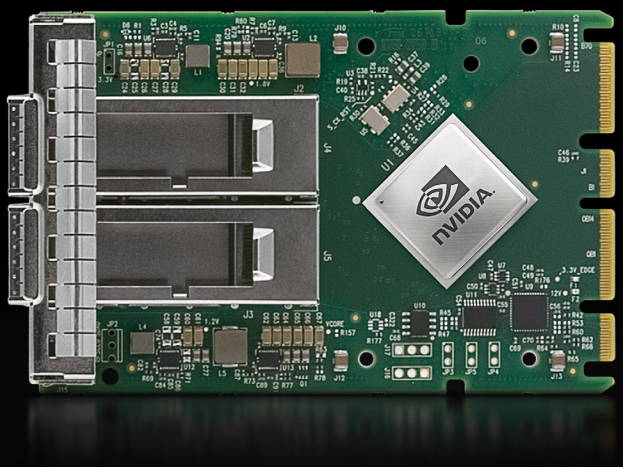
Datasheet

ConnectX-6 Dx 2x100G OCP Ethernet NIC

Accelerated networking for modern cloud data centers.



NVIDIA® ConnectX®-6 Dx is a highly secure and advanced network interface card (NIC) that accelerates mission-critical cloud and data center applications, including security, virtualization, software-defined networking (SDN) and network functions virtualization (NFV), big data, machine learning, and storage. ConnectX-6 Dx provides up to two ports of 100Gb/s Ethernet connectivity and is powered by 50Gb/s (PAM4) or 25/10 Gb/s (NRZ) serializer/deserializer (SerDes) technology.

Accelerated Networking and Security

ConnectX-6 Dx features virtual switch (vSwitch) and virtual router (vRouter) hardware accelerations that deliver significantly higher performance than non-accelerated solutions. ConnectX-6 Dx supports a choice of single-root I/O virtualization (SR-IOV) and VirtIO in hardware, so customers can best address their application needs. By offloading cloud networking workloads, ConnectX-6 Dx frees up CPU cores for business applications while reducing total cost of ownership.

In the face of a growing cyber threat landscape, ConnectX-6 Dx provides built-in inline encryption and decryption, stateful packet filtering, and other capabilities, bringing advanced security down to every node with unprecedented performance and scalability.

Built on the solid foundation of NVIDIA's ConnectX line of NICs, ConnectX-6 Dx offers best-in-class remote direct-memory access (RDMA) over converged Ethernet (RoCE) capabilities, enabling scalable, resilient, and easy-to-deploy RoCE solutions. For data storage, ConnectX-6 Dx optimizes a suite of storage accelerations, bringing Non-Volatile Memory Express over Fabrics (NVMe-oF) target and initiator offloads.

Product Specifications	
Maximum total bandwidth	200Gb/s
Supported Ethernet speeds	200GbE, 100GbE, 50GbE, 40GbE, 25GbE, 10GbE
Number of network ports	2
Network interface technologies	NRZ/PAM4
Host interface	PCIe Gen4.0 x16, with NVIDIA Multi-Host™ technology
Platform security	Hardware root of trust and secure firmware update
Form factor	OCP3.0 SFF
Network interface	QSFP56

Features*

Network Interface

- Dual ports of 10/25/40/50/100GbE
- Up to 200Gb/s total bandwidth

Host Interface

- PCIe Gen 4.0 compatible, 16 lanes
- NVIDIA Multi-Host supports connection of up to four hosts

Enhanced Networking

- Zero-touch RoCE
- NVIDIA Accelerated Switch and Packet Processing (ASAP²)™ for SDN and virtual network functions (VNF) acceleration
- SR-IOV
- VirtIO acceleration
- Overlay network acceleration: Virtual Extensible LAN (VXLAN), Generic Network Virtualization Encapsulation (GENEVE), Network Virtualization using Generic Routing Encapsulation (NVGRE)
- Programmable flexible parser
- Connection tracking (L4 firewall)
- Flow mirroring, sampling, and statistics
- Header rewrite
- Hierarchical quality of service (QoS)
- Stateless Transmission Control Protocol (TCP) offloads

Cybersecurity

- Inline hardware Internet Protocol Security (IPsec) encryption and decryption
  - Advanced Encryption Standard-Galois/Counter Mode (AES-GCM) 128/256-bit key
  - RoCE over IPsec
  - Note that IPsec traffic consumes bandwidth differently than non-IPsec traffic, please consult the support documentation
- Inline hardware Transport Layer Security (TLS) encryption and decryption
  - AES-GCM 128/256-bit key
- Data-at-rest AES-XEX-based tweaked codebook mode with ciphertext stealing (AES-XTS) encryption and decryption
  - AES-XTS 256/512-bit key
- Platform security
  - Hardware root of trust
  - Secure firmware update

Storage Offloads

- Block-level encryption: XTS-AES 256/512-bit key
- NVMe-oF offloads for target machine
- T10 Data Integrity Field (T10-DIF) signature handover operation at wire speed for ingress and egress traffic
- Storage protocols: Server Routing Protocol (SRP), Internet Small Computer Systems Interface (iSCSI) Extensions for RDMA (iSER), Network File System (NFS) over RDMA, Server Message Block (SMB) Direct, NVMe-oF

Management and Control

- Network controller sideboard interface (NC-SI), Management Component Transport Protocol (MCTP) over System Management Bus (SMBus) and MCTP over PCIe—baseboard management controller (BMC) interface, NC-SI over reduced media-independent interface (RMII)-Based Transport (RBT) in Open Compute Project (OCP) 3.0 cards
- Platform-Level Data Model (PLDM) for Monitor and Control DSP0248
- PLDM for Firmware Update DSP0267
- I2C interface for device control and configuration

Remote Boot

- Remote boot over Ethernet
- Remote boot over iSCSI
- Unified Extensible Firmware Interface (UEFI) and Preboot Execution Environment (PXE) support for x86 and Arm® servers

Ordering Information

For product specifications visit the online **ConnectX-6 Dx OCP3.0 user manual**.

Cisco SKU	Cisco PID	NVIDIA SKU	Product Description	Qualified Cisco Servers
30-100309-01	UCSC-O-N6CD100GF	900-9X658-0086-SB0 (Legacy OPN: MCX623436AC-CDAB)	ConnectX-6 Dx EN adapter card, 100GbE, OCP3.0, With Host management, Dual-port QSFP56, PCIe 4.0 x16, Crypto and Secure Boot, Thumbscrew (Pull Tab) Bracket	Cisco rack servers: UCS C220 M6, UCS C240 M6, UCS C220 M7, UCS C240 M7

Cards come assembled with a tall bracket PN MEC018771, if needed the short bracket PN MEC016919 is available in the box as well.
Server qualification is presented as of the date of publication. For latest server qualification information, please visit the **Cisco Hardware Compatibility List (HCL)**.

Optics and Cables

NVIDIA-Supported Cables and Modules

NVIDIA recommends using NVIDIA cables and modules. **Additional information on tested modules**:
Select firmware version > Select NVIDIA OPN > Select PSID > Select “Release Notes” under Download/Documentation.

Cisco-Branded Interoperable Cables and Modules: basic Interoperability by NVIDIA & UCS at NIC Introduction.

QSFP Product ID	Product Description
QSFP-100G-AOC10M	100GBASE QSFP active optical cable, 10m
QSFP-100G-AOC7M	100GBASE QSFP active optical cable, 7m
QSFP-100G-AOC5M	100GBASE QSFP active optical cable, 5m
QSFP-100G-CU5M	100GBASE-CR4 passive copper cable, 5m
QSFP-100G-CU3M	100GBASE CR4 passive copper cable, 3m
QSFP-100G-LR4-S	100GBASE-LR4 QSFP transceiver, LC, 10km over SMF
QSFP-100G-SR4-S	100GBASE SR4 QSFP transceiver, MPO, 100m over OM4 MMF
QSFP-40/100-SRBD	100G and 40GBASE SR-BiDi QSFP transceiver, LC, 100m OM4 MMF
QSFP-100G-DR-S	100GBASE DR QSFP transceiver, 500m over SMF
QSFP-100G-LR4-S	100GBASE LR4 QSFP transceiver, LC, 10km over SMF
QSFP-100G-SR1.2	100GBASE QSFP, Bi-Direction Transceiver over MMF
QSFP-100G-AOC10M	100GBASE QSFP active optical cable, 10m
QSFP-100G-AOC7M	100GBASE QSFP active optical cable, 7m

For latest updates on the TMG Supported Optics & Cables, please consult the **Cisco Transceiver Module Group (TMG) Compatibility Matrix**.
Break-out and split cables are not supported.

Compatibility-Tested Network Switches

- Cisco Nexus 93180YC-FX Switch
- Cisco Nexus 93180YC-EX Switch
- Cisco Nexus C93600CD-GX Switch
- Cisco Nexus 5596UP Switch
- Cisco Nexus 5596T Switch

Tested 200GbE Switches

Speed	Switch Silicon	OPN # / Name	Description	Vendor
200GbE	Spectrum-3	MSN4600V-XXXX	64 QSFP56 ports, 200GbE 2U Open Ethernet Switch with Onyx	NVIDIA
200GbE	Spectrum-2	MSN3700-XXXX	32 QSFP56 ports, 200GbE Open Ethernet Switch System	NVIDIA

Tested 100GbE Switches

Speed	Switch Silicon	OPN # / Name	Description	Vendor
100GbE	Spectrum-3	MSN4600-XXXX	64-port non-blocking 100GbE Open Ethernet Switch System	NVIDIA
100GbE	Spectrum-2	MSN3700C-XXXX	32-port non-blocking 100GbE Open Ethernet Switch System	NVIDIA
100GbE	Spectrum-2	MSN3420-XXXX	48 SFP + 12 QSFP ports non-blocking 100GbE Open Ethernet Switch System	NVIDIA
100GbE	Spectrum	MSN2700-XXXX	32-port non-blocking 100GbE Open Ethernet Switch System	NVIDIA
100GbE	N/A	QFX5200-32C-32	32-port 100GbE Ethernet Switch System	Juniper
100GbE	N/A	7060CX-32S	32-port 100GbE Ethernet Switch System	Arista
100GbE	N/A	3232C	32-port 100GbE Ethernet Switch System	Cisco
100GbE	N/A	N9K-C9236C	36-port 100GbE Ethernet Switch System	Cisco
100GbE	N/A	93180YC-EX	48-port 25GbE + 6-port 100GbE Ethernet Switch System	Cisco
100GbE	N/A	S6820-56HF	L3 Ethernet Switch with 48 SFP28 Ports and 8 QSFP28 Ports	H3C
100GbE	N/A	BMS T7032-IX7	32 QSFP28 ports support for 10/25/40/50/100GbE	QuantaMesh

Environmental Specifications

Temperature	
Operational: 0°C to 55°C (32°F to 131°F)	**Non-operational:** –40°C to 70°C (–40°F to 158°F)

The non-operational storage temperature specifications apply to the product without its package.

Airflow Requirements

	Hot Aisle Heatsink to Port		Cold Aisle @ 35°C Port to Heatsink
Cable	**Active Mode**	**Standby Mode @45°C**	**Active Mode or Standby Mode**
Passive cable	600LFM@55°C	100LFM	Not supported
Active 2.2W NVIDIA cable	1000LFM@55°C	300LFM	
Active 3.5W cable	800LFM@50°C	500LFM	

Power

Cable	Cable Type	Active Mode	Standby Mode
Typical power (for ATIS traffic load)	Passive cable	19W	5.7W
Maximum power	Passive cable	26.6W	10W

Power numbers are provided for passive cables only. For board power numbers while using active cables, please add the outcome of the following formula to the passive cables' power numbers stated above.

Power while using Active Cables = Card Power with Passive Cable + Active Module Power x Number_of_Modules / 0.9 (efficiency factor).

Ready to Get Started?

To learn more about NVIDIA NICs, visit:
nvidia.com/ethernet-adapters

* This section describes hardware features and capabilities.
Please refer to the **driver** and firmware release notes for feature availability.
Images are for illustration only; actual products may vary.