Overview

HPE EDR InfiniBand/Ethernet 100Gb Adapters

HPE EDR InfiniBand 100Gb 1-port 841QSFP28 Adapter is based on Mellanox ConnectX®-5 technology. It supports InfiniBand function for HPE ProLiant XL and DL Servers. It is designed for customers who need low latency and high bandwidth InfiniBand interconnector in their high performance computing (HPC) systems.

HPE EDR InfiniBand/Ethernet 100Gb 2-port 841QSFP28 Adapter is based on Mellanox ConnectX®-5 VPI technology. It supports dual-function InfiniBand and Ethernet for HPE ProLiant XL and DL Servers. It can function as a dual ported EDR InfiniBand card, a dual ported 100Gb Ethernet card, or a mixed function card. It is designed for customers who need low latency and high bandwidth interconnector in their high performance computing (HPC) systems.

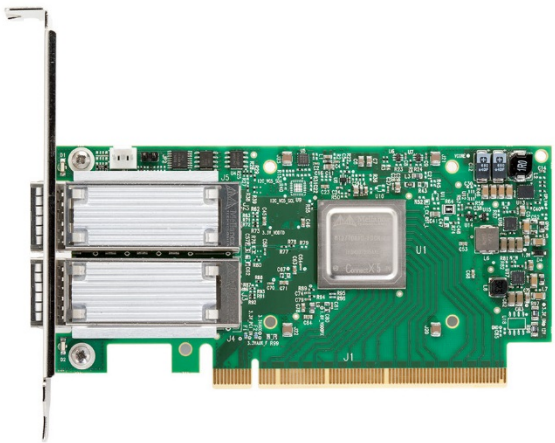
HPE EDR InfiniBand/Ethernet 100Gb 1-port 841OCP QSFP28 Adapter is based on Mellanox ConnectX®-5 VPI technology. It supports dual-function InfiniBand and Ethernet for the HPE Apollo 70 Server. It is designed for customers who need low latency and high bandwidth interconnector in their high performance computing (HPC) systems based on HPE Apollo 70 servers.

HPE EDR InfiniBand/Ethernet 100Gb 1-port and 2-port 840QSFP28 Adapters are based on Mellanox ConnectX®-4 technology. They support dual-function InfiniBand and Ethernet for HPE ProLiant XL and DL Servers. The single ported card can function as a single port EDR InfiniBand card, or a single port 100Gb Ethernet card; the dual ported card can function as a dual ported EDR InfiniBand card, a dual ported 100Gb Ethernet card, or a mixed function card. They are designed for customers who need low latency and high bandwidth interconnector in their high performance computing (HPC) systems.

Combined with EDR InfiniBand Switches or 100Gb Ethernet Switches, they deliver low latency and up to 100Gbps bandwidth, ideal for performance driven server and storage clustering applications in HPC and enterprise data centers.

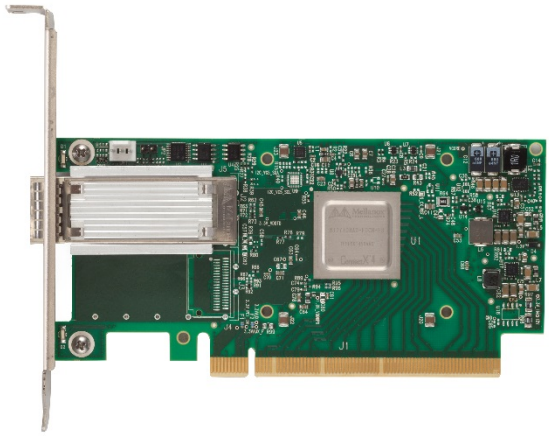
Overview

P/N 872725-B21 (ConnectX®-5)

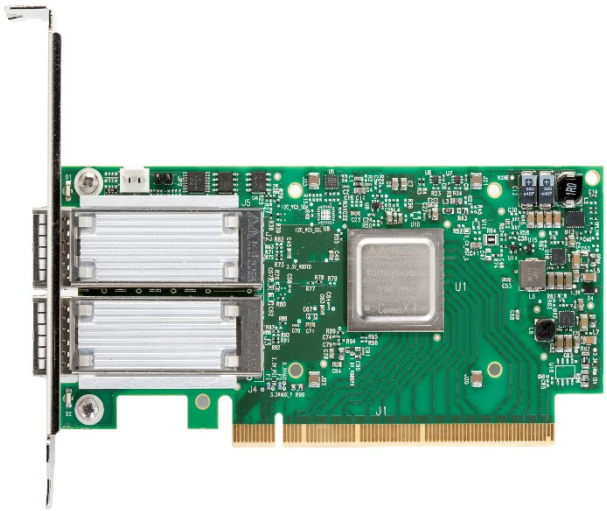


P/N 872726-B21 (ConnectX®-5)

Overview

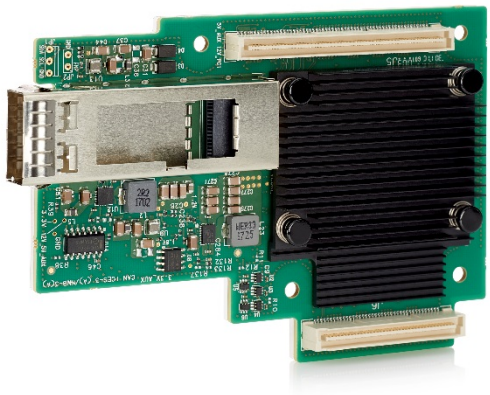


P/N 825110-B21 (ConnectX®-4)



P/N 825111-B21 (ConnectX®-4)

Overview



P/N P02012-B21 (ConnectX®-5)

Standard Features

Models

HPE InfiniBand EDR 100Gb 1-port 841QSFP28 Adapter	872725-B21
HPE InfiniBand EDR/Ethernet 100Gb 2-port 841QSFP28 Adapter	872726-B21
HPE InfiniBand EDR/Ethernet 100Gb 1-port 841OCP QSFP28 Adapter	P02012-B21
HPE InfiniBand EDR/Ethernet 100Gb 1-port 840QSFP28 Adapter	825110-B21
HPE InfiniBand EDR/Ethernet 100Gb 2-port 840QSFP28 Adapter	825111-B21

Kit Contents

- Low profile PCIe adapter with tall bracket and short bracket in the box or OCP adapter.
- Quick install card
- Product warranty statement

Servers supported

HPE IB EDR 100Gb 1p 841QSFP28 Adapter:

HPE ProLiant XL Servers:

- Apollo 10 – pc40 Gen10; sx40 Gen10; kl20
- Apollo 2000 – XL170r, XL190r Gen10; XL170r, XL190r Gen9
- Apollo 4500 – XL450 Gen10
- Apollo 6000 – XL230k Gen10
- Apollo 6500 – XL270d Gen9

HPE ProLiant DL Servers:

- DL360 – Gen10, Gen9
- DL380 - Gen10,Gen9
- DL560 - Gen 10
- DL580 - Gen10

HPE IB EDR/EN 100Gb 2p 841QSFP28 Adapter:

HPE ProLiant XL Servers:

- Apollo 2000 – XL170r, XL190r Gen10; XL170r, XL190r Gen9
- SGI 8600 – XA730i Gen10

HPE IB EDR/EN 100Gb 1p 841OCP QSFP28 Adapter:

HPE ProLiant AR Servers:

- Apollo 70 – AR44z; AR64z

HPE IB EDR/EN 100Gb 1p or 2p 840QSFP28 Adapters:

HPE ProLiant XL Servers:

- HPE ProLiant XL170r Gen9 for Apollo 2000
- HPE ProLiant XL190r Gen9 for Apollo 2000
- HPE ProLiant XL230a Gen9 for Apollo 6000
- HPE ProLiant XL250a Gen9 for Apollo 6000
- HPE ProLiant XL250a Gen9 for Apollo 6500

HPE ProLiant DL Servers:

- HPE ProLiant DL360 Gen10, Gen9
- HPE ProLiant DL380 Gen10, Gen9
- HPE ProLiant DL580 Gen10, Gen9

Product Features

HPE 1p/2p 841QSFP28 adapters, 1p 841OCP QSFP28 and 1p/2p 840QSFP28 adapters

- Improved thermal control with HPE ProLiant XL and DL servers
- Supports UEFI and legacy boot options (legacy boot option doesn't apply to HPE 1p 841OCP QSFP28 adapter)

Standard Features

- PXE boot over InfiniBand or Ethernet
- Port personality configuration via UEFI
- Low profile PCIe Gen3 x16 (apply to HPE 1p/2p 841QSFP28 and 1p/2p 840QSFP28 adapters)
- OCP 2.0 form factor, 2x PCIe Gen3 x8 (apply to HPE 1p 841OCP QSFP28 adapter)
- HPE Standard warranty, support, service
- InfiniBand feature highlights (apply to 1p/2p 841, 1P 841OCP and 1p/2p 840 adapters)
  - Hardware-based reliable transport
  - Collective operations offload
  - Hardware-based reliable multicast
  - Extended Reliable Connected transport (XRC)
  - Dynamically Connected transport (DCT)
  - Enhanced Atomic operations
  - Advanced memory mapping support, allowing user mode registration and remapping of memory (UMR)
  - On demand paging (ODP) – registration free RDMA memory access
- Ethernet feature highlights (apply to HPE 2p 841, 1p 841OCP and 1p/2p 840 adapters)
  - 100/50/40/10G Ethernet
  - RoCE (RDMA over Converged Ethernet)
  - Data Center Bridging (DCB)
  - Stateless offloads for overlay networks and tunneling protocols
  - SR-IOV: up to 256 Virtual Functions
  - SR-IOV: up to 16 Physical Functions per port

EDR InfiniBand or 100G Ethernet Throughput

The HPE 1p/2p 841QSFP28 adapters, 1p 841OCP QSFP28 and 1p/2p 840QSFP28 adapters deliver up to 100Gbps EDR InfiniBand, providing the network performance needed to improve response times and alleviate bottlenecks that impact performance of customers' applications. They are ideal for high performance computing clusters and datacenter servers that require low latency and high bandwidth networking. The HPE 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 1p/2p 840QSFP28 adapters also support Ethernet and can deliver 100G Ethernet speed.

InfiniBand Standards

The HPE 1p/2p 841QSFP28 adapters, 1p 841OCP QSFP28 and 1p/2p 840QSFP28 adapters provide support for the following InfiniBand standard
Compliant to IBTA 1.3 standard

Congestion Control

Hardware-based congestion control

Offloads

Collective operation offloads
The HPE 1p/2p 841QSFP28 adapters and 1p 841OCP QSFP28 support the following new offloads:
Tag Matching and Rendezvous Offloads
Adaptive Routing on Reliable Transport
Burst Buffer Offloads for Background Checkpointing
NVMe over Fabric (NVMf) Offloads

Transport

Hardware-based reliable transport
Extended Reliable Connected transport (XRC)
Dynamically Connected transport (DCT)

Atomic Operation

Enhanced Atomic operations

IEEE Standards

The HPE 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 1p/2p 840QSFP28 adapters provide support for the following IEEE Standards:

Standard Features

	IEEE 802.3bj, 802.3bm 100 Gigabit Ethernet IEEE 802.3ba 40 Gigabit Ethernet IEEE 802.3ad, 802.1AX Link Aggregation IEEE 802.1Q, 802.1P VLAN tags and priority IEEE 802.1Qau (QCN) – Congestion Notification IEEE 802.1Qaz (ETS) IEEE 802.1Qbb (PFC) IEEE 802.1Qbg IEEE 1588v2
Jumbo Frames	The HPE 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 1p/2p 840QSFP28 adapters support jumbo frames (also known as extended frames), permitting up to a 9.6K byte (KB) transmission unit (MTU).
CPU Offload	The HPE 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 1p/2p 840QSFP28 adapters support the following offload features RDMA over Converged Ethernet (RoCE) TCP/UDP/IP stateless offload LSO, LRO, checksum offload RSS (can be done on encapsulated packet),TSS, HDS, VLAN Insertion/stripping, Receive flow steering Hardware offload of encapsulation and de-capsulation of NVGRE and VXLAN overlay networks
Single-Root I/O Virtualization	The HPE 2p 841QSFP28, 1p 841OCP QSFP28 and 1p/2p 840QSFP28 adapters support SR-IOV: SR-IOV: up to 256 Virtual Functions SR-IOV: up to 16 Physical Functions per port Configurable via UEFI.
IPv4 and IPv6	The HPE 2p 841QSFP28 adapter, 1p 841OCP QSFP28 adapter and 1p/2p 840QSFP28 adapters support IPv4 and IPv6.
Time synchronization implementations (PTP)	Synchronization of system clocks throughout a network, achieving clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems. The HPE 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 1p/2p 840QSFP28 adapters support Precision Time Protocol IEEE 1588v2
Network Adapter Teaming	The HPE 2p 841QSFP28 adapter, 1p 841OCP QSFP28 and 1p/2p 840QSFP28 adapters support NIC teaming on Linux and on Windows with tools from the Operating Systems.
Server Integration	The HPE 1p/2p 841QSFP28 adapters, HPE 1p 841OCP QSFP28 and HPE 1p/2p 840QSFP28 adapters are validated, tested, and qualified server options for the supported HPE ProLiant and HPE Apollo servers. This approach provides a more robust and reliable networking solution than offerings from other venders and provides users with a single point of contact for both their servers and their network adapters.
Configuration Utilities	HPE 1p/2p 841QSFP28 adapters, HPE 1p 841OCP QSFP28 and HPE 1p/2p 840QSFP28 adapters are configurable through UEFI.
LED Indicators	The colored LED on each port of the HPE 1p/2p 841QSFP28 adapters, HPE 1p 841OCP QSFP28 and HPE 1p/2p 840QSFP28 adapters indicate link status and link activity.
HPE Sea of Sensors 3D	The HPE 1p/2p 841QSFP28 adapters and HPE 1p/2p 840QSFP28 adapters support the HPE's Sea of Sensors technology for improved thermal control and energy efficiency.
Warranty	1 year warranty, parts exchange.

Service and Support

For more information To learn more on services for HPE Options, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Or visit: **http://www.hpe.com/services/proliant**

Parts and Materials HPE will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

The defective media retention service feature option applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction.

Related Options

Direct Attach Cable (Passive Copper cables)	HPE 0.5m InfiniBand EDR QSFP Copper Cable	834973-B21
	HPE 1m InfiniBand EDR QSFP Copper Cable	834973-B22
	HPE 1.5m InfiniBand EDR QSFP Copper Cable	834973-B23
	HPE 2m InfiniBand EDR QSFP Copper Cable	834973-B24
	HPE 3m InfiniBand EDR QSFP Copper Cable	834973-B25
	NOTE: Direct Attach Cable must be purchased separately for copper environments.	
Active Optic Cables (AOCs)	HPE 5m InfiniBand EDR QSFP Optical Cable	834972-B22
	HPE 7m InfiniBand EDR QSFP Optical Cable	834972-B23
	HPE 10m InfiniBand EDR QSFP Optical Cable	834972-B24
	HPE 12m InfiniBand EDR QSFP Optical Cable	834972-B25
	HPE 15m InfiniBand EDR QSFP Optical Cable	834972-B26
	HPE 20m InfiniBand EDR QSFP Optical Cable	834972-B27
	HPE 30m InfiniBand EDR QSFP Optical Cable	834972-B28
	NOTE: Active Optical Cable must be purchased separately for fiber-optic environments.	
	NOTE: Active Optical Cable are not supported with the HPE 1p 841OCP QSFP28 adapter.	
Additional Supported Cables	For qualified cables for 100GbE, please refer to the release notes of the Adapters: visit **the support website** and search by part number and operating system. Look for the most recent release.	

Technical Specifications

General Specifications (HPE 841QSFP28)	**Network Processor**	Mellanox ConnectX-5
	Data Rate	100Gbps
	Bus Type	PCIe Gen3 x16
	Form Factor	Low profile adapter compliant with the PCIe Gen3 standard
Power and Environmental Specifications	**Operating Temperature**	32° to 131° F (0° to 55° C)
	Humidity	5% to 95% non-condensing
	Power	1p Adapter with Passive cables: 15.5W (typical), 17.17W (max); Active Optical cables: 20.29W. 2p Adapter with Passive cables: 17.6W (typical), 19W (max); Active Optical cables: 23.9W (typical), 25.8W (max).
General Specifications (HPE 1p 841OCP QSFP28)	**Network Processor**	Mellanox ConnectX-5
	Data Rate	100Gbps
	Bus Type	2x PCIe Gen3 x8
	Form Factor	OCP 2.0 type2
Power and Environmental Specifications	**Operating Temperature**	32° to 131° F (0° to 55° C)
	Humidity	5% to 95% non-condensing
	Power	1p Adapter with Passive cables: 17.2W (typical), 19.4W (max); Active Optical cables: not supported.
General Specifications (HPE 840QSFP28)	**Network Processor**	Mellanox ConnectX-4
	Data Rate	100Gbps
	Bus Type	PCIe Gen3 x16
	Form Factor	Low profile adapter compliant with the PCIe Gen3 standard
Power and Environmental Specifications	**Operating Temperature**	32° to 131° F (0° to 55° C)
	Humidity	5% to 95% non-condensing
	Power	1p Adapter with Passive cables: 13.91W (typical), 15.70W (max); with Active Optical cables: 19.59W. 2p Adapter with Passive cables: 16.12W (typical), 18.04W (max); with Active Optical cables: 24.80W.
EMC (Emissions)	FCC Part 15 (CFR 47) ,Class A ICES-003 ,Class A EN55022 ,Class A CISPR22 ,Class A AS/NZS CISPR 22, Class A (RCM mark) VCCI Class A EN55024 KC (Korea)	
RoHS Compliance	6 of 6	
Safety	UL 60950-1 CAN/CSA-C22.2 No. 60950-1 EN 60950-1 IEC 60950-1	

Related Options

Environmental

EU: IEC 60068-2-64: Random Vibration
EU: IEC 60068-2-29: Shocks, Type I / II
EU: IEC 60068-2-32: Fall Test

Operating System Support

HPE 1p 841QSFP28 adapters configured as IB only mode are supported on MLNX_OFED 4.2-1.2 and later version on the following Linux Operating systems:

- RHEL: 6.8, 6.9; 7.3, 7.4
- CentOS: 6.8, 6.9; 7.3, 7.4
- SLES: 11 SP3, SP4; 12 SP2, SP3
- OEL: 6.8, 6.9; 7.3, 7.4
- Ubuntu: 16.04, 16.10, 17.04, 17.10

HPE 2p 841QSFP28 adapter and 1p/2p 840QSFP28 adapters configured as IB only mode, Ethernet only mode, or Port 1 IB and Port 2 Ethernet mode are supported on MLNX_OFED 4.2 on the following Linux operating systems:

- RHEL: 6.8, 6.9; 7.3, 7.4
- CentOS: 6.8, 6.9; 7.3, 7.4
- SLES: 11 SP3, SP4; 12 SP2, SP3
- OEL: 6.8, 6.9; 7.3, 7.4
- Ubuntu: 16.04, 16.10, 17.04, 17.10

HPE 1p 841OCP QSFP28 adapter configured as IB mode or Ethernet mode are supported on MLNX_OFED on the following Linux operating systems:

- RHEL: 7.5 ARM
- SLES: 12 SP3 ARM

HPE 2p 841QSFP28 and 1p/2p 840QSFP28 adapters configured as Ethernet only mode are supported on WinOF2 version 1.80 on the following Windows operating systems:

- Windows Server 2012 R2 (x64 only)
- Windows Server 2016 (x64 only)

HPE 2p 841QSFP28 adapter and 1p/2p 840QSFP28 adapters configured as Ethernet only mode are also supported in the following virtualized environments:

- ESXI 6.x (VMware 4.16-1.0.3)

Please refer to the firmware/software download page of the device for the latest update.

Environment-friendly Products and Approach

End-of-life Management and Recycling

Hewlett Packard Enterprise offers end-of-life product return, trade-in, and recycling programs, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE Directive (2012/19/EU) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard Enterprise web site: http://www.hpe.com/RECYCLE. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
4-Jun-2018	Version 4	Updated	Add HPE 1p 841OCP QSFP28 adapter
5-Feb-2018	Version 3	Updated	Updated information and add HPE 2p 841QSFP28 adapter
25-Sept-2017	Version 2	Updated	Update information and add HPE 1p 841QSFP28 adapter
31-Mar-2016	Version 1	Created	Initial Version of the QuickSpecs of HPE EDR InfiniBand/100GbE Adapters

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