



Built for  
Next-Generation  
Connected  
Vehicles

# NXP® 88Q9098 Concurrent Wi-Fi® 6 with Bluetooth® 5 BLE SoC

The new 88Q9098 wireless SoC family extends NXP leadership in providing comprehensive 802.11ax solutions by enabling gigabit-level performance, superior reliability and enhanced security for automotive applications.

## PRODUCT OVERVIEW

Delivering reliable, high-performance wireless connectivity is becoming more difficult in today's increasingly congested automobile environment. To meet this challenge, the new NXP 88Q9098x product line features 802.11ax solutions with 2 x 2 plus 2 x 2 concurrent dual Wi-Fi, dual-mode Bluetooth® 5/ Bluetooth LE and 802.11p for connected vehicles. 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 2 x 2 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 Bluetooth LE long-range. ECC enables safe and secure vehicle-to-everything (V2X) communication and Bluetooth LE 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:

- ▶ 2 x 2 + 2 x 2 concurrent dual Wi-Fi with Bluetooth 5 (88Q9098A)
- ▶ 2 x 2 Wi-Fi + 2 x 2 802.11p concurrent operation with Bluetooth 5 (88Q9098P)
- ▶ 2 x 2 + 2 x 2 concurrent dual Wi-Fi or 2 x 2 Wi-Fi + 2 x 2 802.11p concurrent operation with Bluetooth 5 (88Q9098S)



## 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

## 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 -40° C up to + 105° C) with external power amplifiers</li> <li>11 x 11 mm, 148-pin DR-QFN package</li> </ul>
WLAN	<ul style="list-style-type: none"> <li>2 x 2 IEEE® 802.11ax</li> <li>2 x 2 IEEE 802.11ac</li> <li>Support 20/40/80/(80+80) MHz channel bandwidths</li> <li>Uplink and downlink OFDMA and MU-MIMO</li> <li>1024 QAM</li> <li>Instantaneous 0-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>2 x wide band speech (WBS) calls</li> <li>2 Mbit/s 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>Bluetooth LE 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>

## 88Q9098X BLOCK DIAGRAM

