AR8031

Ultra low-power 10/100/1000 RGMII/SGMII Gigabit Ethernet Transceiver

Technology Overview

Atheros ETHOS® technologies provide customers with industry-leading low-power and solution size to enable Fast or Gigabit Ethernet connectivity in networking equipment, consumer electronics and computing platforms. Our PHY, controller and switch solutions support the IEEE 802.3az standard for Energy Efficient Ethernet, to extend battery-charges on computing platforms and deliver power-efficiencies in networking equipment. Atheros also enables incremental power-saving techniques to offer our customers the very lowest power Ethernet in the industry today. The unmatched efficiency and advanced carrier-class features of Atheros ETHOS solutions give customers a competitive edge when designing products for energy-conscious consumers and businesses.

Solution Highlights

- SGMII and RGMII MAC interface support
- Atheros ETHOS-Designed Green Ethernet (EDGE™) power-saving technology
- Fiber support to 1000Base-X and 100Base-FX with fault detect
- Integrated MDI termination resistors
- Full IEEE 802.3az support
- Atheros proprietary SmartEEE support
- Wake-on-LAN (WOL)
- Jumbo frame support up to 10 kb full duplex
- Synchronous-Ethernet support with recovered clock output
- Complete IEEE 1588 V2 support
- Single 3.3V supply

AR8031 Product Overview

The AR8031 is part of the Arctic family of PHYs – which includes the AR8030, AR8033, and AR8035. The AR8031 is Atheros' 4th generation, single port, 10/100/1000 Mbps Ethernet PHY. It supports both RGMII and SGMII interfaces to the MAC.
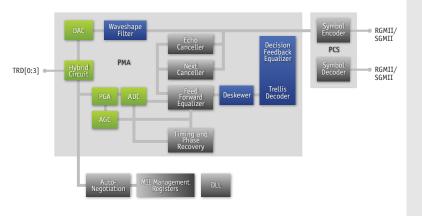
The AR8031 provides a low-power, low BOM (bill-of-materials) cost solution for a wide range of applications, including enterprise, carrier and home networks, including optical modules and media converters.

The AR8031 supports both Sync-E and IEEE1588-V2 timing protcols. The AR8031 device incorporates a 1.25 GHz SERDES which can be connected directly to fiber-optic transceivers for 1000 Base-X/100 Base-FX mode.

The AR8031 integrates Atheros ETHOS-Designed Green Ethernet (EDGE) power saving technologies to automatically save significant power in all operating and idle modes. The AR8031 also supports IEEE 802.3az EEE standard (Energy Efficient Ethernet) with proprietary SmartEEE technology to improve energy efficiency in systems using legacy MAC devices without 802.3az support – enabling customers to fully realize the energy benefits of the new standard by just replacing the PHY devices in their designs.

The AR8031 also supports Wake-on-LAN (WoL), embeds CDT (Cable Diagnostics Test) technology on-chip, and requires only a single, 3.3V power supply. On-chip regulators provide the other voltages. It integrates the termination R/C circuitry on both the MAC interfaces (RGMII/SGMII) and the line side.

AR8031 Architecture

There is Here.™

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Transceiver

AR8031 Specifications

10/100/1000Base-T IEEE 802.3 compliant

Supports 1000Base-T PCS and auto-negotiation with next page support

Supports RGMII and/or SGMII interfaces to MAC devices

Supports Fiber and Copper combo mode when MAC interface works in RGMII mode

Supports additional IEEE 1000 Base-X and 100 Base-FX with Integrated Serdes

RGMII timing modes support internal delay and external delay on both Rx and Tx paths

Atheros ETHOS-Designed Green Ethernet (EDGE) power saving modes with internal automatic DSP power saving scheme

Supports 802.3az (Energy Efficient Ethernet)

Supports Wake-on-LAN (WoL) to detect magic packet and notify the sleeping system to wake up

Fully integrated digital adaptive equalizers, echo cancellers, and near end crosstalk (NEXT) cancellers

All-digital baseline wander correction

Supports Synchronous Ethernet

Error-free operation up to 140 meters of CAT5 cable

Automatic channel swap (ACS)

Automatic MDI/MDIX crossover

Automatic polarity correction

IEEE 802.3u compliant Auto-Negotiation

Jumbo Frame support up to 10KB (full duplex)

Software programmable LED modes

Multiple loopback modes for diagnostics

Single power supply: 3.3V, optional for external regulator for core voltage

Atheros Cable Diagnostic Test (CDT) Technologies

IEEE 802.3 remote fault indication and fault propagation in fiber mode

Pin to Pin compatible with low cost AR8033

48-pin QFN package

Industrial temperature range option

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.

ATHEROS

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