STM32WB
WIRELESS SERIES
Bluetooth LE 5.0 & 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 5.0 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 5.0 & IEEE 802.15.4
The STM32WB SoC offers multi-protocol stacks including Bluetooth® 5.0, 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.

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
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<tr>
<td>Dual-core solution in a single die</td>
<td>Dual-core solution with independent clock trees ensures real-time RF execution and optimized PCB and BOM</td>
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<td>TX: 5.2 mA, RX: 4.5 mA</td>
<td>Extended battery life time. Perfect fit for coin cell battery</td>
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<td>BLE: –96 dBm, 802.15.4: –100 dBm</td>
<td>Comfortable and robust operating distance of connection</td>
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<td>Integrated balun, USB 2.0 crystal-less, LCD driver</td>
<td>Reduces BOM cost and PCB footprint</td>
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<td>OTA firmware updates, customer key storage</td>
<td>Easy fleet maintenance, brand and IP protection</td>
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Note* Features availability or characteristics depend on STM32WB reference
STM32WB WIRELESS SERIES | BLUETOOTH LE 5.0 & IEEE 802.15.4

STM32WB55 BLOCK DIAGRAM

Control
- Power supply: 1.7 to 3.6 V
- 12-bit ADC
- SAR 4.25 Msps
- Temperature sensor
- Voltage scaling (2 modes)

STM32WB PORTFOLIO

Flash memory size / RAM size (bytes)
- 256K / 96K
- 512K / 96K
- 512K / 128K
- 1M / 128K
- 1M / 256K
- 512K / 256K
- 640K / 256K
- 1M / 256K
- 256K / 128K
- NV: 96K

Multi-protocol RF stack
- BLE 5.0
- IEEE 802.15.4
- 2 x ULP UART
- 4 x 16-bit 32-bit timers
- 2 x 16-bit timers

INTERNAL PERIPHERALS
- Arm® Cortex®-M0+ 32 MHz
- Nested vector interrupt controller (NVIC)
- ART Accelerator™
- AHB bus matrix
- 2 x DMA 7 channels
- RTC/AWU/CSS
- PLL/FLL
- SysTick timer
- 2 watchdogs (WWDG/IWDG)

Memory
- Up to 1-Byte Flash memory
- Up to 256-Byte SRAM
- Boot ROM
- Secure boot loader

Connectivity
- 2 x SPI, 2 x I²C
- 1 x UART, LIN, Smartcard, IrDA
- Quad-SPI (XIP)
- AI (full duplex)

Encryption/security
- 256-bit AES/PKA
- TRNG/PCROP
- FUS/CKS

Display
- 8 x 40 LCD driver

Analog
- 2 x ULP comparators
- 1 x 12-bit ADC
- SAR 4.25 Msps

STM32WB BLOCK DIAGRAM

HARDWARE TOOLS

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

SOFTWARE TOOLS

STM32CubeMX
Enables faster development thanks to its MCU pinout and clock configurator, power consumption calculator and code generation tools.

STM32CubeIDE
Is an Eclipse-based IDE which integrates the features of the STM32CubeMX configuration tool.

STM32CubeMonitor
Is a development tool dedicated to wireless connectivity (STM32CubeMonRF) which helps reduce time-to-market by enabling radio testing and beaconing.

STM32CubeProg
Is an all-in-one software tool for programming STM32 devices which can be easily used to interact with the memory of the STM32WB, including secure programming of the RF stacks.

STM32WBx0 VALUE LINE
Extending our portfolio, the STM32WBx0 Value Line 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.

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

COMPANION CHIPS
STMicroelectronics’ integrated matching RF components are tailored for STM32WB packages:
- MLPF-WB55-0xE3, QFN: 80, WLCSP100: x = 2.