

## Atheros XSPAN® Technology

Expanding performance. Expanding possibilities.

Atheros offers the most innovative and complete portfolio of 802.11n wireless LAN chipset solutions. The new AR9002 family of chipsets, the third-generation of Atheros' XSPAN 802.11n technology, builds upon the company's broad portfolio of XSPAN products – with enhanced performance, highest integration, smaller form factors and lower overall cost – to meet the needs of the rapidly growing 802.11n market. Like all Atheros XSPAN products, AR9002 chipsets are compliant to the latest IEEE draft 2.0 802.11n specification.

Atheros' AR9002 chipsets feature:

- **Leading Integration** with complete turnkey solution that delivers end product cost and form factors to drive broad market adoption of 802.11n products.
- **Dual-Band, and Multiple MIMO Configurations** that enable OEMs to tailor product price/performance for specific application and market segment requirements.
- **Rich Media & Peripheral Interfaces** that anticipate the requirements for advanced media networking applications and allow end-product feature differentiation.
- **Simple Setup via Atheros' JumpStart for Wireless**, the company's simple network configuration software which supports both the PIN and push-button setup methods complying to the Wi-Fi Protected Setup specification.
- **Worldwide 5 GHz Full-Spectrum Support** for state-of-regulatory requirements with Atheros' Dynamic Frequency Selection (DFS).

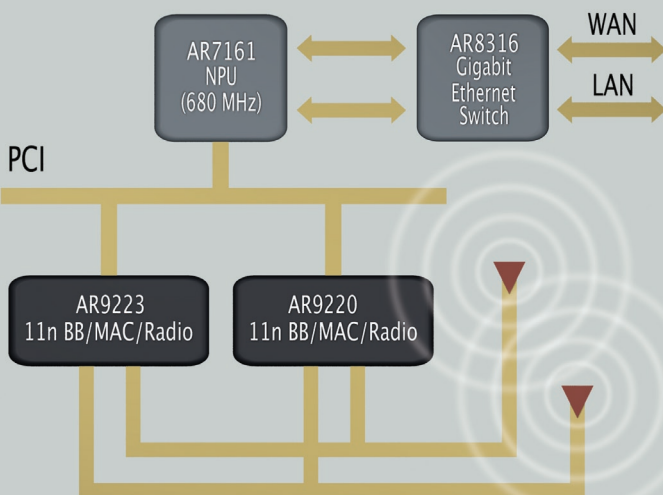
## Product Overview

The Atheros AR9002AP-4XHG chipset incorporates all of the key components needed to deliver high-performance, dual-concurrent AP/routers. The AR9002AP-4XHG solution features the industry's only custom-designed WLAN network processor, two simultaneous single-chip, dual-radios, two MAC/basebands and Atheros' Gigabit Ethernet Switch.

The design leverages the extraordinary processing power of Atheros' 680 MHz AR7161 WNPU to achieve Gigabit Ethernet connectivity to the WAN and LAN, along with abundant remaining processing capacity for sophisticated routing and networking applications.

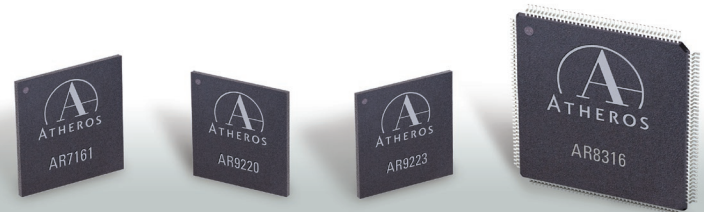
Designed for our Premium Home AP/router, gateway, SMB and Enterprise customers, the AR9002AP-4XHG delivers the ultimate in 802.11n networking with simultaneous 2.4 and 5 GHz bands and 2x2 MIMO reliability achieved with Atheros XSPAN Technology.

## AR9002AP-4XHG Architecture



# AR9002AP-4XHG

*The industry's highest performance,  
dual-concurrent 802.11n  
AP/router solution*



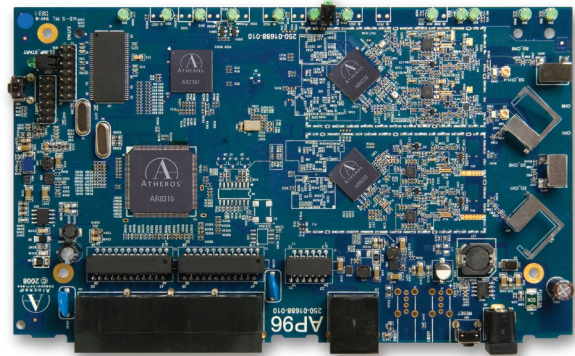
## Solution Highlights

- Next-generation, high-performance draft 2.0-compliant 802.11n wireless access point and router chipset solution including:
  - AR7161: 680 MHz Wireless Network Processing Unit (WNPU)
  - AR9220: Single chip 2.4/5 GHz Mac/Baseband/Radio
  - AR9223: Single chip 2.4 GHz Mac/Baseband/Radio
  - AR8316: Six Port Gigabit Ethernet Switch
- Full support for Dynamic Frequency Selection (DFS) enabling uncompromised operation in the broad range of 5 GHz channels
- Atheros XSPAN technology – providing the industry's highest TCP/IP throughput at enhanced range
- Support for 2x2 MIMO with spatial multiplexing
- Enables bandwidth of up to 600 Mbps PHY/link rate (dual-band) – twelve times the bandwidth of 802.11g or 802.11a
- Dual-band WLAN radios operate from 2.300 to 2.500 GHz and 4.9 to 5.925 GHz
- Compliant with IEEE 802.11a, 802.11b, 802.11g, 802.11d, 802.11e, 802.11h, 802.11i, 802.11j, draft 2.0 802.11n
- Available in commercial temperature grades
- Lead-free RoHS compliant

Expanding Performance. **Expanding Possibilities.**

## AR9002AP-4XHG Reference Design Highlights

- Based on the Atheros AP94 reference design platform, with 802.11n single chip on board design, Atheros AR7161 processor, Gigabit Ethernet WAN and LAN connectivity with access to all WNPU system interfaces.
  - I<sup>2</sup>S: audio streaming
  - SLIC: VoIP
  - Dual USB: NAS, networking printer connectivity, etc.
- Enables fastest development and evaluation of software, hardware, and other implementation options



AP96

## AR9220 Dual-band MAC/Baseband/Radio

- Supports 2.4 and 5 GHz 2x2 Configuration
- Industry's first single chip 802.11n MAC/BB/Radio
- IEEE 802.11n draft compliant
- Performance enhancements include:
  - Weak signal detection
  - Improved Rate over Range performance
  - MIMO Power Save

## AR9223 MAC/Baseband/Radio

- Supports 2.4 GHz 2x2 Configuration
- Industry's first single chip 802.11n MAC/BB/Radio
- IEEE 802.11n draft compliant
- Performance enhancements include:
  - Weak signal detection
  - Improved Rate over Range performance
  - MIMO Power Save

## AR7161 Wireless Network Processor

- Wireless LAN processors for home and enterprise access points, routers and gateways
- Processor speeds of up to 680 MHz
- 32-bit MIPS 24K processor core
- Two 10/100/1000 Ethernet MACs
- High speed UART and GPIOs
- DDR and serial FLASH memory interfaces
- 32-bit, 33/66 MHz PCI 2.3 host interface
- Two USB 2.0 MAC/PHYs
- I<sup>2</sup>S interface to directly support an external audio codec

## iQUE™: Intelligence for a Quality User Experience

There are many more devices on the home network today with more high-bandwidth requirements and latency-sensitive content streaming from the Internet and the local network. In addition there is more demand for network capacity from the combination of 802.11n on the WLAN and Gigabit Ethernet connectivity from the WAN. Atheros platforms address these issues with intelligent use of available spectrum through:

- Dual-concurrent networking
- QoS techniques on the WAN
  - Rate adaptation, aggregation sizing, retry algorithms
  - Multicast to unicast
  - Queue management
- New QoS techniques on the WLAN
  - Packet inspection & Classification
  - Prioritization
  - Fast path (Quick Link)
- Spectrum Analysis

## AR9002AP-4XHG Specifications

Frequency Band	2.300 to 2.500 GHz and 4.9 to 5.925 GHz
Network Standard	802.11a, 802.11b, 802.11g, draft 2.0 802.11n
Modulation Technology	OFDM with BPSK, QPSK, 16 QAM, 64 QAM; DBPSK, DQPSK, CCK
FEC Coding Rate	1/2, 2/3, 3/4, 5/6
Hardware Encryption	AES, TKIP, WEP
Quality of Service	802.11e, WMM, WMM-PS
Communication Interface	PCI
Peripheral Interface	GPIOs, LEDs
Memory Interface	EEPROM, DDR, FLASH
Supported Data Rates	
IEEE 802.11a	6 - 54 Mbps
IEEE 802.11b	1 - 11 Mbps
IEEE 802.11g	6 - 54 Mbps
XSPAN	6.5 - 300 Mbps (per band)

For more information on the AR9002AP-4XHG or other solutions from Atheros contact your local representative:

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