STM32WBA 32-BIT MCU WIRELESS SERIES

Multiprotocol flexibility (Bluetooth® LE/Zigbee/Thread), +10dBm

Supporting the latest protocols, the STM32WBA series brings designers the performance, efficiency, and security required for short-range applications.

Certified for Bluetooth® Low Energy 5.4 and IEEE 802.15.4 (Zigbee®, Thread and Matter) protocols, this product series allows developers to easily add wireless communication to their device, at an affordable cost.

Based on the Arm® Cortex®-M33 core featuring TrustZone® technology, the STM32WBA series provides a high level of security, protecting data, IP, and preventing hacks or device cloning. The STM32WBA wireless MCU embeds 1 Mbyte of flash memory and 128 Kbytes of RAM.

Leveraging the STM32U5 architecture, the STM32WBA series offers the same digital and analog peripherals, suitable for many applications, from industrial, to smart home and consumer markets.

STM32WBA enabling features

From coded-phy up to 2 Mbits/sec high data rate	Ensure fast and reliable data transfer
Up to +10dBm output power	Extended communication range capabilities
Audio Auracast and Unicast support	Enables audio sharing and enhanced user experience with better efficiency

NEW FEATURES FOR EMBEDDED DEVELOPERS

- Support for latest protocols
- Enhanced security
- Low-power consumption
- High output power
- Reduce bill of materials
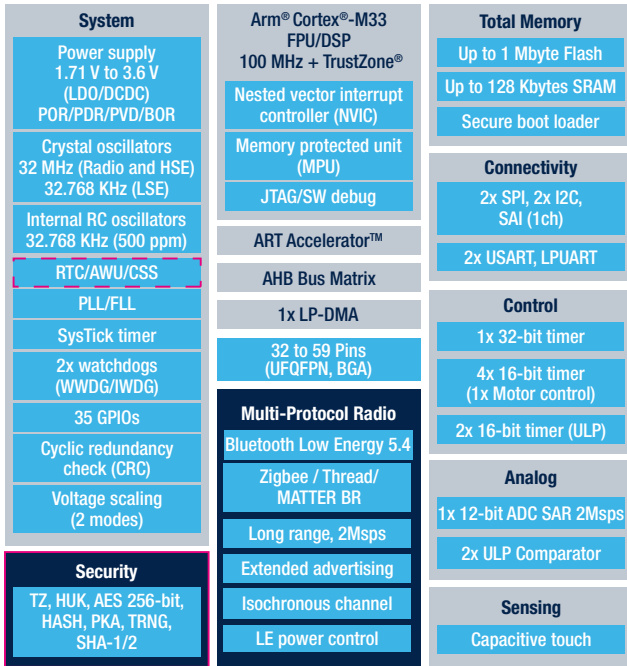

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Security

The STM32WBA targets PSA Certified Level 3 and SESIP 3 IoT security standards.

Security is at the heart of many applications, protecting data for safe resource monitoring and anti-hacking, like in medical and industrial fields, including predictive maintenance applications or device fleet management. Thanks to the Arm® Cortex®-M33 core with Arm® TrustZone® technology, the STM32WBA5 isolates and protects code and IPs whenever required using isolation capability and TF-M library included in the product ecosystem.

The 2.4 GHz wireless STM32WBA series provides an integrated solution to help developers streamline their design journey, while addressing market requirements.

STM32WBA55 block diagram

System	Arm® Cortex®-M33 FPU/DSP 100 MHz + TrustZone®	Total Memory
Power supply 1.71 V to 3.6 V (LDO/DCDC) POR/PDR/PVD/BOR	Nested vector interrupt controller (NVIC)	Up to 1 Mbyte Flash
Crystal oscillators 32 MHz (Radio and HSE) 32.768 KHz (LSE)	Memory protected unit (MPU)	Up to 128 Kbytes SRAM
Internal RC oscillators 32.768 KHz (500 ppm)	JTAG/SW debug	Secure boot loader
RTC/AWU/CSS	ART Accelerator™	**Connectivity**
PLL/FLL	AHB Bus Matrix	2x SPI, 2x I2C, SAI (1ch)
SysTick timer	1x LP-DMA	2x USART, LPUART
2x watchdogs (WWDG/IWDG)	32 to 59 Pins (UFQFPN, BGA)	**Control**
35 GPIOs	**Multi-Protocol Radio**	1x 32-bit timer
Cyclic redundancy check (CRC)	Bluetooth Low Energy 5.4	4x 16-bit timer (1x Motor control)
Voltage scaling (2 modes)	Zigbee / Thread/ MATTER BR	2x 16-bit timer (ULP)
Security	Long range, 2Msps	**Analog**
TZ, HUK, AES 256-bit, HASH, PKA, TRNG, SHA-1/2	Extended advertising	1x 12-bit ADC SAR 2Msps
	Isochronous channel	2x ULP Comparator
	LE power control	**Sensing**
		Capacitive touch

Legend:
- ☐ Side channel attack resistant
- ☐ Active anti-tamper protection
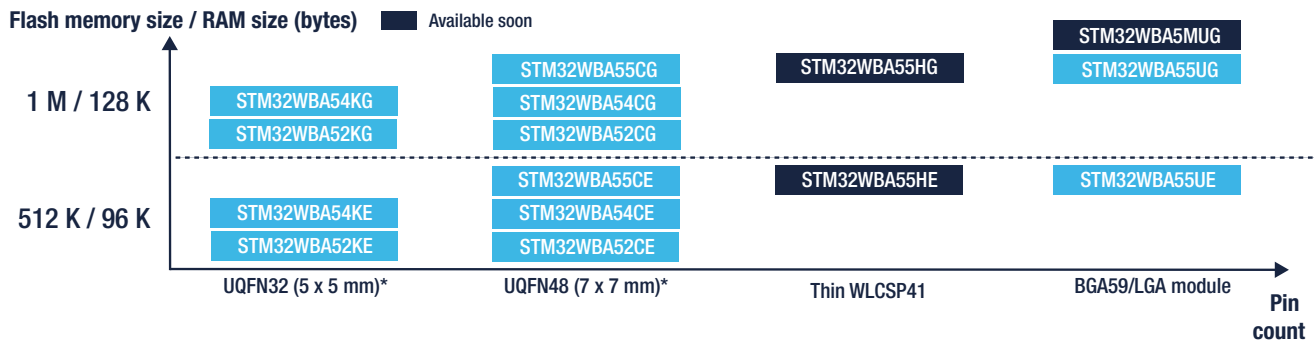
Hardware tools

NUCLEO-WBA55CG

STM32WBA55G-DK1

Embedded software and software tools

- **STM32CubeMX** is a free STM32 tool for configuration, code generation and power calculation.

- **STM32CubeWBA** is the STM32Cube MCU package the STM32WBA series (HAL and low-layer peripheral drivers, CMSIS, file system, RTOS, Bluetooth Low Energy, Zigbee, Thread stacks - and examples running on ST boards).

- **STM32CubeMonitor-RF** allows you to test and monitor the RF performance of your product.

- **STM32CubeProgrammer** is a programming tool.

STM32WBA portfolio

Flash memory size / RAM size (bytes)   ■ Available soon

	UQFN32 (5 x 5 mm)*	UQFN48 (7 x 7 mm)*	Thin WLCSP41	BGA59/LGA module
1 M / 128 K	STM32WBA54KG / STM32WBA52KG	STM32WBA55CG / STM32WBA54CG / STM32WBA52CG	STM32WBA55HG	STM32WBA5MUG / STM32WBA55UG
512 K / 96 K	STM32WBA54KE / STM32WBA52KE	STM32WBA55CE / STM32WBA54CE / STM32WBA52CE	STM32WBA55HE	STM32WBA55UE

Pin count →

*MLPF-WB-04D3: Integrated macthing RF components tailored for UQFN32 and UQFN48 packages.

Order code: FL2403STM32WBA

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