# AR8327
AR8327N

7-port Low-power Managed/ Layer3 Gigabit Switch with Hardware NAT

ATHEROS®

Solution Highlights

- One GMII or two RGMII MAC interfaces
- Single SERDES/SGMII Interface
- 5 integrated 10/100/1000Base-T PHYs with integrated termination for the MDI interface
- Supports IEEE 802.3az standard
- Atheros ETHOS-Designed Green Ethernet (EDGE™) power saving modes
- QoS support with four traffic classes based on port, IEE802.1p, IPV4 TOS, IPV6 TC and MAC addresses
- Full VLAN support including QinQ and VLAN tag insertion and removal, with IVL and SVL
- VLAN translation and mapping
- Line rate hardware NAT (AR8327N)
- Hardware IGMP V1/2/3 and MLD V1/2 snooping, join and fast leave
- 96 Custom ACLs and rule based counters
- Ingress and Egress rate limiting and bandwidth control
- Broadcast storm suppression

AR8327 Architecture
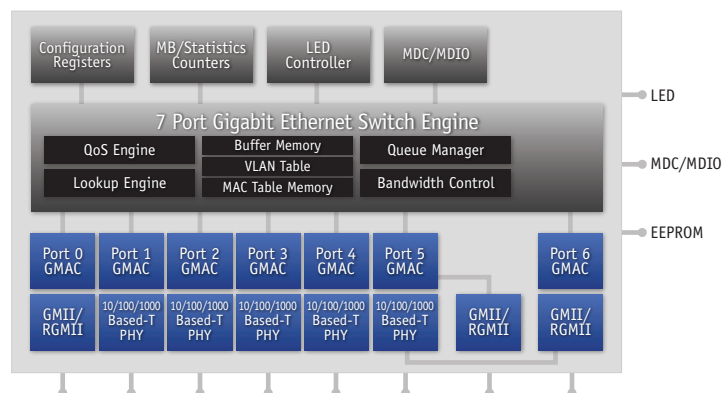
Technology Overview

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.

AR8327 Product Overview

The AR8327 is the latest in high performance small network switching. It is ultra low power, has extensive routing and data management functions and includes hardware NAT functionality (AR8327N).

The AR8327/AR8327N is a highly integrated seven-port Gigabit Ethernet switch with a fully non-blocking switch fabric, a high-performance lookup unit supporting 2048 MAC addresses, and a four-traffic class Quality of Service (QoS) engine. The AR8327 has the flexibility to support various networking applications. The AR8327/AR8327N is designed for cost-sensitive switch applications in wireless AP routers, home gateways, and xDSL/cable modem platforms.

The AR8327/AR8327N complies with 10Base-T, 100Base-T and 1000Base-T specifications, including the MAC control, pause frame, and auto-negotiation, providing compatibility with all industry-standard Fast Ethernet and Gigabit Ethernet networks. The AR8327/AR8327N device contains five full-duplex 10/100/100Base-T transceivers and 10/100Base-T that can run at half duplex, each of which performs all of the physical layer interface functions for 10Base-T Ethernet on Category 3, 4, or 5 unshielded twisted-pair (UTP) cable and 100Base-T Fast/Gigabit Ethernet on Category 5 UTP cable. The remaining 2 ports feature a standard GMII/RGMII/MII/Serdes interface to allow connection to a host CPU in PON/xDSL/Cable/Wifi/Fiber routers.

The MACs on the AR8327/AR8327N support Jumbo Frames to reduce overhead on the link for more efficiency. SPI or EEPROM interfaces provide easy programming of the on-chip 802.1p QoS and/or DiffServ/TOS allowing switch traffic to be given different classes of priority or service - for example, voice traffic for IP phone applications, video traffic for multimedia applications, or data traffic. Up to 4k virtual LANs (VLANs) can be set up via the SPI port for separation of different users or groups on the network. ACL features can reduce CPU effort for VLAN/QOS/DSCP/forward mapping and remapping based on Layer1 to Layer4 information. 16 PPPoE header add/removal can increase video QOS and offload the CPU. Hardware IGMP V1/V2/V3 is an innovation for IPTV service. Atheros low-power can increase energy efficiency for no link or idle states.

The 8327N supports line rate NAT (Network Address Translation) offloading the processor and improving throughput.

AR8327
AR8327N

7-port Low-power Managed/Layer3
Gigabit Switch with Hardware NAT

AR8327N Reference Design Highlights

- Support five Gigabit TP, Extra Two RGMII MAC.
- Serdes/SGMII Interface for Active Fiber connection.
- Console UART interface to control chip setting.

AR8327 Specifications

10/100/1000Base-T IEEE 802.3 compliant

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

GMII/RGMII/MII/Serdes connections to MAC devices and SFPs

Supports additional IEEE 1000Base-X and 100Base-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 IEEE 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

Automatic channel swap (ACS)

Automatic MDI/MDIX crossover

Automatic polarity correction

IEEE 802.3u compliant Auto-Negotiation

Jumbo Frame support up to 9KB (full duplex)

Software programmable LED modes

Multiple loopback modes for diagnostics

96 ACL rules for traffic shaping and routing

Supports 16 PPPoE sessions with hardware header removal

802.1D spanning tree support

Ingress and Egress rate limiting

Broadcast storm suppression

Port mirroring

IEEE 802.3x Flow control for full duplex and and back pressure for half duplex

Hardware loop detection

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

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.

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