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Wi-Fi 6 Device Certification

Ravi Subramanian and Wi-Fi Alliance | Aug 2023





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Wi-Fi Alliance Overview



Creating Wi-Fi CERTIFIED™ products: Wi-Fi Alliance® testing & certification

March 2023

The Worldwide Network of Companies that Brings You Wi-Fi®



Wi-Fi CERTIFIED™ is foundational to Wi-Fi success

- **Flagship product certification program**
- **Establishes industry-agreed standards, requirements for performance and quality user experiences**

The Wi-Fi CERTIFIED logo is an internationally recognized seal of approval designating products with proven interoperability, conformance to standards and the highest industry-standard security protections in place





Wi-Fi CERTIFIED

products are the most reliable way to give customers confidence that their devices will interoperate and provide a quality experience

After understanding the benefits of Wi-Fi CERTIFIED:

80%

Poll respondents indicated they are likely to look for Wi-Fi CERTIFIED 6® over non-certified products

60%

Poll respondents indicated they are willing to pay more for the Wi-Fi CERTIFIED seal of approval

Source: Wakefield Research, 2019

Wi-Fi certification options



	Product candidates	When to use	Where to test
FlexTrack	Highly differentiated products designed from the ground up	Extensive flexibility in Wi-Fi customization and optimization	Completed at an Authorized Test Laboratory (ATL)
QuickTrack	End products are based on a Qualified Solution that has already completed full Wi-Fi functionality testing	Targeted modifications to Wi-Fi components and functionality	Completed at an ATL or member testing site
Derivative	For product portfolios where multiple products use identical Wi-Fi designs	Members apply for certification of derivative products without the testing requirement	None required



QuickTrack Testing & Certification

QuickTrack Testing & Certification

Provides a time-saving, cost-efficient option for products with limited or targeted modifications to Wi-Fi components and functionality

- **Products based upon a Qualified Solution leverage the extensive Wi-Fi testing previously completed for Wi-Fi components**
- **Member companies can control and perform certification testing at company test sites (MCTL), without the need to rely on a third party for testing**
- **Simplified process reduces costs and duration to achieve certification; removes redundant testing and leverages core Wi-Fi functionality testing already completed**
- **Can be easily integrated into product quality testing to ensure certified products continue to meet Wi-Fi CERTIFIED requirements over product lifetime**

FlexTrack

QuickTrack

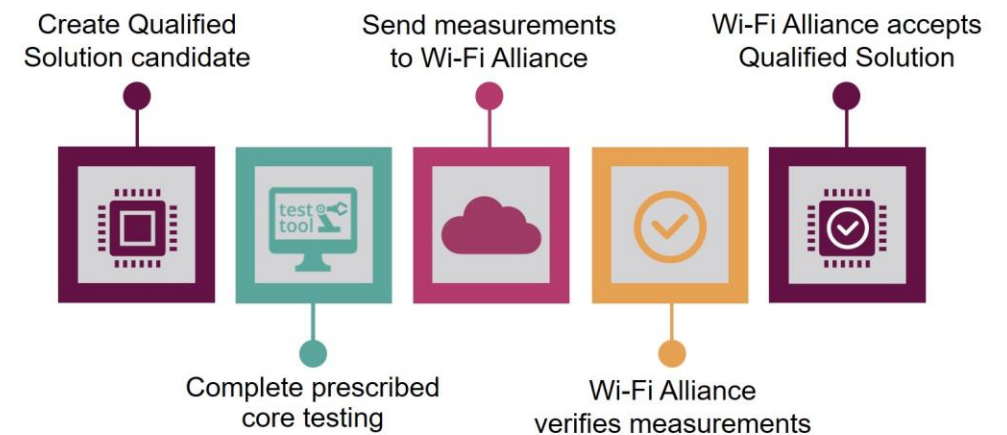
Derivative

QuickTrack Ready Solution Providers Deliver Greater Value to their Customers

Solution Providers become QuickTrack ready by providing Qualified Solutions to benefit their customers by:

- **Enabling faster time-to-market**
- **Reducing test and certification costs**
- **Promoting their customer's lifetime product quality**
- **Maintaining Wi-Fi CERTIFIED assurances**

Process to create a Qualified Solution



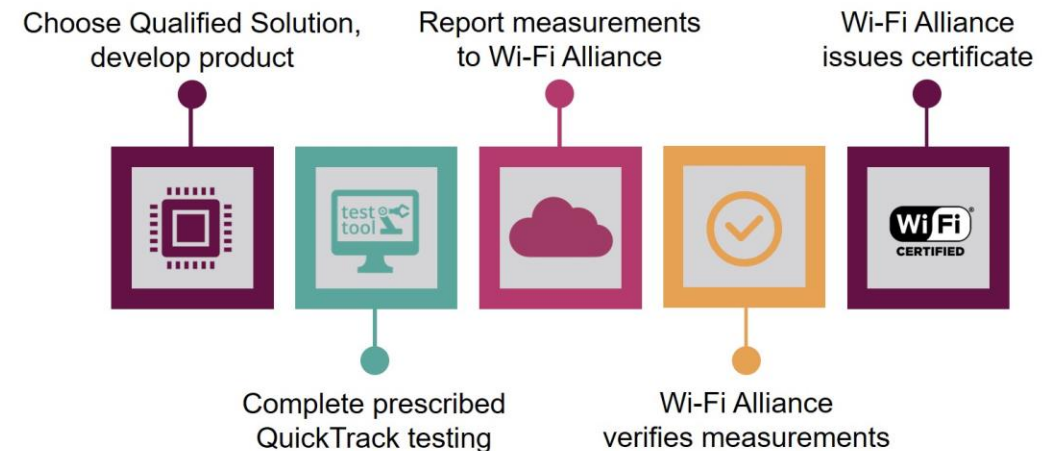
Product Developers can Streamline their Certification Process

Reduce testing time and complexity by designing products based on Qualified Solutions

- **Qualified Solutions include chipsets, modules, and other solutions pre-tested by Solution Providers**
- **Maintains Wi-Fi CERTIFIED assurances**
- **Applicable to new products and variations of previously certified devices**
- **Available to Sponsor, Contributor, Affiliate and Small Business Introductory Participant members***

** Members must be in good standing to certify products*

QuickTrack Process for End Product Developers



QuickTrack Customization and Pricing

Provided with a Qualified Solution, which has already completed testing

Component	Customizable
Chipset	--
Driver	Exceptions possible; apply for exception in the certification system
Firmware	Exceptions possible; apply for exception in the certification system
RF architecture	--
OS	✓
Physical interface	✓
RF components	✓
Antenna	✓
Cost, eligibility	
Wi-Fi CERTIFIED license fee (per product model)	\$7,500
Testing	Only Conformance testing, duration (4 to 5 hours), Performed either at ATL or members' own facilities (MCTL)
Eligible members	All except Implementer membership

QuickTrack Wi-Fi CERTIFIED Program Availability

Program testing currently available:

Wi-Fi CERTIFIED 6[®] and Wi-Fi 6E

Wi-Fi CERTIFIED WPA3[™] & WPA2[™]

Wi-Fi CERTIFIED[™] ac

Wi-Fi CERTIFIED Enhanced Open[™]

Wi-Fi CERTIFIED[™] n

Protected Management Frames

Wi-Fi CERTIFIED Agile Multiband[™]

Wi-Fi CERTIFIED Data Elements[™]

Wi-Fi CERTIFIED Wi-Fi Protected Setup[™]

Wi-Fi CERTIFIED Wi-Fi Direct[™]

Steps to Become a MCTL

Members shall submit an application to Wi-Fi Alliance for review using the online lab application form found here: [QuickTrack Lab Application | Wi-Fi Alliance](#)

Member purchases approved qualified AP and/or STA for use in QuickTrack certification path testing. The list of approved devices for QuickTrack certification testing can be found here: [QuickTrack Supported Devices | Wi-Fi Alliance](#). Cost of the devices is mentioned in catalog (section 9): [Wi-Fi Alliance Test Bed Catalog](#)

Wi-Fi Alliance marks as an active MCTL in certification system.

NOTE: No qualification testing, or test data submissions are required for establishing an MCTL.

Instead, the application process is used as a formal indication by the member of their interest in proceeding with product certifications via the QuickTrack path. Additionally, the process also establishes one or more contacts at the member lab responsible for the lab's operations



Derivative Certification

Derivative certification for products based on a Wi-Fi CERTIFIED Source Product

FlexTrack

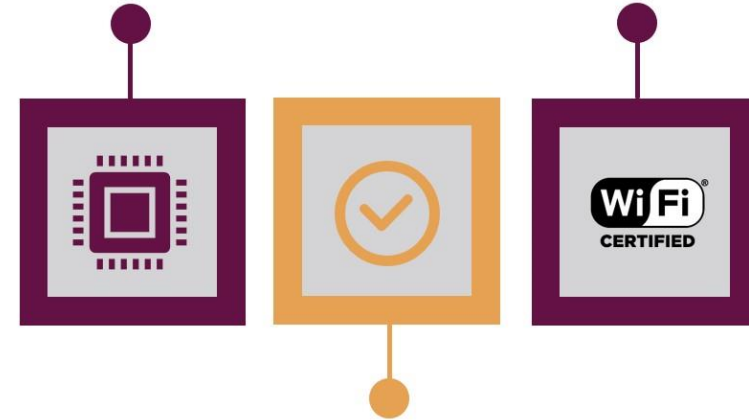
QuickTrack

Derivative

- End product derivatives of source product have no Wi-Fi functionality changes
- No testing required; leverages test results of an existing Wi-Fi CERTIFIED product via the [Derivative Certifications Policy](#)
- Available to Sponsor, Contributor, Affiliate, Small Business Participant, Implementer, and Small Business Implementer members *

Apply for derivative certification

Wi-Fi Alliance issues certificate



Wi-Fi Alliance reviews, approves application

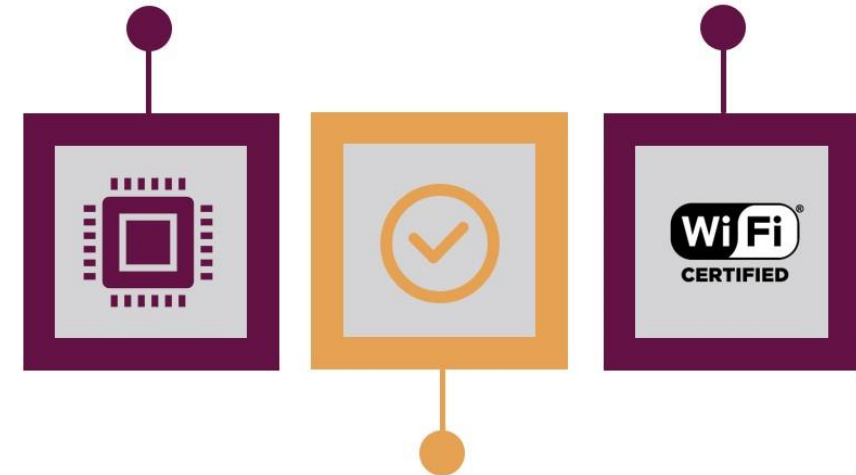
** Members must be in good standing to certify products*

Derivative certification for products based on a Wi-Fi CERTIFIED Source Product

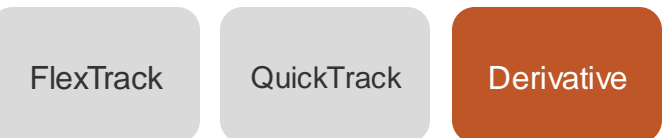
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Apply for derivative certification

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Wi-Fi Alliance reviews, approves application



Derivative Customization and Pricing

**Best choice for identical
Wi-Fi products in different
product form factors, sizes**

Component	Customizable
Chipset	--
Driver	--
Firmware	--
RF architecture	--
OS	--
Physical interface	--
RF components	--
Antenna	--
Cost, eligibility	
Wi-Fi CERTIFIED license fee (per product model)	\$600 for first 16 product models* (\$100 post that) \$4,000 for Implementers
Testing	n/a
Eligible members	All membership types

Wi-Fi Certification Customization Options

Component	FlexTrack	QuickTrack	Derivative
Chipset	✓	--	--
Driver	✓	Exceptions possible; apply for exception in the certification system	--
Firmware	✓	Exceptions possible; apply for exception in the certification system	--
RF architecture	✓	--	--
OS	✓	✓	--
Physical interface	✓	✓	--
RF components	✓	✓	--
Antenna	✓	✓	--
Cost, eligibility			
Wi-Fi CERTIFIED license fee (per product model/USD)	\$5,000	\$7,500	\$600 for first 16 product models* (\$100 post that) \$4,000 for Implementers
Testing	Interop & Compliance + Conformance testing, duration (2~4 weeks), Performed at ATL	Only Conformance testing, duration (4 to 8 hours), Performed either at ATL or members' own facilities (MCTL)	n/a
Eligible members	All except Implementer membership types	All except Implementer membership types	All membership types



Using the Wi-Fi CERTIFIED Brand

Using the Wi-Fi CERTIFIED Logo

- A company must be a member of Wi-Fi Alliance in good standing and achieve certification to use the Wi-Fi CERTIFIED logo and Wi-Fi CERTIFIED certification marks
- Wi-Fi Alliance members are bound to follow the requirements of the [Brand Style Guide](#) pursuant to the [Certification Mark License Agreement](#)
- The Wi-Fi CERTIFIED logos may not be changed in configuration or proportion, and must include the ® or ™ to identify as a registered mark
- The logo should be displayed with a clear background and without a border. Dark colored or patterned backgrounds that interfere with the visibility of the logo are not permitted.



More information available at
[Our Brands | Wi-Fi Alliance](#)

Proper use of the Wi-Fi CERTIFIED logo

Correct

- Prefer white or clear background



- On product, illuminated or not illuminated



Incorrect

- No patterned or dark backgrounds, no added borders



- No use of retired logos (see [Brand Style Guide](#))

Resources

Certification option	Public website	Member website
General	<ul style="list-style-type: none"> • Product Certification Highlights • QuickTrack Highlights • Authorized Test Laboratory (ATL) list • Additional questions: support@wi-fi.org 	<ul style="list-style-type: none"> • ATL User Guide • Certification System Getting Started Guide • Member Support Portal • Test Bed Information • Wi-Fi Test Suite
FlexTrack		<ul style="list-style-type: none"> • Training - FlexTrack New Product Application Training
Derivative		<ul style="list-style-type: none"> • Training - Product Derivative Application
QuickTrack resources (all resources on member website)	Solution Providers	End product developers
QuickTrack	<ul style="list-style-type: none"> • QuickTrack Qualified Solution Policy • QuickTrack Qualified Solution and End Product Development Guidelines • QuickTrack Solution Test Laboratory Requirements Guidelines and Procedures • QuickTrack Test Tool User Manual • QuickTrack Qualified Solution Application Training • QuickTrack New Product Application Training • QuickTrack Test Tool Platform Acceptance Plan • QuickTrack Solution Provider Highlights 	<ul style="list-style-type: none"> • QuickTrack Qualified Solution and End Product Development Guidelines • QuickTrack Test Tool User Manual • Training - QuickTrack New Product Application

Join us to Drive the future of Wi-Fi Now!

- Membership in Wi-Fi Alliance brings together product certification, industry networking, marketing resources, regulatory influence, and an opportunity to shape the future of the industry

Queries on Wi-Fi Alliance membership:

membership@wi-fi.org

Queries on Wi-Fi Certification:

support@wi-fi.org or
certificationinfo@wi-fi.org

www.wi-fi.org



facebook.com/wificertified



@wifialliance



Linkedin.com/company/wi-fi-alliance



@wifialliance官方微博



A large, bold, blue lowercase letter 'w' is positioned on the left side of the slide. It is partially overlaid by a thick, blue diagonal line that runs from the top left towards the bottom right. The background features several parallel, semi-transparent blue diagonal lines that create a sense of depth and movement.

Silicon Labs Wi-Fi Overview

This is a subtitle

Agenda

- Introduction to Wi-Fi Alliance and Certification
- WFA Certification Options
- Steps required for WFA certification and brand usage
- Silicon Labs' Wi-Fi Portfolio and Certified solutions
- Customer next steps based on Silicon Labs' Wi-Fi 6 Certification
- Summary and Benefits based on Silicon Labs' certified solution

Wi-Fi CERTIFIED 6 and Key Prerequisite Certifications

Wi-Fi CERTIFIED 6

- Ensure each connected device performs at an optimum level.
- Devices meet the highest standards for security and interoperability, and enable lower battery consumption, making it a solid choice for any environment, including the Internet of Things (IoT).
- Key features certified include OFDMA, Target-Wake-Time, BSS Coloring, MU-MIMO downlink/uplink





Wi-Fi Agile Multiband

- Facilitates better management of Wi-Fi network environments
- Enables Wi-Fi devices to better respond to changing Wi-Fi network conditions.
- Improves Connectivity Experience

Wi-Fi CERTIFIED WPA3

- Enable more robust authentication
- Deliver increased cryptographic strength
- Disallow outdated legacy protocols
- Require use of Protected Management Frames (PMF)

Silicon Labs' Wi-Fi SoC & WFA Certifications

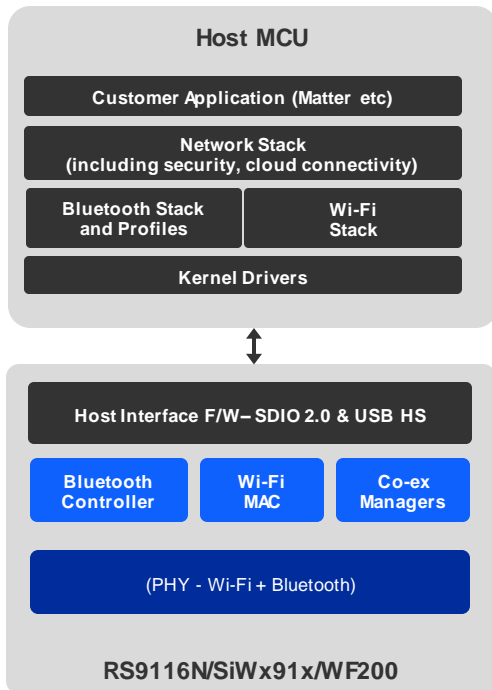
	Wi-Fi 4		Wi-Fi 6	Wi-Fi 6
Features	WF200 	RS9116 	SiWx917 	SiWx915 
	Wi-Fi 4	Wi-Fi 4	Wi-Fi 6	Wi-Fi 6
Wi-Fi (2.4 GHz)	Wi-Fi 4	Wi-Fi 4	Wi-Fi 6	Wi-Fi 6
BT Low Energy (LE)		✓	✓	✓
BT Classic (Audio)		✓		
Low Power Modes	PS-POLL	PS-POLL, Optimized for Listen Interval	PS-POLL, Optimized for Listen Interval, TWT	PS-POLL, Optimized for Listen Interval, TWT
Wi-Fi Features	OFDM	OFDM	OFDM, OFDMA, MU-MIMO	OFDM, OFDMA, MU-MIMO
Wi-Fi WPA3 Security	✓	✓	✓	✓
ARM® Apps MCU (SoC Mode)			✓	✓
ML Accelerator, PSRAM Interface, MCU Security (PSA-L2)			✓	✓
Ultra Low Power		✓	✓	✓
Matter	✓	✓	✓	✓
Wi-Fi Certification	Wi-Fi CERTIFIED n * Wi-Fi CERTIFIED WPA3*	Wi-Fi CERTIFIED n Wi-Fi CERTIFIED WPA3	Wi-Fi CERTIFIED 6* Wi-Fi Agile Multiband * Wi-Fi CERTIFIED WPA3*	Wi-Fi CERTIFIED 6* Wi-Fi Agile Multiband * Wi-Fi CERTIFIED WPA3*

Silicon Labs' Wi-Fi Software Architectures & WFA Certifications

RCP WFA Certification *

RCP

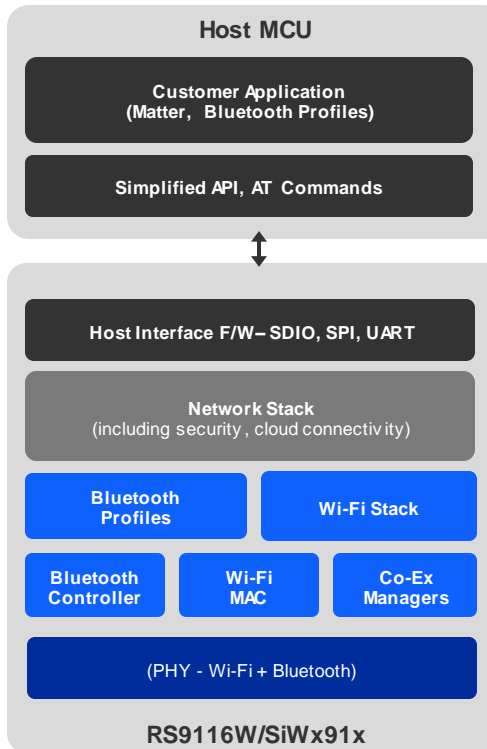
- Host runs Linux OS, wireless, networking and security stacks
- RS9116/SiWx91x supports Wi-Fi and Bluetooth radio
- WF200 supports Wi-Fi Only



NCP / SoC WFA Certification *

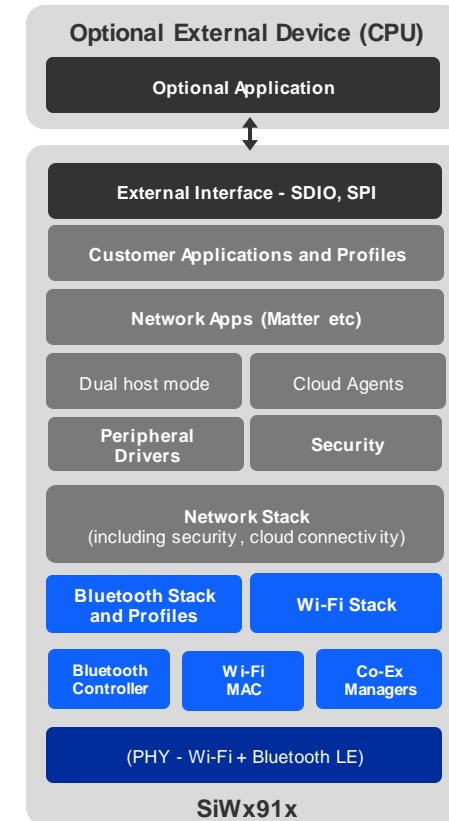
NCP

- Host runs RTOS, customer application, cloud agent, Matter
- RS9116/SiWx91x runs Wi-Fi and Bluetooth radio, wireless and networking stacks

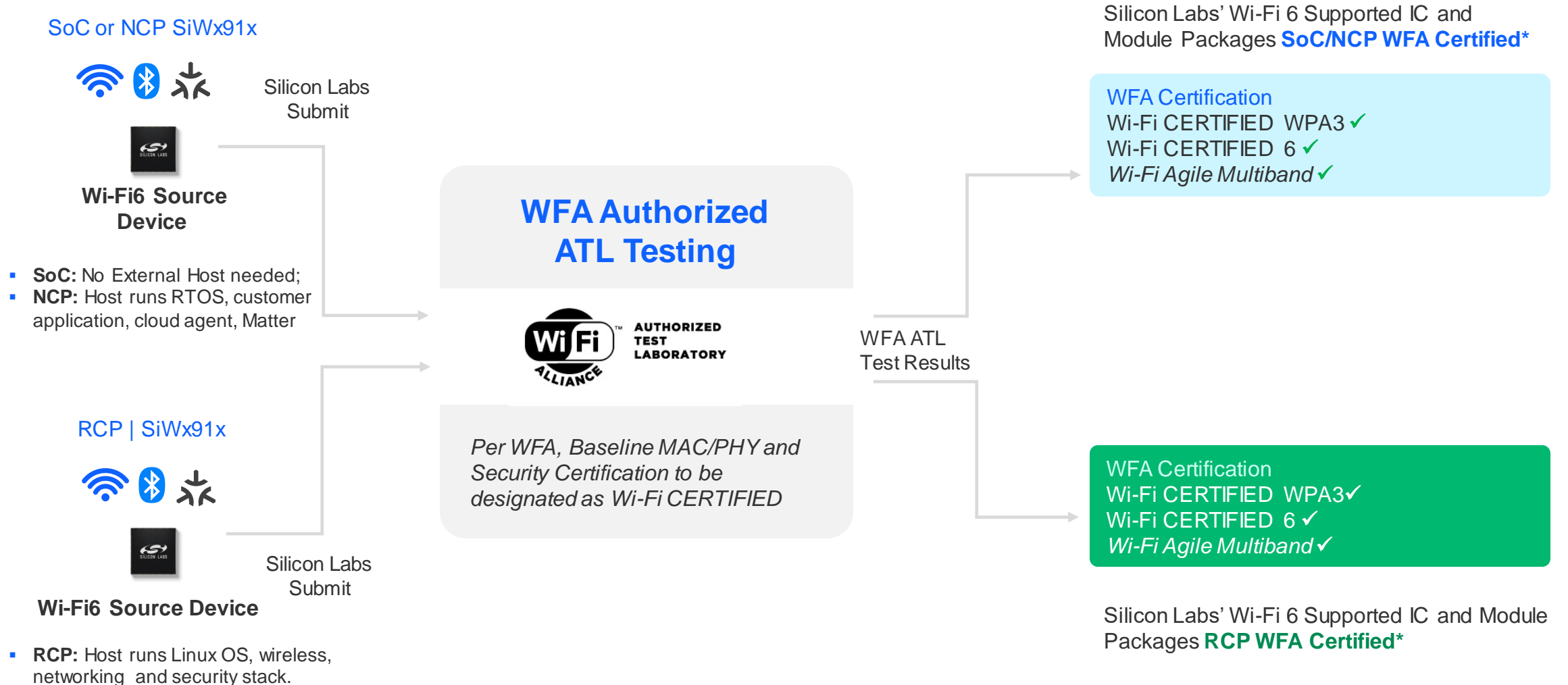


SoC

- No Host needed
- All code runs on SiWx91x



Silicon Labs Provides Two Wi-Fi 6 WFA Certifications



Leverage Silicon Labs' Products for Derivative Certification

Derivative Certification:

1. Customer product does not affect Wi-Fi functionality
2. Leverages test results of an existing Silicon Labs Wi-Fi CERTIFIED Solution via the WFA Derivative Certifications Policy
3. No additional testing required by customer
4. Customer files paperwork for certification with WFA

Customer / Partner Product(s) Utilize Silicon Labs' Wi-Fi Solution as is

Silicon Labs' Wi-Fi 6 Supported IC and Module Packages **SoC/NCP WFA Certified Solution**

Silicon Labs' Wi-Fi 6 Supported IC and Module Packages **RCP WFA Certified Solution**

Customer / Partner Derivative Product(s)

Product 1

Product A

·
·
·

·
·
·

Product N

Product Y

Changes in the new product **MUST NOT** affect the Wi-Fi functionality

Leverage Silicon Labs' Products for Quick Track Certifications

Quick Track:

1. Customer product may affect Wi-Fi functionality
2. Conformance testing needed at a MCTL or WFA Authorized Test Lab (ATL)

Customer / Partner Product(s) Utilize Silicon Labs' Wi-Fi Solution to Customize Wi-Fi



Changes in the new product [CAN](#) affect the Wi-Fi functionality

Leverage Silicon Labs Wi-Fi Certification for Matter



Matter Wi-Fi Requirements

- **Must certify Bluetooth with Bluetooth SIG**
 - If using Silicon Labs certified part, can skip testing
 - Must still submit certification documents to BT SIG
- **May certify Wi-Fi with Wi-Fi Alliance**
 - If using the Wi-Fi Certified logo, you must test and certify
- **Must certify Matter with CSA**
 - Must test a qualified test house
 - Must submit documents to CSA
 - Bluetooth and Wi-Fi certification IDs
 - Can use Silicon Labs' Wi-Fi certification ID if not using Wi-Fi Certified logo

Silicon Labs' Certification Summary and Benefits

Based on Silicon Labs' Wi-Fi Certifications (Source Product)

Silicon Labs' Wi-Fi 6 Supported IC and Module Packages **SoC/NCP WFA Certified**

Silicon Labs' Wi-Fi 6 Supported IC and Module Packages **RCP WFA Certified**

Customer / Partner Product(s)

Component	Quick Track	Derivative Certification
Applications	Modifiable	Modifiable
OS	Modifiable	Modifiable
Wi-Fi Driver	Modifiable	Not Modifiable
Physical Interface	Modifiable	Not Modifiable
Wi-Fi Firmware (Binary Code)	Not Modifiable	Not Modifiable
Wi-Fi Chip	Not Modifiable	Not Modifiable
Wi-Fi RF Components on the PCBA	Modifiable	Not Modifiable
Antenna	Modifiable	Not Modifiable
Network Stack	Modifiable	Not Modifiable
Testing Needed	Yes	No

Benefits of Derivative Certification:

- The new product must operate in the same manner as the Wi-Fi CERTIFIED Source Product
- Any changes in the new product **MUST NOT** affect the wireless functionality.
- Changing the product application code **DOES NOT** affect WFA Certification.

Benefits of Quick Track Certification:

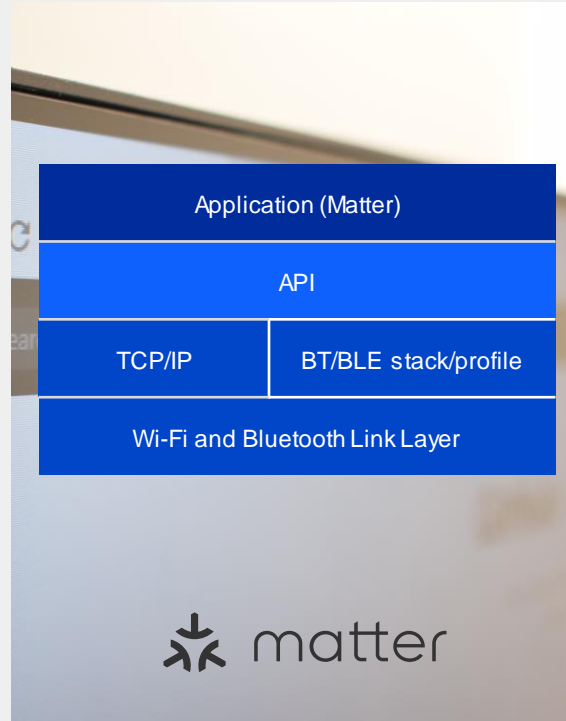
- Enables customer to make changes in their product that CAN affect the Wi-Fi wireless functionality
- Changing the product application code **DOES NOT** affect WFA Certification.

Silicon Labs - Complete Solution for Enabling Wi-Fi Products



SOCS AND MODULES

Industry-leading Ultra-Low-Power Wi-Fi 4 and 6 SoCs with pre-certified modules



EMBEDDED SOFTWARE

Wi-Fi SDK with Integrated Wi-Fi, BT/BLE, IP networking stacks, Cloud and Matter support



DEVELOPMENT TOOLS

Evaluation Kit hardware, Mobile Apps plus Studio software to simplify development and speed time to market



CERTIFICATION

Support for end-product certification
WFA and Matter certification

W

Thank you!