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. Align solutions are forward compatible to higher-performance, multi-stream, MIMO-based 802.11n, and are available in reference designs to serve the networking, PC and consumer electronics markets. The enhanced throughput of Align 1–stream solutions improves network efficiency by occupying the wireless channel for shorter periods than slower 11g devices–reducing congestion and increasing capacity for additional wireless devices. Align employs all the mandatory and select optional features of the 11n specification, and Atheros' advanced radio design techniques, to effectively double the wireless coverage over legacy WLAN.

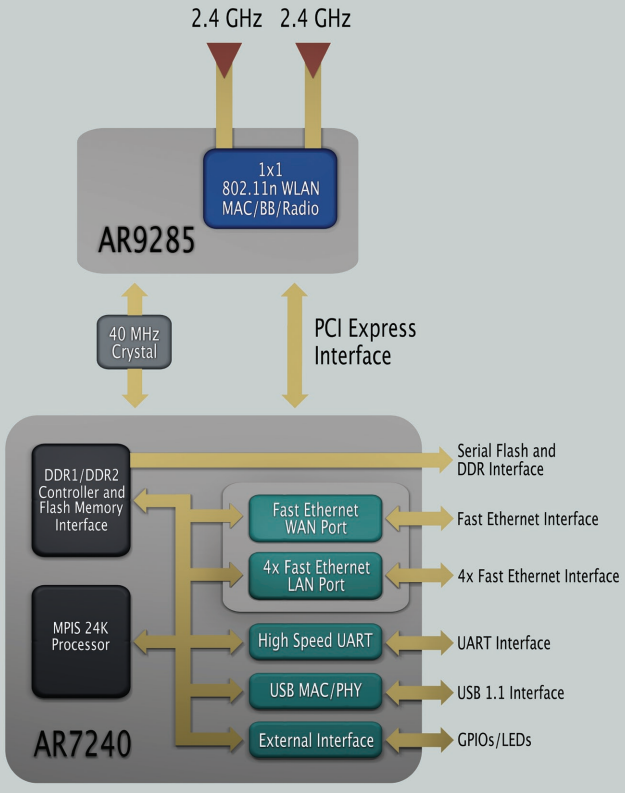
Product Overview

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.

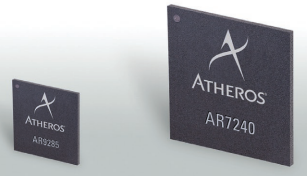
Designed for high-volume, mainstream, single-band routers, and as an upgrade path for 11g and Super G® markets, the AR9002AP–1S targets applications in the retail, carrier gateway, SMB and enterprise segments. It achieves the industry's highest level of performance for 1–stream 11n, using Atheros Align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

AR9002AP-1S Architecture



AR9002AP-1S

AP/Router solution based on 802.11n 1–stream specification



Providing the ideal upgrade path for 802.11g value-class portfolios

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
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 MAC/PHY
- 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.

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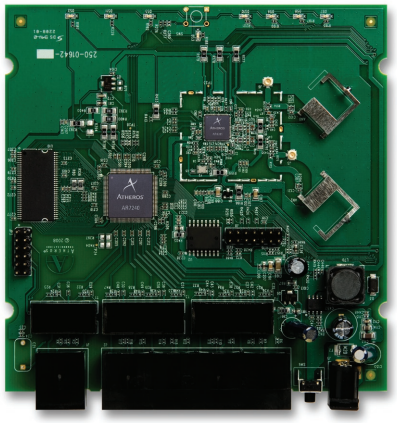

AP91

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

For more information on the AR9002AP-1S or other solutions from Atheros contact your local representative:

Atheros Communications, Inc.
t +1 408.773.5200
f +1 408.773.9940

Atheros Hong Kong Limited
t +852 8206.1131
f +852 8206.1301

Atheros Communications KK-Japan
t +81 3.5501.4100
f +81 3.5501.4129

Atheros (Shanghai) Co., Ltd.
t +86 21.5108.3626
f +86 21.5027.0100

Atheros Communications Intl, LLC-Taiwan
t +886 2.8751.6385
f +886 2.8751.6397

Atheros Korea
t +82 31.786.0428

For more information on Atheros and Atheros wireless technology please visit www.atheros.com

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