

Multi-Gigabit Enterprise Client Connectivity

AQtion™ Multi-Gigabit Ethernet Controller

Product Overview

Following its success in pioneering and deploying AQrate, a new class of Ethernet PHY connectivity solution capable of delivering Multi-Gigabit Ethernet over copper cables such as Cat5e typically used for Gigabit, Aquantia has developed AQtion, an Enterprise-class client controller technology supporting Multi-Gigabit speeds.

Aquantia's AQtion devices, the AQC107 and AQC108 support 5 and 2.5 Gigabit Ethernet over copper, or 2.5/5GBASE-T, and are compliant with the NBASE-T specification and the new IEEE 802.3bz standard that was formally ratified in September 2016. In addition, both devices also support backward compatibility with 100MbE and Gigabit Ethernet. The AQC107 has the extra feature of supporting up to 10 Gigabit Ethernet, or 10GBASE-T, on Cat6A copper cables, complying with the IEEE standard 802.3an. The AQtion controller is designed with a PCI Express Gen2/3 x1, x2, x4 for optimal line rate performance connecting to the CPU on the system side.

The AQtion software includes drivers for Windows (10, 8.x, and 7), Mac OS X, and Linux. Aquantia also provides UEFI and PXE boot code, as well as ROM programming and Windows Installer utilities.

Device Name	Speeds	Package
AQC107	5-speed	12 mm x 14 mm
AQC108	4-speed	12 mm x 14 mm

The AQtion devices are packaged in a 12 mm x 14 mm, 0.8 mm pitch flip-chip BGA.



Applications

Aquantia's AQtion Ethernet controller product family is a game changer that enables diverse environments ranging from Enterprise and SMB networks to gaming connectivity to evolve beyond 1 Gbps to 10 Gbps, 5 Gbps, and 2.5 Gbps data rates. Aquantia's AQtion Ethernet controllers are ideally suited to provide a wide variety of Enterprise clients with the ability to more easily perform more data-intensive applications such as video editing, image rendering, database transfers, artistic simulations, and Enterprise-class backups involving big data stored in local Network-Attached Storage (NAS).

Features	Benefits
Single-chip solution	Integrated PCIe, MAC, and PHY minimizes board space and power utilization
PCI Express Gen3 or Gen2	Supports line rates of 8.0 GT/s and 5.0 GT/s per lane
Bus width	Supports Gen3 x4 or Gen2 x4
MSI, MSI-X, and legacy INTx PCIe interrupts	Improved CPU utilization and network performance
Two SMBus (Master/Slave + Slave)	Communication and management function

PHY Specific Features

Integrated Aquantia AQRate PHY featuring NBASE-T technology	100 meters over Cat 5e and Cat 6a at 5 Gbps/2.5Gbps/1Gbps/100 Mbps • Requires no change to existing infrastructure or cabling
Advanced cable diagnostics	On-chip high resolution cable analyzer
Audio Video Bridging (AVB) and PTP/1588v2	Management of time-sensitive traffic packets
EEE support	PHY power savings mode

MAC Specific Features

Benefits

LSO, RSS, DCA, and header checksum	Increased network performance and lower host CPU utilization
Wake-on-LAN (WoL) power management	Supports lower power modes
On-chip CPU DASH	Desktop management
MACsec	Secured traffic over Ethernet links
Internet Control Message Protocol (ICMP)	Supports diagnostic, error, and operational information messages
Address Resolution Protocol (ARP)	Resolves network layer addresses into link layer addresses
Multicast Domain Name System (mDNS)	Resolves host names to IP addresses
Transmission Control Protocol (TCP) Keepalives (KA)	Supports link checking between devices
Quality of Service (QoS) support	Up to eight traffic classes and Data Center Bridging (DCB)
Jumbo frames (up to 16 Kbytes)	Improved network performance with reduced CPU utilization
IPv4, IPv6/TCP and IPv6/UDP checksum offload	Offloading calculations and improved CPU usage

