SILICON LABS A Matter Matter Soc and Module Selector Guide

Selecting the Right Matter Device for Your Applications





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How Silicon Labs' Portfolio is **Ideal for Matter** Development

Hardware

Single-SoC Matter solutions

- High-performance RF enables reliable connectivity in every room of the house and beyond
- **Ultra-low-power** Extend battery life and recharging interval
- **Fully integrated MCU** Simplify product design, reduce BoM costs, improve profits
- **RF-Certified Modules** Accelerate time-to-market by up to 9 months

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## **Secure Programming**

Securely program Matter certificates, security settings, keys, and flash software

- **Prevent** counterfeiting and IP theft
- **Simplify** the creation of QR codes
- **Reduce** manufacturing risks and costs
- Accelerate production time



### Software

#### Pre-certified and tested Matter, Wi-Fi, Thread, and Bluetooth software

- **Pre-certified** and tested Matter. Wi-Fi. Thread. and Bluetooth software
- **Full compliance** and maximum performance on Silicon Labs hardware
- **Reduce time and costs** of development and certification

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• **Improve** product quality

## Security

#### **Fully Matter-compliant security**

- Secure Vault covers all mandatory, recommended, and optional security requirements
- **PSIRT** offers constant monitoring and rectification of vulnerabilities (Matter requirement)
- **MG26** has the highest PSA Level 3 certification
- **SiWG917** is the best Wi-Fi security (Certifiable for PSA Level 2)
- The best SDK support with 10 years of longevity

## **Developer Journey**

#### Most comprehensive end-to-end process for Matter

- Matter ecosystem developer journeys for learning and experimenting in advance
- **Dev Kits** for all Matter use-cases
- **Tools** for all teams and needs
- **Connectivity Lab** to test interoperability for Matter and save certification time

## **Most Complete**

#### Most Complete Go-to-Market Solution for Matter

- **Enhance user experience** with high-performance wireless and ultra-low-power
- Matter-compliant security to protect devices, users, and brand reputation
- **Develop faster and reduce costs** with community support 24/7, developer journeys, and documentation
- Accelerate certification via the Connectivity Lab

# Wireless Hardware for Matter



### Performance

V and

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 improved 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 wireless MCUs, many-on-chip functionalities, and single-SoC Matter solutions



# Pre-Certified Wireless Software for Matter

Our SDKs provide pre-certified and tested wireless protocol stacks for Wi-Fi, Thread, Bluetooth LE, and Matter application layer firmware.

Silicon Labs wireless protocol stacks are tested and quality assured for full compliance, stability, and maximum performance to:



Increase overall product quality



Reduce development time and costs

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Ensure that devices can pass final certifications on the first go





## Matter Security Solutions



#### Fully Compliant

With Secure Vault, PSIRT, and CPMS, receive the functions needed to cover all mandatory, recommended, and optional security requirements on the Matter specification in one package



Featuring advanced IoT security solutions; our MG26 supports the highest PSA Level 3 certification and SiWG917 features the best Wi-Fi security on the market, supporting the PSA Level 2

## Secure Programming



#### Ready to Ship

With CPMS, securely program all Matter certificates, security settings, keys, applications, and bootloaders; Onboarding Payload is provided for the QR code, so Matter products are ready to ship



Instead of separate programming and flashing (in-house/CM), Silicon Labs programs SoCs during production and can deliver Matter-related programming as part of the process; reduces risk, cost, and time-to-market

Most Complete Matter Development Solution



#### Learn in Advance

Access the most comprehensive Matter developer journeys for popular ecosystems like Google, Amazon, Apple, and SmartThings; these journeys help development teams learn the entire process in advance to avoid common mistakes and plan resources wisely



Leverage development kits for all Matter use cases: Matter over Wi-Fi, Matter over Thread, border router, Matter bridge, and more

#### **Most Advanced**



#### Always Up-to-Date

Continuously monitor vulnerabilities and receive timely security updates; with us, you get the best support service in the industry, with up to 10 years of longevity for software and security



#### Programmable

Safely program Matter certificates, keys, security settings, applications, and bootloaders on wireless SoCs to reduce risks, save costs, and accelerate production

#### **Accelerate Production**



#### **Reduce Risks**

Wireless SoCs are delivered to the CM secured and programmed with an encrypted SW image, preventing counterfeiting and IP theft



### **Maximize Security**

Achieve maximum protection with Silicon Labs Secure Vault, which is broadly recognized as the most advanced IoT security solution and is fully compliant with the Matter specification

### Kits for all Use-cases



### Tools for all

Find the right complete package of Matter and wireless SDKs for any IDE



### **Connectivity Lab**

Work with the only silicon vendor offering Connectivity Lab*

- Test Matter devices with ecosystems
- Save time and money with remote or onsite testing
- Validate functionality in a friendly zone before applying for official certifications and badges



# High-Performance, Low-Power Wireless SoCs for Thread and Wi-Fi

- Lowest power on the market for Wi-Fi
- Industry-leading wireless characteristics (TX power, RX sensitivity, etc.)
- Single-SoC Matter solutions with Bluetooth LE co-existence
- Integrated wireless MCUs with many add-ons: AI/ML, Sensor Hub, high-accuracy ADC, etc.
- Most advanced security with PSA Level 3 certification for Matter, Thread, Bluetooth LE
- Best IoT Security for Wi-Fi supporting PSA Level 2



# 📩 matter



# Current and Future Application Support



# Silicon Labs Thread Solutions





#### Largest combination of Flash and RAM enables more complex applications and ML capabilities

- High Performance Compute
- The tri-core device has a 78MHz M33 application core and dedicated cores for both the radio and security subsystems
- AI/ML accelerator further offloads compute intensive tasks for machine learning
- Robust RF Performance provide longrange and reliable communication
- Robust Security protects the data and the device - Secure Vault High is designed for PSA Level 3 and protects against local and remote attacks
- Rich Peripheral set with up to 64 GPIOs and 4 dedicated analog pins enables better system integration -
- Low Power enables smaller batteries and provides longer battery life
- Pin compatible with xG24 devices Pin compatible 6x6 QFN48 for xG24 allows easy migration for devices that need more memory and ML capabilities

#### Memory - RAM 512 kB, Flash 3200 kB



### Single-SoC Matter solution

### Higher accuracy for industrial sensors

### **Extend product lifetime**

### Reduce BOM and PCB footprint while simplifying design

#### Faster AI/ML processing with lower energy consumption

Memory – RAM 256 kB, Flash 1536kB

#### Reliable, low-latency, and long-range Thread connectivity for SoC and RCP solutions

• +20 dBm output power

Increased RF sensitivity

 Integrated Bluetooth LE Co-ex for easy commissioning

#### Matter-compliant security

• Secure Vault[™] High supports the Matter hardware and software security requirements with PSA/SESIP Certification Level 3

• 20-bit ADC for more granular output values

 Large memory facilitating more features, smooth OTA updates, and longer product lifetime

 Integrated AI/ML hardware accelerator enables 2-4X faster ML inferencing and up to 6X lower power compared to nonaccelerated processors (depends on the algorithm and model)



#### High-performance and reliable Thread RCP solution for Matter gateways

- +20 dBm output power
- High RF sensitivity

#### Multi-protocol

- Bluetooth LE co-ex for easy device commissioning
- Zigbee

#### Improved Wi-Fi blocking performance

• Prevent interference by filtering out Wi-Fi signals

#### Secure Vault[™] High

• The most advanced IoT security with PSA/SESIP Level 3

#### Memory - RAM 96 kB, Flash 1024kB



#### **High-performance and reliable** Thread RCP solution for Matter gateways

- +20 dBm output power
- Increased RF sensitivity

#### Multi-protocol

• Bluetooth LE co-ex for easy device commissioning

#### Improved Wi-Fi blocking performance

• Prevent interference by filtering out Wi-Fi signals

#### Secure Vault[™] Mid

 The most advanced IoT security with PSA/SESIP Level 2

#### Memory - RAM 64 kB, Flash 512 kB



# Silicon Labs Wi-Fi Solutions





#### Lowest-power Wi-Fi 6 SoC battery-powered devices

#### Minimal battery replacement and recharging hassle for users

- Always-on cloud connectivity with minimal power
- Lowest power Wi-Fi 6 SoC can enable multi-year battery life for IoT devices such as smart locks

### Improved user experience with superior wireless performance and easy device commissioning

Bluetooth LE co-ex

#### Devices, users, and brand are protected from cyber threats

• Best-in-Class Security for Wi-Fi - PSA Level 2 Certifiable, WPA3, TLS 1.3, AI/ML engine

#### Fully integrated wireless MCU

- Dual core with an application-dedicated ARM core
- High memory, PSRAM
- AI/ML, ultra-low-power sensor hub

#### Maximum Wi-Fi gateway compatibility

- Independently tested
- Reduce user frustration, customer care costs, and improve brand loyalty

#### Seamless integration with Silicon Labs development solutions

• Simplicity Studio 6 streamlines the development process, reducing costs and time-to-revenue



#### Ultra Low Power Wi-Fi 6 Module

#### Faster Time-to-Revenue

- Integrated Antenna & Worldwide RF Certifications
- Many integrated BoM components, EMC shielding, etc.

#### Differentiate through Ultra-Low-Power

• Increase the Battery Life for your IoT Device

#### Enhance User Experience & Wireless Reliability

• Wi-Fi 6 on 2.4GHz in every corner of the building

#### Multiprotocol Simplification

• Wi-Fi 6, Bluetooth LE 5.4, Matter – Certified stacks

#### Protect the Device, Users, and Your Brand

• High level of Device, Protocol, and Networking Security

#### **BoM-friendly Package for Wireless & Computing**

- Separate Application and Wireless Processing
- Large memory: Embedded SRAM up to 672 KB, In-package Flash up to 8 MB and supports optional external Flash up to 16 MB, In-package PSRAM up to 8 MB and supports optional external PSRAM up to 16 MB
- Wireless, Computing, and Peripherals in the same package



#### HARDWARE COMPARISON FOR THREAD

# MG26 vs. MG24 vs. MG21 vs. MR21



	MG26
Protocol Support	RCP SoC - Dyna Bluetooth L Supports C
Frequency Bands	2.4 GHz
Core	Cortex-M3
Max Flash	3200 kB
Max RAM	512 kB
Security	Secure Vau
Rx Sensitivity (15.4)	-105.4 dBm
Rx Sensitivity (Bluetooth LE 1Mbps)	-97.6 dBm
Active Current	53.9 µA/MI
Sleep Current (EM2, 16 kB ret)	1.4 µA
TX Current @ +0 dBm (2.4 GHz)	5.9mA
TX Current @ +10 dBm (2.4 GHz)	19.5 mA
TX Current @ +20 dBm (2.4 GHz)	152.7 mA
RX Current (802.15.4)	6.2 mA
RX Current (Bluetooth LE 1 Mbps)	5.4 mA
Serial Peripherals	USART, EU
<b>Analog Peripherals</b>	20-bit ADC
Other	Die Temp S
<b>Operating Voltage</b>	1.71 V to 3
GPIO	28, 32, 45,
Package	6x6 QFN48 12.9x15.0 F

	MG24	MG21	MR21
amic Multi-Protocol w/ _E DTA with internal flash	RCP SoC - Dynamic Multi-Protocol w/ Bluetooth LE Supports OTA with internal flash	Multi-protocol, Proprietary Bluetooth, Thread and Zigbee (NCP and SoC) Matter (RCP only)	Single Protocol only, Thread and Matter (RCP only)
	2.4 GHz	<b>2</b> .4 GHz	2.4 GHz
3 (78 MHz)	Cortex-M33 (78 MHz)	Cortex-M33 (80 MHz)	Cortex-M33 (80 MHz)
	1536 kB	1024 kB	512 kB
	256 kB	96 kB	64 kB
ult High	Secure Vault Mid Secure Vault High	Secure Vault Mid Secure Vault High	Secure Vault Mid
n	-105.4 dBm	-104.5 dBm	-104.5 dBm
	-97.6 dBm	-97.5 dBm	-97.5 dBm
Hz	33.4 µA/MHz	63.8 µA/MHz	50.9 µA/MHz
	1.3 µA	4.5 µA	4.5 µA
	5.0 mA	9.3 mA	9.3 mA
	19.1 mA	33.8 mA	33.8 mA
	156.8 mA	185 mA	185 mA
	5.1 mA	9.4 mA	9.4 mA
	4.4 mA	8.8 mA	8.8 mA
JSART, I2C	USART, EUSART, I2C	USART, I2C	USART
C, ACMP, VDAC	20-bit ADC, ACMP, VDAC	12-bit ADC, ACMP	
Sensor	Die Temp Sensor	Die Temp Sensor	Die Temp Sensor
8.8 V	1.71 V to 3.8 V	1.71 V to 3.8 V	1.71 V to 3.8 V
49, 64	26, 28/32	20	20
3, 8x8 QFN68, 7x7 BGA136, PCB Module	5x5 QFN40, 6x6 QFN48 12.9x15.0 PCB Module	4x4 QFN32	4x4 QFN32



#### HARDWARE COMPARISON FOR WI-FI

# **917 SoC vs 917 Modules**



#### Parameter SiWG917

#### Sampling / In-Production

Wi-Fi Generation / Bandwidth

Embedded SRAM and FLASH

NWP Type / Speed (MHz)

MCU Type / Speed (MHz)

Modes of Operation

Temperature Range

- In Production
- RF Bands (GHz) 2.4GHz
  - Wi-Fi 6 / 20M
- Bluetooth Support Bluetooth LE
  - RCP, NCP, S
  - -40 to 85C
  - PSRAM, AI/ML Yes
    - 672kB and u
    - NWP 160MF
    - Cortex M4F
    - WPA2/WPA3 TRNG, PUF, Secure XIP
    - 46 7x7 QFN84,

    - Ultra Low Po

Max GPIO (GPIO Multiplexer)

WLAN Max Tx Power / Rx Sens

IC Pkg

**Power Modes** 

**Target Applications** 

Security

- 19.5dBm / -9
- Door Locks,
- Power Tools

	SiWG917Y
n: Q1 2025	IP: Q4 2024
	2.4GHz
MHz (OFDMA, MU-MIMO, TWT)	Wi-Fi 6 / 20MHz (OFDMA, MU-MIMO, TWT)
Ξ 5.1	Bluetooth LE 5.4
SoC	RCP, NCP, SoC
	-40 to 85C
	Yes
up to 8MB; opt ext. flash	672kB and up to 8MB; opt ext. flash
Ηz	NWP / 160MHz
/ 180MHz	Cortex-M4F / 180MHz
3, SSL/TLS 1.3 Secure Boot, Secure OTA, Secure Zone (TEE), (AES-XTS), Advanced Crypto	WPA2/WPA3, SSL/TLS 1.3 PSA-L1 Certified PSA-L2 certifiable TRNG, PUF, Secure Boot, Secure OTA, Secure Zone, Encrypted XiP (AES-XTS), Advanced Crypto
	43
PCB Module	16 mm x 21.1 mm x 2.3 mm PCB Module
97.5dBm	17.5dBm / -95dBm
ower	Ultra Low Power
, HVAC, Portable Medical, Sensors, Cameras, Switches, , Asset Monitoring, Fleet Management, Clinical Medical, Metering	Smart Homes, Smart Cameras, Appliances, Consumer Health and Wearables, Clinical Medical, Industrial, Smart Building, and Asset Tracking



# **Matter Over** Thread Development Kits



## **Pro Kit** EFR32xG24 +20 dBm, EFR32xG26 + 10 dBm

Pro Kit with the MG24 SoC and MG26 SoC is THE development tool for Matter innovators! All tools for developing wireless applications. Enhance with Add-on radio boards!



Learn More & Order!

# **Dev Kit**

EFR32xG24, EFR32xG26

A small, cost-effective, and feature-rich development kit based on the MG24 SoC and MG26 SoC for prototyping and experimenting energy-friendly Matter devices. Supports Qwik and Ada Fruit boards.

Learn More & Order!

# **Explorer Kit**

#### EFR32xG24, EFR32xG26

The Explorer Kit is an ultra-low cost board for rapid Matter prototyping and concept creation on the MG24 SoC and MG26 SoC.



#### Learn More & Order!



# Solutions for **Matter Over** Thread

**Pro Kit Add-Ons** 



# **Radio Board**

+10 dBm EFR32xG24/xG26 Wireless 2.4 GHz

The +10 dBm Radio Board works with the MG24 and MG26 Pro Kit. Supports Bluetooth LE, Thread, Matter, and other protocols.



Learn More & Order!

## **Antenna Diversity**

A radio board for antenna diversity development for managing multipath fading on the MG24 Pro Kit. Includes an antenna reference design.

+20 dBm EFR32xG24/xG26 Wireless 2.4 GHz

## **Radio Board**

#### +20 dBm EFR32xG24/xG26 Wireless 2.4 GHz

The +20 dBm Radio Board works with the MG24 Pro Kit. Supports Bluetooth LE, Thread, Matter, and other protocols.







# Solutions for **Matter Over** Wi-Fi



# SiWG917 Dev Kit for SoC Mode

Radio board with SiWx917 that plugs into the Pro Kit baseboard; radio board provides access to the SiWx917 MCU peripherals and the internal application MCU for development using Simplicity Studio IDE and Debugger



## SiWG917Y Module Wi-Fi 6 and Bluetooth LE 8MB Flash RF-Pin **Radio Board**

The SiWG917Y Module SoC Radio Board is designed to work with the Wireless Pro Kit Mainboard (not included) to support the development of wireless IoT devices based on based on the SiWG917M ultra-low power SoC that includes Single-Band Wi-Fi 6 + Bluetooth LE 5.4, Matter, and IP networking stack for cloud connectivity.



## SiWN917Y Module Wi-Fi 6 and Bluetooth **LE 4MB Flash RF-Pin Co-Processor Radio** Board

The SiWN917Y SoC Radio Board is designed to work with the Wireless Pro Kit Mainboard (not included) to enable you to develop IoT devices using the SiWG917 ultra-low power SoC supporting Wi-Fi 6, Bluetooth LE 5.4, Matter, and IP networking stack for cloud connectivity.





# 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 world-leading consumer and industrial brands. Our customers develop solutions for wide range of applications, from medical devices to smart lighting to building automation, and much more.



