STM32WBxM WIRELESS MODULES

Bluetooth LE 5.2, Zigbee 3.0 and Thread

With a fully integrated reference design, ST's ready-to-use STM32WBxM module eases RF design for faster market introduction of wireless devices

Built on the dual-core, multi-protocol and ultra-low power STM32WB55 MCU, the STM32WB5M wireless module features the MCU's full reference design, antenna included. It provides access to all the peripherals embedded in the WLCSP100 package on which it is based.

It supports Bluetooth® LE 5.2, as well as IEEE 802.15.4 protocols (in single, and concurrent modes) covering a wide spectrum of IoT application needs.

KEY FEATURES & BENEFITS

- Fully certified for all protocols and regulations to speed up time to market and reduce overall cost
- Small form factor
- Smart pinout to allow cost-effective PCB manufacturing
- Fully integrated solution with a ready-to-use package
- Easy platform integration
  - No radio expertise required
- Up to 75m communication range for wide application convenience
- 1Mbyte Flash / 256 Mbytes RAM: large memory to address the requirements of high-end devices
- Security features for anti-cloning and IP protection
- Various peripherals : USB FS, LCD, TSC
- Concurrent modes supported: allows multiple standards to run at the same time for innovative use cases

KEY APPLICATIONS

Suitable for multiple point-to-point or Mesh applications :

- Healthcare & medical devices
- Trackers
- Building and home automation
- Retail and advertising beacons
- Industrial

www.st.com/stm32wb-modules

STM32WB5M block diagram

Control

Power supply
1.8 to 3.6 V
w/ DC/DC +
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
68 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/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 5

IEEE 802 15.4

AES

Arm® Cortex®-M0+
32 MHz

Nested vector
interrupt
controller (NVIC)

Memory

1-Mbyte
Flash memory

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

FUS/CKS

Display

8 x 40 LCD driver

Standard protocols

OPENTHREAD released by Google   Bluetooth™ 5   Z 3.0

STM32WBxM portfolio

Flash memory / RAM size (bytes)

1 M / 256 K   **STM32WB5MMG**   → Pin count

86-pin LGA
(0.435 mm pitch)

Hardware tools

This STM32WB Discovery Kit is the most cost-effective way to quickly start developing with STM32WB5M module.
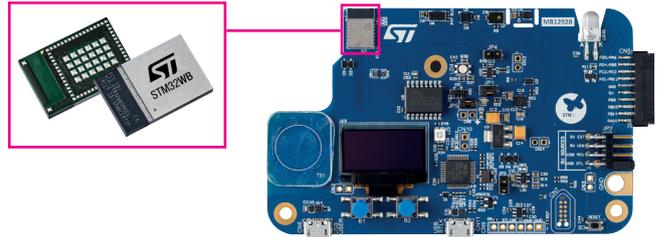
Note : *available in Q1/2021

Order code : STM32WB5MM-DK*

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

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.

STM32WB ONLINE TRAINING
www.st.com/stm32wb-online-training

MIX
Paper from
responsible sources
FSC
www.fsc.org   FSC® C003379

life.augmented