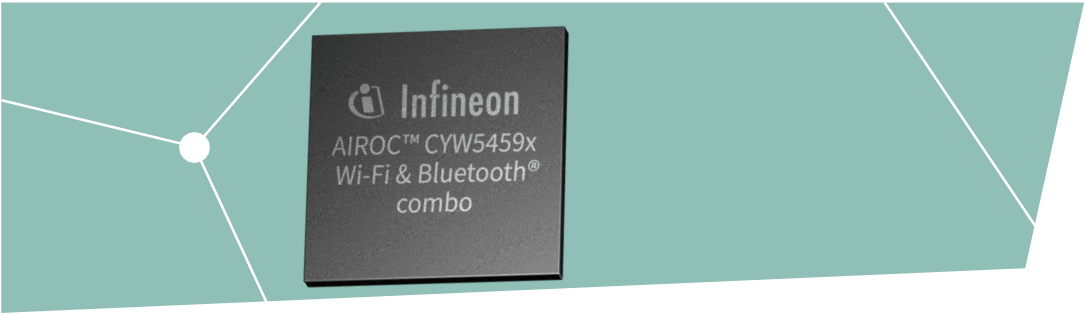


Product brief

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

Reliable solution for IoT applications needing Wi-Fi 5

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® 5.3. 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 CYW54590 supports 2x2 MIMO operations as well as two fully simultaneous SISO channels; 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, host interface is through a high-speed 4- wire UART interface and PCM interface for audio.

In addition, the CYW5459x implements highly sophisticated enhanced collaborative coexistence hardware mechanisms and algorithms that 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 systems is achieved.

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 WLAN, 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™ 54591X webpage.

AIROC™ CYW5459x Benefits

- IEEE Wi-Fi 5 802.11a/b/g/n/ac-compliant Wi-Fi w/ 2X2 MIMO provides Best interoperability with access points delivers seamless high definition video/audio experience
- Advanced co-existence engine allows for optimal Wi-Fi and Bluetooth® performance
- Dual-Mode Bluetooth® 5.3 to support Long Range, high-speed (2Mbps) and Advertising Extensions
- High speed interfaces PCIe 3.0 and SDIO for reduced latency
- Tighter pitch package WLBGA .40nm 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 or 1+1 RSDB modes (CYW54950 Only)
- 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
- UART for Bluetooth® ®, 12S/PCM for Bluetooth® audio

Bluetooth® Features:

- Class 1 (100 m) and Class 2 (10 m) operation
- Bluetooth® 5.3 (BR + EDR + Bluetooth® LE): Supports LE-2Mbps, LE-Long Range, LE-Advertising Extension
- Dedicated Bluetooth® path for best Coex performance

General Features:

- Supports two concurrent data streams using Real Simultaneous Dual Band

For more information, please go to:
AIROCCYW5459x

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

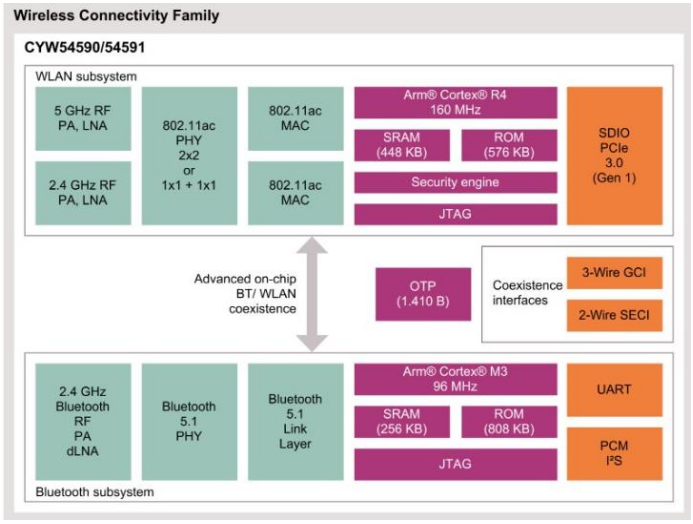
Reliable solution for IoT applications needing Wi-Fi 5

Key applications

High Definition Video Streaming	Digital Signage, Video Surveillance
Smart Home	Smart Speakers, Gaming, Virtual Reality, Smart TV, Multi-Room Speakers
Networking Throughput	Gateways, Edge Computing, WLAN, Datacenter

Product summary

Name	Description	Temperature range [°C]	Package
CYW5459x	Dual-Band Wi-Fi 5 + Bluetooth® Combo SoC	-40C to +85C	194-ball WLBGA (5.16mm x 7.7mm, 0.4mm pitch)
CYW54591: Murata Type 1XA (LBEE5XV1XA)	Fully certified Murata Module integrating the AIROC™ Dual-Band Wi-Fi 5 + Bluetooth® Combo SoC	-40C to +85C	11.4 (Typ.) x 8.9 (Typ.) x 1.40 (Max.) Solder bump height = 0.04 (Typ.)
CYW54591: Murata Type 2XZ (LBEE5XV2XZ)	Fully certified Murata Module integrating the AIROC™ Dual-Band Wi-Fi 5 + Bluetooth® Combo SoC	-40C to +85C	11.4 (Typ.) x 8.9 (Typ.) x 1.40 (Max.) Solder bump height = 0.04 (Typ.)
CYW54590: Murata Type 2BZ (LBEE5XV2BZ)	Fully certified Murata Module integrating the AIROC™ Dual-Band Wi-Fi 5 + Bluetooth® Combo SoC	-40C to +85C	11.4 (Typ.) x 8.9 (Typ.) x 1.40 (Max.) Solder bump height = 0.04 (Typ.)
CYW54590: Murata Type 2BA (LBEE5XV22BA)	Fully certified Murata Module integrating the AIROC™ Dual-Band Wi-Fi 5 + Bluetooth® Combo SoC	-40C to +85C	11.4 (Typ.) x 8.9 (Typ.) x 1.40 (Max.) Solder bump height = 0.04 (Typ.)
CYW54590: AzureWave (CM590)	2x2 dual-band 2.4 GHz and 5 GHz Wi-Fi 5 (802.11ac) and Bluetooth® 5.3. In IEEE 802.11ac mode	-40C to +85C	13 x 15mm
CYW54591: Azurewave (AW-CB511NF)	Offers Real Simultaneous Dual Band functionality enabling 1x1 connections on both the 2.4 GHz and 5 GHz bands at the same time	-40C to +85C	22 x 30 x 2.25mm
CYW54591: Azurewave (AW-CM572)	Offers Real Simultaneous Dual Band functionality enabling 1x1 connections on both the 2.4 GHz and 5 GHz bands at the same time	-40C to +85C	22 x 30 x 2.25mm
Quectel FC80A	Establishes WLAN & Bluetooth connections. 2×2 MIMO and 1×1+1×1 RSDB supported & provides maximum theoretical data rate up to 866.6Mbps	-30°C to +75°C	15mm × 13mm × 2.2mm



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