



# AR8228/AR8229

7-Port Low-power Managed  
Hybrid Switch Supports  
Industrial Temperatures



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## Qualcomm® ETHOS®

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



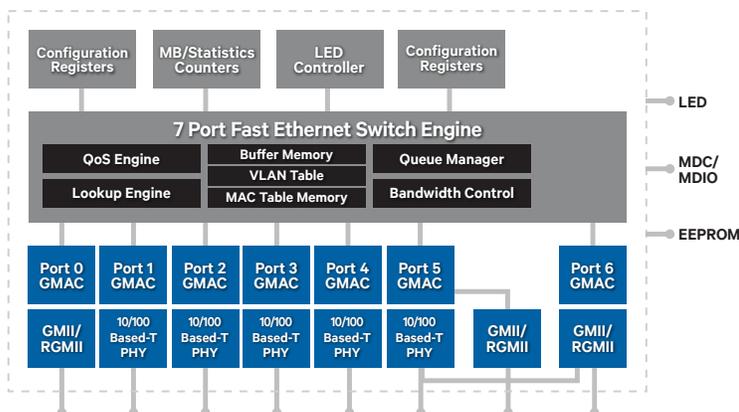
### Qualcomm ETHOS

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

- Up to three GMII/RGMII MAC interface
- 5 Integrated 10/100Base-T PHYs
- QoS support with four traffic classes based on port, IEEE 802.1p, IPV4 TOS, IPV6 TC and MAC addresses
- Full VLAN support including QinQ and VLAN tag insertion and removal
- IGMP V1/2/3 and MLD V1/2 support with hardware snooping and fast leave
- 32 Custom ACLs and rule based counters
- Ingress and Egress rate limiting
- Broadcast storm suppression
- Industrial Temperature range (AR8229)

### AR8228/AR8229 System Architecture



### AR8228/AR8229 Product Overview

The AR8228/AR8229 devices contain five full-duplex 10/100Base-T Ethernet transceivers, each of which performs all of the physical layer interface functions for 10Base-T Ethernet over Category 3, 4, or 5 unshielded twisted-pair (UTP) cable and 100Base-T Ethernet over Category 5 UTP cable.

The AR8228/AR8229 have up to three GMII/RGMII/TMII/MII interfaces to allow connection to host CPU in xDSL/Cable/Wi-Fi routers.

AR8228/AR8229 supports up to 9K Jumbo Frames which are typically used for high-performance connections to servers because they offer a smaller percentage of overhead on the link for more efficiency.

SPI or EEPROM interfaces provide easy programming on-chip functions even in unmanaged environments.

QoS functionality allows switch traffic to be given different classes of priority, 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.

32 ACLs can reduce CPU effort for VLAN/QoS/DSCP/forward mapping and remapping based on Layer1 to Layer4 information. Support for 16 PPPoE header removal sessions can increase video quality and further offload the CPU.

Hardware IGMP V1/V2/V3 (lite) and MLD1/2 (lite) is an innovation for IPTV service control without CPU effort.

Full QinQ support allows independent routing and QoS decisions based on destination and traffic types in triple play applications.

Qualcomm EDGE™ ETHOS-Designed Green Ethernet, power-saving features increases energy efficiency in disconnect or idle states while optimizing power consumption in active links based on cable length.

### AR8228/AR8229 Specifications

10/100Base-T IEEE 802.3 compliant

Supports GMII, RGMII, MII and TMII interfaces to MAC devices

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

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

Qualcomm Cable Diagnostic Test (CDT) Technologies

IEEE 802.3 remote fault indication and fault propagation in fiber mode

32 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

IEEE802.3x Flow control for full duplex and and back pressure for half duplex

Hardware loop detection

Industrial temperature range (AR8229)

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.

For more information, please visit us online @ [qca.qualcomm.com](http://qca.qualcomm.com)

