

# WISEN-1 2.4GHz, 1T1R, Wi-Fi 6 + BLE 5

## Low-power Wi-Fi & BLE Combo with Application MCU



WISEN-1 is a highly integrated 1T1R 2.4GHz Wi-Fi 6 + BLE 5.1 combo chip and MCU-based SoC solution for ultra-low-cost and low-power IoT applications. WISEN-1's excellent communication range and low power makes it the ideal solution for low power applications such as Smart-home (remote monitoring and sensing), battery IPC, visual Doorbell, connected home appliance, etc.

The application processor subsystem contains a high-performance 32-bit RISC-V MCU which operates up to 160MHz and it includes embedded SRAM/ROM. The Wi-Fi subsystem contains a 2.4GHz radio and 802.11b/g/n/ax modem/MAC to achieve low latency, long range and low power consumption. The Bluetooth LE subsystem contains a Bluetooth 5.1 radio, modem and link controller, as well as Bluetooth mesh feature.

WISEN-1 enables ultra-small form factor solutions with minimal external components, reducing total silicon and system-level costs. An extensive range of peripheral interfaces and security features are fully supported by this SoC solution. Advanced connectivity and power management techniques enable extremely low active and sleep power consumption, thus extending the useful life of battery-powered devices.

## Features

### WLAN

- IEEE 802.11 b/g/n/ax compliant
- 11b/g/n 20/40MHz bandwidth and 11ax 20MHz in 2.4GHz band
- 1T1R mode with data rate up to MCS 7
- Support MU DL/UL OFDMA
- Support STBC
- Support TWT
- Security support for WFA WPA/WPA2/WPA3
- Support IEEE 802.11e and Wi-Fi Multimedia (WMM)
- Supports 802.11w protected managed frame
- TX/RX A-MPDU, RX A-MSDU
- Fragmentation and defragmentation
- Greenfield, mixed mode, legacy modes support
- Support Soft-AP mode and concurrent mode
- Integrated LNA, PA and T/R switch
- Low power consumption

### MCU & Memory

- 32-bit RISC-V single-core application processor with floating-point support
- 384 KB ROM
- 352 KB SRAM
- embedded 4MB NOR Flash
- SPI (single, dual & quad) for external FLASH

### Bluetooth Low Energy

- Bluetooth LE 5.1 fully compliant
- Data rate 1Mbps, 2Mbps, Long range 125kbps and 500kbps
- Auto acknowledgement, retransmission and flow control
- Support full-function Bluetooth LE AoA and AoD features
- Advertising extensions
- Long data and Adv packets
- Support for stable modulation index
- Channel selection algorithm #2
- Multiple advertisement sets
- Both central and peripheral modes
- Integrated Balun and PA

### Security

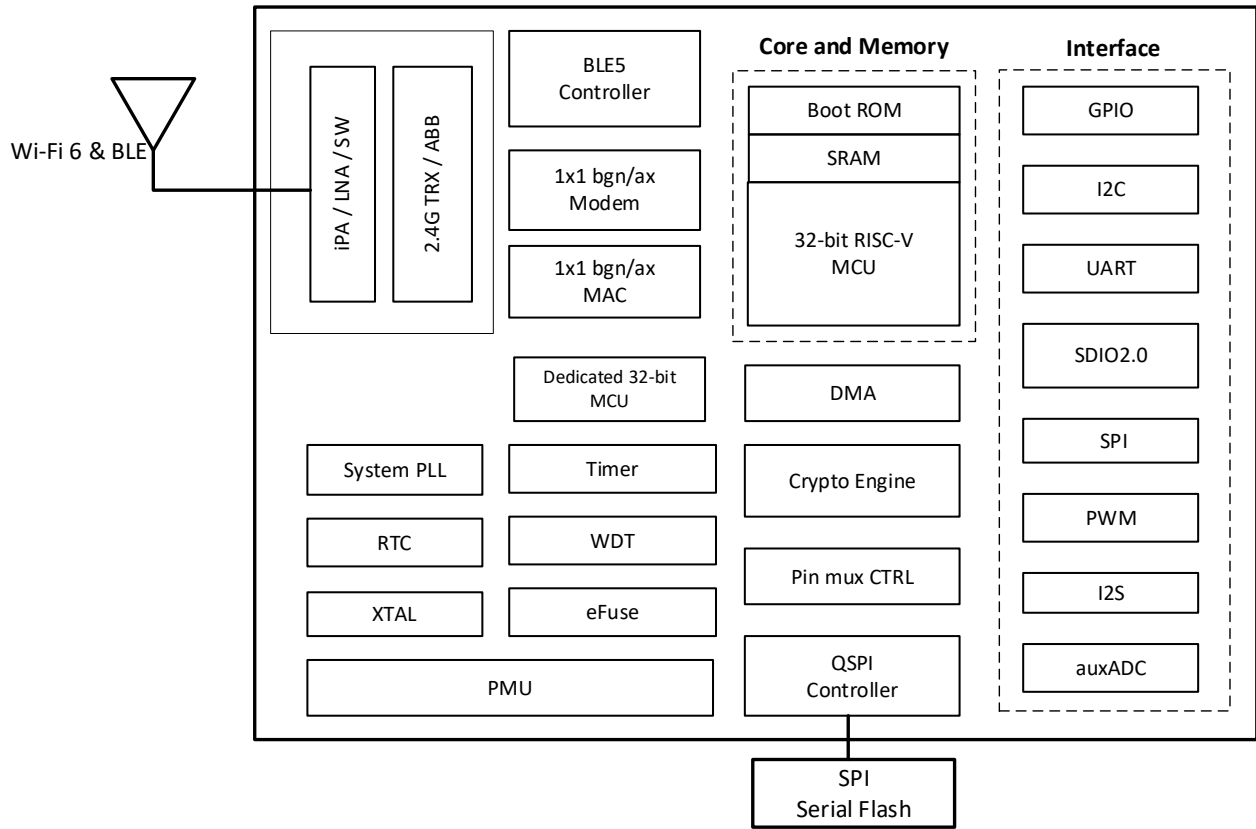
- Secure boot
- Flash encryption
- Cryptographic hardware acceleration

### Peripheral Interfaces

- Programmable GPIO, 12-bit SAR ADC
- 2 x SPI master, 3 x UART, 2 x I2C
- 6 x PWM controllers, 1 x I2S
- SDIO 2.0 device

### Miscellaneous

- Support 2.7V~3.6V voltage input
- 40MHz crystal clock
- QFN 40-pin, 5mm x 5mm



**WISEN-1 System Block Diagram**