SX-ULPGN
Hostless 802.11n Wi-Fi Internet-of-Things Platform

Optional External MCU Support with Silex UART AT Command Set

SX-ULPGN is a low power, cost effective 802.11b/g/n Internet-of-Things (IoT) platform based on the Qualcomm QCA4010 System-on-Chip (SoC). SX-ULPGN is a feature-rich intelligent Wi-Fi solution for IoT that integrates a full Wi-Fi stack, full networking/security stack, and embedded CPU and memory for on-chip application development. It includes an integrated RF front end and an internal PCB antenna.

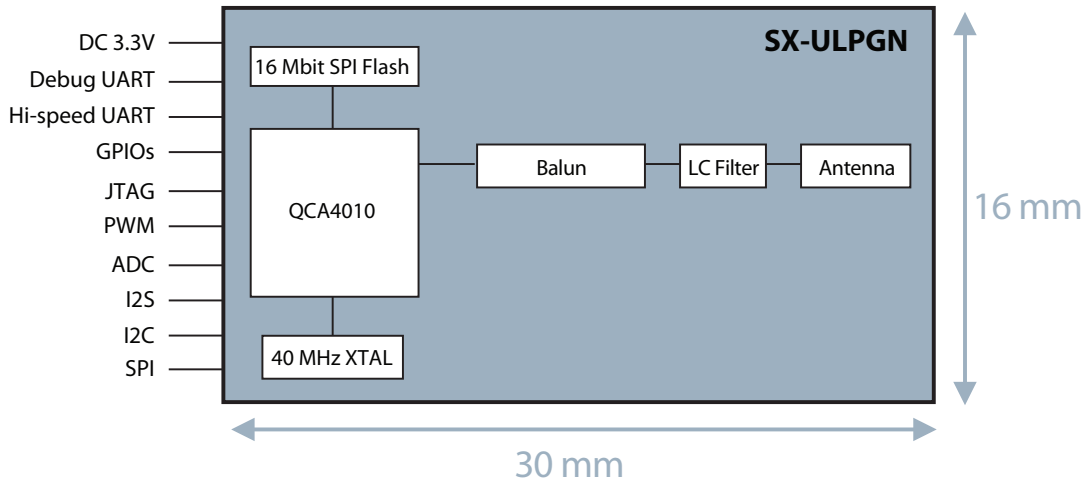
This module is ideally suited for embedded wireless IoT products including medical devices, remote control, appliances, home & factory automation, energy management, residential lighting, security, sensors, wearables, etc.

SX-ULPGN is an FCC/IC & CE certified module. In order to expedite your product development process, Silex can provide both hardware and software engineering services including custom application development, as well as turnkey product design and manufacturing.

Key Features

- Single stream (1x1) IEEE 802.11b/g/n conformity (2.4 GHz)
- Data rate up to 72.2 Mbps MCS7 HT20
- Tensilica Xtensa® 7 130 MHz CPU
- Up to 800 Kbytes of RAM available for application code
- Network and security: TCP/IP, IPv4/IPv6, HTTP, SSL/TLS
- UART, SPI, I2C, I2S, PWM, ADC, JTAG, and GPIO interfaces
- Internal 1.2V and 1.8V regulator and power management unit
- IEEE sleep, fast wake-up, low power Rx listen
- AllJoyn® Support
- Embedded ThreadX® Real-Time-Operating-System (RTOS)

Block Diagram



SX-ULPGN is based on the QCA4010 Reference Hardware & Software.
The Software and documentation is available on the Qualcomm Developer Network:
https://developer.qualcomm.com/hardware/qca4010

PN: 141-00211-100
REV C. 20161028

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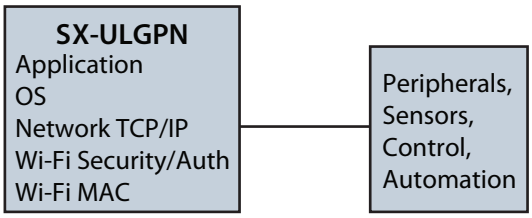
Hostless IoT System Use Case

Cost Effective Solution by Eliminating External Host

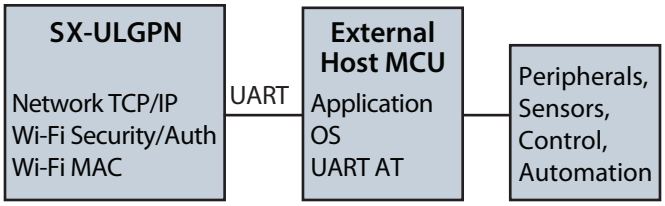
The SX-ULPGN's internal CPU can act as a host with the application running from the internal memory. Peripherals and sensors connect to the CPU using any of the available interfaces: UART, SPI, I2C, I2S, ADC, PWM, GPIO.



UART AT Command Use Case

Simplified Implementation by Using MCU UART AT Command Interface

SX-ULPGN can also provide Wi-Fi connectivity to an external host via the UART interface. It can offload the host MCU by performing network, security, and authentication.



Ordering Information

SX-ULPGN-2000	Bulk SKU
SX-ULPGN-2000-SP	Sample Pack
SX-ULPGN-EVK	Evaluation Kit

Specifications:

Product Name	SX-ULPGN / QCA4010
Interfaces	SPI Master x 1, Debug UART x 1, High Speed UART x 2, I2C master x 1, I2C Slave x 1, I2S x 1, PWM x 6, ADC x 4, JTAG x 1, GPIOs
Operating Voltage	3.3V +/- 10% I/O Supply Voltage
Frequency Range	802.11b/g/n: 2.412 – 2.472 GHz
Baseband Specification	CSMA/CA with ACK
Data Rates	802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: MCS 0 to 7
Modulation Techniques	802.11b: CCK, DQPSK, DBPSK 802.11g: 64QAM, 16QAM, QPSK, BPSK 802.11n: BPSK, QPSK, 16QAM, 64QAM
Network Operating Modes	Station, AP, Concurrent (MCC), Wi-Fi Direct
Operating Channels (2.4GHz)	11: (Ch. 1-11) – North America 13: (Ch. 1-13) – Europe
Transmit Output Power (Tolerance +/- 1.5 dBm)	802.11b: 17 dBm (US) 14 dBm (EU) (1-11Mbps) 802.11g: 17 dBm (US) 14 dBm (EU) (6 Mbps) 802.11g: 13 dBm (US, EU) (54 Mbps) 802.11n: 17 dBm (US) 14 dBm (EU) (MCS0, HT20) 802.11n: 15 dBm (US) 14 dBm (EU) (MCS4, HT20) 802.11n: 12 dBm (US) 12 dBm (EU) (MCS7, HT20)
Typical Receive Sensitivity	802.11b: -95 dBm (1 Mbps) 802.11g: -89 dBm (6 Mbps) 802.11n: -89 dBm (MCS0, HT20)
Current Consumption (Typical, 11ng, HT20) 3.3V	Rx: 76 mA (TCP downlink) Tx: 124 mA (TCP uplink) Standby: 13 uA (Suspend), 450 uA (DTIM3)
Security	WPA, WPA2, WPS, WEP 64/128
OS Supported	ThreadX® & Qualcomm AllJoyn® Platform
Temperature	Operating: 0 – +70 Degrees C (Ambient) Storage: -40 – +85 Degrees C (Ambient)
Relative Humidity	Operating: 5 – 90% (Non-condensing) Storage: 5 – 95% (Non-condensing)
Package	46 Pin Solder Down "stamp" Format

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