



# SN2700 Open Ethernet Switch



## Spectrum-based 32-port 100GbE Open Ethernet Platform

Mellanox SN2700 provides the most predictable, highest density 100GbE switching platform for the growing demands of today's data centers.

The SN2700 switch is an ONIE (Open Network Install Environment) based platform for allowing a multitude of operating systems to be mounted on it and utilizing the advantages of Open Networking and the capabilities of the Mellanox Spectrum™ ASIC.

The SN2700 has three modes of operation. It can be provided preinstalled with Mellanox Onyx™ (successor to MLNX-OS Ethernet), a home-grown operating system utilizing common networking user experiences and industry standard CLI. It can come preinstalled with Cumulus® Linux, a revolutionary operating system taking the Linux user experience from servers to switches and providing a rich routing functionality for large scale applications. Finally, it can be provided with a bare ONIE image ready to be installed with the aforementioned or other ONIE-based operating systems.

The SN2700 switch is an ideal spine and top-of-rack (ToR) solution, allowing maximum flexibility, with port speeds spanning from 10Gb/s to 100Gb/s per port and port density that enables full rack connectivity to any server at any speed. The uplink ports allow a variety of blocking ratios that suit any application requirement.

Powered by the Spectrum ASIC and packed with 32 ports running at 100GbE, the SN2700 carries a whopping throughput of 6.4Tb/s with a landmark 9.52Bpps processing capacity in a compact 1RU form factor.

Keeping with the Mellanox tradition of setting performance record switch systems, the SN2700 introduces the world's lowest latency for a 100GbE switching and routing element, and does so while having the lowest power consumption in the market. With the SN2700, the use of 25, 40, 50 and 100GbE in large scale is enabled without changing power infrastructure facilities.

The SN2700 is part of Mellanox's complete end-to-end solution which provides 10GbE through 100GbE interconnectivity within the data center. Other devices in this solution include ConnectX®-4 based network interface cards, and LinkX™ copper or fiber cabling. This end-to-end solution is topped with Mellanox NEO™, a management application that relieves some of the major obstacles when deploying a network. NEO enables a fully certified and interoperable design, speeds up time to service and eventually speeds up RoI.

The SN2700 introduces superior hardware capabilities including dynamic flexible shared buffers and predictable wire speed performance with no packet loss for any packet size.

## HIGHLIGHTS

### BENEFITS

- A predictable data center through predictable, affordable network
- Choice, no vendor lock-in
- Zero Packet Loss ([learn more](#))
- Future proof solution: enhanced scalability
- Arranged and organized data center
  - Supports speeds of 10/25/40/50/56/100GbE
  - Easy deployment
  - Easy maintenance
- Unprecedented performance
  - Line rate performance on all ports at all packet sizes
  - Storage and server applications run faster
- Lowest power
- Software Defined Networking (SDN) support
- Running Mellanox Onyx, Cumulus Linux, and alternative operating systems over ONIE

### KEY FEATURES

- Throughput
  - 6.4Tb/s
  - 9.52B packets-per-second
- High density
  - 32 40/56/100GbE ports in 1RU
  - Up to 64 10/25/50GbE ports
- Lowest latency
  - 300nsec for 100GbE port-to-port
  - Flat latency across L2 and L3 forwarding

While Spectrum provides the thrust and acceleration that powers the SN2700, the system gets yet another angle of capabilities while running with a powerful x86-based processor, which allows this system to not only be the highest performing switch fabric element, but also gives the ability to incorporate a Linux running server into the same device. This opens up multiple application aspects of utilizing the high CPU processing power and the best switching fabric to create a powerful machine with unique appliance capabilities that can improve numerous network implementation paradigms.

While the SN2700 Ethernet switch series is aimed at the 100/50/25GbE market, Mellanox offers the SN2700B series for the 40/10GbE market. SN2700B switches are priced comfortably for the 40/10GbE market and provide the superior feature set of Spectrum.

## FEATURES

### Layer 2 Feature Set

- Multi chassis LAG (MLAG)
- IGMPv2/v3, Snooping, Querier
- VLAN 802.1Q (4K)
- Q-In-Q
- 802.1W Rapid Spanning Tree
  - BPDU Filter, Root Guard
  - Loop Guard, BPDU Guard
- 802.1Q Multiple STP
- PVRST+ (Rapid Per VLAN STP+)
- 802.3ad Link Aggregation (LAG) & LACP
  - 32 Ports/Channel – 64 Groups Per System
- LLDP
- Store & forward / cut-through mode of work
- HLL
- 10/25/40/50/56/100GbE
- Jumbo Frames (9216 Bytes)

### Layer 3 Feature Set

- User and management VRFs
- IPv4 & IPv6 routing including route maps: BGP4, OSPFv2
- PIM-SSM

- BFD (BGP, OSPF, static routes)
- VRRP
- DHCPv4/v6 Relay
- Router Port, int VLAN, NULL Interface for Routing
- ECMP, 64-way
- IGMPv2/v3 Snooping Querier

### Synchronization

- PTP IEEE-1588 (SMPTE profile)
- NTP

### Quality of Service

- 802.3X Flow Control
- WRED, Fast ECN & PFC
- 802.1Qbb Priority Flow Control
- 802.1Qaz ETS
- DCBX – App TLV support
- Advanced QoS – Qualification, Rewrite, Policers – 802.1AB
- Shared buffer management

### Management and Automation

- ZTP
- Ansible, Puppet
- FTP / TFTP / SCP
- AAA , RADIUS / TACACS+ / LDAP
- JSON & CLI, Web UI

- SNMP v1,2,3
- In-band management
- DHCP, SSHv2, Telnet
- SYSLOG
- 10/100/1000Mb/s Ethernet RJ45 mng ports
- USB Console port for Management
- Dual SW image
- Events history
- ONIE

### Network Virtualization

- VXLAN Hardware VTEP – L2 GW
- Integration with VMware NSX & OpenStack, etc.

### Software Defined Network (SDN)

- OpenFlow 1.3:
  - Hybrid
  - Supported controllers: ODL, ONOS, FloodLight, RYU, etc.

### Docker Container

- Full SDK access through the container
- Persistent container & shared storage

### Monitoring & Telemetry

- sFlow
- Real time queue depth histograms & thresholds
- Port mirroring (SPAN & ERSPAN)
- Enhanced Link & Phy Monitoring
- BER degradation monitor
- Enhanced health mechanism
- 3<sup>rd</sup> party integration (Splunk, etc.)

### Security

- USA Department of Defense certification – UC APL
- System secure mode – FIPS 140-2 compliance
- Storm Control
- Access Control Lists (ACLs L2-L4 & user defined)
- 802.1X - Port Based Network Access Control
- SSH server strict mode – NIST 800-181A
- CoPP (IP filter)
- Port isolation

\* This section describes hardware features and capabilities. Please refer to the driver and firmware release notes for feature availability.

## SPECIFICATIONS

### Power Specifications

- Typical Power with passive cables (ATIS): 150W
- Input range: 100-127 VAC, 200-240VAC
- Frequency: 50-60Hz, single phase AC, 4.5A, 2.9A

### Physical Characteristics

- Dimensions: 1.72" (43.8mm) H x 16.84" (427.83mm) W x 27" (686mm) D
- Weight: 11.1kg (24.5lb)

### Supported Modules and Cables\*

- QSFP28, SFP28 (with QSA) short and long range optics
- QSFP28 to QSFP28 DAC cable
- QSFP breakout cables 100GbE to 4x25GbE and 40GbE to 4x10GbE DAC, optical
- QSFP breakout cables 100GbE to 2x50GbE DAC, optical
- QSFP AOC
- 100BASE-T module

\* Systems limited to 40GbE will support modules and cables accordingly

Table 1 - SN2700 Series Part Numbers and Descriptions

OPN	Description
MSN2700-CS2F	Spectrum™ based 100GbE, 1U Open Ethernet Switch with Mellanox Onyx, 32 QSFP28 ports, 2 Power Supplies (AC), x86 CPU, Standard depth, P2C airflow, Rail Kit, RoHS6
MSN2700-CS2R	Spectrum™ based 100GbE, 1U Open Ethernet Switch with Mellanox Onyx, 32 QSFP28 ports, 2 Power Supplies (AC), x86 CPU, Standard depth, C2P airflow, Rail Kit, RoHS6
MSN2700-CS2RC	Spectrum™ based 100GbE 1U Open Ethernet Switch with Cumulus Linux, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, C2P airflow, Rail Kit, RoHS6
MSN2700-CS2FC	Spectrum™ based 100GbE 1U Open Ethernet Switch with Cumulus Linux, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, P2C airflow, Rail Kit, RoHS6
MSN2700-CS2FE	Spectrum™ based 100GbE 1U Development System with SDK, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, P2C airflow, Rail Kit, RoHS6
MSN2700-CS2FO	Spectrum™ based 100GbE 1U Open Switch with ONIE, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, P2C airflow, Rail Kit, RoHS6

Table 2 - SN2700B Series Part Numbers and Descriptions

OPN	Description
MSN2700-BS2F	Spectrum™ based 40GbE, 1U Open Ethernet Switch with Mellanox Onyx, 32 QSFP28 ports, 2 Power Supplies (AC), x86 CPU, Standard depth, P2C airflow, Rail Kit, RoHS6
MSN2700-BS2R	Spectrum™ based 40GbE, 1U Open Ethernet Switch with Mellanox Onyx, 32 QSFP28 ports, 2 Power Supplies (AC), x86 CPU, Standard depth, C2P airflow, Rail Kit, RoHS6
MSN2700-BS2FC	Spectrum™ based 40GbE, 1U Open Ethernet Switch with Cumulus Linux, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, P2C airflow, Rail Kit, RoHS6
MSN2700-BS2FO	Spectrum™ based 40GbE 1U Open Switch with ONIE, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, P2C airflow, Rail Kit, RoHS6
MSN2700-BS2RC	Spectrum™ based 40GbE, 1U Open Ethernet Switch with Cumulus Linux, 32 QSFP28 ports, 2 Power Supplies (AC), Standard depth, x86 CPU, C2P airflow, Rail Kit, RoHS6

\*C2P – Connector-to-Power supply airflow, P2C – Power supply-to-Connector airflow.