STM32WB WIRELESS SERIES

life.augmented

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

www.st.com/stm32wb

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

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

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

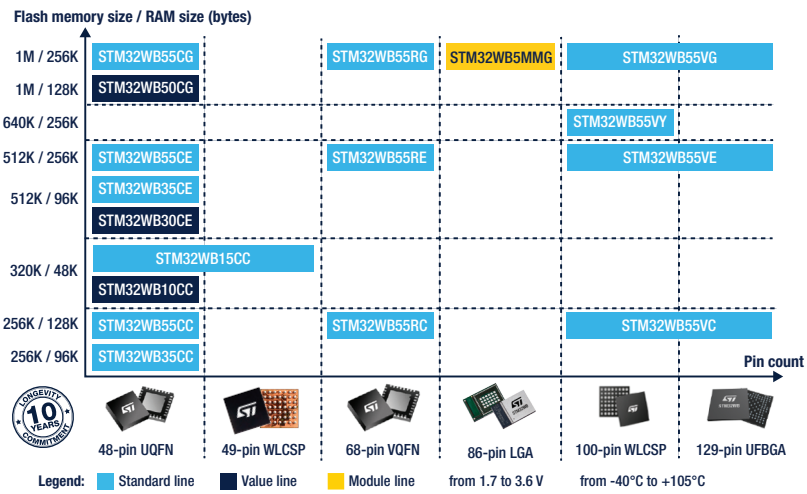
Connectivity
- 2 x SPI, 2 x I²C
- 1 x USART, LIN, Smartcard, IrDA Modem control
- 1 x ULP UART
- USB 2.0 FS - Xtal less
- Quad-SPI (XIP)
- SAI (full duplex)

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

STM32WB PORTFOLIO



Companion chip
STMicroelectronics' integrated matching RF components are tailored for STM32WB packages:
MLPF-WB55-0xy3, QFN: x=0, WLCSP100 : x =2; y=D: bumped package, y=E bumpless package

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

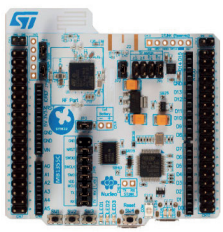
The STM32CubeWB package includes the STM32Cube hardware abstraction layer (HAL) and low-layer (LL) APIs peripheral drivers, a consistent set of middleware components (RTOS, USB, FatFS and STM32 touch sensing), as well as Bluetooth® LE 5.3, OpenThread and Zigbee 3.0 connectivity stacks. All embedded software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

SOFTWARE TOOLS

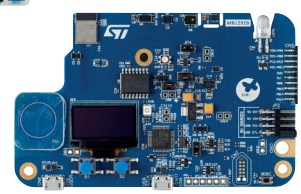
STM32 CubeProgrammer
STM32 CubeIDE
STM32 CubeMonitor
STM32 CubeMX

HARDWARE TOOLS

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



Order codes:
NUCLEO-WB55RG,
NUCLEO-WB15CC



Order code:
STM32WB5MM-DK

STANDARD PROTOCOL

OPENTHREAD released by Google
Zigbee 3.0
Bluetooth™
matter

MIX
Paper from responsible sources
FSC® C003379

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