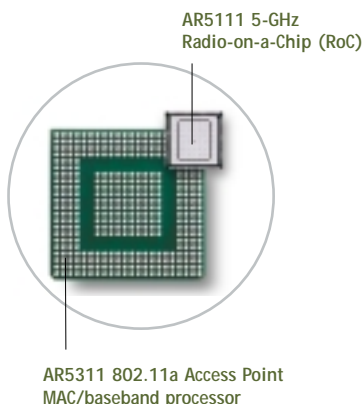**ATHEROS**
COMMUNICATIONS™

AR5001AP

AR5001AP WLAN Access Point Solution

With integrated microprocessor, MAC, baseband functionality, and Radio-on-a-Chip (RoC), the AR5001AP Access Point Solution provides the crucial building blocks for enterprise-quality WLAN access points. Use of the Advanced Encryption Standard (AES) resolves security concerns. This two-chip set represents the most highly integrated solution ever offered for implementing WLAN access points, thus reducing the cost and complexity of wireless networking.

AR5111 5-GHz Radio-on-a-Chip (RoC)

AR5311 802.11a Access Point MAC/baseband processor

Highlights

• Support for IEEE 802.11a

• Uses CMOS technology exclusively, minimizing power consumption and cost while maximizing reliability

• Highly integrated 2-chip set

• 5-GHz Radio-on-a-Chip

• 802.11a MAC/baseband processor

• Second-generation 802.11a technology

• Full line-speed support for the Advanced Encryption Standard without performance degradation. Legacy support for TKIP and WEP

• Quality of Service support (QoS)

• 108-Mbps Turbo Mode

• Dynamic Frequency Selection/Transmit Power Control (DFS/TPC) for international operation

• Extended 802.11a tuning range: 5.150 -5.850 GHz

• Support for draft IEEE 802.11e, f, h, and i standards

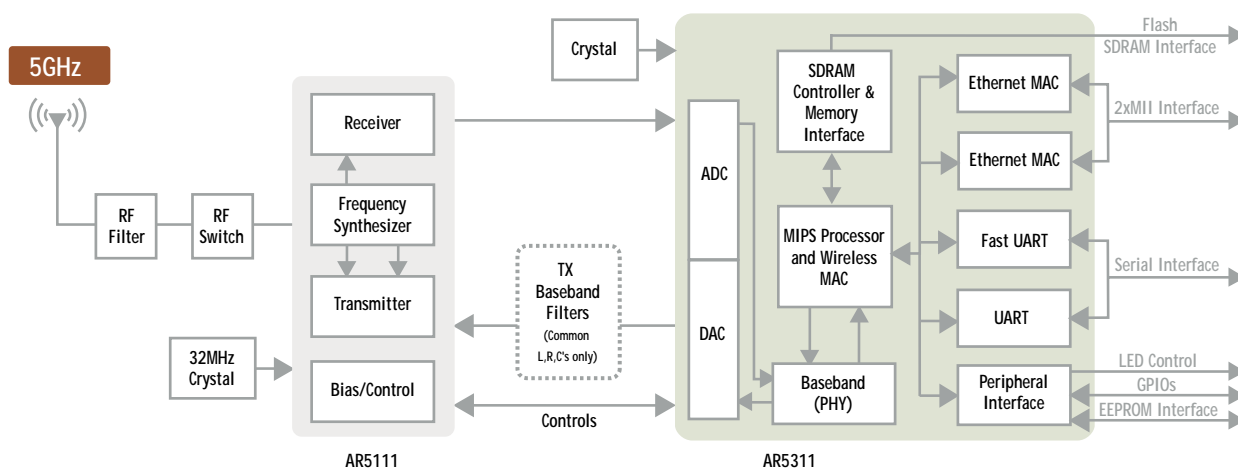• Enhanced performance, transmission range and reliability

Chipset overview

The AR5001AP Access Point Solution comprises two low-power chips, each of which rely exclusively on standard-process CMOS. As a result, the chip set delivers reliable, cost-effective connectivity.

The chipset includes:

AR5311 802.11a Access Point MAC/baseband processor

• Integrated 32-bit MIPS R4000-class processor

• Two 10/100 Ethernet MACs

• One Bluetooth-ready 1-Mbps UART and one 115-kbps UART

• One local bus interface

• Smart Select™ technology automatically chooses the data rate, error-correction mode, radio channel, power-management method, and security technology best suited to any situation

• Integrated analog-to-digital and digital-to-analog converters

• SDRAM and Flash memory Interface

• Low-power operational and sleep modes

AR5111 5-GHz Radio-on-a-Chip (RoC)

- Dynamic IF Dual Conversion architecture provides super-heterodyne performance at Zero IF prices

- Support for IEEE 802.11a standard

- Integrated second-generation power amplifier (PA) and low-noise amplifier (LNA)

- External PA and/or LNA can be used for special applications

- Enhancements to the transmit and receive chains

- Eliminates all IF filters and most RF filters; no external voltage-controlled oscillators (VCOs) or surface acoustic wave (SAW) filters needed

Applications

- Access points that bridge 802.11a to an enterprise network backbone

- Access points that bridge 802.11a and Bluetooth to an enterprise network backbone

- SOHO/residential gateways

- Residential media gateways that share video and data in the home

- Ethernet bridge for low-cost wireless connection to devices such as cable modems

- Local-bus bridge

In an enterprise or public "hot spot" application, the AR5001AP's two Ethernet MACs can be used to connect to both an Ethernet LAN backbone and an existing 802.11b WLAN access point, which then passes data through the AR5001AP. For homes, the dual MACs can connect to both a broadband Internet pipe and an access switch supporting multiple PCs and entertainment devices.

Second-Generation 802.11a

At the heart of the AR5001AP Access Point Solution is Atheros second-generation 802.11a technology. This technology includes the second-generation implementation of the Orthogonal Frequency Division Multiplexing (OFDM) modulation scheme with 15 advances in OFDM radio design. As the modulation scheme for both 802.11a and the draft 802.11g standards, OFDM is key to high-performance wireless networking.

OFDM mitigates multipath intersymbol interference at high data rates by simultaneously transmitting multiple subcarriers on orthogonal frequency channels. Each subcarrier is modulated at a low symbol rate. Because this approach is tolerant of many common channel impairments, OFDM improves range and reliability, making it the ideal choice for supporting multiple high-bandwidth tasks in real time.

AR5001AP Features Include

▸ **Full hardware support for Advanced Encryption Standard (AES) security—at full line-speed with no performance degradation. Support for Temporal Key Integrity Protocol (TKIP) and WEP.**

▸ **Quality of Service (QoS) for real time video, audio voice**

▸ **Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) for international use**

▸ **Up to 108-Mbps Atheros Turbo Mode™ in addition to standard rates of 6, 9, 12, 18, 24, 48 and 54-Mbps**

▸ **Smart Select™ optimization of data rate, error-correction mode, radio channel, power-management, and security**

▸ **Superior link robustness through proprietary channel estimation and error correction, as well as low noise, high linearity, RF front end and analog baseband circuits.**

▸ **Extended 5.150 to 5.850-GHz tuning range**

AR5001AP Chipset Specifications

Frequency Band	5.150 - 5.850 GHz
Network Standard	802.11a
Network Architectures	Ad hoc, Infrastructure
Modulation Technology	OFDM
Modulation Techniques	BPSK, QPSK, 16 QAM, 64 QAM
FEC Coding Rates	1/2, 2/3, 3/4
Security	
Encryption	AES, TKIP, WEP
Authentication	802.1x
Quality of Service	802.11e draft
Media Access Technique	CSMA/CA
Communication Interface	High Speed UART, UART, 2x MII
Peripheral Interface	EEPROM, GPIOs, LEDs
Memory Interface	Flash, SDRAM
Supported Data Rates	
IEEE 802.11a Standard Mode	6 - 54 Mbps
Atheros Turbo Mode	12 - 108 Mbps

Chip Specifications	AR5111	AR5311
Operating Voltage	2.5V +/- 5%	2.5V +/- 10%
	3.3V +/- 10%	3.3V +/- 10%
Package Dimensions	9mm x 9mm	21mm x 21mm
Packaging	64 LPCC	388 PBGA

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