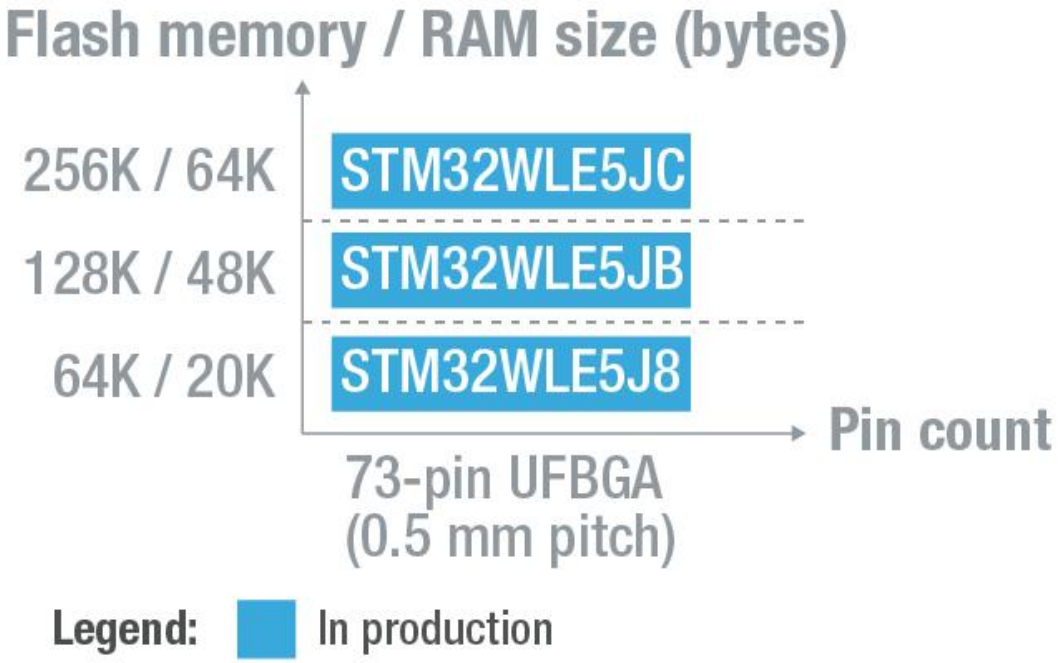
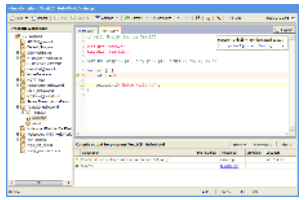
STM32WL Sub-GHz - portfolio



Up to 43 GPIOs for full flexibility
+
Tiny package footprint

STM32WL – introductory ecosystem

Fully integrated into the rich and market-proven STM32 ecosystem



STM32 Nucleo-64

Flexible prototyping

Schematics, Gerber files

RF reference design material

Dev tools

STM32CubeMX for pinout and clock configuration

STM32CubeProg

Projects for multiple IDE's

Fast prototyping examples

Stacks

LoRaWAN

Sigfox

M-Bus

Please contact your nearest ST Sales Office for more information

Releasing your creativity

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Questions?

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Thank you

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