Technology Overview
The AR9002AP-1S features Atheros Align technology which leverages the 802.11n 1-stream specification to provide the optimal upgrade path from legacy 802.11 solutions. The single-stream feature enables a new class of Wi-Fi devices that deliver performance enhancements over the existing 802.11g technology, at comparable price points.

Product Overview
The Atheros AR9002AP-1S integrates into an advanced two-chip solution all the key components needed to deliver high-performance, 2.4 GHz 1-stream AP/routers. This solution features a custom-designed WLAN network processor with integrated Fast Ethernet Switch.

With a fast 400 MHz MIPS32® 24K® CPU on-board, the Atheros AR7240 delivers wire-speed LAN and WAN connectivity with plenty of CPU overhead remaining for advanced routing and networking applications.

Designed for high-volume, mainstream, single-band routers, and as an upgrade path for 11g and Super G® markets, the AR9002AP-1S targets applications in the retail, carrier gateway, SMB and enterprise segments. It achieves the industry’s highest level of performance for 1-stream 11n, using Atheros Align technology, while dramatically reducing RBOM components to deliver the lowest solution cost in the industry.

Solution Highlights
- Highly integrated two-chip solution for extremely cost effective AP/router platforms
- New-generation wireless access point and router chipset solution based on the 802.11n 1-stream specification, featuring:
  - AR7240: 400 MHz Network Processor (SoC) with fully integrated five ports of Fast Ethernet for configurations of up to four LAN and one WAN ports
  - AR9285: single-chip, PCI Express® 1.1 compliant CMOS MAC/Baseband/Radio with integrated power amplifier and low noise amplifier.
- Support for 1-stream 11n specification
- Enables bandwidth of up to 150 Mbps PHY rate – 3x the bandwidth of 802.11g
- Compliant with IEEE 802.11b, 802.11g, 802.11d, 802.11e, 802.11g, 802.11h, 802.11i
- Available in commercial temperature grades
- Lead-free RoHS compliant
AR9002AP-1S Specifications

**Frequency Band** 2.4 GHz

**Wireless Network Standard** 802.11b, 802.11g, 802.11n

**Wired Network Standard** 802.3, 802.3u, 802.1Q

**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 Express

**Peripheral Interface** USB, GPIOs, LEDs, UART, JTAG

**Memory Interface** Flash, DDR1 & DDR2 DRAM

**Supported Data Rates**
- IEEE 802.11b 1 – 11 Mbps
- IEEE 802.11g 6 – 54 Mbps
- IEEE 802.11n 1-stream 6.5 – 150 Mbps

AR9002AP-1S Reference Design Highlights

- Forward-compatible with multi-stream 802.11n, backwards compatible with 802.11g
- Supports 802.11n optional features including HT40, half-guard interval (Short GI), and Rx STBC (Receive Space-Time Block Coding)
- Fast Ethernet interfaces are compliant to and support advanced QoS features
- Low RBOM component count and cost
- Aggressive 2-layer PCB design and reduced memory footprint for absolute lowest solution cost
- PCI Express based specification 1.1 compliant
- Worldwide regulatory compliant
- Single worldwide SKU
- Driver support in Linux for maximum cost effectiveness

AR9285 MAC/Baseband/Radio

- Highly compact, small footprint package
- Fourth generation solution with integrated power amplifier and low noise amplifier for best total solution cost
- PCI Express based specification 1.1 compliant
- Low power sleep modes

AR7240 Wireless Network Processor

- Network Processor SOC for home, SMB, and enterprise access points, routers, and gateways.
- 32-bit MIPS 24K processor core, operating at up to 400 MHz with 8 KB icache and 32 KB dcache
- Integrated state-of-the-art Fast Ethernet switch core and five Fast Ethernet PHYs
- Ethernet switch core features non-blocking switch fabric, high-performance address lookup unit, four-traffic-class Quality of Service (QoS) engine, and 512 KB of embedded memory and integrated frame buffer memory
- Range of low-power states supported on Wired Ethernet, including cable detect, idle mode, and link length detect
- PCI Express based specification 1.1 compliant
- Supports DDR1 and DDR2 DRAM and serial flash
- Integrated USB MACPHY
- Spectrum Analysis

AR9002AP-1S Software Development Kit (SDK)

A Linux Software Development Kit (SDK) is available, providing solution developers with a feature-rich driver and board support package (BSP), including compiling environment that allows the freedom to customize and add functional blocks to meet application specific requirements.