STM32WB Wireless Series
Bluetooth 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® 5.0 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® 5.0 & IEEE 802.15.4
The STM32WB SoC offers multi-protocol stacks including Bluetooth® 5.0, 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 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>
</tr>
</thead>
<tbody>
<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>
</tr>
<tr>
<td>TX: 5.2 mA, RX: 4.5 mA</td>
<td>Extended battery life time. Perfect fit for coin cell battery</td>
</tr>
<tr>
<td>BLE: −96 dBm, 802.15.4: −100 dBm</td>
<td>Comfortable and robust operating distance of connection</td>
</tr>
<tr>
<td>Integrated balun</td>
<td>Reduces BOM cost and PCB footprint</td>
</tr>
<tr>
<td>OTA firmware updates</td>
<td>Easy fleet maintenance</td>
</tr>
<tr>
<td>Crystal-less USB 2.0 FS interface*</td>
<td>Optimized BOM cost. Battery charging detection</td>
</tr>
<tr>
<td>LCD driver*, integrated booster*</td>
<td>Only a simple low-cost glass display is needed</td>
</tr>
<tr>
<td>Quad-SPI XIP*</td>
<td>Simple way to upgrade active memory on existing designs.</td>
</tr>
<tr>
<td>Customer key storage*</td>
<td>Offers brand protection, IP protection and device integrity</td>
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</table>

Note* Features availability or characteristics depend on STM32WB reference
HARDWARE TOOLS
This STM32 Nucleo pack is the most cost-effective way to quickly get started developing STM32WB-based prototypes.

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 5.0, 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** 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.
- **STM32CubeMonRF** is a development tool dedicated to wireless connectivity 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.

STANDARD PROTOCOL

**OPEN THREAD**

**Bluetooth™ 5.0**

**ZigBee**

**ART Accelerator™**

**AHB Bus matrix**

**2 x DMA 7 channels**

**Multi-protocol RF stack**

**Bluetooth™ 5.0**

**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, I²C**

**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**

**FUS/CKS**

**Display**

**8 x 40 LCD driver**

**STM32WB55 BLOCK DIAGRAM**

**STM32WB PORTFOLIO**

**Flash memory / RAM size (bytes)**

<table>
<thead>
<tr>
<th>Pin count</th>
<th>Flash memory / RAM size (bytes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48-pin UQFN (0.5 mm pitch)</td>
<td>STM32WB55CG</td>
</tr>
<tr>
<td>68-pin UQFN (0.4 mm pitch)</td>
<td>STM32WB55RG</td>
</tr>
<tr>
<td>100-pin WL CSP (0.4 mm pitch)</td>
<td>STM32WB55VG</td>
</tr>
<tr>
<td>129-pin UF BG A (0.5 mm pitch)</td>
<td>STM32WB55CC</td>
</tr>
<tr>
<td>256 K / 256 K</td>
<td>STM32WB55CE</td>
</tr>
<tr>
<td>512 K / 256 K</td>
<td>STM32WB55RE</td>
</tr>
<tr>
<td>1 M / 128 K</td>
<td>STM32WB55VE</td>
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</tbody>
</table>

**STANDARD PROTOCOL**

**COMPANION CHIP**

STM32Microelectronics’ integrated matching RF components are tailored for STM32WB packages: MLPF-WB55-0xE3, QFN: x=0, WLCSP100: x=2.

Order code: P-NUCLEO-WB55
Order code: FLSTM32WB1119

For more information on ST products and solutions, visit www.st.com/stm32wb

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