

SX-ULPGN-DB

Hostless 802.11a/b/g/n Dual Band Wi-Fi Internet-of-Things Platform



Optional External MCU Support with Silex UART AT Command Set

SX-ULPGN-DB is a low power, cost effective 802.11a/b/g/n Dual-Band Internet-of-Things (IoT) platform based on the Qualcomm QCA4012 System-on-Chip (SoC). SX-ULPGN-DB 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.

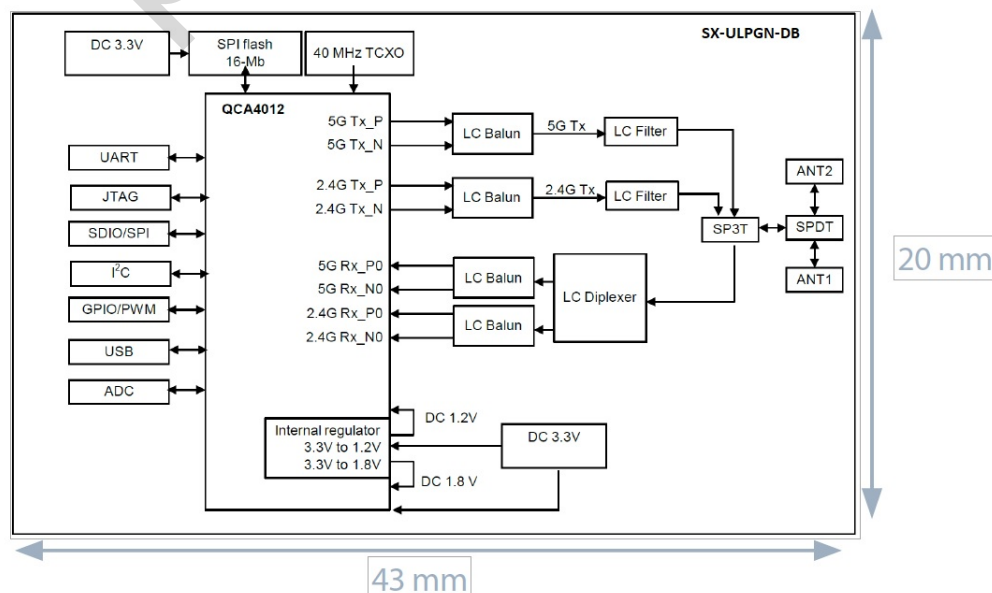
This module is ideally suited for embedded wireless IoT products including medical devices, remote control, appliances, home & factory automation, energy management, residential lighting, security, sensors, wearables, etc.

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 802.11a/b/g/n conformity (2.4GHz, 5GHz)
- 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®, Apple HomeKit, Google Weave, and Amazon AWS IoT Support (Coming Soon)
- Embedded ThreadX® Real-Time-Operating-System (RTOS)

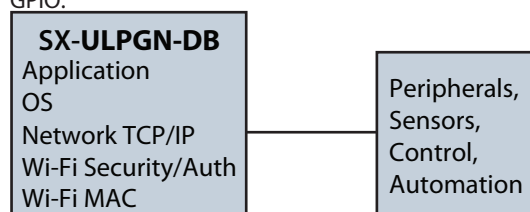
Block Diagram



Hostless IoT System Use Case

Cost Effective Solution by Eliminating External Host

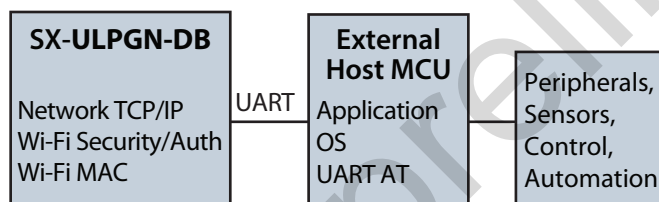
The SX-ULPGN-DB's internal CPU can act as a host with the application running from the internal memory. Peripherals and sensors connect to the CPU using any of the available interfaces: UART, SPI, I2C, I2S, ADC, PWM, GPIO.



UART AT Command Use Case

Simplified Implementation by Using MCU UART AT Command Interface

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

SX-ULPGN-DB is based on the QCA4012 Reference Hardware & Software. The Software and documentation is available on the Qualcomm Developer Network: <https://developer.qualcomm.com/hardware/qca4010-12>

Specifications:

Product Name	SX-ULPGN-DB / QCA4012
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	802.11a/b/g/n: 2.412–2.472GHz, 5.18–5.825GHz
Baseband Specification	CSMA/CA with ACK
Data Rates	802.11b: 11, 5.5, 2, 1 Mbps 802.11a/g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: MCS 0 to 7 HT20 and HT40
Modulation Techniques	802.11b: CCK, DQPSK, DBPSK 802.11a/g: 64QAM, 16QAM, QPSK, BPSK 802.11n: BPSK, QPSK, 16QAM, 64QAM
Network Operating Modes	Station, AP, Concurrent (MCC), Wi-Fi Direct
Operating Channels	Channels 1-11 (2.4GHz) Channels 36 - 165 (5GHz)
Transmit Output Power (Tolerance +/- 1.5 dBm)	802.11b: 17 dBm (2.4GHz) (1 Mbps) 802.11g: 17 dBm (2.4GHz) (6 Mbps) 802.11g: 12 dBm (2.4GHz) (54 Mbps) 802.11n: 16 dBm (2.4GHz) (MCS0, HT20) 802.11n: 12 dBm (2.4GHz) (MCS7, HT20) 802.11a: 14 dBm (5GHz) (6 Mbps) 802.11a: 7 dBm (5GHz) (54 Mbps) 802.11n: 13 dBm (5GHz) (MCS0, HT20) 802.11n: 6 dBm (5GHz) (MCS7, HT20)
Typical Receive Sensitivity	802.11b: -96 dBm (1Mbps) 802.11g: -92 dBm (6 Mbps) 802.11n: -92 dBm (MCS0, HT20) (2.4GHz) 802.11n: -72 dBm (MCS7, HT20) (2.4GHz) 802.11a: -90 dBm (6Mbps) (5GHz) 802.11a: -73 dBm (54Mbps) (5GHz) 802.11n: -90 dBm (MCS0, HT20) (5GHz) 802.11n: -70 dBm (MCS7, HT20) (5GHz)
Current Consumption (Typical, 11ng, HT20) 3.3V	Rx: 80 mA (TCP downlink) Tx: 147 mA (TCP uplink) Standby: 13 uA (Suspend), 504 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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