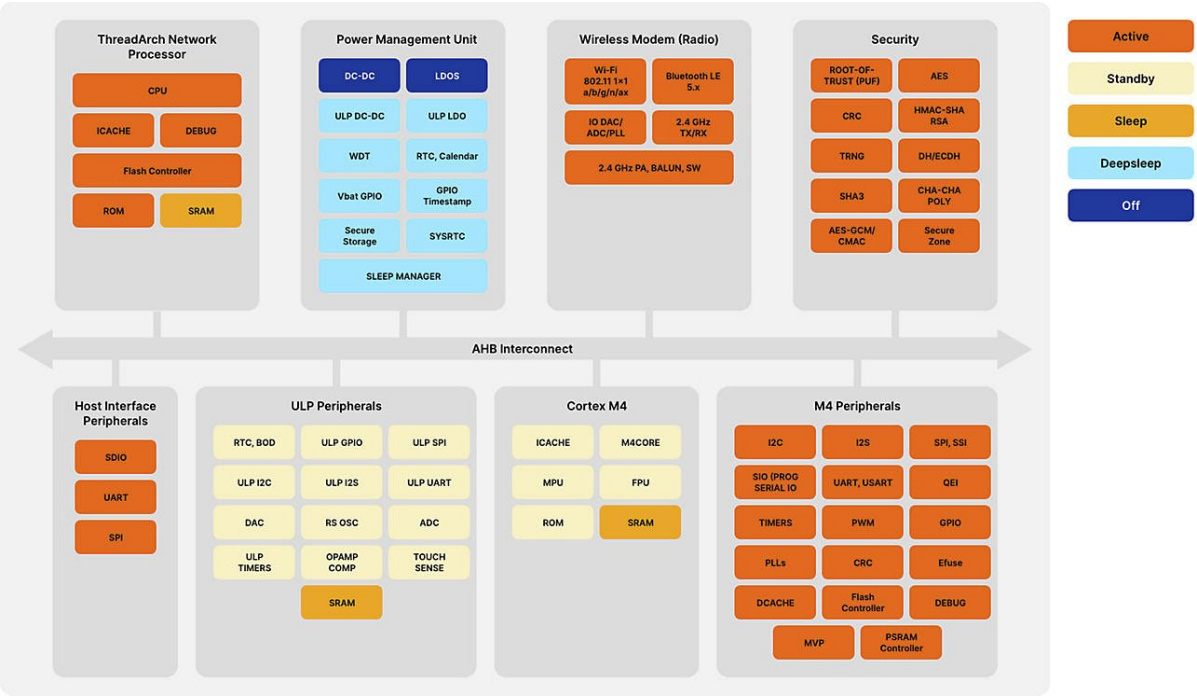
SiWx917 Wi-Fi® 6 plus Bluetooth® Low Energy (LE) 5.4 SoCs

SILICON LABS

Our SiWx917 SoC is our lowest power Wi-Fi 6 SoC, ideal for ultra-low power IoT wireless devices using Wi-Fi®, Bluetooth, Matter, and IP networking for secure cloud connectivity. It is optimal for developing battery operated devices that need long battery life. SiWx917 SoC includes an ultra-low power Wi-Fi 6 and Bluetooth Low Energy (LE) 5.4 wireless CPU subsystem, and an integrated micro-controller (MCU) application subsystem, security, peripherals and power management subsystem all in a single 7x7 mm QFN package. The wireless subsystem consists of a multi-threaded processor running up to 160 MHz, baseband digital signal processing, analog front end, 2.4 GHz RF transceiver and integrated power amplifier. The application subsystem consists of an ARM® Cortex®-M4F running up to 180 MHz, embedded SRAM, FLASH, and Sensor Hub. The ARM® Cortex®-M4F is dedicated for peripheral and application-related processing, while the multi-threaded processor runs the wireless and networking stacks on independent threads, thus providing a fully integrated solution that is ready for a wide range of embedded wireless IoT applications.

Target applications include Smart Homes, Consumer Health and Wearables, Medical, Industrial, Retail, Smart Building and Cities, Asset Tracking.



Alcom electronics
Singel 3 | B-2550 Kontich | Belgium | Tel. +32 (0)3 458 30 33
info@alcom.be | www.alcom.be
Rivium 1e straat 52 | 2909 LE Capelle aan den IJssel | The Netherlands
Tel. +31 (0)10 288 25 00 | info@alcom.nl | www.alcom.nl

SiWx917 Common Specs

Ultra-Low Power Wireless System on a Chip

- Wi-Fi 6 Single band 2.4 GHz and Bluetooth Low Energy 5.4 wireless radio
- ARM® Cortex®-M4F Application MCU up to 180 MHz
- Integrated baseband processor, RF transceiver, high-power amplifier, balun and T/R switch
- Embedded SRAM up to 672 KB
- Embedded Flash up to 8 MB and supports opt external Flash up to 16 MB
- Embedded PSRAM up to 8 MB and supports Opt external PSRAM up to 16 MB
- Integrated Wi-Fi stack, TCP/IP stack, Bluetooth stack supporting wireless coexistence and Matter

Wi-Fi 6

- Compliant to to 2.4 GHz, single-spatial stream IEEE 802.11 b/g/n/ax
- Supports 802.11ax 20 MHz features such as OFDMA, MU-MIMO, and Target Wake Time (TWT)
- Transmit power up to +20 dBm with integrated PA
- Receive sensitivity as low as -97.5 dBm
- Data Rates: up to 86 Mbps (802.11ax MCS0 to MCS7)
- Operating frequency range: 2412 MHz - 2484 MHz

Bluetooth Low Energy 5.4

- Transmit power up to +19.5 dBm with integrated PA
- Receive sensitivity: LE: -95 dBm, LR 125 Kbps: -106 dBm
- Operating frequency range: 2402 MHz - 2480 MHz
- Bluetooth Low Energy 1 Mbps, 2 Mbps and Long-Range modes (125 kbps, 500 kbps)

Microcontroller Subsystem

- ARM® Cortex®-M4F core with up to 180 MHz
- Integrated FPU, MPU, and NVIC
- In-System Programming (ISP) and Over-the-Air (OTA) wireless firmware update
- Power-On Reset (POR), Brown/Black-out and Black-out Detection
- Rich set of Analog and Digital Peripherals
- Digital Peripherals - SDIO, 1x USART, 2x UART, 4x SPI, 3x I2C, 2x I2S, SIO, PWM, QEI
- Timers: 4x 16/32-bit, 1x 24-bit, WDT, RTC
- Up to 45 GPIOs (GPIO Multiplexer)
- Analog Peripherals - 12-bit 16-ch, 5 Msps ADC, 10-bit DAC
- 3x Op-amps 2x Comparators, IR detector and Temp Sensor, 8 capacitive touch sensor inputs

High Level of Security

- QSPI Encrypted XIP from Flash (w/ AES-XTS)
- Secure Zone
- TRNG, Root of trust (PUF)
- Secure Boot & OTA

- Advanced Cryptographic Accelerators
- Secure Key Storage, Secure Debug, Anti Rollback and Secure Attestation

Ultra-Low System Power Consumption

- Wi-Fi Standby Associated mode current: 55 µA @ 1-second interval
- Deep sleep current ~ 2.5 µA, Sleep/Standby current (RAM retention) ~ 10 µA
- Low MCU Sub-system active current: 32 µA/MHz in LP mode

Matter

- Matter over Wi-Fi with Bluetooth LE commissioning

Software and Protocol Support

- Integrated Wi-Fi stack, TCP/IP stack, Bluetooth stack supporting wireless coexistence
- Support for Embedded Client mode, Access Point mode (up to 8 clients), Concurrent Wi-Fi and Bluetooth LE mode
- Supports advanced Wi-Fi and Networking security features: WPA, WPA2 (Personal/Enterprise), WPA3 (Personal)
- Integrated TCP/IP stack supports HTTP/HTTPS, DHCP, SSL/TLS1.3, MQTT
- Wireless firmware upgrade and provisioning
- Supports both hosted (Radio Co-Processor (RCP), and Network Co-processor (NCP) modes and host-less (SoC) modes

Operating Conditions

- Wide operating supply range: 1.75 V to 3.63 V
- Operating temperature: -40°C to +85/105°C

Package Size

- QMS: 7.00 mm x 7.00 mm x 0.85 mm

Development Environment

- Simplicity Studio v5, GitHub