Atheros ROCm™ Platform
Radio-On-Chip for Mobile (ROCm) Products

Introducing the Atheros ROCm platform of high-performance wireless solutions for mobile and embedded devices. The Atheros ROCm platform gives customers unsurpassed ability to:

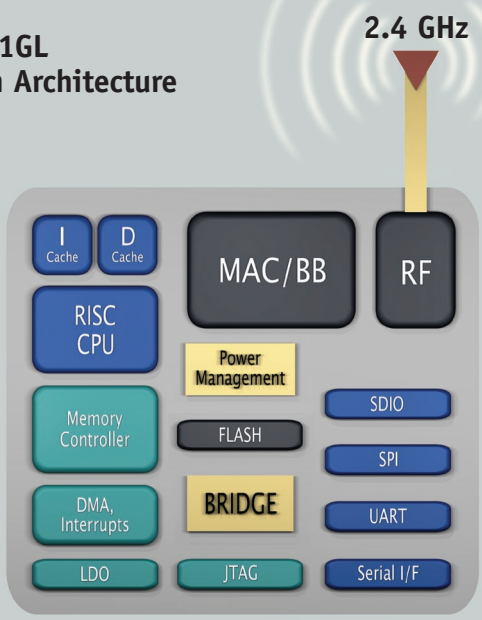
- Build the most power efficient devices
- Design for smallest form factor applications
- Achieve the most cost effective designs
  - Greater integration of functionality
  - Low-cost chip solution
- Deliver Atheros-class performance in a wide array of mobile devices

AR6001GL Technology Overview

The AR6001GL allows direct connection to cellular baseband and application processors via SDIO, SPI, and memory-mapped parallel interfaces. Its on-board processing and storage capabilities allow it to be integrated with the host platform with minimal development up-front and minimal loading during runtime. With its high degree of on-chip integration, it requires minimal external circuitry, and the entire solution, including front-end module, is designed to occupy minimal PCB area.

Sophisticated system-level features include fast sleep/wake context switching for energy-efficient VoIP, adaptive radio biasing for low-power operation, and spur cancellation and radio co-existence features for cellular/Bluetooth/802.11 interference mitigation. The AR6001GL is designed from the ground up to be a robust, space- and energy-efficient 802.11 solution to bring true broadband access capability to a range of mobile devices.

AR6001GL System Architecture



AR6001GL

AR6001GL

Embedded 802.11b/g Solution for Mobile and Battery-Operated Devices

AR6001GL
Low power and compact footprint for versatile wireless VoIP and data with embedded FLASH

AR6001GL Chip Features

- SDIO 1.1, SPI, UART, local bus parallel memory-mapped interfaces
- Integrated RISC processor
- External serial and parallel memory interfaces
- Integrated MAC/baseband processor and radio
- On-chip low-dropout linear regulator
- Fractional-N synthesizer for radio agility and external reference frequency scaling
- WEP, TKIP, and AES engines for line-speed encryption support
- Advanced Quality of Service
- Digital audio I^2S output for wireless speaker support
- Embedded low power FLASH

Solution Features

- Leading Edge APSD support for energy-efficient VoIP (sleep between voice packets)
- Fast channel scanning and changing for handset-assisted handover
- Adaptive radio biasing for low-power or high-performance modes
- In-band spur cancellation algorithms for interference immunity
- Bluetooth co-existence interface for time-shared transmission
- JumpStart for Wireless™ secure configuration tool
- Supports Cisco Compatible Extensions version 4.0

Summary of Benefits

- Universal client 802.11b/g capability for mobile and embedded devices
- Low power consumption with adaptive radio biasing for sustained power savings
- Self-contained, modular design for minimal host loading
- High integration level for compact and low-cost designs
- System-level enhancements for energy-efficient VoIP, interference immunity, and Bluetooth co-existence

Actual size comparison

AR6001GL Reference Design - SD13

The AR6001GL integrates the RF transceiver, baseband, MAC, central processing and peripheral control functions. A separate RF front-end module integrates the power amplifier, low-noise amplifier, and transmit/receive switch.

For the BGA package, the total solution area is less than 150 mm^2. The height of all solutions is less than 1.4 mm.

Applications

- Dual-mode cellular phones
- Smartphones with video and MP3 playback capability
- 802.11 Terminals
  - VoIP handsets for use with services such as Skype,™ Vonage,™ etc.
  - Web clients with text, VoIP, and video messaging capability
- Media devices such as MP3 music or MP4 video players
- Mobile gaming platforms with peer-to-peer network capability
- Control and automation in robotics, appliances, white goods, toys, etc.
- Digital still cameras and camcorders

AR6001GL Software Package

The software package consists of an NDIS equivalent interface, WLAN firmware, and control module running on the Host. NDIS[1] equivalent interface for seamless integration and operation of the 11g station.

WLAN Firmware

- Host/Target communication layer for basic packetized message exchange between the host and AR6001GL
- eCOS BSP – Basic Kernel
  - Atheros Radio Test module
  - Firmware upgrade
  - Basic Boot Module Interface
- Wireless Module Interface (WMI) – High-level API to allow setup and configuration of the networks from the host
  - WLAN mode configuration (Infrastructure or Ad-Hoc)
  - Regulatory control
  - Power consumption vs. performance oriented modes
  - Listen Interval
- Network scanning, discovery, roaming
- MLME protocol support

Host connection and industry-standard security management[2] module:

- Configuration of scanning and roaming parameters
- TSPEC(s) for special (QoS or low-energy) handling of tagged data
- Control of security policy and provisioning of encryption keys
- Support for third party security supplicants

1 NDIS - Microsoft's Network Driver Interface Specification

2 Windows ZeroConfig equivalent functionality with security supplicant for key management

AR6001GL Specifications

Frequency Band	2.4 GHz
Network Standard	802.11b, 802.11g
Modulation Modes	OFDM with BPSK, QPSK, 16 QAM, 64 QAM, CCK
Internal FLASH	512 KB
Hardware Security	AES, TKIP, WEP, WPA, WPA2, 802.11i
Quality of Service	Wi-Fi Multimedia, 802.11e EDCF
Media Access Technique	CSMA/CA
Data Path Interfaces	SDIO 1.1, SPI, 8- or 16-bit parallel memory mapped
Control Interfaces	16550-style UART, EJTAG, GPIO, I^2S
Memory Interfaces	Serial FLASH, Parallel FLASH, SRAM
Supported Data Rates	
IEEE 802.11b	1 to 11 Mbps
IEEE 802.11g	6 to 54 Mbps
Physical Specifications	
Package Dimensions	BGA 10mm x 10mm
Related ICs	AR6001G, AR6001GL, AR6001GZ AR6001X, AR6001XL, AR6001XZ

Contact your local Atheros representative and ask about the AR6001 or other solutions from Atheros:

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