# STM32WB WIRELESS SERIES



### Bluetooth LE 5.3 & IEEE 802.15.4



# Deliver best-in class IoT solutions with built-in key storage, OTA firmware updates and protocol concurrency control

### A wireless dual-core brain

The STM32WB series is a dual-core, multi-protocol and ultra-low-power 2.4 GHz MCU system-on-chip.

It supports Bluetooth® LE 5.3 as well as IEEE 802.15.4 protocols (in Single and Concurrent modes) covering a wide spectrum of IoT application needs.

Based on ST's best-in-class, ultra-low-power MCU with wide peripheral set, the STM32WB series reduces development time, BOM cost, and extends application battery life. STM32WB inspires innovation.

### Bluetooth® LE 5.3 & IEEE 802.15.4

The STM32WB SoC offers multi-protocol stacks including Bluetooth® 5.3, OpenThread, Zigbee 3.0, proprietary protocols and concurrent mode, for best in-class RF performance.

Dedicated core to radio activity provides SW flexibility and better user experience.

### **IP Protection**

STM32WB devices offer device integrity and industrial IP protection feawtures to meet manufacturers' increasing demand for brand protection.

Features	Benefits
Dual-core solution in a single die	Dual-core solution with independent clock trees ensures real-time RF execution and optimized PCB and BOM
TX: 5.2 mA, RX: 4.5 mA BLE: -96 dBm, 802.15.4: -100 dBm	Extended battery life time. Perfect fit for coin cell battery Comfortable and robust operating distance of connection
Integrated balun, USB 2.0 crystal-less, LCD driver	Reduces BOM cost and PCB footprint
OTA firmware updates, customer key storage	Easy fleet maintenance, brand and IP protection

Note\* Features availability or caracteristics depend on STM32WB reference

### STM32WB55 BLOCK DIAGRAM

#### Control

Power supply
1.7 to 3.6 V
w/ DC/DC + LD0
POR/PDR/PVD/BOR

Xtal oscillators 32 MHz (RF) 32.769 kHz (LSE)

Internal RC oscillators 32 kHz+ 4 ~ 48 MHz + 16 MHz (HSI) + 48 MHz ± 1% acc. over V and T(°C)

RTC/AWU/CSS

PLL/FLL

SysTick timer

2 watchdogs (WWDG/IWDG)

Up to 72 GPIOs

Cyclic redundancy check

Voltage scaling (2 modes)

**Encryption/security** 

256-bit AES/PKA

TRNG/PCROP

FUS/CKS

### Arm® Cortex®-M4 FPU/DSP 64 MHz

Nested vector interrupt controller (NVIC)

Memory protected unit (MPU)

JTAG/SW debug

ART Accelerator™

AHB Bus matrix

2 x DMA 7 channels

**Multi-protocol RF stack** 

Bluetooth® LE

IEEE 802.15.4

AES

Arm® Cortex®-M0+

32 MHz

**Nested vector** 

interrupt controller (NVIC)

**Timers** 

4 x 16-bit 32-bit timers

2 x ULP 16-bit timers

## SAI (full duplex) Analog

Memory

Up to 1-Mbyte

Flash memory

Up to 256-Kbyte SRAM

**Boot ROM** 

Secure boot loader

Connectivity

2 x SPI, 2 x I<sup>2</sup>C

1 x USART, LIN,

Smartcard, IrDA

Modem control

1 x ULP UART

USB 2.0 FS - Xtal less

Quad-SPI (XIP)

2 x ULP comparators

1 x 12-bit ADC SAR 4.25 Msps

Temperature sensor

### Display

8 x 40 LCD driver

### Sensing

16-key capacitive touch

### STM32WBx0 VALUE LINE

It focuses on the essentials and offers a feature-optimized solution to help developers meet the design requirements of cost-sensitive industrial and consumer IoT applications. Nucleos are a useful tool to quickly get you started with the STM32WBx0 microcontrollers.

#### **EMBEDDED SOFTWARE**

The STM32CubeWB package includes the STM32Cube hardware abstraction layer (HAL) and low-layer (LL) APIs peripheral drivers, a consistent set of middleware components (RTOS, USB, FatFS and STM32 touch sensing), as well as Bluetooth® LE 5.3, OpenThread and Zigbee 3.0 connectivity stacks. All embedded software components come with a full set of examples running on STMicroelectronics boards.

### **SOFTWARE TOOLS**

STM32 Cube Programmer







### **HARDWARE TOOLS**

This STM32 Nucleo is the most cost-effective way to quickly get started developing STM32WB-based prototypes.







Order codes:

1. NUCLEO-WB55RG,
NUCLEO-WB15CC

2. STM32WB5MM-DK

3. B-WB1M-WPAN1

'Avalable in Q2/2023

### STANDARD PROTOCOL

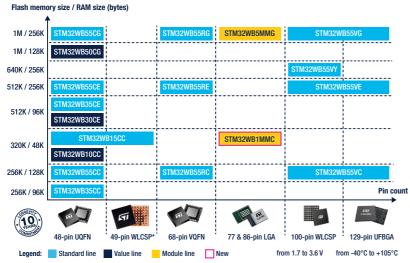
OPENTHREAD







### STM32WB PORTFOLIO



Companion chip

STMicroelectronics' integrated matching RF components are tailored for STM32WB WLCSP, QFN, BGA packages: MLPF-WB-01E3, MLPF-WB-01D3, MLPF-WB55-02E3, MLPF-WB-02D3



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