STM32WB Wireless Series
Bluetooth™ 5 & 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™ 5 as well as IEEE 802.15.4 communication protocols (in Single and Concurrent modes) covering a wide spectrum of IoT application needs.

Based on ST's best-in-class, ultra-low-power STM32L4 MCU, the STM32WB series reduces development time and BOM cost, extends application battery life and inspires innovation thanks to its rich and flexible peripheral set.

The STM32WB series is designed to fit industrial, healthcare and consumer applications.

BLUETOOTH™ 5 & IEEE 802.15.4

The STM32WB SoC offers multi-protocol stacks including Bluetooth™ 5, OpenThread and ZigBee® 3.0* as well as standardized IEEE 802.15.4 protocols in Concurrent mode for best-in-class RF performance and dedicated core to radio activity provides SW flexibility and better user experience.

IP PROTECTION

STM32WB devices ooffer 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	Reduces BOM cost and PCB footprint
OTA firmware updates	Easy fleet maintenance
Crystal-less USB 2.0 FS interface	Optimized BOM cost. Battery charging detection
LCD driver, integrated booster	Only a simple low-cost glass display is needed
Quad-SPI XIP	Simple way to upgrade active memory on existing designs.
Customer key storage Secure bootloader	Offers brand protection, IP protection and device integrity

Note: *Coming soon

STM32WB55 BLOCK DIAGRAM

Control
- Power supply 1.71 to 3.6 V w/ DC/DC + LDO PDR/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)

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

Arm® Cortex®-M4 FPU/DPS 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™ 5
- IEEE 802 15.4
- AES

Arm® Cortex®-M0+ 32 MHz
- Nested vector interrupt controller (NVIC)

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)

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

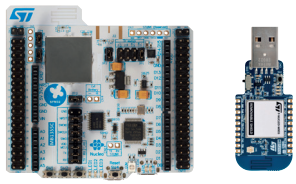
Sensing
- 16-key capacitive touch

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

Display
- 8 x 40 LCD driver

HARDWARE TOOLS

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



Order code: P-NUCLEO-WB55

EMBEDDED SOFTWARE

The STM32CubeWB package includes the STM32Cube HAL and low-layer (LL) APIs peripheral drivers, a consistent set of middleware components (RTOS, USB, FatFS and STM32 touch sensing), as well as BLE and Thread connectivity stacks. All embedded software utilities come with a full set of examples running on STMicroelectronics boards.

SOFTWARE TOOLS

STM32CubeMX enables faster development thanks to its MCU pinout and clock configurator, power consumption calculator and code generation tools. An Eclipse plug-in (STSW-STM32095) is also available.

STM32CubeMonRF, a development tool dedicated to wireless connectivity, is also available for radio testing and beaconing to fasten time to market.

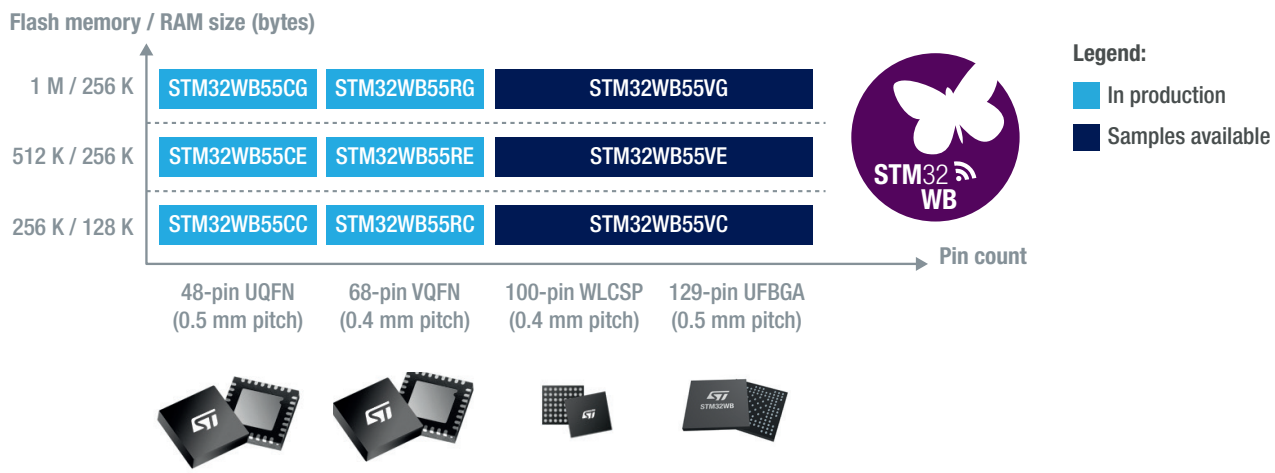
STANDARD PROTOCOL

THREAD Bluetooth 5 zigbee

COMPANION CHIP

STMicroelectronics' integrated RF matching components tailored for the STM32WB QFN packages (MLPF-WB55-01E3).

STM32WB PORTFOLIO



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