

# MARVELL® 88Q9098x

802.11ax Concurrent Dual Wi-Fi Built for Next-Generation Connected Vehicles

## PRODUCT OVERVIEW

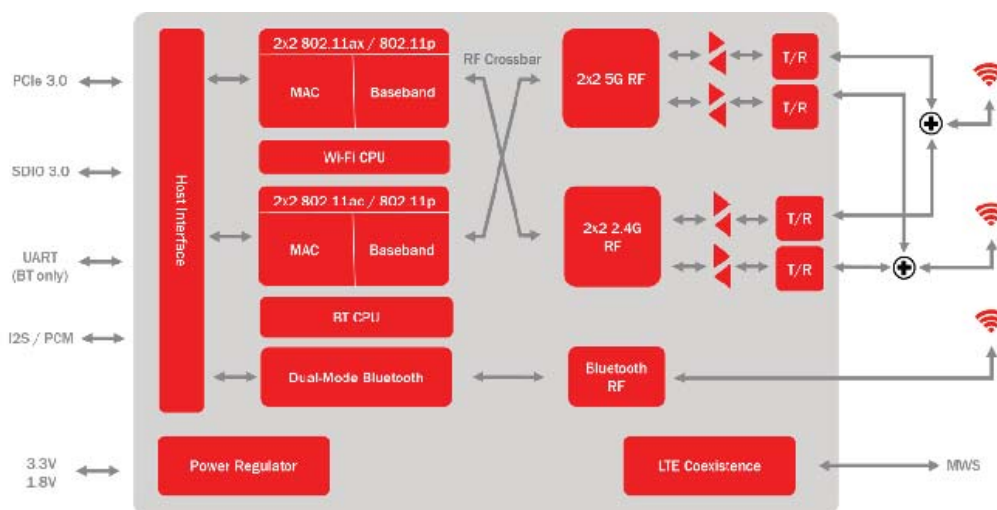
The 88Q9098x family of automotive wireless SoCs is the industry's first 802.11ax solution with 2x2 plus 2x2 concurrent dual Wi-Fi, dual-mode Bluetooth 5/BLE and 802.11p for connected vehicles. Delivering reliable and high-performance wireless connectivity is becoming more difficult in the increasingly congested automobile environment. The new 88Q9098 combo solution enables gigabit-level performance, superior reliability, and enhanced security for the car and extends Marvell leadership in providing comprehensive 802.11ax solutions. Our innovative concurrent dual Wi-Fi architecture sets a new technology precedent, integrating two complete Wi-Fi subsystems into a single SoC, and enabling two independent 2x2 data streams to run concurrently and at full throughput.

The wireless combo solution also has a robust set of features including 802.11p with an on-chip Elliptic Curve Cryptography (ECC) hardware accelerator and BLE long-range. ECC enables safe and secure vehicle-to-everything (V2X) communication and BLE long-range provides long-distance mobile connectivity for a wide variety of automotive applications from IVI to TCU.

The 88Q9098x family of footprint compatible wireless solutions include:

- 2x2 + 2x2 Concurrent Dual Wi-Fi with Bluetooth 5 (88Q9098A)
- 2x2 Wi-Fi + 2x2 802.11p Concurrent Operation with Bluetooth 5 (88Q9098P)
- 2x2 + 2x2 Concurrent Dual Wi-Fi or 2x2 Wi-Fi + 2x2 802.11p Concurrent Operation with Bluetooth 5 (88Q9098S)

## BLOCK DIAGRAM



## KEY FEATURES AND BENEFITS

FEATURES	BENEFITS
General Features	<ul style="list-style-type: none"> <li>• Concurrent Dual Wi-Fi operating modes for various automotive applications</li> <li>• AEC-Q100 grade 2 support (from -40C up to + 105C) with external power amplifiers</li> <li>• 11x11 mm, 148 pin DR-QFN package</li> </ul>
WLAN	<ul style="list-style-type: none"> <li>• 2x2 IEEE 802.11ax</li> <li>• 2x2 IEEE 802.11ac</li> <li>• Support 20/40/80/(80+80) MHz channel bandwidths</li> <li>• Uplink &amp; Downlink OFDMA and MU-MIMO</li> <li>• 1024 QAM</li> <li>• Instantaneous O-DFS</li> </ul>
DSRC	<ul style="list-style-type: none"> <li>• On-chip Elliptic Curve Cryptography (ECC) hardware acceleration for secure V2X applications</li> <li>• Maximum Ratio Combining (MRC) and Cyclic Shift Diversity (CSD) technologies to maximize range and performance of 802.11p for V2X communication</li> </ul>
Bluetooth 5	<ul style="list-style-type: none"> <li>• 2x Wide Band Speech (WBS) calls</li> <li>• 2 Mbps LE</li> <li>• Long Range</li> <li>• LTE Coexistence Arbitration</li> </ul>
Precision Location	<ul style="list-style-type: none"> <li>• 802.11mc</li> <li>• BLE Angle of Arrival (AoA)/Angle of Departure (AoD)</li> <li>• Distance: within 1 meter</li> <li>• Angle: within 10 degree</li> </ul>
Host Interfaces	<ul style="list-style-type: none"> <li>• PCIe 3.0</li> <li>• SDIO 3.0</li> <li>• High Speed UART (for Bluetooth only)</li> </ul>

## TARGET APPLICATIONS

- In-Vehicle Infotainment (IVI)
- Telecommunications Control Unit (TCU)
- Remote Diagnostics
- Advanced Driver Assistance Systems (ADAS)
- Connected Gateway (C-GW)
- Vehicle-to-Everything (V2X) Communication



**ABOUT MARVELL:** Marvell first revolutionized the digital storage industry by moving information at speeds never thought possible. Today, that same breakthrough innovation remains at the heart of the company's storage, networking, and connectivity solutions. With leading intellectual property and deep system-level knowledge, Marvell's semiconductor solutions continue to transform the enterprise, cloud, automotive, industrial, and consumer markets. For more information, visit [www.marvell.com](http://www.marvell.com).