SILICON LABS | amazon sidewalk

Amazon Sidewalk Hardware Selector Guide

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 of 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 an 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 pool, 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 makes 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 innovates with Amazon for long term success via hardware and software roadmaps:

Complete Solution – One-stop-shop

- Increase efficiency with a single wireless partner

High Compute Platforms

- Cortex® M33 with large Flash and RAM options
- Rich peripherals and options for higher number of GPIOs

Better Protection from Cyber Threats

- Full Compliance with Amazon security requirements

Broad Hardware Portfolio

- SG28 Dual-Band SoC: Bluetooth LE and Sub-GHz FSK
- SG23 SoC: Streamlined FSK
- BG21 and BG24: High-performance Bluetooth LE

Superior RF Performance

- Up to 1-mile range on SG28 and SG23

Ultra-low-power – Maximum Battery Life

- Longer battery replacement or recharging interval

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

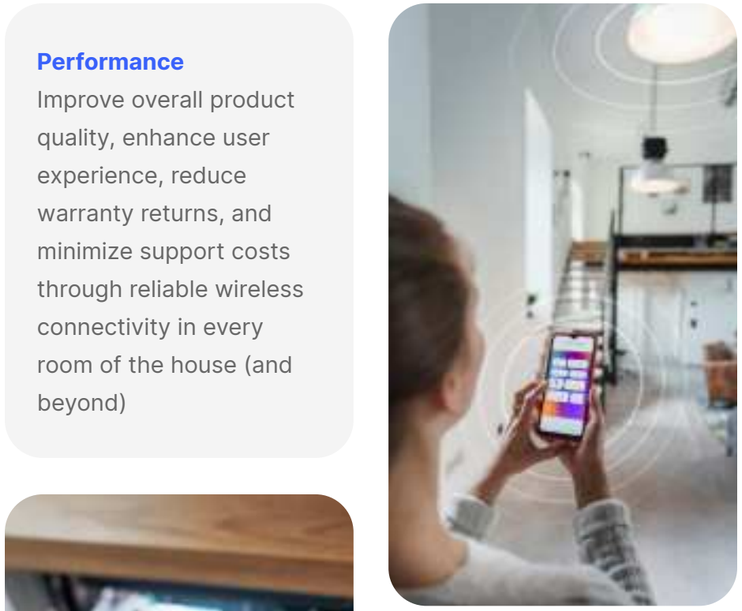
- Secure Vault High
- Amazon-compliant Security
- PSA Level 3 and TrustZone
- Secure Programming (CPMS)

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. 1× 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

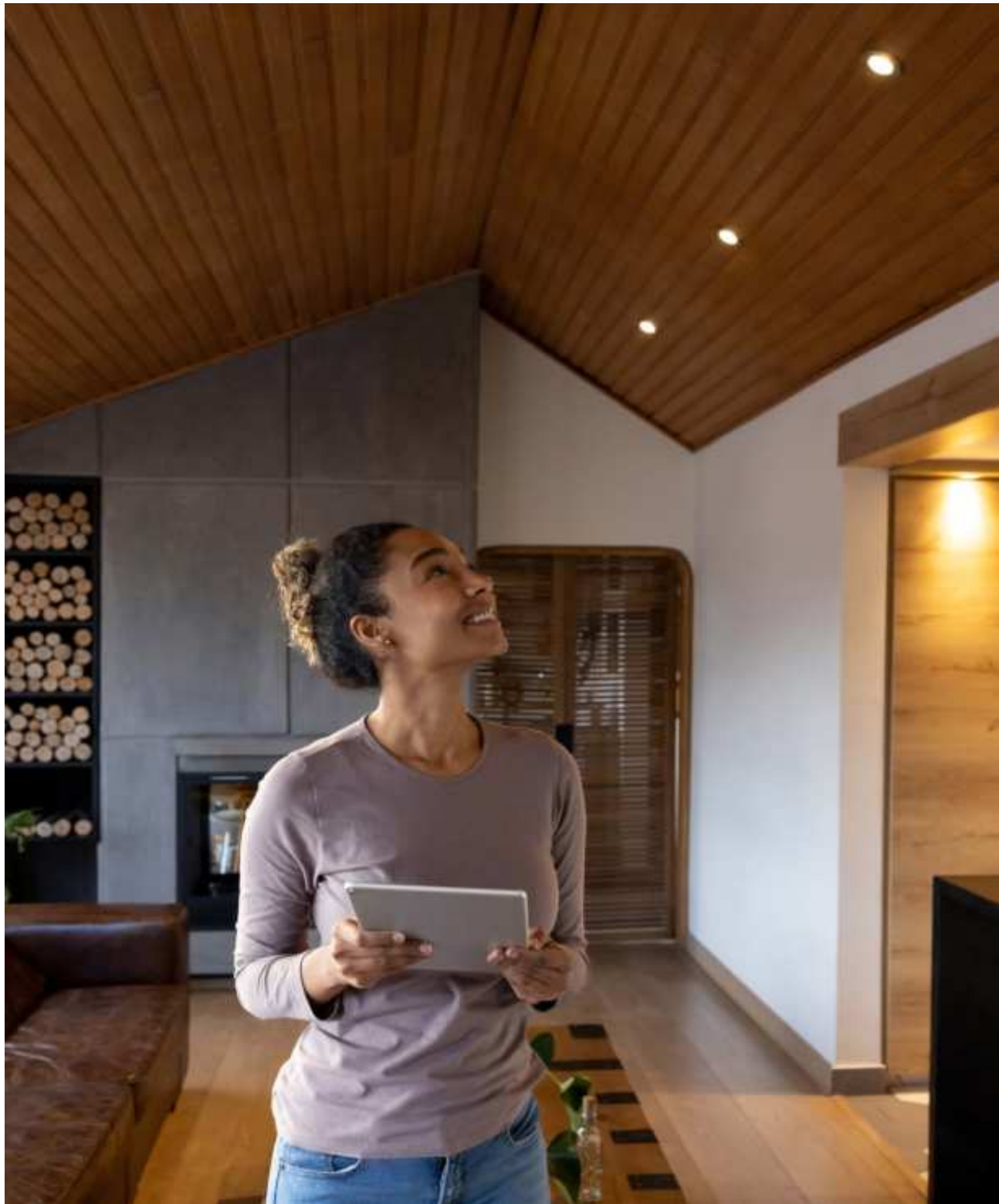
KG100S FSK & CSS Sub-GHz+ Bluetooth LE 2.4 GHz Kits

KG100S-PK6130A

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

KG100S-RB4332A

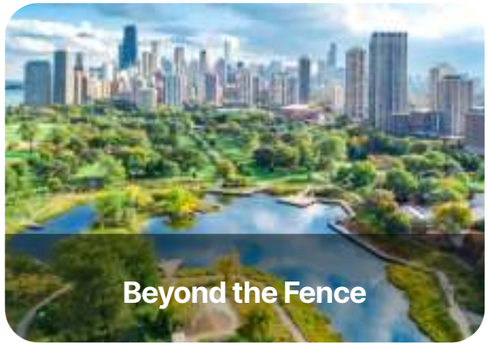
- 1x KG100S Radio board
- 1× 915 MHz Antenna



Product Comparison

				
	BG21	BG24	SG23	SG28
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 (EM2, 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.