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
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.

SX-ULPGN / QCA4010

- 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: 802.11 b/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)
- 802.11n: 13 dBm (US) (54 Mbps)
- 802.11n: 17 dBm (US) 14 dBm (EU) (MC50, HT20)
- 802.11n: 15 dBm (US) 14 dBm (EU) (MC54, HT20)
- 802.11n: 12 dBm (US) 12 dBm (EU) (MC57, HT20)
- Typical Receive Sensitivity:
- 802.11b: -95 dBm (1 Mbps)
- 802.11g: -89 dBm (6 Mbps)
- 802.11n: -89 dBm (MC50, 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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