Interfaces

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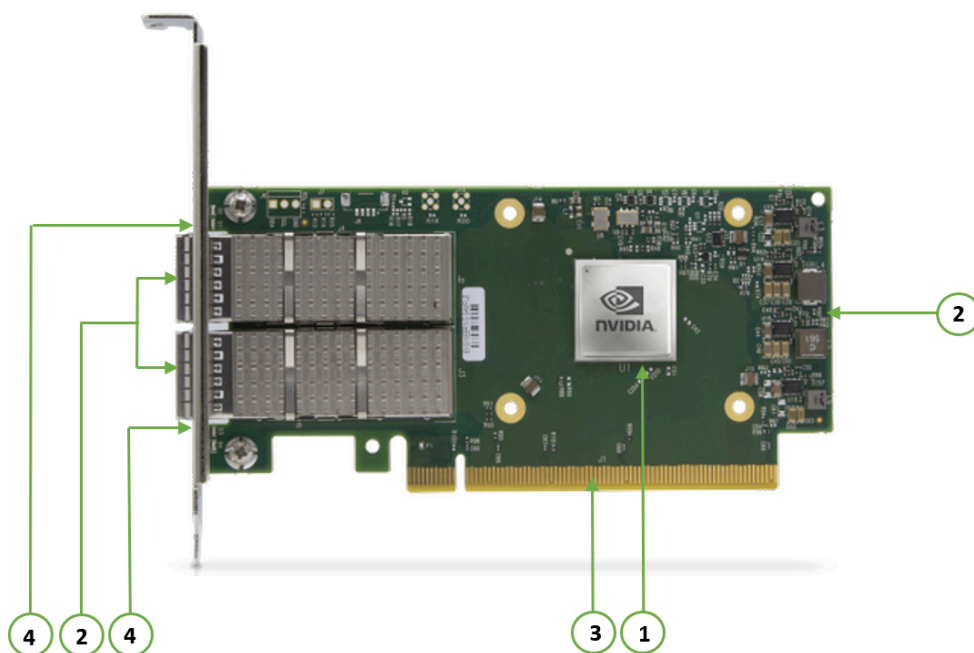
The below figures show the component side of the ConnectX-6 Dx adapter card. Each numbered interface that is referenced in the figures is described in the following table with a link to detailed information.

> **ⓘ Note**
>
> The below figures are for illustration purposes only and might not reflect the current revision of the adapter card.

Callout	Item	Description
1	"ConnectX-6 Dx IC"	ConnectX-6 Dx IC on the board.
2	"Ethernet SFP28/SFP56/QSFP56 Interface"	Ethernet traffic is transmitted through the adapter's SFP28/SFP56/QSFP56 connectors. The networking connectors allow for the use of modules, optical and passive cable interconnect solutions.

Callout	Item	Description
3	"PCI Express Interface"	PCIe Gen 3.0/4.0 through an x8/x16 edge connector.
4	"Networking Ports LEDs Interface"	There are two I/O LEDs per port to indicate speed and link status.
	"SMBus Interface"	Allows BMC connectivity using MCTP over SMBus or MCTP over PCIe protocols.
	"Voltage Regulators"	Voltage supply pins that feed onboard regulators.

ConnectX-6 Dx IC Interface

The ConnectX®-6 Dx EN family of adapter IC devices delivers two ports of 10/25/40/50/100Gb/s or a single-port of 200Gb/s Ethernet connectivity paired with best-in-class hardware capabilities that accelerate and secure cloud and data-center workloads.

Encryption

> (i) **Note**
>
> Applies to Crypto OPNs only.

ConnectX-6 Dx brings security to every end-point, including:

- Purpose-built inline acceleration engines that offload IPsec and TLS data-in-motion and XTS-AES data-at-rest cryptographic operations.

- Stateful firewall solution acceleration, powered by Open vSwitch connection tracking and NVIDIA's ASAP2 technology.

- Embedded hardware root-of-trust and support for RSA-based secure firmware update and secure boot, providing guaranteed integrity of the network adapter.

Ethernet SFP28 / SFP56 / QSFP56 Interfaces

The network ports of the ConnectX-6 Dx adapter card are compliant with the IEEE 802.3 Ethernet standards listed in Features and Benefits. Ethernet traffic is transmitted through the SFP28 / SFP56 / QSFP56 connector on the adapter card.

> (i) **Note**
>
> The adapter card includes special circuits to protect from ESD shocks to the card/server when plugging copper cables.

PCI Express Interface

ConnectX-6 Dx adapter cards support PCI Express Gen 3.0/4.0 (1.1 and 2.0 compatible) through x8/16 edge connectors. The device can be either a master initiating the PCI Express bus operations, or a slave responding to PCI bus operations.
The following lists PCIe interface features:

- PCIe Gen 4.0 and 3.0 compliant, 2.0 and 1.1 compatible

- 2.5, 5.0, 8.0, or 16.0 GT/s link rate x8 or x16 lanes

- Auto-negotiates to x16, x8, x4, x2, or x1

- Support for MSI/MSI-X mechanisms

Networking Ports LEDs Interface

For the networking ports LEDs description, follow the below table depending on the OPN you have purchased.

OPN	LEDs Scheme
MCX621102A[C/N/E]-ADAT, MCX621202A(C/S)-ADAT	Scheme 1: One Bi-Color LED
MCX623102A[C/N]-ADAT, MCX623102A[C/N]-GDAT, MCX623102A[S/E/N/C]-GDAT MCX623105A[N/E]-CDAT, MCX623106A[C/N/S/E]-CDAT, MCX623106P[C/N/E]-CDAT, MCX623105A[C/N/S/E]-VDAT	Scheme 2: One Bi-Color LED and one Single Color LED

Scheme 1: One Bi-Color LED

There is one bicolor (Yellow and Green) I/O LED per port to indicate speed and link status.

Link Indications

State	Bi-Color LED (Yellow/Green) Physical link speed
Beacon command for locating the adapter card	1Hz blinking Yellow
Error	4Hz blinking Yellow Indicates an error with the link. The error can be one of the following: 	Error Type	Description	LED Behavior	 |---|---|---| | I^2C | I^2C access to the networking ports fails | Blinks until error is fixed | | Over-current | Over-current condition of the networking ports | Blinks until error is fixed |
Physical Activity	The Green LED will blink.
Link Up	The Green LED will be solid.

Scheme 2: One Bi-Color LED and one Single Color LED

There are two I/O LEDs per port to indicate speed and link status. LED1 is a bicolor LED (Yellow and green) and LED2 is a single color LED (green).

Link Indications

State	Bi-Color LED (Yellow/Green)			Single Color LED (Green)
Beacon command for locating the adapter card	1Hz blinking Yellow			OFF
Error	4Hz blinking Yellow Indicates an error with the link. The error can be one of the following:			ON
	Error Type	Description	LED Behavior	
	I^2C	I^2C access to the networking ports fails	Blinks until error is fixed	
	Over-current	Over-current condition of the networking ports	Blinks until error is fixed	
Physical Activity	The Green LED will blink.			Blinking
Link Up	The Green LED will be solid.			ON

SMBus Interface

ConnectX-6 Dx technology maintains support for manageability through a BMC. ConnectX-6 Dx PCIe stand-up adapter can be connected to a BMC using MCTP over SMBus or MCTP over PCIe protocols as if it is a standard NVIDIA PCIe stand-up adapter. For configuring the adapter for the specific manageability solution in use by the server, please contact NVIDIA Support.

Voltage Regulators

The voltage regulator power is derived from the PCI Express edge connector 12V supply pins. These voltage supply pins feed on-board regulators that provide the necessary power to the various components on the card.