

Multi-Gigabit Enterprise Client Connectivity

Scalable mGig Multi-Gigabit Ethernet Controller

Overview

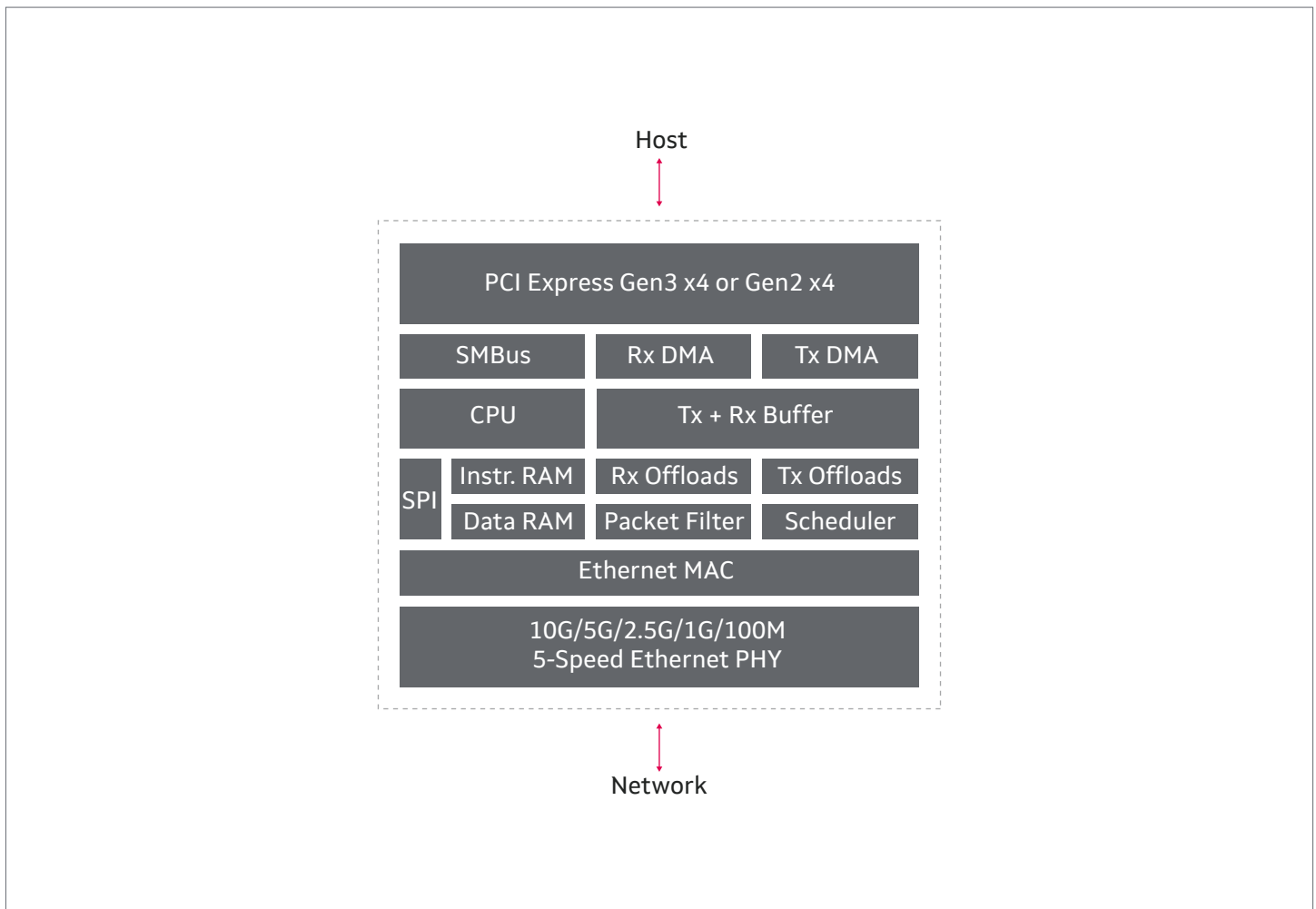
Scalable mGig Ethernet controllers leverage industry proven Marvell Alaska PHY technology to deliver Multi-Gigabit Ethernet over copper cables, including Cat5e and Cat 6, which were previously limited to Gigabit Ethernet speeds.

Marvell's Scalable mGig devices, the AQC107 and AQC108 support 5/2.5 Gigabit Ethernet over copper, and 2.5/5GBASE-T respectively, and are compliant with the NBASE-T specification and the new IEEE 802.3bz standard that was formally ratified in September 2016. FastLinQ Edge devices are packaged in a 12 mm x 14 mm, 0.8 mm pitch flip-chip BGA.

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 Cat 6A copper cables, complying with the IEEE standard 802.3an. These Scalable mGig controllers are designed with a PCI Express Gen2/3 x1, x2, x4 for optimal line rate performance connecting to the CPU on the system side.

The Scalable mGig software includes drivers for Windows (10, 8.x, and 7), macOS X, and Linux. Marvell also provides UEFI and PXE boot code, as well as ROM programming and Windows Installer utilities.

Block Diagram



Key Features

| Features | Benefits |
|---|---|
| Single-chip solution | <ul style="list-style-type: none">• Integrated PCIe, MAC, and PHY minimizes board space and power utilization |
| PCI Express Gen3/Gen2 | <ul style="list-style-type: none">• Supports line rate of up to 8.0 GT/s per lane |
| Bus width | <ul style="list-style-type: none">• Supports Gen3/Gen2 x1 |
| MSI, MSI-X, and legacy INTx PCIe interrupts | <ul style="list-style-type: none">• Improves CPU utilization and network performance |
| Two SMBus (Master/Slave + Slave) | <ul style="list-style-type: none">• Supports communication and management function |
| PHY Specific Features | Benefits |
| Integrated Marvell Alaska PHY featuring NBASE-T technology | <ul style="list-style-type: none">• 100 meters over Cat 5e or better at 5 Gbps, 2.5 Gbps, 1 Gbps,• 100 Mbps (requires no change to existing infrastructure or cabling) |
| Advanced cable diagnostics | <ul style="list-style-type: none">• On-chip high resolution cable analyzer |
| Audio Video Bridging (AVB) and PTP/1588v2 | <ul style="list-style-type: none">• Management of time-sensitive traffic packets |
| MAC Specific Features | Benefits |
| <ul style="list-style-type: none">• Large Send Offload (LSO)• Receive Side Scaling (RSS)• Direct Cache Access (DCA)• Header checksum | <ul style="list-style-type: none">• Increased network performance and lower host CPU utilization |
| Wake-on-LAN (WoL) power management | <ul style="list-style-type: none">• Supports lower power modes |
| On-chip CPU DASH | <ul style="list-style-type: none">• Desktop management |
| Internet Control Message Protocol (ICMP) | <ul style="list-style-type: none">• Supports diagnostic, error, and operational information messages |
| Address Resolution Protocol (ARP) | <ul style="list-style-type: none">• Resolves network layer addresses into link layer addresses |
| Multicast Domain Name System (mDNS) | <ul style="list-style-type: none">• Resolves host names to IP addresses |
| Transmission Control Protocol (TCP) Keepalives (KA) | <ul style="list-style-type: none">• Supports link checking between devices |
| Quality of Service (QoS) | <ul style="list-style-type: none">• Supports up to eight traffic classes and Data Center Bridging (DCB) |
| Jumbo Frames (up to 16Kbytes) | <ul style="list-style-type: none">• Improves network performance while reducing CPU utilization |
| IPv4/v6, IPv6/TCP, and IPv6/UDP checksum offload | <ul style="list-style-type: none">• Offloads calculations and improves CPU usage |

Ordering Codes

| Part Number | Speed | Package |
|-------------|---------|-------------|
| AQC111C | 4-Speed | 9 mm x 9 mm |
| AQC112C | 3-Speed | 9 mm x 9 mm |

This FastLinQ Edge device is in a 9 mm x 9 mm, 0.8 mm pitch 100-pin FCBGA

Target Applications

Motherboards, PCs, Workstations, docking stations, NAS, Routers, Gateways, and other embedded applications.

Drivers: Windows 10 (32-bit/64-bit), Windows 8.0/8.1 (32-bit/64-bit), Windows 7 (32-bit/64-bit), Linux 3.10 and higher

Utilities: ROM programming and Windows installer

Boot Options: UEFI and PXE



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