



AR8328/AR8328N

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



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Qualcomm® ETHOS®

The Need. Hunger for bandwidth on today's media rich networks.
The Feed. Ethernet.
Qualcomm Engineered.



Qualcomm ETHOS

Qualcomm 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. Qualcomm 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 Qualcomm ETHOS solutions give customers a competitive edge when designing products for energy-conscious consumers and businesses.

Solution Highlights

- Supports GMII/RGMII with up to three ports
- Single SERDES/SGMII Interface
- 5 integrated 10/100/1000Base-T PHYs with integrated termination for the MDI interface
- Supports IEEE 802.3az standard
- Qualcomm 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 (AR8328N)
- 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

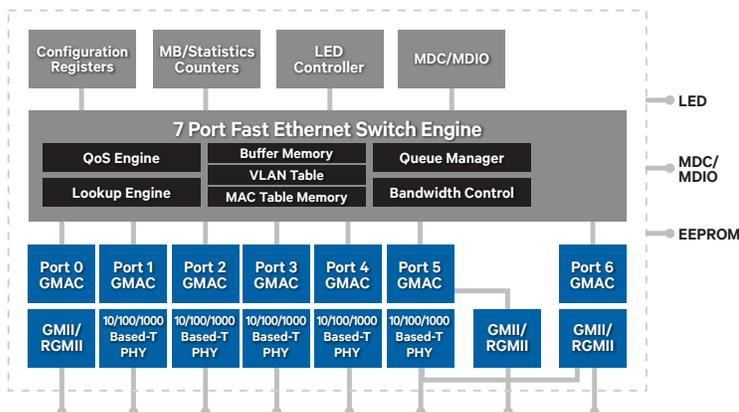
AR8328/AR8328N Product Overview

The AR8328 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 (AR8328N).

The AR8328/AR8328N 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 AR8328 has the flexibility to support various networking applications. The AR8328/AR8328N is designed for cost-sensitive switch applications in wireless AP routers, home gateways, and xDSL/cable modem platforms.

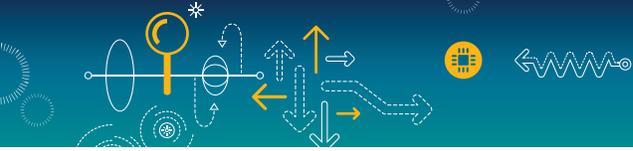
The AR8328/AR8328N complies with 10Base-T, 100Base-T and 1000Base-T specifications, including the MAC control, pause frame, and auto-negotiation, providing compatibility with all industry-standard Fast Ethernet and Gigabit Ethernet networks. The AR8328/AR8328N device contains five full-duplex 10/100/1000Base-T 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/Wi-Fi/Fiber routers.

AR8328/AR8328N System Architecture



The MACs on the AR8328/AR8328N 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 quality and offload the CPU. Hardware IGMP V1/V2/V3 is an innovation for IPTV service. Qualcomm low-power can increase energy efficiency for no link or idle states.

The AR8328N supports line rate NAT (Network Address Translation) offloading the processor and improving throughput.



AR8328/AR8328N 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

Qualcomm 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 back pressure for half duplex

Hardware loop detection

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

Qualcomm Cable Diagnostic Test (CDT) Technologies

IEEE 802.3 remote fault indication and fault propagation in fiber mode

Qualcomm Atheros is a wholly owned subsidiary of Qualcomm Technologies, Inc. and a leading provider of wireless and wired technologies for the mobile, networking, computing and consumer electronics markets. We're focused on inventing technologies that connect and empower people in ways that are elegant and accessible to all.

Our broad connectivity portfolio allows us to offer our global customer base high-performance, end-to-end solutions, featuring Wi-Fi®, GPS, Bluetooth®, FM, Ethernet, HomePlug™ Powerline and PON technologies. By leveraging substantial expertise in RF, signal processing, software and networking we can deliver highly-integrated, low-power, system-level solutions that enable developers to create high-performance, differentiated products.

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