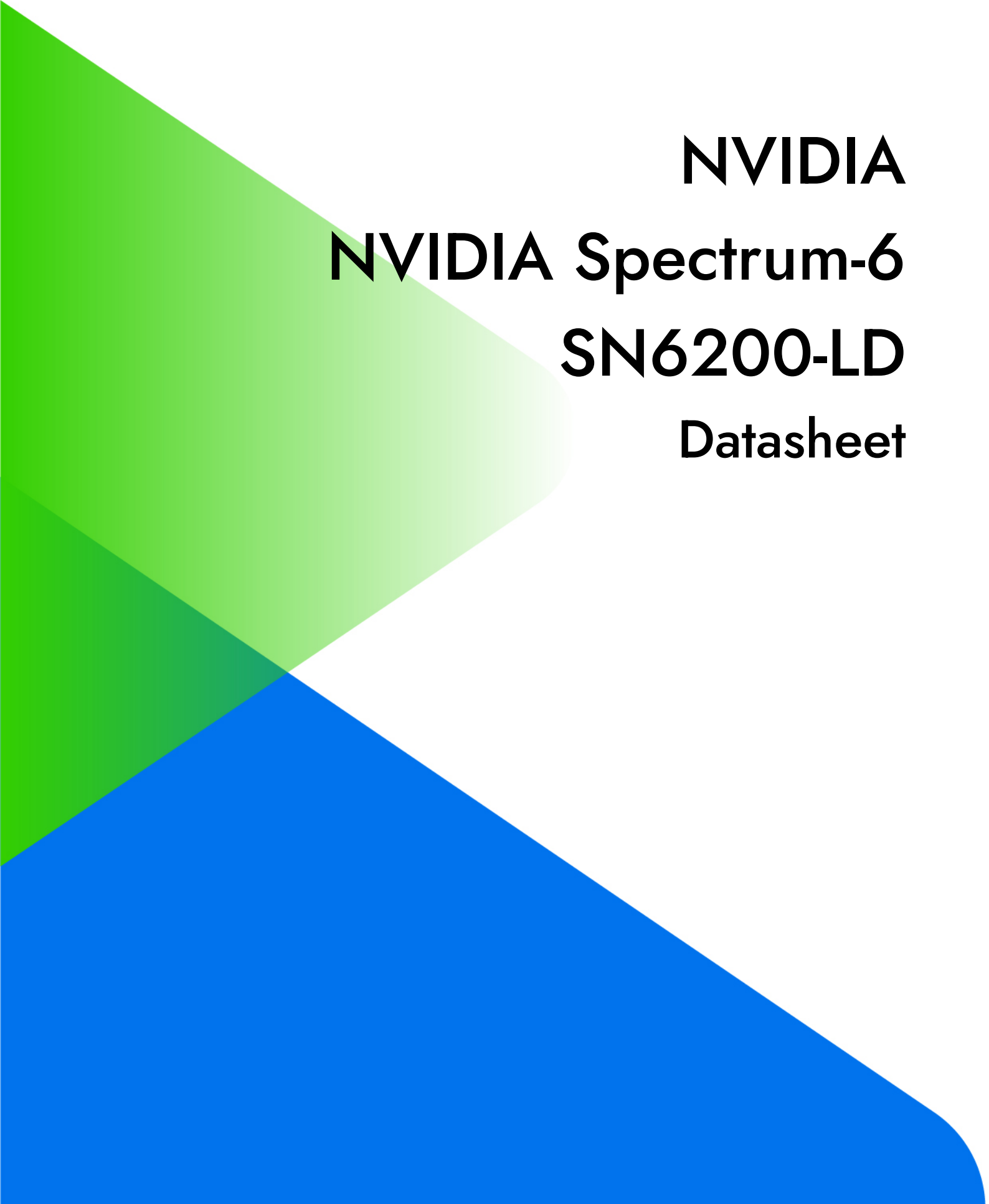




NVIDIA

NVIDIA Spectrum-6

SN6200-LD

Datasheet



Product Overview

- The NVIDIA Spectrum-6 SN6200-LD is a 1U liquid-cooled hybrid Ethernet system designed for high-density AI factory and intra-rack networking.
- It combines 32 front-facing OSFP interfaces with 256 x 200GbE ports connected to the backplane, linking fabric-facing traffic with dense in-rack connectivity.
- Built on the NVIDIA Spectrum-6 ASIC, the system provides up to 102.4Tb/s of switching throughput in a compact 1U platform.
- The published front-facing configurations support 256 x 200GbE or 256 plus 2 x 100GbE connections, while the backplane is used for intra-rack connectivity.
- A 48–60VDC busbar power design and dedicated liquid-cooling airflow support dense rack integration with reduced front-to-rear cabling.
- Secure boot, Spectrum-X positioning, and the open NVIDIA Spectrum Ethernet software ecosystem support controlled deployment and lifecycle operation.

Product Highlights

- **Hybrid Front-and-Backplane Design:** Combines 32 front OSFP interfaces with 256 x 200GbE backplane ports for fabric-facing and intra-rack connectivity.
- **256 x 200GbE Front-Facing Scale:** The published front-facing configuration supports up to 256 x 200GbE connections or 256 plus 2 x 100GbE connections.
- **102.4Tb/s Spectrum-6 Throughput:** The NVIDIA Spectrum-6 architecture provides up to 102.4Tb/s of switching throughput in a compact 1U system.
- **Liquid Cooling and Busbar Power:** Dedicated liquid cooling and a 4860VDC busbar input support high-density AI rack deployments.

Detailed Features



NVIDIA Spectrum-6 SN6200-LD

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Component	Specification
System Model	NVIDIA Spectrum-6 SN6200-LD
Front Interface	32 x OSFP interfaces, 2 x 800GbE per interface
Backplane Interface	256 x 200GbE ports for intra-rack connectivity
Switching Capacity	102.4 Tb/s
Power and Cooling	48–60VDC busbar input, liquid cooling



Hybrid Rack-Scale Architecture

The SN6200-LD connects front-facing Ethernet fabric links with a dense backplane. This arrangement is designed for systems where network traffic must move both between racks and within an AI rack, reducing the need to build every in-rack link through external top-of-rack cabling.

OSFP Front Connectivity

The system provides 32 front OSFP interfaces, with each interface described as supporting two 800GbE connections. The OSFP form factor aligns the platform with high-speed Spectrum-6 interconnects and supports flexible optical cabling options.

Backplane-Connected 200GbE Scale

The 256 backplane ports are intended for intra-rack connectivity rather than general front-panel access. This gives the platform a distinct role in rack-scale architectures where compute or system trays exchange traffic through a dedicated internal fabric.

102.4Tb/s Spectrum-6 Switching

The Spectrum-6 ASIC provides up to 102.4Tb/s of switching throughput. This capacity supports high-bandwidth AI and cloud fabrics while keeping the switch in a compact 1U form factor.

Front-Facing Breakout Options

The published front-facing modes support 256 x 200GbE or 256 plus 2 x 100GbE connections. These options allow the external side of the system to be matched to different fabric and endpoint speeds.

Liquid-Cooled 1U Deployment

Dedicated liquid cooling is intended for dense rack environments where air cooling would impose greater thermal and airflow constraints. The 1U chassis supports compact placement alongside compute and system trays.

4860VDC Busbar Integration

The busbar power design is suited to rack-scale DC power distribution. It can simplify power cabling and support the service model of high-density AI infrastructure, subject to the complete rack power design.

Secure and Open Ethernet Operation

Secure boot and Spectrum-X positioning provide a controlled platform security baseline, while NVIDIA's open Ethernet software ecosystem supports operating-system and automation choices for large-scale deployments.

Technical Specifications

Product Specifications

Feature	Value
User SKU	MLNX-SN6200-LD
System model	SN6200-LD
Product family	NVIDIA Spectrum-6 SN6000
Product type	1U liquid-cooled hybrid Ethernet system
Switch ASIC	NVIDIA Spectrum-6
Front interface configuration	32 x OSFP interfaces, 2 x 800GbE per interface
Backplane interface configuration	256 x 200GbE ports
Backplane role	Intra-rack connectivity
Front-facing supported rates	256 x 200GbE or 256 plus 2 x 100GbE
Maximum front-facing 200GbE scale	256
Maximum front-facing 100GbE scale	256 plus 2
Maximum switching throughput	102.4 Tb/s
OSFP lane architecture	8 electrical lanes per OSFP form factor



Feature	Value
Signaling	200G SerDes and PAM4-based Spectrum-6 interconnect architecture
Forwarding architecture	Full wire-speed Ethernet forwarding with adaptive routing, congestion control, and performance isolation
Network virtualization	Single-pass VXLAN routing and bridging, centralized VXLAN routing, and hardware-accelerated tunnel termination
Telemetry and visibility	Hardware-accelerated high-frequency telemetry, NetQ histogram visibility, and open telemetry APIs
Open NOS ecosystem	NVIDIA Cumulus Linux, Pure SONiC, and open network operating system support
Security architecture	Hardware root of trust, secure boot, and authenticated hardware, firmware, and network operating system components
Power input	48–60VDC busbar
Cooling	Liquid cooling
Airflow	Dedicated liquid-cooling airflow
Form factor	1U
Spectrum-X	Positioned for NVIDIA Spectrum-X Ethernet deployments
Management interface types	RJ45 OOB Ethernet, RJ45 BMC, RJ45 RS232 console, and USB-A are documented for the SN6000 platform interface set
Packet buffer	160 MB per Spectrum-6 ASIC in the SN6000 series datasheet
Time synchronization	Precision Time Protocol support is listed for the SN6000 platform

Product Comparison

Feature	NVIDIA Spectrum-6 SN6200-LD	NVIDIA Spectrum-6 SN6600-LD / 920-9N62F-00LI-GC1	NVIDIA Spectrum-6 SN6810-LD / 920-9N64K-00LI-GC0
System model	SN6200-LD	SN6600-LD	SN6810-LD
Chassis	1U	2U	2U
ASIC architecture	1 x Spectrum-6	1 x Spectrum-6	1 x Spectrum-6



Feature	NVIDIA Spectrum-6 SN6200-LD	NVIDIA Spectrum-6 SN6600-LD / 920-9N62F-00LI-GC1	NVIDIA Spectrum-6 SN6810-LD / 920-9N64K-00LI-GC0
Front optical interfaces	32 x OSFP, 2 x 800GbE per interface	64 x OSFP	128 x MMC-16 co-packaged optics
Backplane connectivity	256 x 200GbE for intra-rack links	Not applicable	Not applicable
Published front-facing modes	256 x 200GbE or 256 plus 2 x 100GbE	512 x 200GbE or 512 plus 2 x 100GbE	512 x 200GbE or 512 plus 2 x 100GbE
Maximum switching throughput	102.4 Tb/s	102.4 Tb/s	102.4 Tb/s
Power input	48–60VDC busbar	48–60VDC busbar	48–60VDC busbar
Cooling	Liquid cooling	Liquid cooling	Liquid cooling
Optical architecture	Hybrid OSFP and backplane	Pluggable OSFP	Co-packaged MMC-16
Management platform	SN6000 platform interfaces	SN6000 platform interfaces	SN6000 platform interfaces
Platform software	Open NOS ecosystem with NVIDIA Cumulus Linux and Pure SONiC	Open NOS ecosystem with NVIDIA Cumulus Linux and Pure SONiC	Open NOS ecosystem with NVIDIA Cumulus Linux and Pure SONiC
Rack role	Intra-rack hybrid spine or fabric switch	AI leaf or spine	CPO AI leaf or spine

Accessories

Category	Accessories
Included Accessories	- SN6200-LD switch system - Model-specific liquid-cooling and rack integration hardware as supplied with the system configuration
Optional Accessories	- 48–60VDC rack busbar power accessories - Compatible OSFP optical modules, cables, and 200GbE backplane interconnect components



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