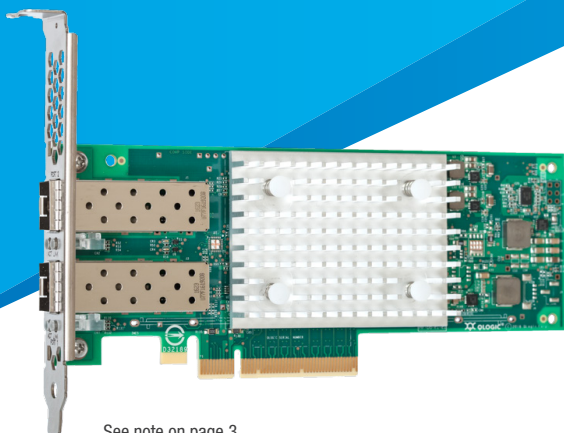


# QLogic FastLinQ QL41262 Dual Port 10/25GbE CNA SFP+

## 10/25GbE Converged Network Adapters with iSCSI, FCoE, and Universal RDMA



See note on page 3.

- Industry's most powerful 25GbE adapters deliver the best price and performance ratio compared to 10GbE
- Universal RDMA delivers the ultimate choice and flexibility with concurrent support for RoCE, RoCEv2, and iWARP technologies
- Enables provisioning of 25GbE/10GbE ports for greater deployment flexibility through switch-independent NIC partitioning
- Increases VM density and accelerates multitenant networks with full offload for tunneling protocols
- Supports FCoE and iSCSI stateless offload operation

## OVERVIEW

QLogic® FastLinQ® QL41262HFCU-DE and QL41262HLCU-DE 10/25GbE Converged Network Adapters (CNAs) with Universal Remote Direct Memory Access (RDMA) leverage QLogic's eighth-generation technology to deliver true 25Gb per second (25Gbps) Ethernet performance. Integrated, advanced networking with simultaneous LAN (TCP/IP) and SAN (Fibre Channel over Ethernet [FCoE] and iSCSI) traffic eliminates I/O bottlenecks and conserves CPU cycles. Optimized for use across enterprises, managed service providers (MSPs), and large public and scalable public cloud deployments, the QL41262 enables organizations to achieve new levels of performance in physical, virtual, and cloud environments.

The 25Gb Ethernet (25GbE) specification enables network bandwidth to be cost-effectively scaled in support of next-generation server and storage solutions residing in cloud and Web-scale data center environments. 25GbE results in a single-lane connection similar to existing 10GbE technology—but it delivers 2.5 times greater bandwidth. Compared to 40GbE solutions, 25GbE technology provides superior switch port density by requiring just a single lane (versus four lanes with 40GbE), along with lower costs and power requirements. QLogic is a leading innovator driving 25GbE technologies across enterprise and cloud market segments.

QLogic FastLinQ QL41262HFCU-DE and QL41262HLCU-DE 10/25GbE Adapters deliver advanced Ethernet solutions that are designed to meet requirements from leading enterprise and cloud providers. QLogic features that collectively deliver the most advanced 25GbE adapter include:

- Accelerates the most demanding telco NFV workloads with QLogic DPDK high-speed packet processing engine
- Cutting-edge server virtualization technologies—single-root I/O virtualization (SR-IOV) and Dell Switch Independent Partitioning
- Network virtualization—offloads for Virtual Extensible LAN (VXLAN), Generic Network Virtualization Encapsulation (GENEVE), and Network Virtualization using Generic Routing Encapsulation (NVGRE)
- Universal RDMA technologies—RDMA over Converged Ethernet (RoCE), RoCEv2, iSCSI Extensions for RDMA (iSER), and Internet wide area RDMA protocol (iWARP)
- Migration path from 10GbE to 25GbE
- Orchestrate and manage hyperscale OpenStack® deployments with QLogic cloud-enabled management framework
- Backward compatible with 10GbE infrastructure for complete investment protection

### REDUCE CAPITAL EXPENDITURE AND OPERATING EXPENSE

QLogic QL41262 10/25GbE technology delivers better price-per-gigabit versus 10GbE. The adapter is backward compatible with existing 10GbE installations while allowing an upgrade to 25GbE infrastructure. This technology enables cloud providers and large-scale data center operators to reduce operating expense while continuing to scale their network of server and storage nodes to meet increasing demands of the future. QLogic 25GbE technology is cost-efficient and power-efficient because it utilizes a single lane in comparison to other alternatives such as quad-lane 40GbE. The QL41262 Adapter is compatible with 25Gbps lanes in 100GbE switches, paving the way to a seamless upgrade path to 100GbE and protecting critical business investments.

### ACCELERATE ANY NETWORK WITH UNIVERSAL RDMA OFFLOAD

QLogic QL41262HFCU-DE and QL41262HLCU-DE 10/25GbE Adapters support RoCE and iWARP acceleration to deliver low latency, low CPU utilization, and high performance on Windows Server® Message Block (SMB) Direct 3.0 and 3.02, and iSER. QL41262 10/25GbE Adapters have the unique capability to deliver Universal RDMA that enables RoCE, RoCEv2, and iWARP. QLogic Universal RDMA and emerging low latency I/O bus mechanisms such as Network File System over RDMA (NFSoverRDMA) allow customers to accelerate access to data. QLogic's cutting-edge offloading technology increases cluster efficiency and scalability to many thousands of nodes.

### HIGH DENSITY SERVER VIRTUALIZATION

The latest hypervisors and multicore systems use several technologies to increase the scale of virtualization. QLogic QL41262HFCU-DE and QL41262HLCU-DE 10/25GbE Adapter support:

- VMware® NetQueue
- Windows® Hyper-V® Virtual Machine Queue (VMQ)
- Linux® Multiqueue
- Windows, Linux, and VMware switch-independent NPAR
- Windows Hyper-V, Linux Kernel-based Virtual Machine (KVM), and VMware ESXi™ SR-IOV

These features provide ultimate flexibility, quality of service (QoS), and optimized host and virtual machine (VM) performance while providing full 25Gbps bandwidth per port. Public and private cloud virtualized server farms can now achieve 2.5 times the VM density for the best price and VM ratio.

### WIRE-SPEED NETWORK VIRTUALIZATION

Enterprise-class data centers can be scaled using overlay networks to carry VM traffic over a logical tunnel using NVGRE, VXLAN, and GENEVE. Although overlay networks can resolve virtual LAN (VLAN) limitations, native stateless offloading engines are bypassed, which places a higher load on the system's CPU. QLogic QL41262HFCU-DE and QL41262HLCU-DE 10/25GbE Adapters efficiently handle this load with advanced NVGRE, VXLAN, and GENEVE

stateless offload engines that access the overlay protocol headers. This access enables traditional stateless offloads of encapsulated traffic with native-level performance in the network. Additionally, QLogic QL41262HFCU-DE and QL41262HLCU-DE 10/25GbE Adapters support VMware NSX® and Open vSwitch (OVS).

### HYPER-SCALE ORCHESTRATION WITH OPENSTACK

QLogic QL41262HFCU-DE and QL41262HLCU-DE 10/25GbE Adapters support the OpenStack open source infrastructure for constructing and supervising public, private, and hybrid cloud computing platforms. They provide for both networking and storage services (block, file, and object) for iSER. These platforms allow providers to rapidly and horizontally scale VMs over their entire, diverse, and widely spread network architecture to meet the real-time needs of their customers. QLogic's integrated, multiprotocol management utility, QConvergeConsole® (QCC), provides breakthrough features that allow customers to visualize the OpenStack-orchestrated data center using auto-discovery technology.

### ACCELERATE TELCO NETWORK FUNCTION VIRTUALIZATION (NFV) WORKLOADS

In addition to OpenStack, QLogic QL41262HFCU-DE and QL41262HLCU-DE 10/25GbE Adapters support NFV that allows decoupling of network functions and services from dedicated hardware (such as routers, firewalls, and load balancers) into hosted VMs. NFV enables network administrators to flexibly create network functions and services as they need them, reducing capital expenditure and operating expenses, and enhancing business and network services agility. QLogic 25GbE technology is integrated into the Data Plane Development Kit (DPDK) and can deliver up to 38 million packets per second to host the most demanding NFV workloads.

### TRUSTED, RELIABLE, AND INTEROPERABLE

QLogic is an industry leader in 25GbE and was the first to demonstrate end-to-end interoperability for 25Gb and 100Gb Ethernet solutions. QLogic QL41262HFCU-DE and QL41262HLCU-DE 10/25GbE Adapters adhere to standards that ensure interoperability with a wide range of network FCoE and iSCSI solutions. In addition, QLogic technology provides an easy upgrade path to 100GbE networks that utilize multiple 25GbE lanes.

**Host Bus Interface Specifications**

**Bus Interface**

- PCI Express® (PCIe®) Gen 3 x8, Gen 2 x8 (electrical)

**Host Interrupts**

- MSI-X supports independent queues

**I/O Virtualization and Multitenancy**

- SR-IOV (up to 192 virtual functions)
- NIC extended partitioning (NPAReP) (up to 16 physical functions)
- Generic routing encapsulation (GRE) and NVGRE packet task offloads
- VXLAN packet task offloads

**Compliance**

- PCI Express Base Specification, rev. 3.1
- PCI Express Card Electromechanical Specification, rev. 3.0
- PCI Bus Power Management Interface specification, rev. 1.2
- Advanced Configuration and Power Interface (ACPI), v2.0

**Ethernet Specifications**

**Throughput**

- 10Gbps line rate per-port in 10GbE mode
- 25Gbps line rate per-port in 25GbE mode

**Ethernet Frame**

- Standard MTU sizes and jumbo frames up to 9,600 bytes

**Stateless Offload**

- IP, TCP, and user datagram protocol (UDP) checksum offloads
- TCP segmentation offload (TSO)
- Large send offload (LSO)
- Giant send offload (GSO)
- Large receive offload (LRO)
  - LRO (Linux)
  - Receive segment coalescing (RSC) (Windows)
- Receive side scaling (RSS)
- Transmit side scaling (TSS)
- Interrupt coalescing
- VMware NetQueue, Microsoft® Hyper-V VMQ (up to 208 dynamic queues), and Linux Multiqueue
- RDMA

**Tunneling Offloads**

- VXLAN
- NVGRE
- GENEVE

**Compliance**

- IEEE Specifications:
  - 802.3-2015 (1Gb, 10Gb, and 25Gb Ethernet Flow Control)
  - 802.3-2015 Clause 52 (10Gb Ethernet Optical)
  - 802.3by (25Gb Ethernet)
  - SFF8431 Annex E (10Gb Direct Attach Copper)
  - 802.3ad (Link Aggregation)
  - 802.1Qbb (Priority-based Flow Control)
  - 802.1Qaz (DCBX and ETS)
  - 802.1q (VLAN)
  - IPv4 (RFQ 791)
  - IPv6 (RFC 2460)
  - 1588-2002 PTPv1 (Precision Time Protocol)
  - 1588-2008 PTPv2

**RDMA Specifications**

**Universal RDMA**

- RoCE
- RoCEv2
- iWARP
- Storage over RDMA: iSER and SMB Direct
- NFSoRDMA

**FCoE Specifications**

**Performance**

- Up to 3.6 million FCoE IOPS

**iSCSI Specifications**

**Performance**

- Up to 2.9 million iSCSI IOPS

**Tools and Utilities**

**Management Tools and Device Utilities**

- QLogic Control Suite™ integrated network adapter management utility (CLI) for Linux and Windows
- QConvergeConsole integrated network management utility (GUI) for Linux and Windows

**Management Tools and Device Utilities (continued)**

- QConvergeConsole Plug-ins for vSphere® (GUI) and ESXCLI plug-in for VMware
- QConvergeConsole PowerKit (Windows PowerShell® cmdlets) for Linux and Windows
- Native OS management tools for networking

**Boot Support**

- Unified extensible firmware interface (UEFI)
- Pre-execution environment (PXE) 2.0
- iSCSI remote boot
- FCoE boot from SAN

**Operating Systems**

- For the latest applicable operating system information, see <http://driverdownloads.qlogic.com>

**Physical Specifications**

**Ports**

- Dual 25/10Gbps Ethernet: SFP28 cages

**Form Factor**

- Low-profile PCIe card 167.65mm × 68.90mm (6.60in. × 2.71in.)

**Environment and Equipment Specifications**

**Temperature**

- Operating: 0°C to 55°C (32°F to 131°F)
- Storage: -40°C to 65°C (-40°F to 149°F)

**Humidity (Relative, Non-condensing)**

- Operational: 10% to 80%
- Non-operational: 93% maximum at 65°F

**Connectivity**

Rate	Cable and Maximum Distance (m)		
	DAC	SR FOC	AOC
10G	7	400 OM4 300 OM3	30
25G	5	100 OM4 70 OM3	30

DAC = Direct attach cable  
SR FOC = SR fiber optic cable  
AOC = Active optic cable

Note:  
All advertised features are enabled in the hardware. Actual feature availability is dependent on software driver releases. See the release notes.  
Picture may not be representative of the final shipping product.

## Agency Approvals—Safety

### US and Canada

- UL 60950-1
- CSA C22.2

### Europe

- TUV EN60950-1
- TUV IEC 60950-1
- CB Certified

## Agency Approvals—EMI and EMC (Class A)

### US and Canada

- FCC Rules, CFR Title 47, Part 15, Subpart Class A
- Industry Canada, ICES-003: Class A

### Europe

- EN55032
- EN55024
- EN61000-3-2
- EN61000-3-3

### Japan

- VCCI: Class A

### New Zealand and Australia

- AS/NZS: Class A

### Korea

- KC-RRA Class A

### Taiwan

- BSMI CNS 13438

## Ordering Information

### QL41262HFCU-DE

- 540-BBYL full-height bracket installed
- SFP28 cage for DAC connectivity
- Can also be used with industry-standard 10G or 25G optical modules provided by customer (optical modules not included)

### QL41262HLCU-DE

- 540-BBZJ low-profile bracket installed
- SFP28 cage for DAC connectivity
- Can also be used with industry-standard 10G or 25G optical modules provided by customer (optical modules not included)



Follow us:       

Corporate Headquarters Cavium, Inc. 2315 N. First Street San Jose, CA 95131 408-943-7100

Copyright © 2017 Cavium, Inc. All rights reserved worldwide. QLogic Corporation is a wholly owned subsidiary of Cavium, Inc. QLogic, FastLinQ, QConvergeConsole, and QLogic Control Suite are registered trademarks or trademarks of Cavium, Inc. All other brand and product names are trademarks or registered trademarks of their respective owners.

This document is provided for informational purposes only and may contain errors. Cavium reserves the right, without notice, to make changes to this document or in product design or specifications. Cavium disclaims any warranty of any kind, expressed or implied, and does not guarantee that any results or performance described in the document will be achieved by you. All statements regarding Cavium's future direction and intent are subject to change or withdrawal without notice and represent goals and objectives only.