**Product Q&A**

**SiWx917**

**What is the SiWx917 and why is it important?**

* We are pre-announcing the availability of SiWx917 Wireless SoCs for ultra-low power IoT Devices. The SiWx917 is optimized for IoT market and includes Wi-Fi®, Bluetooth Low Energy (LE) and Matter support. The product is our first Wi-Fi 6 SoC, that includes Wi-Fi 6 + BLE 5.1, a dual core architecture with a ThreadArch® core for wireless and a Cortex® Arm®-M4 processor with FPU MCU for customer applications.
* The SiWx917 is a pivot point in the Silicon Labs portfolio, as, due to its dual core architecture, it will now allow customers to design complete end-to-end Wi-Fi + Bluetooth LE products without the need for an external microcontroller. The additional advantages brought by this new product are as follows:
	+ Through its support of Wi-Fi 6 features like OFDMA, DL/UL MU-MIMO, BSS Coloring beamforming and long guard intervals, the SiWx917 will offer better radio performance. This will allow it to provide better throughput and range to customer applications and will allow for more end devices to be supported by an access point, thus allowing for denser deployments.
	+ With its support for Target Wake Time (TWT), in addition to other power save features, it will be able to provide ultra-low power consumption even in congested environments, enabling long battery life for battery based IoT designs.
* The SiWx917 further cements the advantages provided by our RS9116 IoT Wi-Fi family by providing a chipset that offers the following advantages compared to the previous generation:
	+ Dual core architecture, offering a single chip solution with an applications core where customer software can run
	+ Wi-Fi 6 support
	+ Ultra low power consumption in congested environments
	+ Higher levels of security (PSA-L2 certifiable security engine)
	+ Machine Learning/Artificial Intelligence capability
* Due to the above features, the SiWx917 will allow the development of more integrated, lower current consumption for longer battery life, easier to develop, future proof IoT products.
* The SiWx917 provides Wi-Fi 6 and Bluetooth technologies with Matter over Wi-Fi support.

**What are the target markets and applications for these devices?**

The following are applications for which the SiWx917 is ideally suited:

* Home automation – Smart locks, security cameras, video doorbells, wireless sensors, thermostats, smoke detectors, wireless switches, remote controls
* Wearables – wearable cameras, tracking badges, smart clothing, medical patches and other monitoring devices
* Industrial and Commercial – POS terminals, portable printers, asset tags, vehicle diagnostics, wireless sensors, weighing scales
* Other applications – Pet trackers, lawn mowers, robotic vacuum cleaners, wireless toothbrushes, dental imaging, baby monitors

**How do these products change the market and what do they make possible?**

* SiWx917 is the right part for matter over Wi-Fi - Resources, RF performance, low power, security, and integrated Wi-Fi 6 + Bluetooth LE security makes it ideal for such applications
* SiWx917 is the right part for integrated battery power IoT devices, as its combination of the following makes it ideal for devices such as sensors, wearables, wireless cameras, smart locks, etc.
	+ Dual core architecture allowing for customer application code to run without the need for an external MCU.
	+ Integrated Wi-Fi + Bluetooth LE solution allows for provisioning as well as integration to Wi-Fi and Bluetooth LE devices simultaneously.
	+ Ultra-low power performance allows for long battery lifetime.
* Security - PSA level 2 certifiable, the highest level available in the market today for Wi-Fi devices
* AI/ML at the very edge
* Analog: SiWx917 will also provide the following analog capabilities allowing for a complete integrated solution:
	+ 8-input channel capacitive touch support
	+ 12 bit 5 msps ADC
	+ 10-bit single ended DAC
	+ 3 general purpose OPAMPs
	+ Analog comparators
	+ Temperature sensor
	+ IR decoder

**What are the AI/ML capabilities of the SiWx917?**

* Developers can achieve ~ 4 times faster inferencing comparing it to a non-accelerated ARM core. This is achieved by using less cycles to do the same operation and therefore it uses less power.

**What protocols are supported by the SiWx917?**

* 802.11b/g/n/ax Wi-Fi, Bluetooth LE 5.1, Matter, TCP, UDP, HTTP/HTTPS, SSL.TLS, MQTT to name a few

**What are the integrated features of SiWx917 and how does it reduce system cost?**

* The device has integrated features that are often found on separate or dedicated ICs
	+ Fully integrated Wi-Fi 6 plus Bluetooth LE 5.1 solution
	+ Dual core architecture allows customers to have a complete single chip IoT solution without the need for an external MCU to run application code
	+ AI/ML Hardware Accelerator
	+ PSA L2 certifiable security (dedicated security core eliminates the need for a separate Secure Element IC)
	+ 46 GPIOs provide input output options for typical IoT applications
	+ 12-bit ADC (eliminates the need for a dedicated external ADC)
	+ Up to 21 dBm with the integrated PA and LNA (eliminates the need for a dedicated FEM (Front End Module)

**Are these products pin compatible with previous generations?**

* While SiWx917 is footprint compatible but not completely pin compatible with RS9116 as there are some minor differences (GPIOs and others) between the two. If USB interface is not to be used, it is possible to be pin compatible with SiWx917

**How does the SiWx917 fit Matter?**

* SiWx917 provides two cores with one of the two being a Arm® Cortex®-M4 applications core that can execute matter and customer code. Matter code will be provided as part of the SiWx917 SoC SDK.

To learn more about the SiWx917, check out the blog [here](https://www.silabs.com/blog/wi-fi-6-addressing-the-greater-density-of-wi-fi-iot-devices).

**Silicon Labs Pro Kit for Amazon Sidewalk**

**What is the Silicon Labs Pro Kit for Amazon Sidewalk?**

* The Silicon Labs Pro Kit for Amazon Sidewalk comprises low-power, high-performance wireless hardware for all Amazon Sidewalk protocols, including Bluetooth Low Energy (LE) and sub-GHz (FSK and CSS), software SDKs, and security. The Pro Kit comes with a pre-flashed software image and AWS pre-registration, providing developers with a quick start to Amazon Sidewalk development, saving them days in setup. Simplicity Studio, the integrated development environment (IDE) for all Silicon Labs technologies, guides developers through the entire Amazon Sidewalk development journey from start to certifying finalized code into a guided, end-to-end process, maximizing innovation and working efficiency. By working together with Silicon Labs, Amazon is better able to scale their Amazon Sidewalk development from concept to launch, saving time and resources for IoT device makers.

**Why is Silicon Labs supporting Amazon Sidewalk?**

* Silicon Labs views Amazon Sidewalk as an exciting new IoT solution that will enable new Long Range IoT applications inside and outside of the home
* Silicon Labs is engaging early with Amazon to continue our track record as a leader in ecosystem development
* There is a strong harmony between Silicon Labs technology and the Amazon Sidewalk project

**Is Amazon Sidewalk active and in full development?**

* Amazon and Silicon Labs are working toward working examples on EFR32 hardware before end of year 2022
* Alpha versions of working examples can be shared with Silicon Labs employees, as well as – with approval from Home & Life BU Ecosystems team – select alpha customers
* Amazon has already turned on the Amazon Sidewalk network that will be launched for device makers in Q1 2023

**Does Amazon Sidewalk use a lot of bandwidth?**

* The maximum bandwidth of an Amazon Sidewalk Bridge to the Amazon Sidewalk server is 80Kbps, which is about 1/40th of the bandwidth used to stream a typical high-definition video
* Today, total monthly data used by Amazon Sidewalk enabled devices, per customer, is capped at 500MB, which is equivalent to streaming about 10 minutes of high-definition video

**Is Amazon Sidewalk a replacement for a home Wi-Fi network?**

* No. Amazon Sidewalk Bridges require Wi-Fi® access for normal operation. When Amazon Sidewalk is on, your Bridge can share a low bandwidth connection with Amazon Sidewalk-enabled devices, like sensors and smart lights that are installed in locations around and outside your home where Wi-Fi may not be available. Amazon Sidewalk does not support high-bandwidth connections like a Wi-Fi or cellular network would, so you would still use those connections for streaming movies, posting on social media, or sending email.

**How does Amazon Sidewalk protect customer information?**

* Preserving customer privacy and security is foundational to Amazon Sidewalk.
* Amazon Sidewalk is designed with multiple layers of privacy and security to secure data travelling on the network and to keep customers safe and in control.
* Amazon Sidewalk has three layers of encryption to secure data travelling on the network.
* Amazon requires third-party applications to certify devices (endpoints) to ensure the same encryption standards and to prevent unauthorized access to the contents of packets.
* The routing information that Amazon receives for operating the network components of Amazon Sidewalk is automatically cleared every 24 hours.
* Amazon Sidewalk is designed to prevent customers with Amazon Sidewalk Bridges from viewing the data from their other customer’s endpoints (and vice versa).
* Amazon uses one-way hashing keys, cryptographic algorithms, and rotating device IDs to dissociate data tied to their customers.

**Will data be encrypted?**

* Packets on the Amazon Sidewalk network have three layers of encryption to ensure data is visible only to the intended recipients.
* Amazon will not be able to interpret the contents of commands or messages sent through Sidewalk by third party services or endpoints (applications).
	+ The Amazon Sidewalk Application Layer enables secure and private communication between the endpoint and the Application Server.
	+ The Amazon Sidewalk Network Layer protects the endpoint’s Amazon Sidewalk packet over the air. Plain-text data in this layer is accessible only to the endpoint and the Amazon Sidewalk Network Server (SNS).
	+ The Flex Layer, which is added by the Amazon Sidewalk Gateway (GW), provides the SNS with a trusted reference of message-received time and adds an additional layer of packet confidentiality. Plaintext data in this layer is accessible only to the GW and the SNS

 To learn more about the Silicon Labs Pro Kit for Amazon Sidewalk, read the blog [here](https://www.silabs.com/blog/new-solution-from-silicon-labs-streamlines-the-amazon-sidewalk-developer-journey).

**EFR32FG25 and EFF01**

**What new products announced at Works With?**

* EFR32FG25 Wireless SoC: The EFR32FG25 is an ideal SoC for sub-GHz Wi-SUN applications for metering, lighting, distribution automation, smart cities, and industrial automation. The high-performance sub-GHz radio provides long range and is not susceptible to 2.4 GHz interference from technologies such as Wi-Fi®. The single chip, multi-core solution, provides industry leading security, high throughput, and an integrated power amplifier to enable the next level of secure connectivity for IoT devices.
* EFF01x: 800/900 MHz Transmit/Receive Front-End Module (FEM): EFF01 is a highly integrated Sub-GHz FEM designed to maximize the range of Sub-GHz networks. The EFF01 is a high-performance, transmit/receive (T/R) front-end module (FEM) optimized for 800/900 MHz EFR32FG25 devices. The device provides a complete T/R chain with T/R switches. The device transmit chain features +30 dBm output power and a switched 14-dB attenuator to extend the dynamic range of the device. The device receive chain features a low-noise amplifier (LNA) with a 1.9 dB noise figure (NF), a voltage peak detector to determine presence of blockers and a LNA position that can be selected to be either before or after the external filter to optimize system NF in the absence of blockers.
	+ The device also includes integrated temperature, voltage and level sensors which combined with a software closed-loop power control algorithm, minimize variation in transmit output power and increase the network’s reliable range. The device also has a shutdown mode, PA bypass mode, and LNA bypass mode to minimize power consumption. EFF01 is offered in a small 24-pin, 4 x 4 mm QFN package.
* FAN 1.1: Wi-SUN FAN 1.1 introduces new OFDM modulation schemes supporting data rates up to 2.4 Mbps, battery powered nodes (LFN) and mode switching from FAN 1.0. These new features enable higher data rates and lower latency while also allowing the customer to select the best modulation and data rate to meet their application requirements. The addition of the Limited Function Node (LFN) allows for the introduction of battery powered devices with up to 20-year battery life expanding the type of nodes that can be added to a Wi-SUN network. FAN 1.1 is backward compatible with existing FAN 1.0 features including all FSK data rates, 6LoWPAN, and IP v6.

**What are the target markets and applications for these devices?**

**EFR32FG25 + EFF01 + FAN 1.1 markets and applications include:**

* Smart Electric Metering
* Street Lighting
* Distribution Automation
* Industrial Applications
* Municipal Infrastructure / Smart Cities
* Smart Agriculture

**How do these products change the market and what do they make possible?**

* Will strengthen smart metering opportunities with better range, performance, and low latency.
* With Wi-SUN FAN 1.1 support, Silicon Labs provides a complete solution (border router, router nodes, sleepy end nodes, such as gas meters, water meters) for smart city initiatives. This enables both long range and high throughput in sub-GHz / proprietary wireless mesh applications.

**Is FG25 Secure Vault™ PSA Level 3 Certified?**

* FG25 incorporates the same underlying technology of our PSA Level 3 certified devices which is available with Silicon Labs Secure Vault™ Mid and High-level options.

**Do these devices support Wi-SUN FAN?**

* Yes, they support Wi-SUN FAN 1.1 which is the latest standard.
	+ OFDM Modulation addition allows for up to 2.4 Mbps data rates and achieve low latency
	+ Complete solution including Border router, Router, Line-powered End Nodes
	+ Concurrency of OFDM and FSK - Concurrent operation of OFDM & FSK, can improve transmission rate and routing efficiency
	+ Modulation and data rate switching to enable more robust networks
	+ Backward compatible to Wi-SUN FAN 1.0

To learn more about the EFR32FG25 and EFF01, check out the blog [here](https://www.silabs.com/blog/secure-sub-ghz-soc-ideal-for-wi-sun-smart-city-applications).

**Matter Development Kit**

**What is the Matter Development Kit?**

* To accelerate the adoption of Matter and to fulfill that vision, we’re announcing a portfolio of hardware and software Matter solutions that provide complete, end-to-end Matter development kits for all ecosystems and wireless protocols.
* Announced and made generally available earlier this year, the central component of the platform is the Silicon Labs 2.4 GHz wireless MG24 SoC for Bluetooth and multiple-protocol operations and supports Matter over Thread as a single-chip solution. The MG24 has an effective range of up to 200 meters indoors for OpenThread while enabling Bluetooth commissioning of new devices on the same chip. When the MG24 is combined with the ultra-low power Silicon Labs RS9116 Wi-Fi product, it enables development of Matter over Wi-Fi 4 with an easy transition to Silicon Labs’ Wi-Fi 6 single-chip Matter SoC in 2023.
* The Silicon Labs Unify SDK, the only multi-protocol software development platform for Matter Border Routers, provides the tools to bridge Matter to other IoT platforms, including Zigbee and Z-Wave, and Silicon Labs Simplicity Studio and GSDK provide developers a single development environment for enabling Matter on wireless devices and seamlessly connecting them to their desired ecosystem.
* No matter the protocol – Bluetooth, Thread, Wi-Fi®, Zigbee, or Z-Wave – Silicon Labs offers hardware, software, and development tool solutions to enable developers to bridge their products to Matter and all the major smart device ecosystems. The MG24 Matter-ready SoC, RS9116W Wi-Fi SoC, Unify SDK, Simplicity Studio, and the Gecko SDK are available today for developers and designers to begin designing Matter-ready products using the wireless protocol of their choice. Complete Matter over Wi-Fi or Matter over Thread development solutions with Bluetooth Low Energy (LE) commissioning, as well as Matter bridges to Zigbee and Z-Wave, all in advance of the expected release of Matter 1.0 this Fall.

**What is Matter and what are the benefits?**

* [Matter](https://buildwithmatter.com/), the global IoT connectivity standard designed to enable seamless communication across IoT systems, has been one of the most important developments in our industry over the last couple of years. Formerly known as Project Connected Home over IP, or Project CHIP, Matter is being developed to provide a unified connectivity standard for a wide range of smart home and commercial applications, including LED bulbs, door locks, HVAC, commercial lighting, and access control.
* Matter is designed to provide interoperable, reliable, and secure connectivity across IoT devices, networks, and ecosystems. As such, it’s a connectivity standard that builds on existing IP-connectivity protocols to enable seamless communication across IoT systems including embedded devices, mobile apps, and cloud services.
* It also simplifies development for a wide range of smart home and commercial applications including LED bulbs, door locks, HVAC, commercial lighting, and access control. This benefits the end customer as well because a new Matter device can be controlled as part of multiple ecosystems in the home. For example, a light bulb can connect into Amazon Alexa, Google Home, and Apple HomeKit at the same time. Consumers can add new products and brands to their smart home without worrying about if it will work or not. Device manufacturers wanting to add additional device types are invited to join the discussions within the [Connectivity Standards Alliance (CSA)](https://csa-iot.org/) and help expand the device types supported today.
* In addition, Matter is being built as an open-source project on GitHub. This will enable more developers to participate in the development process to create robust and secure software that will successfully interoperate among all implementations.

**When will Matter devices be available to consumers?**

* The goal is to have the first end-devices available by the end of 2022 with the initial focus on smart home applications. But Matter is designed to scale to other areas as well, including commercial buildings, industrial IoT (IIoT) and medical applications.

**How does Matter help developers and manufacturers ensure the security of IoT devices?**

* The Matter Software Development Kit (SDK) was built by a large team of security-focused developers from across the industry, including Silicon Labs. It is fully open source, and the team continues working to establish a regular auditing and inspection protocol to monitor development changes. Matter focuses on provisioning of device identity and firmware security, and all Matter devices will include a unique identifier, similar to the way a website domain name or IP address works. Also, like a website, Matter devices will work with certificates that verify the device type and brand. Matter will also rely on public key infrastructure (PKI) to manage the certificates, and the certificate data will be stored on a secure enclave.
* Furthermore, Silicon Labs’ [Secure Vault](https://www.silabs.com/security/secure-vault) prevents IoT ecosystem security breaches and protects intellectual property or revenue loss from counterfeiting. When combined with Secure Vault, Matter delivers state-of-the-art security that helps connected device manufacturers address escalating and ever-evolving IoT security threats.

**Once devices are operating in homes, how does Matter ensure devices continue to stay secure?**

* Security is a core tenant of Matter, including authentication of devices joining the network, encryption of messages all the way to the destination, use of proven and standard cryptographic algorithms, and over-the-air (OTA) updates. Additionally, with Matter, secure connections can be unicast to one device or broadcast to many devices in the ecosystem to ensure that data arrives in a confidential and unaltered state at its intended destination. This is accomplished with a layered approach to authentication and attestation. Matter security is also self-contained, which means it does not rely on the security of communication technologies it runs on top of. Security measures adopted by technologies like Wi-Fi or Thread are an added level of protection.

**What will happen to other smart home standards, such as Zigbee and Z-Wave, that I just used in my latest device designs?**

* Matter will be compatible with other smart home protocols through Matter bridges. These devices can translate from Matter to other protocols, such as Zigbee or Z-Wave, allowing continued use of existing devices in the home. Many existing bridge devices in the home can be upgraded to Matter to take advantage of the new technology. In addition, Silicon Labs is developing a new bridge solution known as the [Unify SDK](https://www.silabs.com/developers/unify-sdk) that will bridge Matter and other technologies.

**Can Wi-Fi and Thread devices communicate?**

* Yes, devices on Wi-Fi, Ethernet and Thread can all run Matter and communicate with one another using IPv6. Silicon Labs has developer kits for Matter Wi-Fi using our [WF200](https://www.silabs.com/wireless/wi-fi/wf200-series-2-transceiver-ics/device.wf200) and [RS9116](https://www.silabs.com/development-tools/wireless/wi-fi/rs9116x-db-evk-development-kit)W, as well as Thread based kits using our [EFR32MG24](https://www.silabs.com/wireless/zigbee/efr32mg24-series-2-socs), [EFR32MG21](https://www.silabs.com/development-tools/wireless/efr32xg21-wireless-starter-kit), and [EFR32MG12](https://www.silabs.com/wireless/zigbee/efr32mg12-series-1-socs).

**As smart home device manufacturers, how does the release of the Matter standard benefit us?**

* Today, a manufacturer may need to develop separate stock-keeping units (SKUs) for the products they are making for each ecosystem. For example, if a manufacturer is selling smart home switches for Amazon Alexa, Apple HomeKit, and Google Home, this would currently require three different SKUs, and often three independent products with distinct hardware and software. But with the Matter standard implemented across all these devices, device manufacturers only need a single SKU per product, reducing development and production time and costs and simplifying the entire supply chain.

**What is Matter multi-admin feature and how will it work for ecosystems?**

* Multi-admin is one of the core features of Matter as it provides users with the flexibility to configure multiple ecosystems to control their smart home, however they want. In short, Matter devices can be connected to multiple platforms, apps, or other control points, giving each user in the smart home the flexibility to control devices how they prefer.

**What about industrial and commercial uses of Matter, will this be possible?**

* Since Matter is an IP-based protocol, buildings that incorporate Matter devices can leverage the building’s existing IP infrastructure to deploy various building automation standards over the corporate IP infrastructure. This is a big advantage for anyone in charge of IT security within a commercial or industrial space because Matter does not require securing and maintaining a separate network for IoT device control. With Matter devices, it is possible for system integrators and building automation managers to connect electrical, mechanical, and lighting systems inside a building using a single unified platform. While industrial and commercial use cases are not the focus of this first release of Matter, is work being done today by CSA members to ensure building automation and management will be able to function as simply as your smart home.

To learn more about Matter, please visit our latest FAQ [here](https://www.silabs.com/wireless/matter/matter-connectivity-standard-faq) and check out the blog on the news [here](https://www.silabs.com/blog/silicon-labs-new-matter-development-platform-simplifies-the-iot-ecosystem).

If you have any questions on our latest product announcements at Works With, please reach out at pr@silabs.com.