

NVIDIA
NVIDIA Spectrum-6
SN6800-LD
(920-9N67K-00LA-GC0)
Datasheet



Product Overview

- The NVIDIA Spectrum-6 SN6800-LD is a 5U liquid-cooled co-packaged optics Ethernet switch built for extreme-scale AI and data-center fabrics.
- Its quad Spectrum-6 architecture provides 512 MMC-16 CPO interfaces, four QSFP112 interfaces, and up to 2,048 x 200GbE connections.
- With 409.6Tbps throughput and four 102.4Tbps Spectrum-6 ASICs, it provides high-radix connectivity for large GPU-cluster scale-out networks.
- The switch supports 2,048 x 200GbE or 2,048 plus 8 x 100GbE configurations for dense leaf, spine, and superspine Ethernet fabrics.
- NVIDIA positions the SN6800-LD for Spectrum-X Ethernet and AI factories that require very high port density, predictable bandwidth, and optical integration.
- A 48VDC busbar architecture, direct liquid cooling, MGX v1.2 rack compatibility, and open NOS options support deployment in high-density AI infrastructure.

Product Highlights

- **Quad Spectrum-6 Architecture:** Four NVIDIA Spectrum-6 ASICs deliver 409.6Tbps total throughput and four shared 256MB packet buffers for extreme-scale Ethernet fabrics.
- **2,048-Port 200GbE Scale:** The 5U system provides 512 MMC-16 co-packaged optical interfaces and supports up to 2,048 x 200GbE connections.
- **CPO and ELS Integration:** Co-packaged optics reduce the electrical path between switching silicon and optical interfaces, while 64 external laser sources support the optical design.
- **Liquid Cooling and Busbar Power:** Direct liquid cooling and 48VDC busbar input support the power and thermal requirements of high-density AI data-center deployments.

Detailed Features



NVIDIA Spectrum-6 SN6800-LD (920-9N67K-00LA-GC0)

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Component	Specification
System Model	NVIDIA Spectrum-6 SN6800-LD
Official NVIDIA SKU	920-9N67K-00LA-GC0
Switch Architecture	4 x NVIDIA Spectrum-6 ASICs with co-packaged optics
Interfaces and Scale	512 MMC-16 CPO interfaces, 4 QSFP112 interfaces, up to 2,048 x 200GbE



Component	Specification
Throughput and Power	409.6 Tbps; 48VDC busbar; direct liquid cooling



Quad Spectrum-6 Switching Platform

The SN6800-LD integrates four NVIDIA Spectrum-6 ASICs and delivers 409.6Tbps total throughput. Each ASIC contributes a 102.4Tbps switching domain, enabling a high-radix platform for very large AI and cloud Ethernet fabrics.

Extreme Port Density

The switch provides 512 MMC-16 co-packaged optical interfaces and four QSFP112 interfaces in a 5U chassis. The platform supports up to 2,048 x 200GbE connections, giving large GPU clusters a dense scale-out fabric.

200GbE and 100GbE Configurations

NVIDIA documents native 2,048 x 200GbE operation and 2,048 plus 8 x 100GbE operation. This lets operators select dense 200GbE connectivity or extend the system to 100GbE links where the network design requires it.

Co-Packaged Optics Architecture

The SN6800-LD uses co-packaged optics to place optical interfaces close to the switching ASICs. The ordering configuration includes 64 external laser sources, supporting an integrated optical path for high-density AI networking.

Spectrum-X Ethernet for AI Fabrics

NVIDIA positions the SN6800-LD within the Spectrum-X Ethernet portfolio for AI factories. Its high radix, CPO connectivity, and multi-ASIC throughput support large leaf, spine, and superspine designs across multiple racks.

Direct Liquid Cooling

The switch uses an open-loop liquid-cooling design with UQD8 v2 connections. The documented SN6800-LD configuration uses five cold and five hot couplers per switch, a 13.5 lpm flow rate, and a 45°C maximum liquid supply temperature.

48VDC Busbar Integration

A 48VDC busbar power architecture with a 40-60VDC input range supports rack-scale power distribution. This design is suited to MGX v1.2 environments where high-power switches and liquid-cooling infrastructure are deployed together.

Open Network Operations

NVIDIA documents pre-installed Cumulus Linux and Pure SONiC options for the Spectrum portfolio. OOB management, BMC, serial console, USB, reset, status LEDs, and lane-select indicators support system bring-up and service operations.

Technical Specifications

Product Specifications

Feature	Value
User SKU	MLNX-SN6800-LD
Official NVIDIA ordering SKU	920-9N67K-00LA-GC0
System model	SN6800-LD
Product family	NVIDIA Spectrum-6 SN6000 Ethernet switch systems
Product type	5U liquid-cooled co-packaged optics Ethernet switch
Switch architecture	Quad NVIDIA Spectrum-6 multi-ASIC platform
Optical architecture	Co-packaged optics
Optical interfaces	512 MMC-16 CPO interfaces
Auxiliary interfaces	4 x QSFP112 interfaces
External laser sources	64 ELS
Maximum 200GbE scale	2,048 ports of 200GbE
Maximum 100GbE scale	2,048 plus 8 ports of 100GbE
Port form factor	MMC-16 co-packaged optics
Signaling	200GbE: 2 x 224G PAM4; 100GbE: 1 x 112G PAM4



Feature	Value
Switching throughput	409.6 Tbps, 4 x 102.4 Tbps
Packet buffer	4 x 256 MB shared packet buffers
Software options	Pre-installed NVIDIA Cumulus Linux; Pure SONiC options are available for supported platforms
Firmware updates	Handled through the management software
Management interfaces	2 x RJ45 100/1000M Base-T OOB management; 1 x RJ45 100/1000M Base-T BMC; 1 x RJ45 RS232 serial console
USB interface	1 x USB Type-A 2.0-compliant port
Local controls	Reset button; status and port LEDs; lane-select LEDs; power button
Form factor	5U
Mounting	19-inch MGX v1.2 rack
Dimensions (H x W x D)	220 mm x 438 mm x 900 mm, including UQD and front levers
Dimensions, imperial	8.75 in x 17.2 in x 35.4 in, including UQD and front levers
Weight	95 kg
Cooling	Fully liquid-cooled
Coolant	Recochem PG-25% propylene-glycol based heat transfer fluid
Cooling design	Open-loop design
Universal quick disconnects	UQD8 v2
UQD couplers	5 cold and 5 hot couplers per switch
Liquid flow rate	13.5 lpm per system
Working pressure	5 bar
Outburst pressure	15 bar
Pressure drop	16.5 PSI
Maximum liquid supply temperature	+45 °C
Minimum liquid supply temperature	+17 °C
Power input	48VDC nominal busbar input; 40-60VDC operating range
Typical power consumption	8.3 kW
Maximum power consumption	10.5 kW
CPU	16-core x86 processor



Feature	Value
System memory	96 GB DDR5
Storage	160 GB NVMe SSD
PCIe	Gen4 x4
Operating temperature	5 to 40 °C ambient, ASHRAE A3
Non-operating temperature	-40 to 70 °C
Operating humidity	10% to 85%, non-condensing
Operating altitude	Up to 3050 m
Safety and EMC	CB, cTUVus, CE, CU, S_Mark, FCC, VCCI, ICES, RCM, BSMI, KCC, CQC
RoHS	RoHS compliant
Rack compatibility	NVIDIA MGX v1.2 rack
Rail kit	930-9SRKT-00F0-00C rack mounting kit for SN6800-LD in MGX v1.2 rack
Ordering configuration	Cumulus Linux Authentication; 512 MMC-16; 4 QSFP112; 64 ELS; Secure Boot; 48VDC busbar; liquid cooling



Product Comparison

Feature	NVIDIA Spectrum-6 SN6800-LD / 920-9N67K-00LA-GC0	NVIDIA Spectrum-6 SN6600-LD / 920-9N62F-00LI-GC1	NVIDIA Spectrum-6 SN6810-LD / 920-9N64K-00LI-GC0
System model	SN6800-LD	SN6600-LD	SN6810-LD
Chassis	5RU	2RU	2RU
ASIC architecture	4 x Spectrum-6	1 x Spectrum-6	1 x Spectrum-6
Optical architecture	512 MMC-16 co-packaged optics	64 OSFP pluggable optics	128 MMC-16 co-packaged optics
Auxiliary interfaces	4 x QSFP112; 64 ELS	1 x QSFP112	1 x QSFP112
Maximum 800GbE scale	Not supported in documented configuration	128	128
Maximum 400GbE scale	Not supported in documented configuration	256	256
Maximum 200GbE scale	2,048	512	512
Maximum 100GbE scale	2,048 plus 8	512 plus 2	512 plus 2
Maximum throughput	409.6 Tbps	102.4 Tbps	102.4 Tbps
Packet buffer	4 x 256 MB	256 MB	256 MB
Cooling	Liquid cooling	Liquid cooling	Liquid cooling
Power input	48VDC busbar	48VDC busbar	48VDC busbar
CPU	16-core x86	8-core x86	8-core x86 AMD
System memory	96 GB DDR5	32 GB DDR5	32 GB DDR5
Storage	160 GB NVMe SSD	80 GB NVMe SSD	80 GB NVMe SSD
Dimensions (H x W x D)	220 x 438 x 900 mm	88 x 438 x 900 mm	87 x 438 x 900 mm
Weight	95 kg	33 kg	32.5 kg
Best-fit role	Extreme-scale CPO AI superspine	High-density pluggable-optics AI leaf or spine	CPO-oriented AI leaf or spine



Accessories

Category	Accessories
Included Accessories	- SN6800-LD switch system - 930-9SRKT-00F0-00C rack mounting kit for MGX v1.2 rack - 2 x ejector bars - HAR000028 RS232 2 m DB9-to-RJ45 harness
Optional Accessories	- 930-9IAW0-00K00 External Laser Source - 930-9SECK-00NA-00A Silicone Photonics cleaning kit



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