**Solution Highlights**

- Supports up to 500 Mbps PHY rates over powerline and 700 Mbps PHY rates over coax
- Highly integrated MAC/PHY transceiver, supporting MII and RGMII interfaces
- Support for low power EuP directive
- IEEE 1901 and HomePlug AV PHY:
  - Supports OFDM 4096/1024/256/64/16/8 QAM, QPSK, BPSK and ROBO Modulation Schemes
  - 128-bit AES Link Encryption with key management
  - Windowed OFDM with noise mitigation based on patented line synchronization techniques improves data integrity in noisy conditions
  - Dynamic channel adaptation and channel estimation
  - Advanced Turbo Code Forward Error Correction
- IEEE 1901 and HomePlug AV MAC:
  - Priority-based CSMA/CA channel access schemes maximize efficiency and throughput
  - Integrated Quality of Service (QoS) enhancements with programmable packet classification engines and multiple priority queuing
  - Supports IGMP managed multicast sessions
- RoHS Compliant: 15x15 mm, 196 LBGA, Pb-Free package

**Technology Overview**

Atheros is committed to addressing the dramatically expanding connectivity requirements of the digital home. The AR7400 is the latest and fastest in Atheros' AMP™ Powerline solutions portfolio and is IEEE 1901 and HomePlug AV compliant. This fourth-generation HomePlug AV-based IC delivers carrier-grade broadband communications over both powerlines and coax.

For consumers and service providers using powerline, AR7400 technology enables fast, wired networking within a home using the home’s existing electrical wiring. It performs even faster over coax, providing last-mile broadband access in multi-dwelling units. In these Ethernet-over-Coax applications, it delivers PHY rates of 700 Mbps and up to 350 Mbps of throughput over coax.

**Product Overview**

The AR7400 is a Powerline Communications (PLC) transceiver IC. This IC enables the world’s smallest, highest performing and lowest power HomePlug AV-based and IEEE 1901-compliant products yet deployed. The chipset operates over a wider spectrum (2 MHz to 68 MHz), delivering over 2x the PHY rate speed of current HomePlug AV solutions.

The AR7400 transceiver is optimized for multi-media streaming applications to reliably deliver up to 500 Mbps PHY rate over the home’s AC wiring. The AR7400 includes a complete IEEE 1901 and HomePlug AV MAC and PHY, an Ethernet MII/RGMII Host Interface and an external memory interface that supports SDRAM/DDR memory. The AR7400 includes high-precision A/D (Analog-to-Digital) and D/A (Digital-to-Analog) converters required for analog interface to the AR1500 AFE/Line Driver IC.

The companion chip is the AR1500 AFE/Line Driver IC. The AR1500 AFE/Line Driver IC includes a Tx filter, a programmable-gain line driver and a programmable-gain Rx amplifier. The amplifier programmability allows signal optimization and multiple country support.
**RD7400-GE**

**Reference Design Highlights**

- Gigabit Ethernet Wall Adapter Reference Design
- Based on 4th-generation IEEE 1901 and HomePlug AV compliant AR7400/AR1500 Chipset
- Supports 500 Mbps PHY rates over powerline
- EuP low power directive compliant
- Emissions Compliance
  - FCC Part 15
  - CE class A and class B
- Reference design covers U.S., and Euro plug types

**AR7400 MAC/PHY Transceiver**

- IEEE 1901 and HomePlug AV compliant
- Supports MII and RGMII interfaces
- Supports SDRAM/DDR Memory
- Support EuP Low Power Directive

**AR1500 AFE/Line Driver IC**

- Companion to the AR7400 MAC/PHY IC
- Supports 2 MHz to 68 MHz operating frequency
- High precision low-noise receiver
- Integrated Tx Line Driver
- Programmable Tx gain control amplifier

Atheros Communications is a global leader in innovative technologies for wireless and wired communications. 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 networking equipment, computing and consumer device manufacturers.

### AR7400 Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Band</td>
<td>2 – 68 MHz</td>
</tr>
<tr>
<td>Network Standard</td>
<td>IEEE 1901 and HomePlug AV</td>
</tr>
<tr>
<td>Modulation Technology</td>
<td>Windowed OFDM</td>
</tr>
<tr>
<td>FEC Coding</td>
<td>Turbo Code</td>
</tr>
<tr>
<td>Hardware Encryption</td>
<td>AES 128-bit</td>
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<tr>
<td>Quality of Service</td>
<td>VLAN/TOS/Packet Classifier/</td>
</tr>
<tr>
<td></td>
<td>Quasi Error Free Delivery</td>
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<tr>
<td></td>
<td>for IPTV service</td>
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<tr>
<td>Communications Interface</td>
<td>MII/RGMII</td>
</tr>
<tr>
<td>Peripheral Interface</td>
<td>SPI/GPIO/UART/I2C</td>
</tr>
<tr>
<td>Memory Interface</td>
<td>SDRAM/DDR</td>
</tr>
<tr>
<td>Supported Data Rates</td>
<td>500 Mbps PHY rate</td>
</tr>
<tr>
<td>Low Power Design</td>
<td>Support EuP Low Power Directive</td>
</tr>
<tr>
<td>Customization Functionality</td>
<td>LED and Programmable Switches</td>
</tr>
<tr>
<td>Security</td>
<td>Supports “Simple Connect”</td>
</tr>
<tr>
<td></td>
<td>with Push Button Encryption</td>
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<tr>
<td></td>
<td>and Network Management Key</td>
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<tr>
<td>Diagnostic and Management Interface</td>
<td>HomePlug AV generic and vendor specific</td>
</tr>
<tr>
<td></td>
<td>Management Message Entries (MME)</td>
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<tr>
<td></td>
<td>TR-069 Remote Management</td>
</tr>
<tr>
<td>Worldwide Regulatory Support</td>
<td>Programmable Power Amplitude adjustments</td>
</tr>
<tr>
<td>Tools</td>
<td>Atheros Powerline Toolkit</td>
</tr>
<tr>
<td></td>
<td>that supports Linux/Windows/RTOS OS</td>
</tr>
<tr>
<td></td>
<td>Complete Software Development Kit</td>
</tr>
<tr>
<td></td>
<td>User Interface Utility</td>
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</tbody>
</table>

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