SILICON LABS Amazon Sidewalk Hardware Selector User Guide

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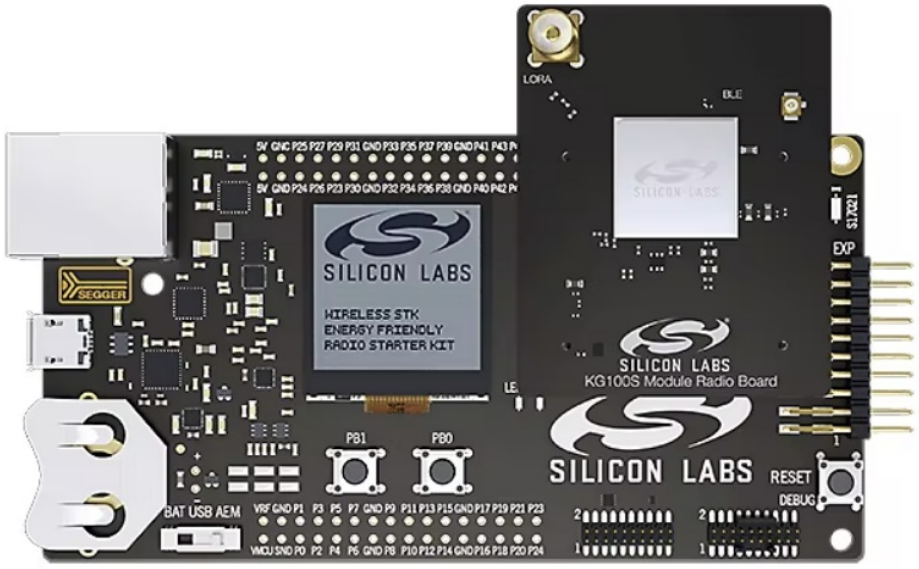


Product Information

Amazon Sidewalk is a low-bandwidth wireless network that allows Bridge device owners to share internet bandwidth to provide wireless connectivity services to compatible devices within range. It supports various RF protocols and connects to the cloud using AWS IoT Core, enabling extended connectivity and new possibilities for IoT applications.

Specifications

- **Wireless Network:** Amazon Sidewalk
- **RF Protocols Supported:** Bluetooth Low Energy (LE), FSK, CSS
- **Cloud Connection:** AWS IoT Core
- **Security Solution:** Secure Vault

Product Usage Instructions

How Amazon Sidewalk Works

Amazon Sidewalk is comprised of nearby Bridge devices that expand the network range by sharing internet bandwidth. Bridge owners can opt-in to provide connectivity services to compatible devices, such as smart home devices, location trackers, and more. Each participating Bridge device enhances the network coverage.

Amazon Sidewalk Architecture

The architecture includes radio, network, and application layers, supporting Bluetooth LE, FSK, and CSS protocols. All devices must connect to AWS IoT Core. Amazon Sidewalk offers convenience to end-users and opens up new opportunities for device manufacturers.

Why Choose Silicon Labs

Silicon Labs provides a comprehensive wireless development solution for Amazon Sidewalk devices, including SDK, hardware, security features, and development tools. Their platform simplifies development processes, reduces costs, and accelerates time to market for IoT devices.

Silicon Labs Portfolio for Amazon Sidewalk Development

- **Hardware:** Wireless development solutions
- **Software:** SDK and development tools

- **Studio & GitHub:** Integrated tools for development
- **Security:** Secure Vault for advanced IoT security
- **Developer Journey:** Support from concept to launch

Wireless Hardware for Amazon Sidewalk

- **Performance:** Enhance product quality and user experience
- **Security:** Advanced IoT security with Secure Vault
- **Battery Life:** Extended battery life for better user experience

FAQs

What devices are compatible with Amazon Sidewalk?

Amazon Sidewalk-enabled devices include smart home devices, location trackers, environmental sensors, and more.

How does Amazon Sidewalk benefit IoT applications?

Amazon Sidewalk extends connectivity beyond the front door, offering convenience to end-users and enabling new possibilities for device manufacturers.

Why should I choose Silicon Labs for my Amazon Sidewalk device?

Silicon Labs provides a complete wireless development solution that simplifies the development process, reduces costs, and accelerates time to market for Amazon Sidewalk devices.

What is Amazon Sidewalk

Amazon Sidewalk is a shared wireless network that uses Amazon Sidewalk bridges, such as compatible Amazon Echo and Ring devices, to enable communication among devices on the network. Amazon Sidewalk enables reliable, low-bandwidth, and long-range connectivity at home and beyond. It connects **IoT devices** and applications such as outdoor lights, motion sensors, and location-based devices. It uses Bluetooth Low Energy for short-distance communication and FSK and CSS radio protocols at 900 MHz frequencies to cover longer distances.

How Does Amazon Sidewalk Work

- Amazon Sidewalk is a low-bandwidth wireless network comprised of nearby Bridge devices. Amazon Sidewalk Bridge device owners can opt-in to share a small portion of their internet bandwidth to provide wireless connectivity services to compatible devices within the range of Amazon Sidewalk. Each participating Bridge

device expands the range of the network.

- Amazon Sidewalk-enabled devices include smart home devices for sensing and control, for example, water leak detectors and irrigation control. They can also be used for location tracking, parks, management, environmental management, airports, and more.

Amazon Sidewalk Architecture

- Amazon Sidewalk is built on an architecture comprising a radio, network, and application layers. It supports 3 different RF protocols. For Bluetooth Low Energy (LE), the Amazon Sidewalk application layer sits on top of the Bluetooth LE stack, while
  for FSK and CSS, it also provides a network layer. All Amazon Sidewalk devices must connect to the cloud using AWS IoT Core for Amazon Sidewalk.
- Unlike many IoT technologies based on a single gateway, Amazon Sidewalk is based on a single distributed network architecture of nearby bridges. Having more Amazon Sidewalk bridges in an area can increase the effectiveness of the network. When the infrastructure expands, the bridges form a distributed network allowing devices to connect and send data to any Bridge in range instead of being limited to one specific bridge. Amazon Sidewalk Bridges will pick up the message from the compatible device and route it through the AWS cloud to the user with multiple layers of security.

In addition to extending connectivity beyond the front door, Amazon Sidewalk can be used by IoT applications to deliver end-users convenience while opening up new possibilities for device manufacturers.

- **Bluetooth Low Energy – In-Home and Connect Device-to-phone Connectivity**
  Bluetooth Low Energy radio PHY can be used for Amazon Sidewalk applications in the home with short-range connectivity for devices such as location-based devices and connect a device to a smartphone with Amazon Sidewalk coverage.

- **Sub-GHz GFSK – In-Home and Beyond Front Door**
  GFSK radio PHY can cover up to one-acre lot and can address applications that need to cover detached buildings and yards such as pools, spa, and water mitigation. GFSK can even support **smart city** and neighborhood applications with Amazon Sidewalk coverage.

- **Sub-GHz CSS – In-Home and Beyond the Fence**
  The CSS (Chirp Spread Spectrum) radio PHY can reach several miles to support applications where devices are far from the nearest Bridge – these can include smart neighborhoods, universities, and agriculture with Amazon Sidewalk coverage.

Why Choose Silicon Labs for Your Amazon Sidewalk Device

Silicon Labs provides IoT device makers with the most complete, one-stop-shop, wireless development solution for **Amazon Sidewalk**, simplifying your development process, reducing costs, and accelerating time to revenue for Amazon Sidewalk devices. The certified solution comprises the Amazon Sidewalk SDK, wireless hardware, security, and development kits and tools. Silicon Labs works with leading device makers that make it easy to build a device for Amazon Sidewalk through fully integrated tools and services. They drive the full developer journey from concept to launch and continuously innovate with Amazon for long-term success via hardware and software roadmaps:

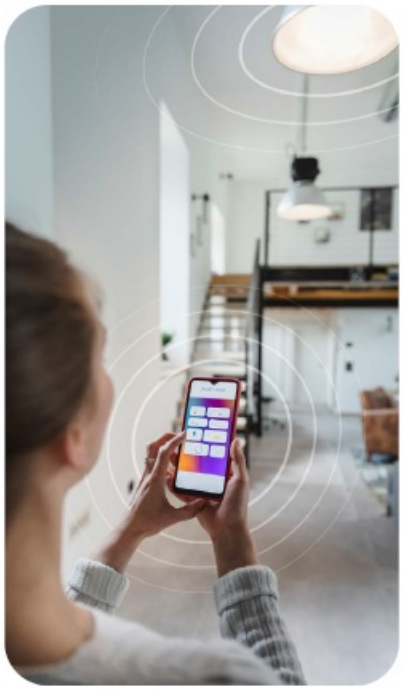
How Silicon Labs Portfolio is Ideal for Amazon Sidewalk Development

- **Hardware**
  - Broad Portfolio
  - Bluetooth LE, Sub-GHz FSK, and CSS
  - Dual-Band SoCs (Bluetooth LE and Sub-GHz FSK)
  - Superior RF Performance
- **Software**
  - Full SDK
  - Pre-certified
  - Available through Simplicity Studio & GitHub
- **Security**
  - Secure Vault High
  - Amazon-compliant Security
  - PSA Level 3 and TrustZone
  - Secure Programming (CPMS)
- **Developer Journey**
  - End-to-end Amazon Sidewalk **Developer Journey**
  - AWS Pre-registered Kits
  - Community Support

Wireless Hardware for Amazon Sidewalk

- **Performance**

  Improve overall product quality, enhance user experience, reduce warranty returns, and minimize support costs through reliable wireless connectivity in every room of the house (and beyond)



- **Battery Life**

  Score better on product reviews and enhance user experience with extended battery life and reduced

recharging intervals on your devices

- **Security**
  Stay protected with the industry’s most advanced IoT security solution, Secure Vault, which is fully compliant with the Matter specification

- **Costs & Simplicity**
  Simplify product designs, reduce BoM costs, and improve your profits using Silicon Labs Matter solutions based on single-chip SoCs and modules

Sidewalk SoCs and Modules Lineup

- Bluetooth LE 2.4GHz + MCU
- +20 dBm TX
- Secure Vault High
- Line Powered Devices

- Bluetooth LE 2.4GHz + MCU
- +19.5 dBm
- Secure Vault High
- AI/ML Accelerator
- Battery Powered Devices

- FSK Sub-GHz + MCU
- +20 dBm output power
- Secure Vault High
- Battery Powered Devices

- Dual-Band SoC with MCU
- FSK Sub-GHz + Bluetooth LE 2.4 GHz
- 1+ mile for Sub-GHz FSK
- Secure Vault High
- Battery Powered Devices

- Bluetooth LE/FSK/CSS PCB Module
- Includes BG21 + SX126x
- Provides longest range with CSS

SG28

PRO-KITS

xG28-PK6024A (+14 dBm)
xG28-PK6025A (+20 dBm)

- Modular development platform
- Dual-Band support
- Advanced development
- RF measurements
- Energy profiling
- External device debug
- Ethernet for large network test
    1. 1x Mainboard
    2. 1x Radio board
    3. 1x 915 MHz antenna
    4. 1x Mini-simplicity cable
    5. 1x AA battery holder

EXPLORER KIT

xG28-EK2705A

- On board debugger
- Dual-Band support
- Qwiic connector
    1. 1x Explorer board

RADIO BOARDS

xG28-RB4400C (+14 dBm)
xG28-RB4401C (+20 dBm)

- Uses existing WSTK boards
- Dual-Band support
- Uses existing software tools
    1. 1x Radio board
    2. 1x 915 MHz antenna

SG23

PRO-KITS

xG23 868 (+14 dBm)
xG23 868 (+20 dBm)

- Modular development platform
- Advanced development
- RF measurements
- Energy profiling
- External device debug
- Ethernet for large network test
    1. 1x Mainboard
    2. 1x Radio board
    3. 1x 915 MHz antenna
    4. 1x Mini-simplicity cable
    5. 1x AA battery holder

EXPLORER KIT

FG23 868-915 MHz (+14 dBm)

- On-board debugger
- Signal breakouts
- On-board segment LC
    1. 1x Dev board
    2. 1x 915 MHz antenna

RADIO BOARDS

xG23 868-915 MHz (+20 dBm)
FG23 433 MHz (+10 dBm)

- Uses existing WSTK boards
- Uses existing software tools
    1. 1x Radio board
    2. 1x 915 MHz antenna

BG24

PRO-KITS

xG24-PK6010A(+20 dBm)

- Modular development platform
- Advanced development
- RF measurements
- Energy profiling
- External device debug
- Ethernet for large network test
    1. 1x Mainboard
    2. 1x Radio board
    3. 1x Mini-simplicity cable
    4. 1x AA battery holder

EXPLORER KIT

xG24-EK2703A

- mikroBus socket
- Qwiic connector
    1. 1x Explorer board

RADIO BOARDS

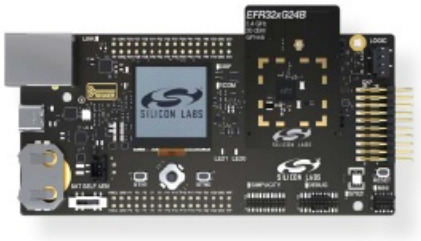
xG24-RB4187C(+20 dBm)

- Uses existing WSTK boards

- Uses existing software tools
    1. 1x Radio board

BG21

PRO-KITS



xG21-PK6027A(+20 dBm)

- Modular development platform
- Advanced development
- RF measurements
- Energy profiling
- External device debug
- Ethernet for large network test
    1. 1x Mainboard
    2. 1x Radio board
    3. 1x Mini-simplicity cable
    4. 1x AA battery holder

KG100S FSK & CSS Sub-GHz+ Bluetooth LE 2.4 GHz Kits

KG100S-PK6130A

- 1x Mainboard
- 1x KG100S Radio board
- 1x BG24 Radio board (BLE Only)
- 1x SX1262 Adapter board
- 1x 915 MHz antenna
- Pre-flashed with OOB Demo and pre-registered with AWS

KG100S-RB4332A

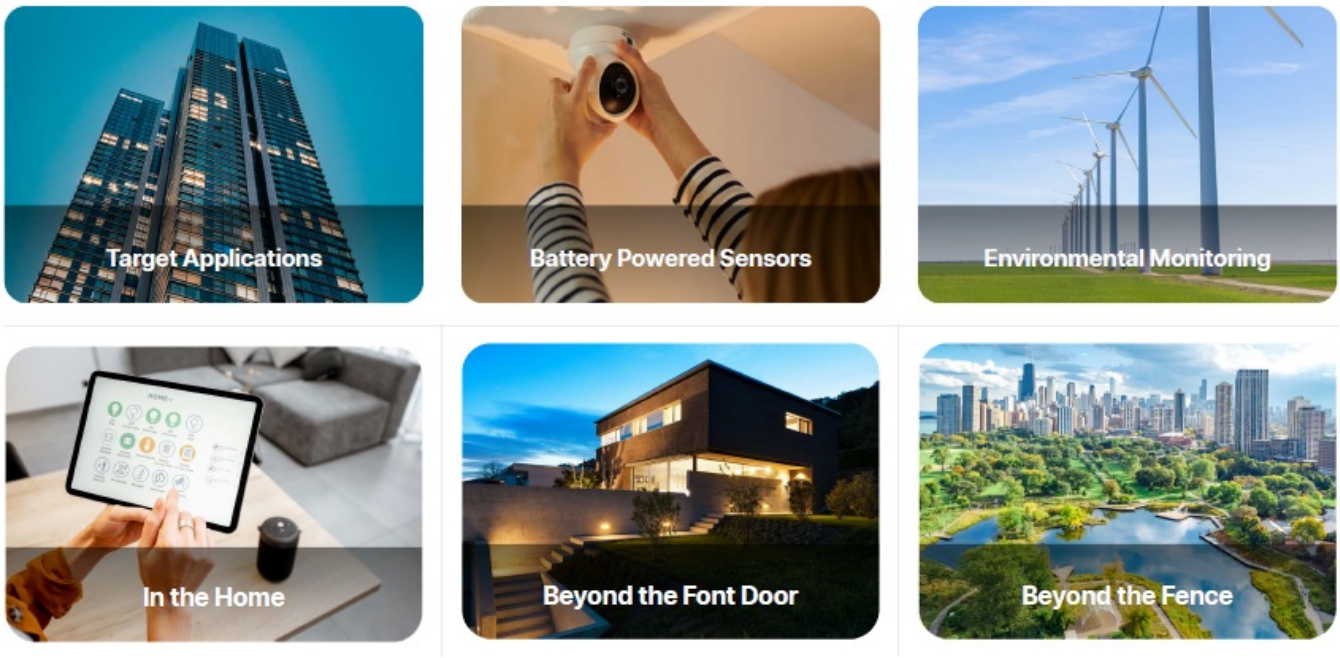
- 1x KG100S Radio board
- 1x 915 MHz Antenna

Product Comparison

				
Core	Cortex-M33 (80 MHz) Cortex-M0+ (Security)	Cortex-M33 (78 MHz) Cortex-M0+ (Radio) Cortex-M0+ (Security)	Cortex-M33(78 MHz)	Cortex-M33(78 MHz)
Max Flash	1024 kB	1536 kB	512 kB	1024kB
Max RAM	96 kB	256 kB	64 kB	256kB
Security	Secure Vault High	Secure Vault High	Secure Vault High	Secure Vault High
Rx Sensitivity (BLE 1Mbps)	-97.5 dBm	-97.6 dBm	NA	-95.6 dBm
Rx Sensitivity (50 kbps, 915 MHz 2GFSK)	NA	NA	-109.5 dBm	-108.6 dBM
Active Current	63.8 µA/MHz	33.4 µA/MHz	26 µA/MHz	33 µA/MHz
Max TX Power	+20 dBm	+19.5 dBm	+20 dBm	+20 dBm
Sleep Current (EM 2, 16 kB ret)	4.5 µA	1.3 µA	1.5 µA (64 kB)	1.3 µA (16kB)
TX Current @ +0 dBm (2.4 GHz)	9.9 mA	4.8 mA	NA	12.3 mA

TX Current @ +20 dBm (915 MHz)	NA	NA	85.5 mA	81.8 mA
RX Current (BLE 1 Mbps)	8.8 mA	4.2 mA	NA	5.2 mA
Serial Peripherals	USART, I2C, I2S,UART	USART, I2C,I2S, UART	USART, EUSART, I2C, I2S,UART	USART, EUSART, I2C, I2S, UART
Analog Peripherals	12-bit ADC, ACMP	20-bit ADC, ACMP, VDAC	16-bit ADC, ACMP, VDAC	16-bit ADC, ACMP, VDAC
Other	Die Temp Sensor	Die Temp Sensor, PLFRCO	Temp Sensor, LESENSE	LESENSE, Temp Sensor
Operating Voltage	1.71 V to 3.8 V	1.71 V to 3.8 V	1.71 V to 3.8 V	1.71 V to 3.8 V
Package GPIO	4×4 QFN32 GPIO 20	5×5 QFN40 GPIO 28 6×6 QFN48 GPIO 32 3.1×3.0 CSP GPIO 20	5×5 QFN40 GPIO 23	6×6 QFN48 GPIO 31 8×8 QFN68 GPIO 49

Amazon Sidewalk Applications



Bluetooth LE

- Tracking
- Theft Prevention
- Access Control
- Home Automation

Sub-GHz FSK

- Outdoor Lighting
- Water Mitigation and Control
- Energy Conservation
- Appliance Predictive Maintenance

Sub-GHz FSK and CSS

- Park Management
- Environmental Management
- Building and Campus Management
- Airports

About Silicon Labs
Silicon Labs is the leading provider of silicon, software, and solutions for a smarter, more connected world. Our industry-leading wireless solutions feature a high level of functional integration. Multiple complex mixed-signal functions are integrated into a single IC or system-on-chip (SoC) device, saving valued space, minimizing overall power consumption requirements, and improving products' reliability. We are the trusted partner for the leading consumer and industrial brands. Our customers develop solutions for a wide range of applications, from medical devices to smart lighting to building automation, and much more.

Documents / Resources

	SILICON LABS Amazon Sidewalk Hardware Selector [pdf] User Guide Amazon Sidewalk Hardware Selector, Amazon Sidewalk, Hardware Selector, Selector

References

- User Manual