# STM32WB WIRELESS SERIES



## Bluetooth LE 5.2 & 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 5.2 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 5.2 & IEEE 802.15.4

The STM32WB SoC offers multi-protocol stacks including Bluetooth® 5.2, 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 features 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 + LDO 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** 

Flash memory size / RAM size (bytes)

STM32WB50CG

STM32WB350

STM32WB30CE

STM32WB10CC

1M / 256K

1M / 128K

640K / 256K

512K / 256k

512K / 96k

320K / 48K

256K / 128k 256K / 96K

10

**STM32WB PORTFOLIO** 

#### 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

### Arm® Cortex®-M0+

STM32WB5MMG

32 MHz

**Nested vector** interrupt controller (NVIC)

#### **Timers**

4 x 16-bit 32-bit timers 2 x ULP 16-bit timers

STM32WB55RE

#### Memory

Up to 1-Mbyte Flash memory

Up to 256-Kbyte SRAM

**Boot ROM** 

Secure boot loader

#### Connectivity

2 x SPI, 2 x I2C

1 x USART, LIN. Smartcard, IrDA Modem control

1 x ULP UART

USB 2.0 FS - Xtal less

Quad-SPI (XIP)

SAI (full duplex)

#### **Analog**

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

STM32WB55VY

100-pin WLCSP

from 1.7 to 3.6 V

STM32WB55VE

#### 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 5.2, OpenThread and Zigbee 3.0 connectivity stacks. All embedded software components come with a full set of examples running on STMicroelectronics boards.

#### SOFTWARE TOOLS

#### STM32CubeMX

Pinout and clock configurator, power consumption calculator and code generation tools.



#### STM32CubeIDE

Eclipse-based IDE with STM32CubeMX configuration tool features included.



#### STM32CubeMonitor

With STM32CubeMonRF **Cube** Monitor dedicated to wireless connectivity enabling radio testing and beaconing.

#### STM32CubeProg

All-in-one software tool for programming STM32 devices including secure programming of the RF stacks.



#### HARDWARE TOOLS

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











Order codes: NUCl FO-WB55RG. NUCLEO-WB15CC















49-pin UQFN



Legend: Standard line

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129-pin UFBGA

from -40°C to +105°C

Pin count

