



AR9462

Single-chip, 2.4/5 GHz, 2-stream
802.11a/b/g/n and BT 4.0 + HS SoC
Solution with SST Technology



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Qualcomm offers the industry's most innovative and complete portfolio of 802.11n wireless LAN chip solutions.



Technology Overview

The AR9462 is a single-chip solution that combines dual-band (2.4/5 GHz), 2-stream 802.11n and Bluetooth 4.0 technologies for notebooks, netbooks and tablets. The highly integrated solution not only provides customers with greater design flexibility, but can actually improve the wireless experience for consumers.

The AR9462 brings Qualcomm XSPAN's industry-leading 2x2 802.11n performance to increasingly smaller computing and CE devices. It delivers data rates of 300 Mbps and TCP throughput of more than 200 Mbps when used in 2x2 mode. It also offers a unique set of advanced 11n technologies known as Signal-Sustain Technology™ (SST), which ensures stronger wireless connections across the entire WLAN link. SST features include Low Density Parity Checking (LDPC), Maximum Ratio Combining (MRC) and Maximum Likelihood Demodulation (MLD) – which together can increase rate-over-range performance by up to 100% at short range, 50% at mid-range and 25% at long range.

The AR9462 also supports the latest Bluetooth 4.0 specification, which includes both High Speed and Low-Energy operation to extend personal area connectivity to a variety of devices. It includes a Bluetooth EDR radio, a 32-bit Tensilica Xtensa CPU, USB 2.0 interface, two 1.2v voltage regulators for analog and digital circuit, auxiliary EEPROM interface, on board PLL, RAM, and on board one time programmable (OTP) ROM.

The AR9462 also delivers superior WLAN/Bluetooth coexistence to ensure the best possible wireless experience. In addition to Qualcomm's standard Universal Wireless Cooperation™ technology, the AR9462 offers advanced algorithms developed to mitigate interference and takes advantage of the physical proximity of the WLAN and Bluetooth radios to provide maximum performance.

Qualcomm offers a robust platform that streamlines the design of wireless devices. On the Bluetooth side, a standard HCI USB interface makes the AR9462 compatible with any upper layer Bluetooth stack. Qualcomm leverages the GNU/Linux BlueZ architecture as the basis of its Bluetooth host stack, which is upstream-compatible with Android and Chrome OS. Microsoft software is available for Windows 7, Vista, and XP. The chip also offers a PCIe interface for WLAN, and Qualcomm's DirectConnect™ technology offers Wi-Fi Direct CERTIFIED support for P2P applications. In addition, its Fast Channel Switch (FCS) feature, the channel switching time is reduced to as little as 1 ms within band and to 2ms in between the 2.4 GHz and 5 GHz bands.

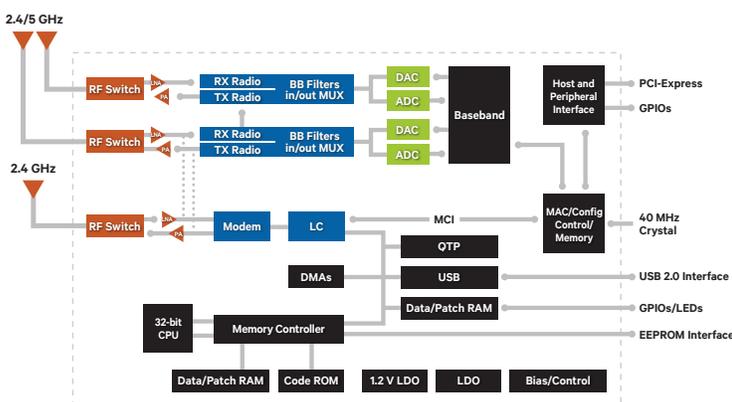
AR9462 integrates several external components, including the 2.4 GHz and 5 GHz Low Noise Amplifiers and Power Amplifiers, switching regulators, and the WLAN and Bluetooth EEPROMs. This can dramatically reduce the RBOM of a standard PCIe Half Mini Card by up to 45%, relative to discrete 2x2 dual-band and Bluetooth combination solutions.

While offering superior performance and a high degree of integration, the AR9462 also consumes lower power in every operation mode – Active TX, Active RX, Idle Associated, and Sleep – compared to discrete solutions. This enables notebooks, tablets and other computing platforms to run much longer on a single battery charge.

Solution Highlights

- Highly integrated single chip solution combining Qualcomm® XSPAN's dual-band, 2x2 802.11n and Bluetooth 4.0
- WLAN
 - 2-stream 802.11n offers a maximum PHY rate of 300 Mbps
 - Conserves power with 1x1 downshift, using Dynamic MIMO Power Save and low platform power with Qualcomm CoolMode
 - Supports Qualcomm's Signal-Sustain Technology™ (SST), which includes advanced WLAN features such as LDPC, MLD, and STBC
 - Supports Qualcomm Wake on Wireless™ (WoW) Cloud and Qualcomm StreamBoost™
- Bluetooth
 - Supports High Speed and Low Energy operation
 - Supports Enhanced Data Rate (EDR) of both 2 Mbps ($\pi/4$ -DQPSK) and 3 Mbps (8-DPSK)
- Wake on Wireless LAN (WoW) and Wake on Bluetooth (WoBT)
- Fast Channel Switch (1 ms within band and 2 ms across bands)
- Advanced integrated coexistence features (beyond discrete chipset coexistence) to maximize combo performance
- Supports antenna sharing between Bluetooth and WLAN
- Two separate On Chip One Time Programmable (OTP) Memories for WLAN and Bluetooth
- Integrated PA, LNA, Tx/Rx switch, Regulator
- 8-bit resolution for Spectral Analysis

AR9462 Architecture



Reference Design Highlights



WB222

- 45% lower RBOM cost compared to Qualcomm combo solutions with discrete chips for WLAN and BT
- Standard Half Mini Card form factor
- Driver support for Windows 7, Windows 8 Vista, XP and Linux (including Chrome OS)
- Support for AR9462 chip on board
- Worldwide regulatory compliance

AR9462 Specifications

WLAN Frequency Band	2.4/5 GHz
Bluetooth Frequency Band	2.4000 - 2.4835 GHz
Network Standard	Compliant with IEEE 802.11n, 802.11g, 802.11b, 802.11d, 802.11e, 802.11j and 802.11i
Modulation Technology	OFDM with BPSK, QPSK, 16 QAM, 64 QAM; DQPSK, CCK, G-FSK, $\pi/4$ -DQPSK, 8-DPSK
FEC Coding	Convolution Code Low-Density Parity Check (LDPC)
Hardware Encryption	AES, TKIP, WEP
Quality of Service	802.11e
Communications Interface	PCIe for WLAN and USB for BT
Peripheral Interface	GPIO
Supported Data Rates	IEEE 802.11a 6 - 54 Mbps IEEE 802.11b 1 - 11 Mbps IEEE 802.11g 6 - 54 Mbps IEEE 802.11n 6.5 - 300 Mbps
Auxiliary Memory Interface	EEPROM
Technology Node	55 nm
Package Dimensions	88-pin QFN 10 mm x 10 mm

Qualcomm Atheros is a wholly owned subsidiary of Qualcomm Technologies, Inc. and a leading provider of wireless and wired technologies for the mobile, networking, computing and consumer electronics markets. We're focused on inventing technologies that connect and empower people in ways that are elegant and accessible to all.

Our broad connectivity portfolio allows us to offer our global customer base high-performance, end-to-end solutions, featuring Wi-Fi®, GPS, Bluetooth®, FM, Ethernet, HomePlug™ Powerline and PON technologies. By leveraging substantial expertise in RF, signal processing, software and networking we can deliver highly-integrated, low-power, system-level solutions that enable developers to create high-performance, differentiated products.

For more information, please visit us online @ qca.qualcomm.com

