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# SX-ULPGN-BTZ
# Low Power WiFi , BLE ,15.4 Single-Chip SoC



## Highly Integrated Multi-Radio Host-less Platform for IoT

SX-ULPGN-BTZ  is a dual band a/b/g/n Wi-Fi , Bluetooth low energy (BLE) , 802.15.4 combo module for the Internet-of-Things (IoT). It is a single stream 1x1 WLAN , BLE 5 + 802.15.4 based on  Qualcomm's QCA4020 System-on-Chip (SoC). It enables seamless integration of three popular wireless connectivity technologies (802.11, Bluetooth and 802.15.4) used in the majority of todays IoT applications. The cost optimized single-chip solution, includes advanced hardware-based security features and a low power architecture targeted at meeting the demands of the latest IoT applications. The SDK's available for the SX-ULPGN-BTZ provide pre-integrated support for OCF specifications as well as support for AWS and MS Azure cloud connectivity.

Developed to address the expanding demands of embedded IoT applications the device is suited for single chip gateways, energy management, lighting, industrial automation, white goods appliances, home security and many other applications requiring multi-radio functionality.
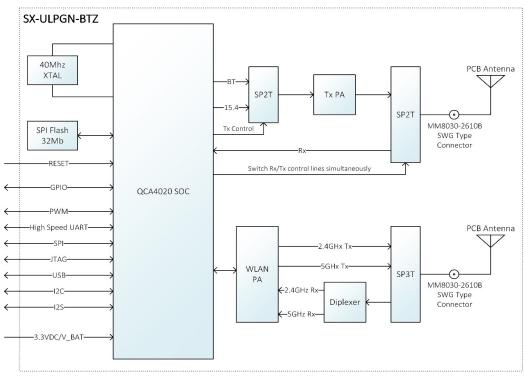
## Key Features

- Dual Band 802.11 a/b/g/n Wi-Fi + Bluetooth Low Energy + 802.15.4 connectivity (Zigbee, Thread PRO R21)

- Ecosystem Support: Amazon AWS, OpenThread, Microsoft Azure

- Supports WPA and WPA2 Enterprise Security. LEAP, EAP-FAST, EAP-TLS, PEAP, EAP-TTLS supported

- Integrated multi-radio co-Existence : 15.4+BLE+Wi-Fi co-existence on 2 antennas

- Configurable memory retention for minimizing deep sleep power per application

- Three dedicated internal processors remove the need for an external CPU/MCU:

  - ARM Cortex-M4F@128 MHz for user applications + 300KB SRAM

  - ARM Cortex-M0@64 MHz for BLE, 15.4 lower level MAC

  - Xtensa7 WLAN processor to run complete Wi-Fi stack

- Integrated PMU to generate power supplies for internal circuitry either from an external battery or a 3.3 V supply

## Specifications

| | |
|---|---|
| Product Name | SX-ULPGN-BTZ-2000 |
| Application CPU | ARM Cortex M4 @ 128MHz<br>32KB L1 cache<br>300+KB RAM |
| Connectivity CPU | ARM Cortex M0 @ 64MHz for BT LE and 15.4 MAC CPU<br>Dedicated 802.11a/b/g/n MAC CPU<br>Isolated RAM and ROM |
| I/O Interfaces | SPI, HSUART, USB, PWM, I2C, I2S, SDIO, ADC, GPIO |
| WLAN Technology | 802.11 a/b/g/n (Dual band) |
| Bluetooth Technology | BT LE v5 |
| Data Rate | WLAN: Up to 150Mb/s |
| WLAN Channel Width | 40 MHz |
| Dimension | 28.5mm x 33.5mm x 4.5mm |
| WLAN Tx Power Out | Up to +17dBm |
| BLE Tx Power Out | Class II (External PA) |
| 15.4 Tx Power Out | Up to 0dBm (External PA) |
| Power Supply | 3.3VDC, 1.8VDC (Optional) |
| Operating Temperature | -20℃ to 80℃ |
| Security | WLAN supports WPA/WPA2 personal and enterprise, WPS2.0<br>Secure boot, Secure Storage, HW crypto engine, HW ECC, 16-bit True RNG, Trusted Execution Environment |
| Antenna | Integrated WLAN + BT/15.4<br>MDX connector for external WLAN + BT/15.4 |

## Block Diagram

**SX-ULPGN-BTZ**

- 40Mhz XTAL
- SPI Flash 32Mb
- RESET
- GPIO
- PWM
- High Speed UART
- SPI
- JTAG
- USB
- I2C
- I2S
- 3.3VDC/V_BAT

QCA4020 SOC

BT → SP2T → Tx PA → SP2T → PCB Antenna
15.4 →
Tx Control
Rx
Switch Rx/Tx control lines simultaneously

MM8030-2610B SWG Type Connector

WLAN PA → 2.4GHx Tx → SP3T → PCB Antenna
5GHx Tx →
2.4GHz Rx ← Diplexer
5GHz Rx ←

MM8030-2610B SWG Type Connector

## Software Features

- Available on Qualcomm Developer Network (QDN)
- Full IDE environment
- Complete peripheral support and functionality.
- Wide range of example applications and demo code.
- Regulatory testing support

## EVK Features

- Evaluation base board for easy evaluation of the SX-ULPGN-BTZ module
- On-board FTDI2232 IC for 4-wire JTAG debugging
- Comprehensive set of headers, test-point for power measurement, direct connect to battery, boot-configuration, other measurements
- Reference design schematics and layout information available.
- Supports JTAG and USB factory programming interfaces.

## Ordering Information

| | |
|---|---|
| SX-ULPGN-BTZ-2000 | Bulk Ordering |
| SX-ULPGN-BTZ-2000 -SP | Sample Pack |
| SX-ULPGN-BTZ -EVK | EVK for SX-ULPGN-BTZ module |

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