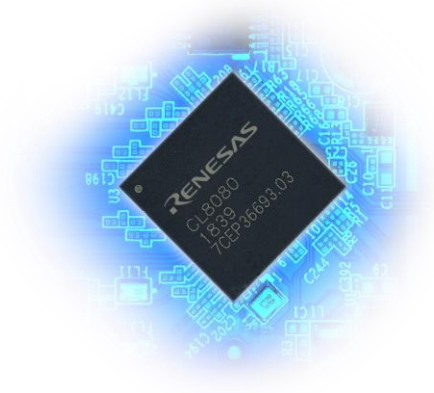
CL8000 Product Family

Wi-Fi 6/6E



Renesas' highly integrated Wi-Fi 6 (802.11ax R2) chip solutions delivers best Wi-Fi network performance for their size by combining two Wi-Fi 6 radios into a single 11x11mm PCIe chip supporting concurrent dual band 8T8R operation. The CL8000 product family offers dual-band concurrent, tri-band concurrent, and quad-band concurrent Wi-Fi 6/6E solutions that are optimized for power, size and cost.

The CL8000 product family is a powerful, highly integrated, Wi-Fi 6 (802.11ax R2) chip family employing a disruptive concurrent dual-band, dual-function, dual transceiver 8T8R flexible MIMO architecture that can drive PHY/Data Link speeds up to 6Gbps for concurrent dual band operation in a single chip.

802.11ax functionality includes MU-OFDMA, MU-MIMO, beamforming, TWT, trigger-based scheduling, 1024QAM and 160MHz support. Renesas' architecture introduces dynamic MAC and PHY improvements to perfect throughput and coverage in dense environments, ensuring that the CL8000 product family delivers a high QoE anywhere, anytime and on any device.

The product family integrates dual MAC, dual PHY, analog and RF in a single package, including the required CPUs and memories to run more of the wireless LAN functions on-chip, eliminating the need for costly external memories and delivering a strong host offloading solution. Interface to the host is over a dual lane PCIe 3.0.

CL8000 architecture allows independent functional operation of the two Wi-Fi radios, allowing for example AP+ AP, AP + STA, AP + Repeater, AP + Listening Radio (Spectrum Intelligence), thus allowing enhanced usability and spectrum agility.

Attributes

- Wi-Fi 6 (802.11ax) R2
- Concurrent Dual Band, Dual Transceiver
- 8T8R Flexible MIMO Architecture
- 6Gbps dual concurrent data link speed
- Single PCIe 3.0 (dual-lane) Interface
- Small 11x11 BGA package

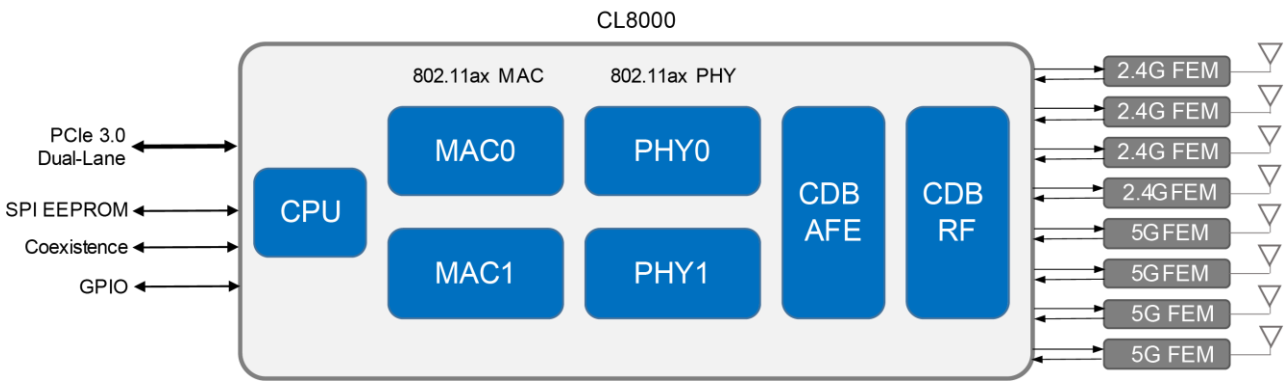
Features

- Concurrent Dual Band in a single chip
- 8T8R Flexible MIMO
- Up to 6Gbps PHY/Data link speed
- DL/UL MU-OFDMA support
- DL/UL MU-MIMO support
- Beam forming support
- Uplink scheduling
- QAM 1024 (MCS 10, 11) modulation
- 20/40/80/160MHz support in 5/6GHz
- 20/40MHz support in 2.4GHz
- Target-Wait-Time
- Triband + Listening Radio
- WEP, WPA, WPA2, WPA3, TKIP, AES, WAPI
- QoS-WMM, WMM-PS
- IEEE 802.11e, h, i, i, k, r, v, w, z support
- Multiple BSSID support
- PCI Express v3.0 dual lane (backwards compatible with v2.0, v1.1)
- Enhanced DFS Radar Detection for long and short pulse radar
- Advanced spectrum Intelligence
- Smart antenna diversity

Applications

- Home Gateways
- Multimedia Gateways
- Enterprise Access Points
- SMB Access Points
- Bandwidth-Intensive Connected IoT
- Mesh Nodes

Block Diagram

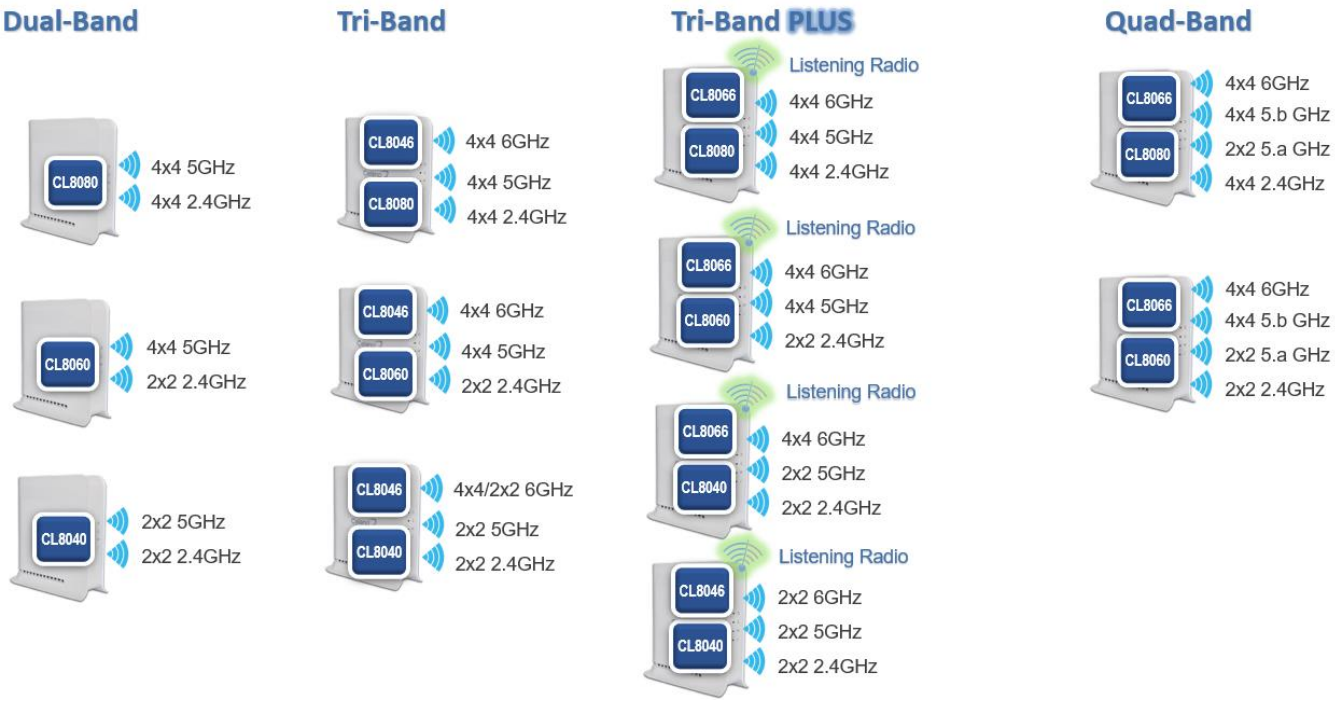


The product family is designed to support standard based features addressing security, Quality of Service and international regulation, as well as above standard integrated value-add functionalities based on Renesas' embedded and edge software technologies, giving end users the greatest performance anytime under any circumstance, while enabling OEMs and service providers advanced management capabilities for enhanced services and operation.

The CL8000 product family consists of the following chips:

Chip	Standard	Package	Band	MIMO	Typical Configurations
CL8080	Wi-Fi 6 (802.11ax)	BGA 11x11	2.4GHz + 5GHz	8T8R system	4x4 + 4x4 / 3x3 + 4x4
CL8060	Wi-Fi 6 (802.11ax)	BGA 11x11	2.4GHz + 5GHz	6T6R system	2x2 + 4x4
CL8040	Wi-Fi 6 (802.11ax)	BGA 11x11	2.4GHz + 5GHz	4T4R system	2x2 + 2x2
CL8066	Wi-Fi 6E (802.11ax)	BGA 11x11	6GHz + 5GHz	6T6R system	4x4 + 2x2 4x4 + 0x1 (Listening Radio)
CL8046	Wi-Fi 6E (802.11ax)	BGA 11x11	6GHz + 5GHz	4T4R system	4x4 2x2 + 0x1 (Listening Radio)

CL8000 Based Solutions



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