

# AR6003

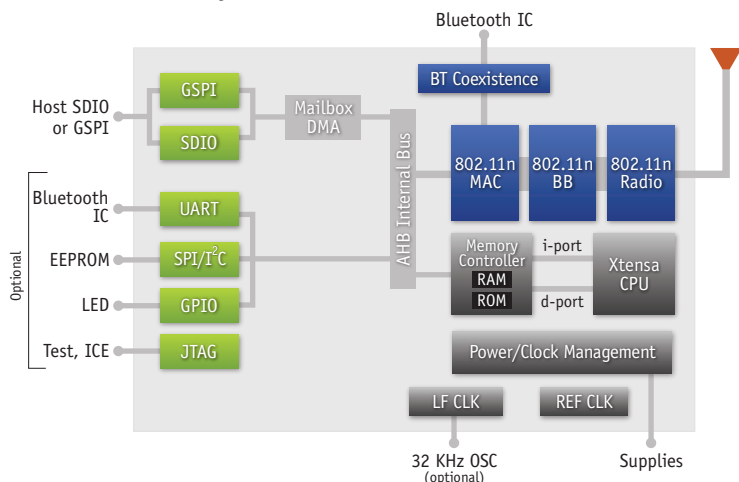
1-stream 11n for Mobile



## AR6003 Solution Highlights

- Most power-efficient 802.11a/b/g/n WLAN implementation for mobile and embedded applications
- Single-stream 802.11n provides highest throughput and superior RF performance for handhelds
- Advanced 802.11n features
  - HT20 (2.4/5 GHz) and HT40 (5 GHz only)
  - Full/Half guard interval
  - Frame aggregation
  - Space time block coding (STBC)
  - Low density parity check (LDPC) encoding
- Optimized for maximum throughput and low power consumption
- Highest level of on-chip integration using CMOS technology
  - Radio/MAC/Baseband
  - Patented Atheros Efficient Power Amplifier (EPA™) for high transmitter output power
  - Power management unit
  - LNA
- Smallest WLAN solution footprint for design flexibility
- Superior coexistence with Bluetooth co-located devices
  - Support for 2-, 3-, and 4-wire handshaking protocols
  - Enhanced PTA schemes and algorithms for optimal throughput at range
- Supports popular interfaces used in low power embedded designs
  - SDIO 2.0
  - GSPI

## AR6003 System Architecture



## Atheros ROCm® Platform

Radio-On-Chip for Mobile (ROCm) Products



The combination of ROCm wireless solutions for mobile WLAN, Bluetooth® and GPS, with Atheros' dominant position in the home, office and Metro Wi-Fi networking markets enables a worldwide wireless ecosystem based on the company's technologies. Atheros-engineered ROCm technologies provide the most reliable wireless performance and connectivity anywhere you go. The Atheros ROCm technologies give customers the unsurpassed ability to:

- Build the most power-efficient devices
- Design for the smallest form factor applications
- Achieve the most cost-effective designs
- Deliver Atheros-class performance in a wide array of mobile devices, all featuring a high level of design and integration ease.

## AR6003 Technology Overview

The AR6003 is the third-generation Wi-Fi chip from Atheros optimized for the throughput, size, and energy efficiency needs of mobile and embedded devices. With its tiny footprint and energy-saving qualities, the AR6003 rounds out Atheros' comprehensive Align® ecosystem of 1-stream 11n solutions, targeting smartphones, mobile gaming and portable CE devices.

With increased data throughput capabilities offered by 11n, the AR6003 achieves up to 48 Mbps in the 2.4 GHz band in 20 Mhz mode, and an unprecedented 85 Mbps in the 5 GHz in 40 Mhz mode. The AR6003 features the lowest current consumption of any 11n mobile WLAN solution on the market today to significantly extend battery life, while supporting the power demands of transmitting large media files. The AR6003 also employs the company's on-chip Efficient Power Amplifier™ (EPA) technology to reduce the power typically consumed by internal PAs, while delivering the output power of an external PA. The result is an average receive current consumption at 11n rates that is 20 percent lower than that of the AR6002, previously the industry's lowest power mobile WLAN solution.

The new ROCm® AR6003 enhances its rate-over-range performance above the coverage improvements inherent in the 802.11n MAC and PHY, by leveraging advanced optional 11n features such as Space Time Block Coding (STBC) and low density parity check (LDPC). In addition, the AR6003 features Atheros Universal Wireless Cooperation™, a suite of advanced wireless coexistence techniques to significantly enhance the simultaneous operation of WLAN and Bluetooth on a mobile device.

Atheros has taken integration to a new level with the AR6003 to enable 11n-class performance in a wider variety of mobile handsets and handheld products. The AR6003 eliminates many external components compared to competitive mobile WLAN solutions. The solution features an integrated linearized, high-efficiency power amplifier. The result of this integration is the industry's most compact standalone 11n solution, measuring a miniscule 5 mm x 5 mm – 50 percent smaller than the AR6002.

# AR6003

1-stream 11n for Mobile

*Smallest footprint and high RBOM integration enables design flexibility and lowest cost*



## AR6003 Radio

- 2.4 GHz and 2.4/5 GHz
- Integrated CMOS Efficient Power Amplifier (EPA™), LNA
- Adaptive radio biasing for low-power or high-performance modes
- Industry-leading receive sensitivity
- No external EEPROM required for RF calibration

## AR6003 MAC/Baseband/Processor

- IEEE 802.11a/b/g/n
- Integrated RISC processor
- Support for industry standard QoS schemes (802.11e, WMM, WMM-PS)
- Hardware accelerated security, including WAPI (China)

Atheros Communications is a leading developer of semiconductor system solutions for wireless and other network communications products. Atheros combines its wireless and networking systems expertise with high-performance radio frequency (RF), mixed signal and digital semiconductor design skills to provide highly integrated chipsets that are manufactured on low-cost, standard complementary metal-oxide semiconductor (CMOS) processes. Atheros technology is used by a broad base of leading customers, including personal computer, networking equipment and consumer device manufacturers.

## AR6003 Specifications

On-chip functionality	Single-chip MAC/BB/RF/PA/LNA
Frequency Band	2.4 GHz, 5 GHz
Network Standard	802.11a, 802.11b, 802.11g, 802.11n (single stream)
Modulation Modes	CCK and OFDM with BPSK, QPSK, 16 QAM, 64 QAM
Hardware Encryption	WEP, WPA/WPA2 (AES and TKIP), WAPI
Quality of Service (QoS)	WMM, WMM-PS, 802.11e
Communications Interface	SDIO 2.0 and GSPI HCI UART over SDIO
Peripheral Interface	UART, SPI, I <sup>2</sup> C, 26 GPIO pins
Supported Data Rates	IEEE 802.11a 6 – 54 Mbps IEEE 802.11b 1 – 11 Mbps IEEE 802.11g 6 – 54 Mbps IEEE 802.11n (2.4 GHz) 7.2 – 72.2 Mbps IEEE 802.11n (5 GHz) 13.5 – 150 Mbps
Physical Specifications	5 mm x 5 mm BGA with 0.4 mm pitch CSP with 0.3 mm pitch
Related ICs	AR6003G – 802.11b/g/n in BGA or CSP AR6003X – 802.11a/b/g/n in BGA or CSP
Bluetooth Coexistence	Supports 2-, 3-, and 4-wire handshaking protocols Bluetooth™ 3.0 + HS ready

For more information on the AR6003 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