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STM32WBxM wireless modules

Bluetooth® Low Energy 5.4, Zigbee 3.0, and Thread

STM32

The STM32 portfolio

Five product categories

Wireless MCU

Short- and long-range connectivity

Ultra-low-power MCU

Mainstream MCU

High-performance MCU

32-bit general-purpose microcontrollers: from 75 to 3,224 CoreMark score

Embedded MPU

32- and 64-bit microprocessors





Enabling edge AI solutions

Scalable security

MPU portfolio

MCU portfolio

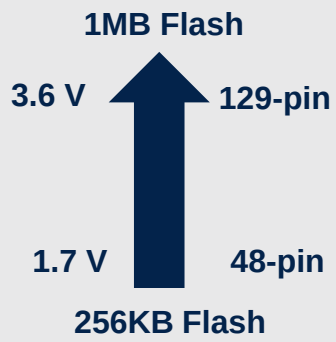
Choose the STM32WB series
7 keys points that make a difference

Open 2.4 GHz radio
Multi-protocol

Dual-core / Full control
Ultra-low-power

IoT Protection ready

Massive integration
Cost saving



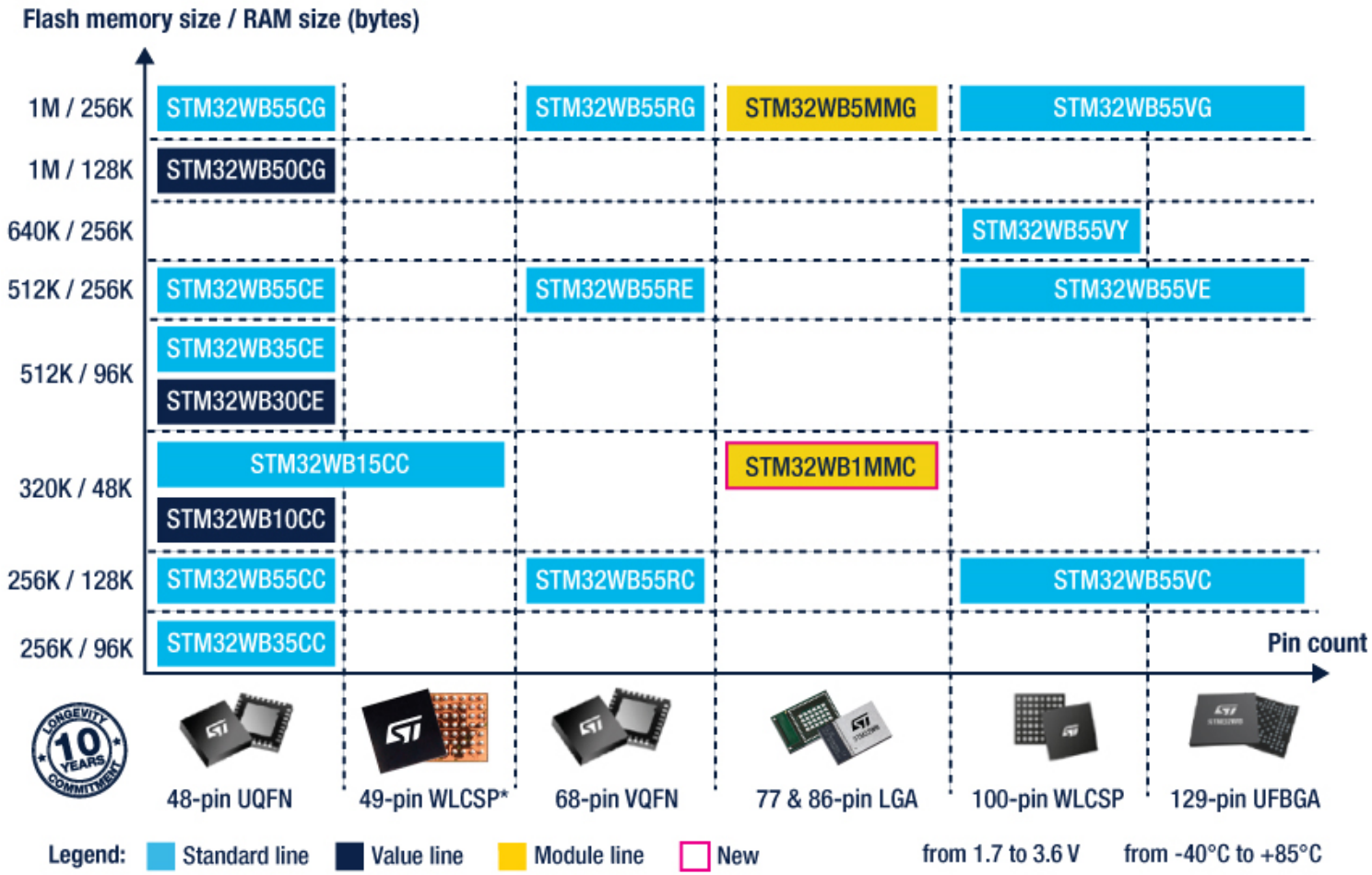
A large offer

Advanced RF tool, Energy control with C code generation

No matter what!

STM32WB MCU provides a large offering

Bluetooth® Low Energy 5.4, OpenThread, Zigbee 3.0 and proprietary protocol capable



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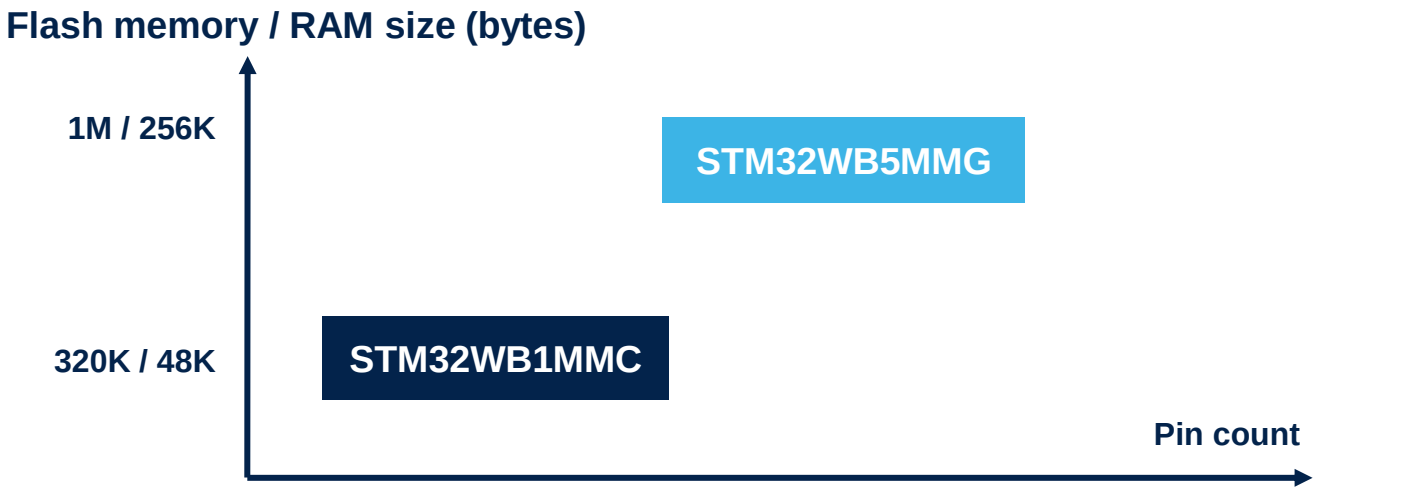
STM32WBxM module portfolio

Easy deliver BLE applications



77-pin LGA
6.5 x 10 mm
0.45 mm pitch

86-pin LGA
7.3 x 11 mm
0.435 mm pitch

from 1.7 V to 3.6 V
from -40°C to +85°C

Latest product generation

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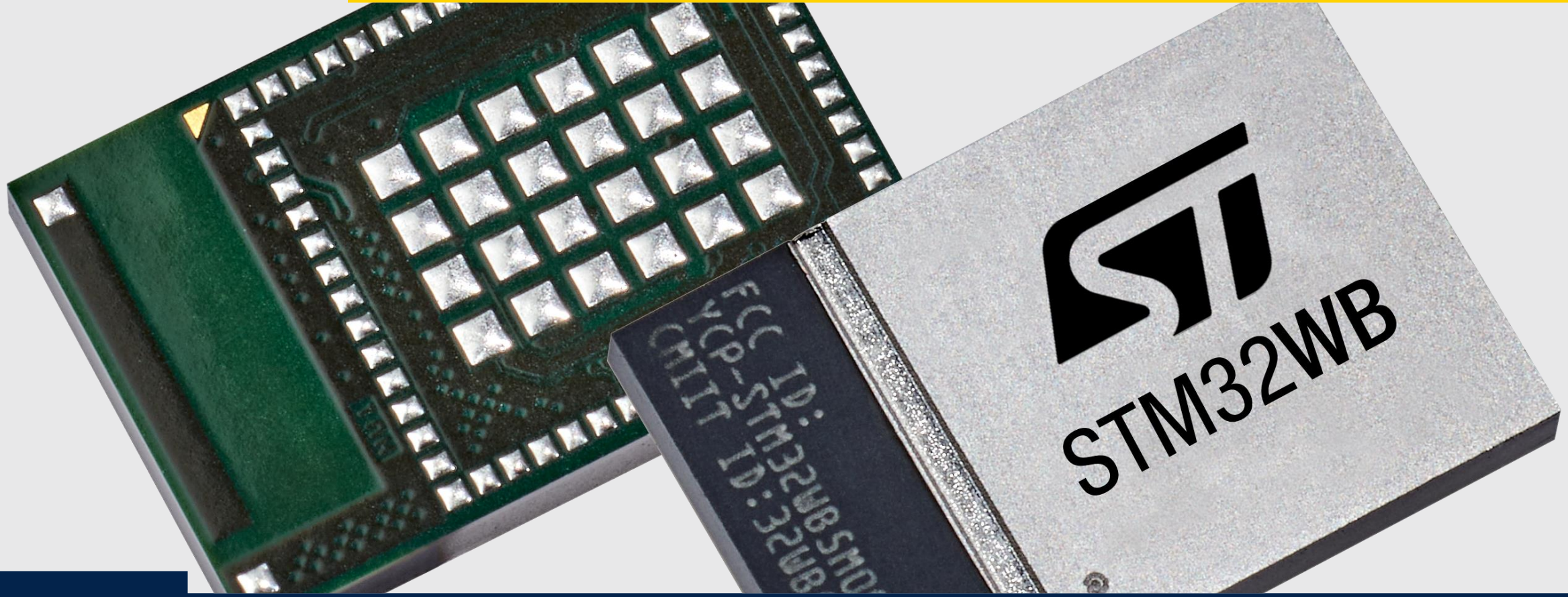
Available as a module to reduce your time to market



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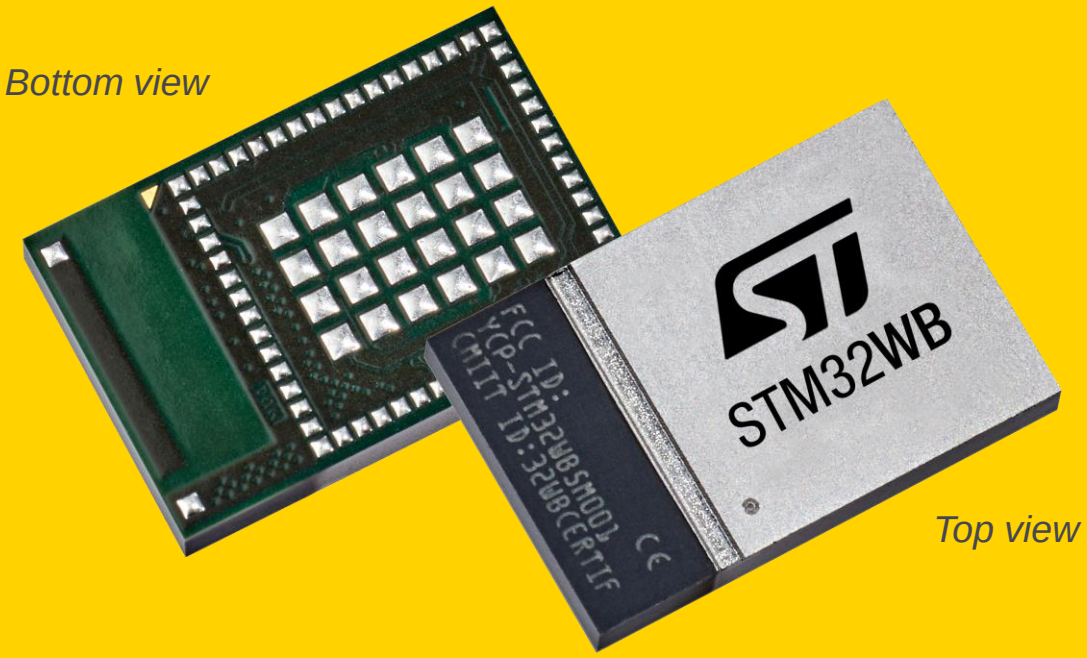
STM32WB5MMG module

Easy to integrate - smooth certification process for developers

Key advantages

- WLCSP100 package integrated
- Maximum of features exposed
- Low-cost PCB for the mother board
- No RF expertise

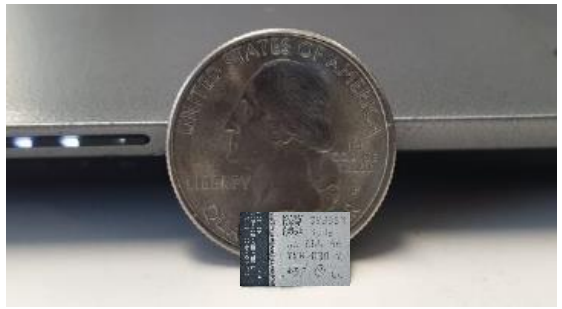
Watch the video



STM32WB5MMG multi-protocol module

Small form factor

- 7.3 x 11 mm
- Full reference design up to antenna, crystals



Reduce the cost

- Down to 2 PCB layers
- Everything inside (single cap outside)
- Free of charge radio stack
- Certified FCC, CE, NCC, JRF, KC, SRRC, ISED, GOST

Multi-protocols

Bluetooth®

zigbee

OPENTHREAD released by Google

matter

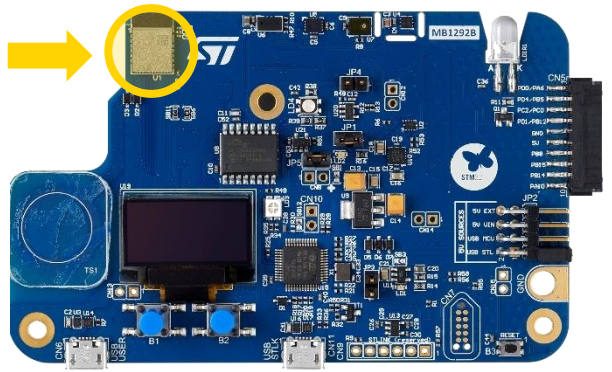
+ Concurrent modes & Proprietary 2.4GHz

RPN : STM32WB5MMGH6TR

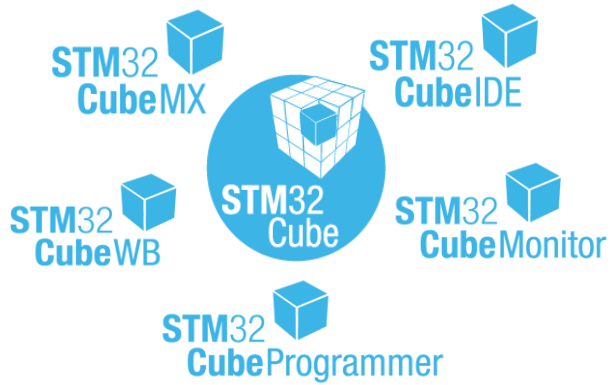
Rich feature set

- Dual core* based
- 1 Mbyte flash memory
  256 KBytes of RAM
- LCD, USB FS, ADC, COMP
- Security
- OTA (application, radio)

Discovery kit

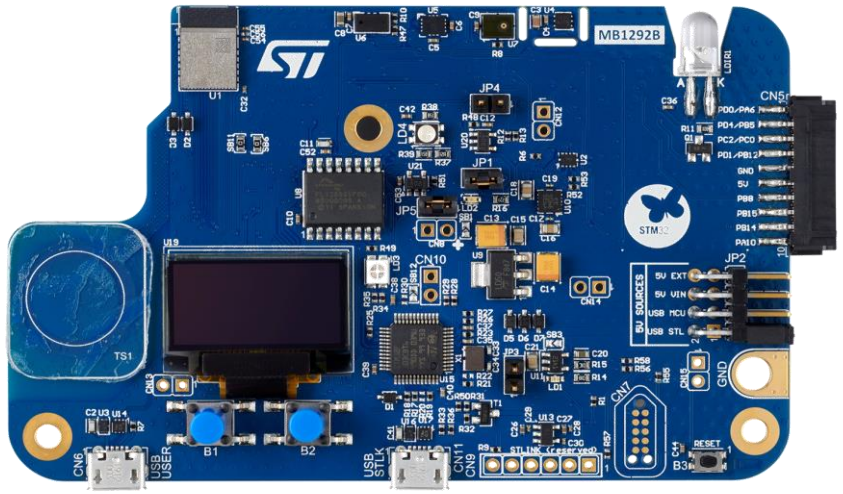


STM32 ecosystem



*Dual Core: One core dedicated to Radio and protocols stack and One core dedicated for application

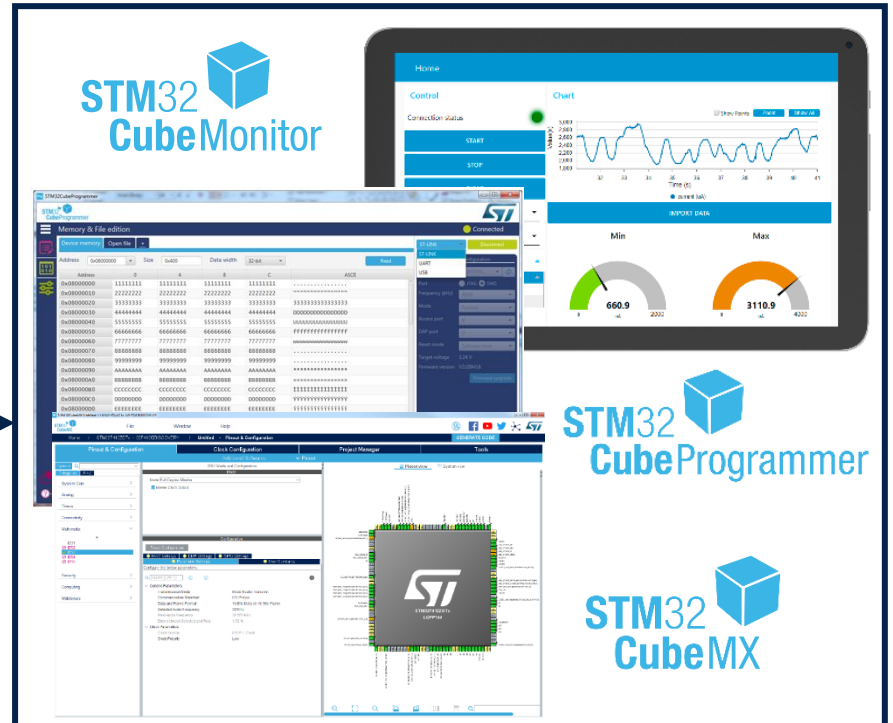
Prototyping made as easy as 1,2,3



STM32WB5MM-DK

Hardware
discovery kit

STM32**WB**



STM32CubeMX/STM32CubeWB/
STM32CubeProg & STM32CubeMonRF
Code generation
Power calculation

STM32 Cube

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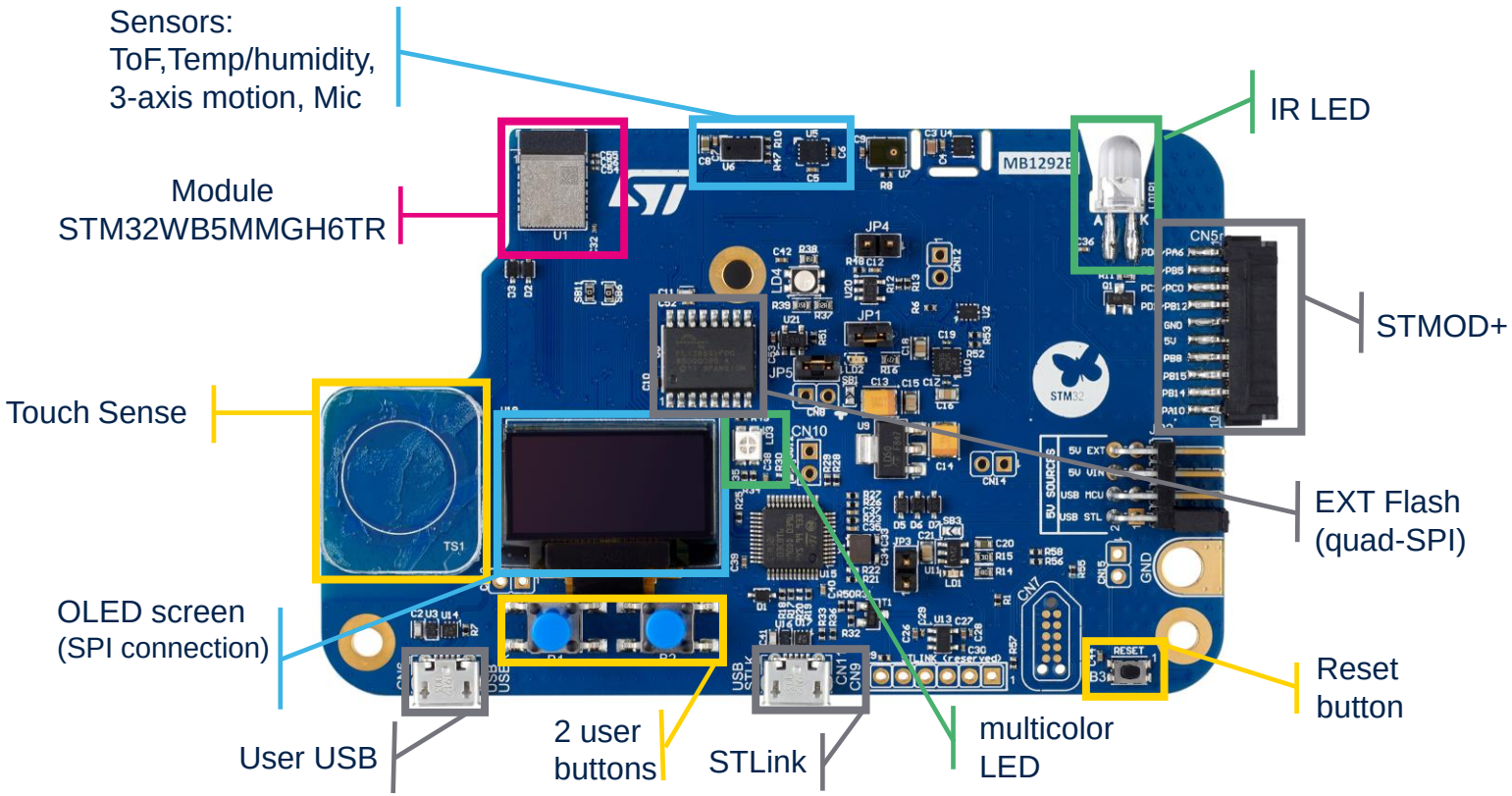
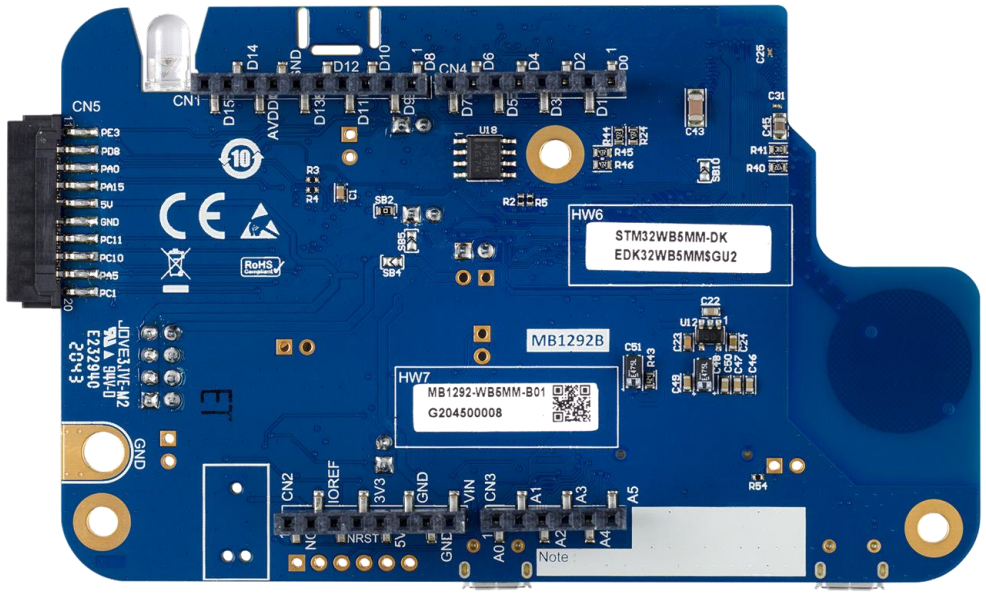
STM32WB5MM-DK

Watch the video



Top view



Bottom view
(ARDUINO connectors)

STM32WB1M module

Bluetooth LE Module Solution

Dual Core

RF Filter

Antenna

XTAL + passive

Control
- Power supply 1.71V to 3.6V w/ DC/DC POR/PDR/PVD/BOR
- Internal 32KHz RC oscillators 0,1 – 48 MHz 16 MHz (HSI)
- RTC / AWU / CSS
- SysTick timer
- 2 watchdogs (WWDG / IWDG)
- Cyclic Redundancy Check
- Voltage scaling

Analog
- 1x ULP comparator
- 1x 12-bit ADC 2.5Msps
- Temperature sensor

Sensing
- 8-keys Capacitive touch

ARM Cortex-M4 FPU/DSP 64MHz
- Nested Vector Interrupt Controller (NVIC)
- Memory Protected Unit (MPU)
- JTAG / SW debug

ART Accelerator™

AHB Bus Matrix

1x DMA 7channels

Multi-Protocol Radio
- Bluetooth™ LE 5.3
- AES 256-bit

ARM Cortex-M0+ MPU 32MHz
- Nested Vector Interrupt Controller (NVIC)
- SW debug

Memory
- 320KB Flash
- 48KB SRAM
- BOOT ROM
- Secure boot loader

Connectivity
- 1x SPI, 1x I²C
- 1x USART ISO7816, smartcard, IrDA, Modem control
- 1x ULP UART

Control
- 1x 16-bit + 1x 32-bit timers
- 2x ULP 16-bit timers

Security
- AES 256-bit / PKA / TRNG PCROP / FUS

Option for external antenna

RF Filter

Internal Antenna

Passives

32KHz XTAL

32MHz XTAL

27 GPIOs

Flash memory / RAM size (bytes)

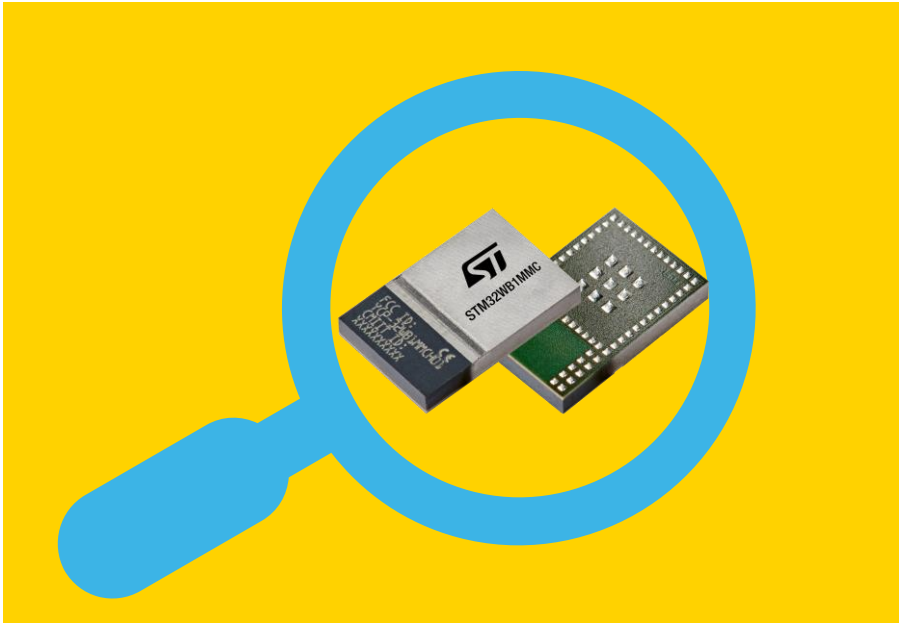
320K / 48K

STM32WB1MMC

Pin count

77-pin LGA

from 1.7 V to 3.6 V
from -40°C to +85°C



STM32WB1M module

Small form factor

- 6.5 x 10 mm
- Everything inside (antenna, crystals…)
- Option:
  internal or external antenna

Extended Battery life

- DCDC configuration
- Standby ultra-low-power mode while radio activities

Reduce costs

- Down to 2 PCB layers
- Everything inside (single cap outside)
- Free radio stack
- Certifications FCC, CE, NCC, JRF, KC, SRRC, ISED

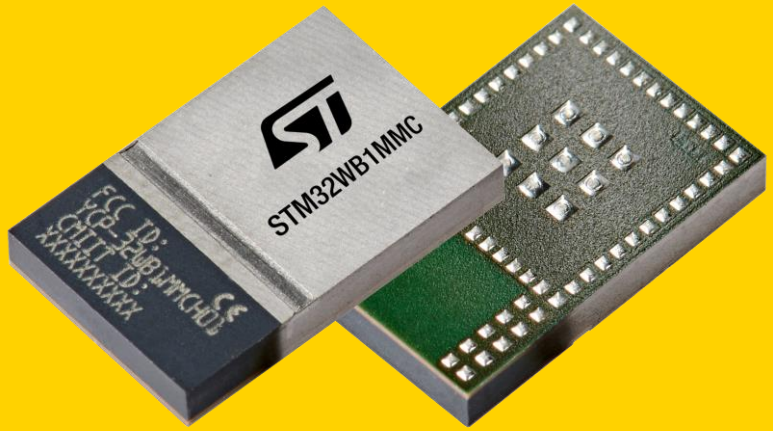
Bluetooth® Low Energy protocol

Bluetooth®

Proprietary 2.4GHz

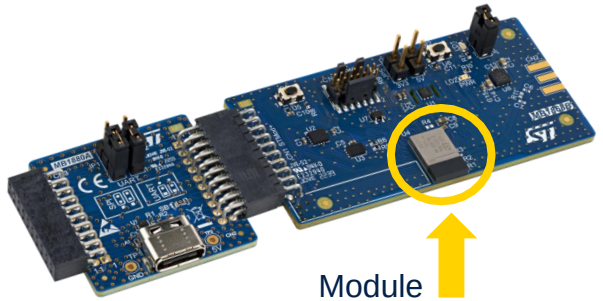
Rich feature set

- Dual core* based
- 320 Kbytes flash
  48 Kbytes RAM
- ADC, COMP, TSC
- Security
- OTA (application, radio)



RPN: STM32WB1MMCH6

Connectivity expansion board



Module
STM32WB1MMCH6

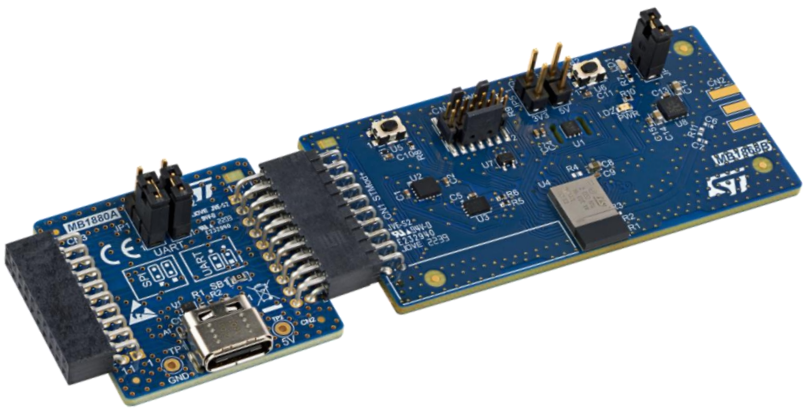
RPN: B-WB1M-WPAN1
SMA connector not assembled by default

STM32 ecosystem

STM32 CubeMX
STM32 CubeIDE
STM32 CubeWB
STM32 Cube
STM32 CubeMonitor
STM32 CubeProgrammer

*Dual Core: One core dedicated to Radio and protocols stack and One core dedicated for application

Prototyping made as easy as 1,2,3

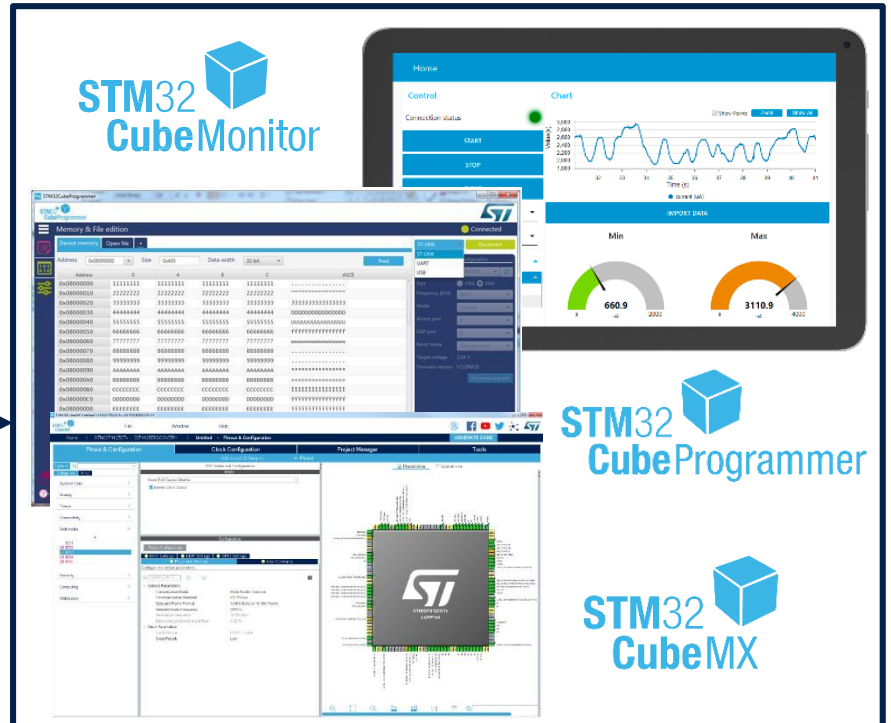


B-WB1M-WPAN1*

Hardware
connectivity expansion board

**Available in Q4/2023*

STM32**WB**



STM32CubeMX/STM32CubeWB/
STM32CubeProg & STM32CubeMonitor
Code generation
Power calculation

STM32 Cube

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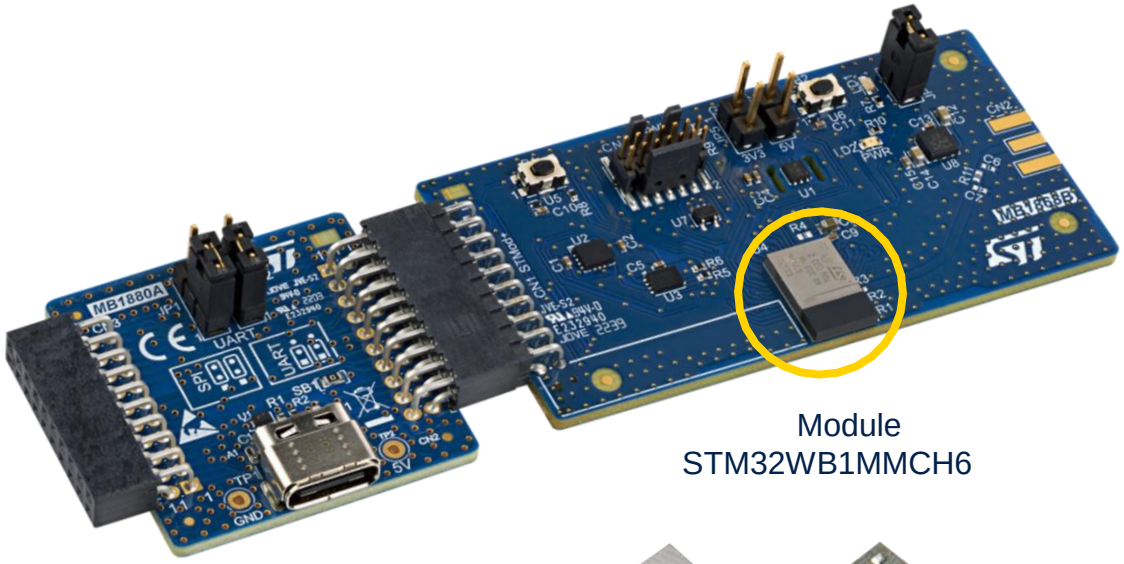
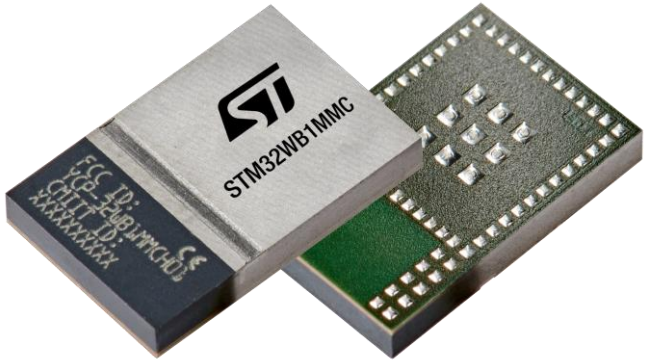
B-WB1M-WPAN1 expansion board



Module
STM32WB1MMCH6



Power supply options:
- From Host through STMOD+ (slave mode)
- From USB type C through STMOD+ adapter (master mode)
- From Battery LiPo type directly connected (master mode)

Boot mode through micro switch

1x User button
1x Reset button
1x LED Blue

Sensors:
- Temperature sensor
- Accelerometer

Connectors:
- STMOD+
- STDC14 receiver
- SMA connector for external antenna connexion opion (not assembled by default)

Additionnal features:
Adapter board female-female STMOD+ (B_STMOD_FEM), provided with CEB
Power consumption measurement capability through jumper

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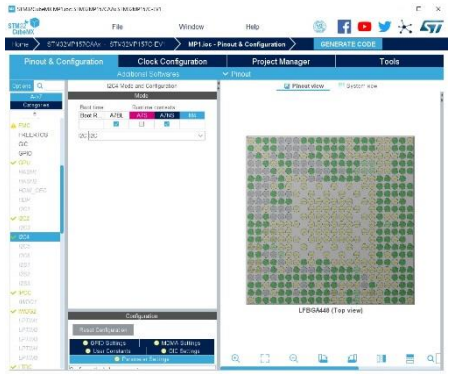
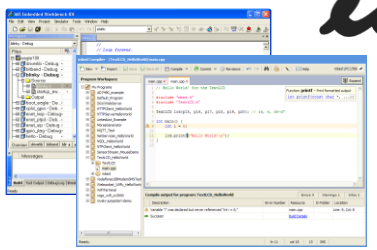
Software tools for STM32WBxM modules

A complete design journey, from configuration to application monitoring





STM32CubeMX

Graphical tool for easy configuration

- Configure and generate code
- Peripherals and middleware configuration

IDEs
Compile and debug

Simple, powerful solutions

- Partners IDE (Arm® Keil®) FREE
- IDE based on Eclipse FREE
- RTOS aware debug

STM32 programming & monitoring tools

STM32CubeProg
STM32CubeMonitor

- Device and memory configuration
- Program the application
- Monitor variables at runtime

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Releasing your creativity

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community.st.com

www.st.com/STM32WB

wiki.st.com/stm32mcu

github.com/STMicroelectronics

STM32WB online training

STM32WB blog article

MOOC – STM32WB workshop

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Our technology starts with You

Find out more at www.st.com/STM32WB

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