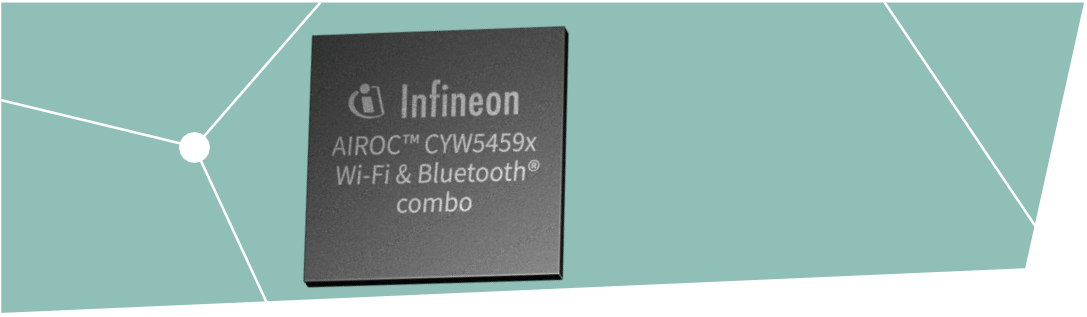


Product brief

AIROC™ CYW54590/54591 Dual-Band Wi-Fi 5 + Bluetooth 5.1 ® Combo SoC

Reliable solution for IoT applications needing Wi-Fi 5

The AIROC™ CYW5459x is a complete dual-band (2.4 GHz and 5 GHz) Wi-Fi 5 2×2 MIMO MAC®/PHY/Radio System-on-Chip. This Wi-Fi 5 single chip device provides a high level of integration with a dual-stream IEEE 802.11ac MAC®/baseband/radio and Bluetooth® 5.1. In IEEE 802.11ac mode, the WLAN operation supports rates of MCS0–MCS9 (up to 256 QAM) in 20 MHz, 40 MHz, and 80 MHz channels for data rates up to 867 Mbps. In addition, all the rates in IEEE 802.11a/b/g/n are supported. Included on-chip Wi-Fi 5 are the 2.4 GHz and 5 GHz transmit power amplifiers and receive low-noise amplifiers. The WLAN operation on the CYW54591 supports 2x2 MIMO operations as well as two fully simultaneous SISO bands; one in 2.4 GHz and the other in 5 GHz enabling dual-band real simultaneous dual-band (RSDB) operation.

For the Wi-Fi operation, the device interfaces to a host SoC processor through a PCIe v3.0-compliant interface running at Gen1 speed, and an SDIO v3.0 interface that can operate in 4b or 1b modes. For the Bluetooth® operation, the host interface is through a high-speed 4- wire UART interface and a PCM interface for audio.

In addition, the CYW5459x implements a highly sophisticated enhanced collaborative coexistence hardware mechanisms and algorithms to ensure that Wi-Fi and Bluetooth® collaboration is optimized for maximum performance. Coexistence support for external radios (such as LTE cellular and GPS) is provided via an external interface. As a result, enhanced overall quality for simultaneous voice, video, and data transmission on a commercial/consumer system is achieved.

The AIROC™ CYW5459x enables fast data streams with minimal latency, making it ideal for high definition video streaming and audio streaming applications, such as smart speakers, gaming, VR, and smart TVs. The throughput of the device also makes it ideal for applications demanding higher throughput like video streaming devices, industrial gateways and edge computing. Multiple Infineon Wireless Module Partners are in production for fast time-to-market, for complete list please see the Infineon Wi-Fi Bluetooth® Partner Module Product Selector Guide or visit the AIROC™ CYW5459x webpage.

AIROC™ CYW5459x Benefits

- IEEE Wi-Fi 5 802.11 a/b/g/n/ac-compliant Wi-Fi w/ 2X2 MIMO provides the best interoperability with access points delivers seamless high definition video/audio experience
- Advanced co-existence engine and allows for optimal Wi-Fi and Bluetooth® performance
- Dual-Mode Bluetooth® 5.1 to support Long Range, high-speed (2Mbps) and Advertising Extensions
- High speed interfaces PCIe 3.0 and SDIO
- Tighter pitch package 0.4mm WLBGA for low cost chip on board designs

Key Features

Wi-Fi Features:

- Wi-Fi 5 (802.11ac), Dual-band (2.4/5 GHz)
- Dual MAC® Architecture: 2x2 MIMO (CYW54590) or 1+1 RSDB (CYW54951)
- RSDB supports simultaneous 2.4GHz & 5GHz operation
- 20/40/80 MHz channels, up to 867MHz PHY data rate
- MU-MIMO (Wave 2) support in STA mode
- Internal PA and LNA w/ support for external PA/LNAs
- PCIe Gen1 (3.0 compliant), SDIO host interface

Bluetooth® Features:

- Class 1 (100 m) and Class 2 (10 m) operation
- Bluetooth® 5.1 (BR + EDR + Bluetooth® LE): Supports LE-2Mbps, LE-Long Range, LE-Advertising Extension
- Dedicated Bluetooth® path for best Coex performance
- UART for Bluetooth®, I2C/PCM for Bluetooth® audio

General Features:

- 3.0 V to 4.8 V power supplies with internal regulator.
- GPIOs: 20

For more information, please go to:
AIROCCYW5459x

AIROC™ CYW54590/54591 Dual-Band Wi-Fi 5 + Bluetooth® Combo SoC

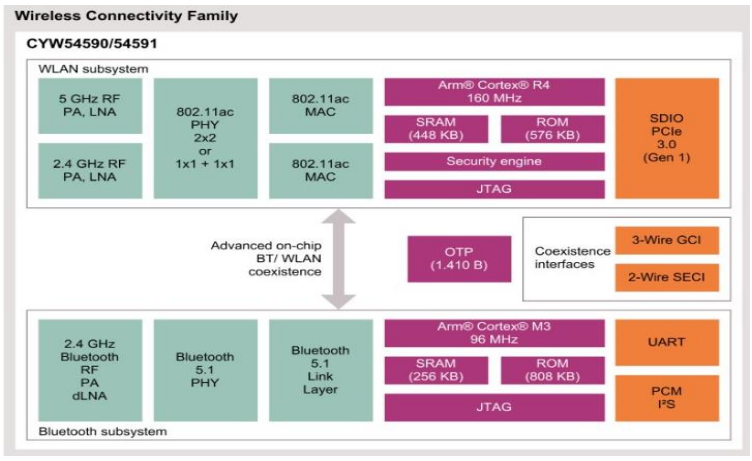
Reliable solution for IoT applications needing Wi-Fi 5

Key applications

High Definition Video Streaming	Surveillance Cameras and Video Streaming Devices
Smart Home	Smart Speakers, Gaming, Virtual Reality, Smart TV, Multi-Room Speakers, Drones, Vacuum Robot
Networking Tools	Gateways, Edge Computing, Mobile Hotspot

Product Summary

Name	Description	Temperature range [°C]	Package
CYW54591RKUBGT	2x2 Dual-Band RSDB Wi-Fi 5 + Bluetooth 5.1 Combo SoC	-40C to +85C	194-ball WLBGA (5.16 mm x 7.7mm, 0.4mm pitch)
CYW54590RKUBGT	2x2 Dual-Band MIMO Wi-Fi 5 + Bluetooth 5.1 Combo SoC	-40C to +85C	194-ball WLBGA (5.16 mm x 7.7mm, 0.4mm pitch)
54591: Murata Type 1XA (LBEE5XV1XA)	Murata Module integrated CYW54591 Dual-Band 2x2 RSDB Wi-Fi 5 + Bluetooth 5.1 combo SoC	-40C to +85C	11.4 x 8.9 x 1.40
54590: Murata Type 2BZ (LBEE5XV2BZ-883)	Murata module integrated CYW54590 Dual [1] Band 2x2 MIMO Wi-Fi 5 + Bluetooth 5.1 combo SoC	-40C to +85C	11.4 x 8.9 x 1.4mm
54590: AzureWave (CM590)	Azurewave module integrated CYW54590 Dual-Band 2x2 MIMO Wi-Fi 5 + Bluetooth 5.1 combo SoC	-40C to +85C	13 x 15mm
54591: Azurewave (AW-CB511NF)	Azurewave Standard M.2 module integrated CYW54591 Dual-Band 2x2 RSDB Wi-Fi 5 + Bluetooth 5.1 combo SoC	-40C to +85C	22 x 30 x 2.25mm
54591: Azurewave (AW-CM572)	Azurewave module integrated CYW54591 Dual-Band 2x2 RSDB Wi-Fi 5 + Bluetooth 5.1 combo SoC	-40C to +85C	13 x 15mm
54591: Quectel FC80A	Quectel module integrated CYW54591 Dual-Band 2x2 RSDB Wi-Fi 5 + Bluetooth 5.1 combo SoC	-30°C to +75°C	15 × 13 × 2.2mm



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