



## Overview of Cisco MDS 9220i Fabric Switch

The Cisco MDS 9220i is a powerful and compact 1 rack unit (1RU) SAN fabric switch with powerful SAN extension capabilities making it ideal for small and mid range storage arrays, hybrid, and all flash.

This device has the following major features:

- 12 x 32 Gbps line rate Fibre Channel ports.
  - 6 x IPS ports that are configurable in various combinations of 4 x 1 Gbps, 4 x 10 Gbps, or 1 x 40 Gbps speeds.
  - 384 Gbps forwarding capacity for Fibre Channel ports and 80 Gbps forwarding capacity for IPS ports.
  - Redundant hot-swappable power supplies and fan modules.
  - WAN optimized TCP/IP stack for reliable and high throughput data replication with FCIP.
  - Advanced application acceleration, data compression, and security features.
  - Enterprise-class features, such as In Service Software Upgrades (ISSU), virtual storage area networks (VSANs), Inter-VSAN Routing, security features, and quality of service (QoS).
  - Extensive diagnostics, such as self test (Online Health Management System [OHMS], link test (ISL and F-port link diagnostics), and peer port statistics querying (Read Diagnostic Parameters [RDP]).
- [Chassis Components, on page 1](#)
  - [Fan Modules, on page 8](#)
  - [Power Supplies, on page 9](#)
  - [Supported SFP, SFP+, and QSFP+ Transceivers, on page 12](#)

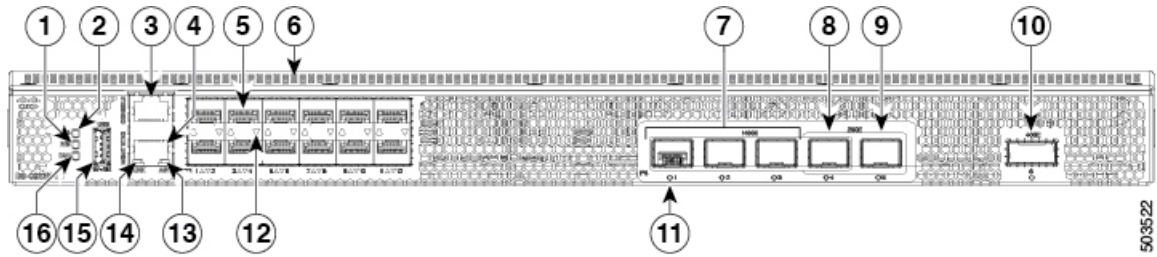
## Chassis Components

This section describes the different components of the chassis.

### Front View

The following figure shows the front view of a Cisco MDS 9220i Switch:

Figure 1: Front View of the Cisco MDS 9220i Switch



1	Power supply status LED	9	Fixed IPS ports (3 x 1/10 Gbps, pluggable SFP, SFP+, or QSFP compatible) <a href="#">1</a>
2	System status LED	10	Fixed IPS port (1 x 40 Gbps, pluggable SFP, SFP+, or QSFP compatible)
3	Serial console port (RJ45)	11	IPS port status LEDs (6)
4	Ethernet management port (1 x 10/100/1000 Mbps, RJ45)	12	FC port status LEDs (12)
5	Fixed FC ports (12 x 8/16/32 Gbps, pluggable SFP or SFP+ compatible)	13	Activity status LED for Ethernet management port
6	Airflow grill	14	Link status LED for Ethernet management port
7	Fixed IPS ports (3 x 1/10 Gbps, pluggable SFP, SFP+, or QSFP compatible)	15	USB port
8	Fixed IPS port (1 x 1/10/25 Gbps, pluggable SFP, SFP+, or QSFP compatible) <a href="#">2</a>	16	Fan status LED

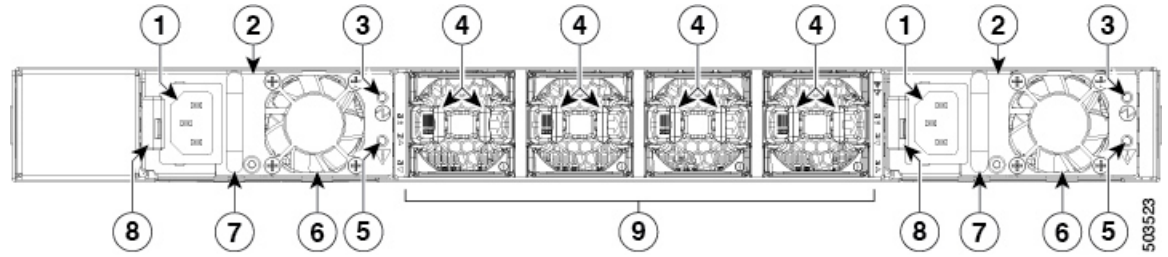
<sup>1</sup> Port 5 and 25-Gbps speed are not supported in Cisco MDS NX-OS Release 8.5(1).

<sup>2</sup> 25-Gbps speed is not supported in Cisco MDS NX-OS Release 8.5(1).

## Rear View

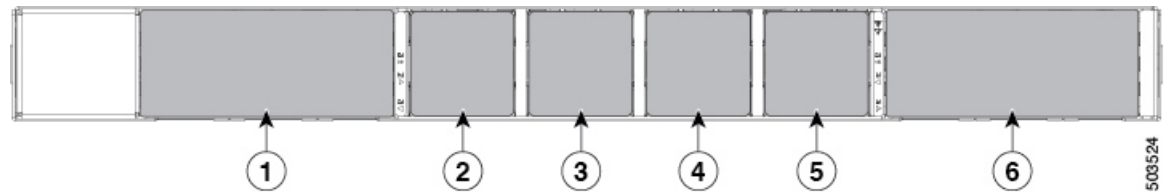
The following figure shows the rear view of a Cisco MDS 9220i Switch:

Figure 2: Rear View of the Cisco MDS 9220i Switch



1	Power supply power receptacle (1 per unit)	6	Power supply unit fan (1 per unit)
2	Power supply units (2, replaceable)	7	Power supply unit handle (1 per unit)
3	Power supply status LED (1 per unit)	8	Power supply unit release latch (1 per unit)
4	Chassis fan module release latches (2 per unit)	9	Chassis fan modules (4, replaceable)
5	Power supply failure status LED (1 per unit)		

Figure 3: Rear Panel Slot Numbering of Cisco MDS 9220i

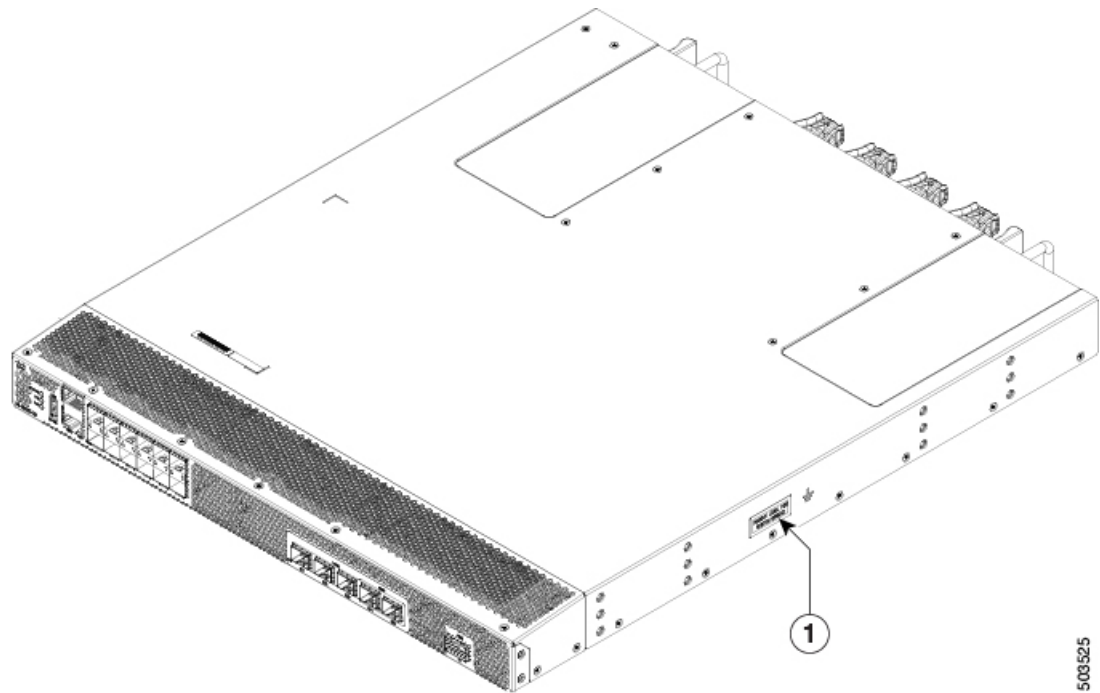


1	Power supply unit slot 1	4	Fan module slot 3
2	Fan module slot 1	5	Fan module slot 4
3	Fan module slot 2	6	Power supply unit slot 2

## Grounding Point

The following figure shows the location of the grounding point of a Cisco MDS 9220i Switch:

Figure 4: Grounding Point of the Cisco MDS 9220i Switch



500525

1	Grounding point
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## Switch LEDs

The Cisco MDS 9220i switch has LEDs on both the front and back of the switch to indicate the status of different system components during bootup tests and online operation. The following tables describe the location of each LED and the meaning of its color:

Table 1: Chassis Activity LEDs for a Cisco MDS 9220i Switch

Switch Component Identifier	Location	Function	Color	Status	State
Power supply status LED	Left side of chassis front panel	System power status	None	Off	Either of the following conditions exists: <ul style="list-style-type: none"> <li>• The system is not receiving sufficient power from the PSUs.</li> <li>• Cisco NX-OS is not running.</li> </ul>
			Green	Solid On	Both PSUs are installed and operational.
			Red	Solid On	A PSU has failed.

Switch Component Identifier	Location	Function	Color	Status	State
System status LED	Left side of chassis front panel	System operational status	Green	Solid On	All diagnostics have passed, Cisco NX-OS is running and the system is operational.
			Amber	Solid On	Any of the following conditions exists: <ul style="list-style-type: none"> <li>The system is running bootup diagnostics.</li> <li>The system is booting.</li> <li>A minor temperature threshold is exceeded.</li> </ul>
			Red	Blinking	Mismatched airflow direction detected in one of the following modules: <ul style="list-style-type: none"> <li>Fan modules—The switch will go down in 10-15 seconds.</li> <li>PSUs—The switch will go down in 10 minutes.</li> <li>Fan modules and PSUs—The switch will go down after 10 minutes.</li> </ul>
				Solid On	One of the following conditions exists: <ul style="list-style-type: none"> <li>A diagnostic test failed or another fault occurred during bootup.</li> <li>A major temperature threshold is exceeded.</li> </ul>
Fan status LED	Left side of chassis front panel	System cooling operational status	Green	Solid on	All fan modules are operational.
			Red	Solid on	Fan failure.

Switch Component Identifier	Location	Function	Color	Status	State
Power supply status LED	Faceplate of each PSU	PSU operational status	None	Off	No input voltage to the PSU.
			Green	Solid on	PSU output voltage is OK.
				Blinking	PSU output voltage is not OK, but input voltage is OK.
Power supply failure status LED	Faceplate of each PSU	PSU fault status	None	Off	PSU is operating normally.
			Amber	Solid on	One of the following conditions exists in the PSU and PSU is still operational: Over voltage Over current Over temperature Fan failure
				Blinking	PSU has a fault, but is still operational.
Fan status LED	Left side of chassis front panel	Fan module operational status	Green	Solid on	Fan module is operating normally.
			Amber	Solid on	The fan in the fan module has failed.

The following table describes the Ethernet port LEDs for the Cisco MDS 9220i switch.

LED	Status	State
Link status LED	Off	There is no link.
	Solid Green	Indicates a physical link.
Activity status LED	Off	There is no traffic.
	Blinking Amber	Indicates traffic.

The following table describes the Fibre Channel and IPS port status LEDs for a Cisco MDS 9220i switch.

Status	State
Solid Green	The link is up.

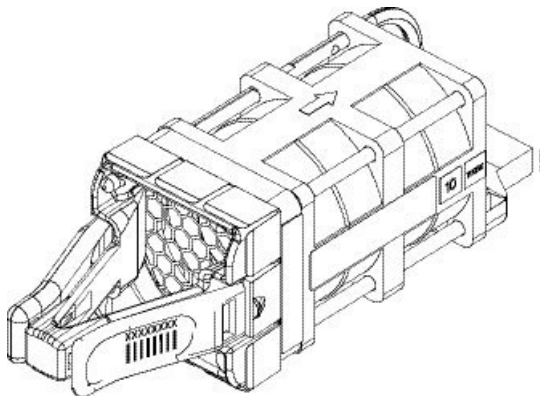
Status	State
Regular Blinking Green	The link is up and the port beacon is active.
Random Blinking Green	The link is up and traffic is flowing through the port.
Solid Amber	The port is configured to be disabled or port hardware has failed.
Blinking Amber	A hardware fault condition exists.
Off	The port is configured as enabled but link is not up and port beacon is not active.

## Fan Modules

Cisco MDS 9220i switch fan modules have a fixed handle for insertion into and removal from the chassis. The fan modules are hot-swappable to allow replacement of a fan module during operation for uninterrupted service. Fan blank modules must be installed in empty fan bays when operating the system for longer than several minutes to provide correct airflow and cooling. If the airflow is inadequate then the preset temperature thresholds will be exceeded and the system will automatically shut down to prevent permanent thermal damage.

The Cisco MDS 9220i switch may be deployed with four operating fan modules. The fan modules are numbered sequentially from left to right when viewed from the rear view of the switch. When only three fan modules are operational, there is no fan redundancy as the system requires a minimum of three operating fan modules to prevent automatic shutdown. This requirement is relaxed during fan module replacement and the system may operate for a maximum of 3 minutes with a single operating fan module for uninterrupted service. For optimal system cooling when using only three fans modules, install the modules in fan bays 2, 3, and 4. When four fan modules are installed, there is redundancy for uninterrupted system operation in the event of up to one fan module failure.

**Figure 5: Cisco MDS 9220i Fan Module**



To facilitate different data center cooling configurations of hot or cold aisles and racks, there are two models of fan modules. The first type has airflow with port-side intake and exhaust at the rear of the chassis. The second type can operate in either direction, that is, rear-chassis intake and port-side exhaust. The airflow direction is denoted on each fan module as follows:

- Red: Port-side intake airflow



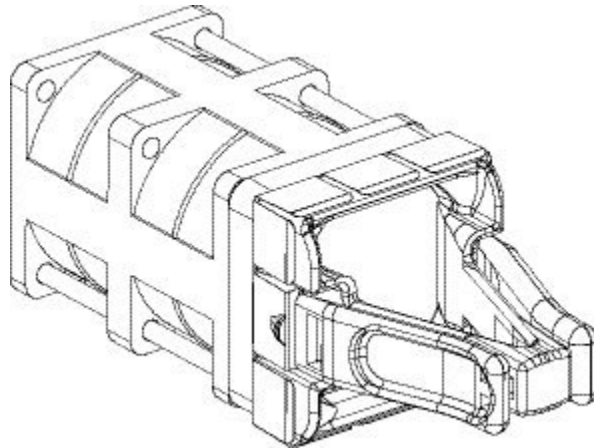
- Blue: Port-side exhaust airflow



**Note** All fan modules in the switch must be of the same airflow type. Do not mix port-side intake or port-side exhaust modules on the same switch.

The following figure shows a fan blank module:

**Figure 6: Fan Blank Module**



For more information on installing and removing fan modules, see [Installing and Removing Fan Modules](#).

## Power Supplies

Cisco MDS 9220i Switch PSUs have an unswitched power receptacle, a PSU status LED and a handle for inserting and removing the PSU from the chassis. The Cisco MDS 9220i switch requires a minimum of one operating power supply unit. When two PSUs are installed, power grid redundancy is available. In the dual PSU configuration, failure of a single PSU is supported, allowing for continuous uninterrupted service and eliminating the power system as a single point of failure. The PSUs are hot-swappable to allow removal and installation of a PSU during system operation. A PSU blank module must be installed if there is an empty PSU bay when operating for longer than several minutes to provide correct airflow. If the airflow is inadequate the preset temperature thresholds will be exceeded and the system will automatically shut down to prevent permanent damage.

The switch supports the following PSUs:

- 500 W AC, port-side intake variant (up to two per switch)
- 500 W AC, port-side exhaust variant (up to two per switch)
- 1200 W HVAC/HVDC, bidirectional airflow variant (up to two per switch)

**Note**

- All PSUs are 80 Plus Platinum certified.
- All PSUs in the switch must be of the same power type. Do not mix AC and HVAC/HVDC power supplies in the same switch.

*Figure 7: Cisco MDS 9220i 500 W AC PSU*

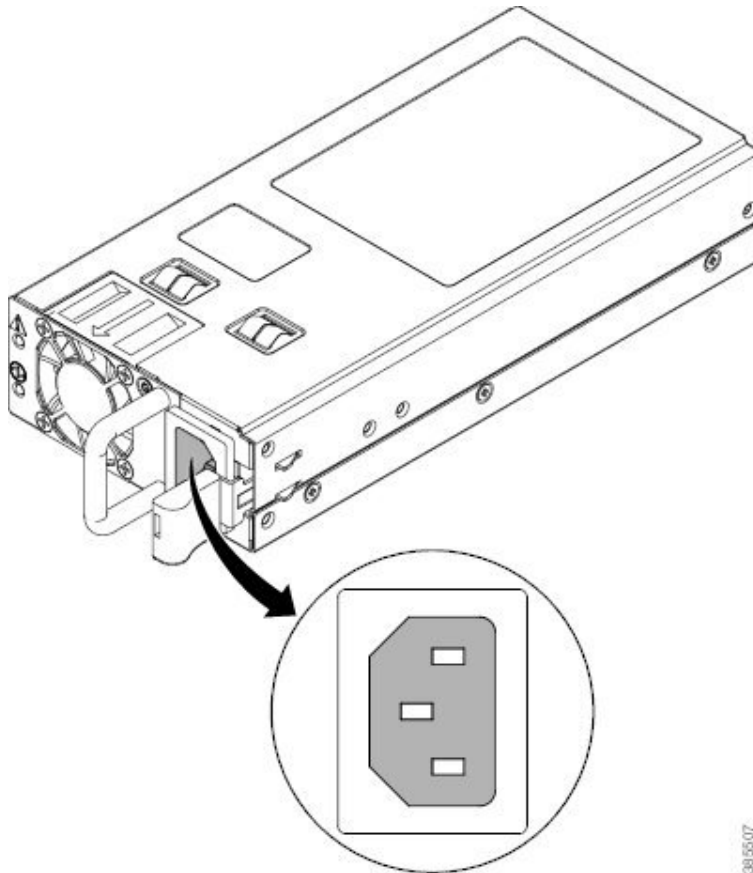
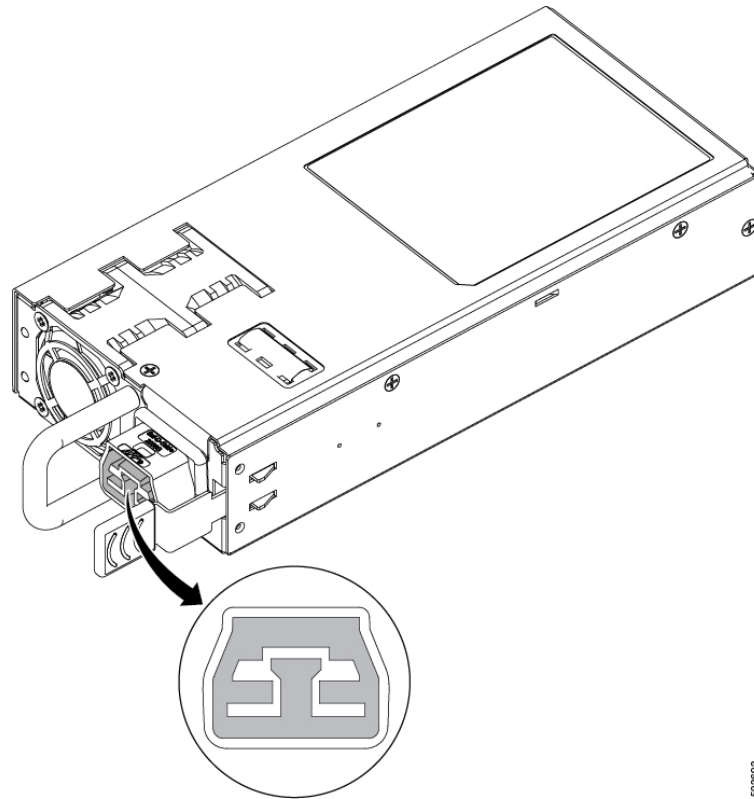


Figure 8: Cisco MDS 9220i 1200 W HVAC/HVDC PSU



To facilitate different data center cooling configurations of hot or cold aisles and racks, there are three models of PSUs. The first type has airflow with port-side intake and exhaust at the rear of the chassis. The second type has airflow in the opposite direction, that is, rear chassis intake and port-side exhaust. The third type has bidirectional airflow where the PSU automatically configures itself to match the airflow of the fan modules. The airflow direction is denoted on each PSU as follows:

- Red: Port-side intake airflow
- Blue: Port-side exhaust airflow
- White: Bidirectional airflow

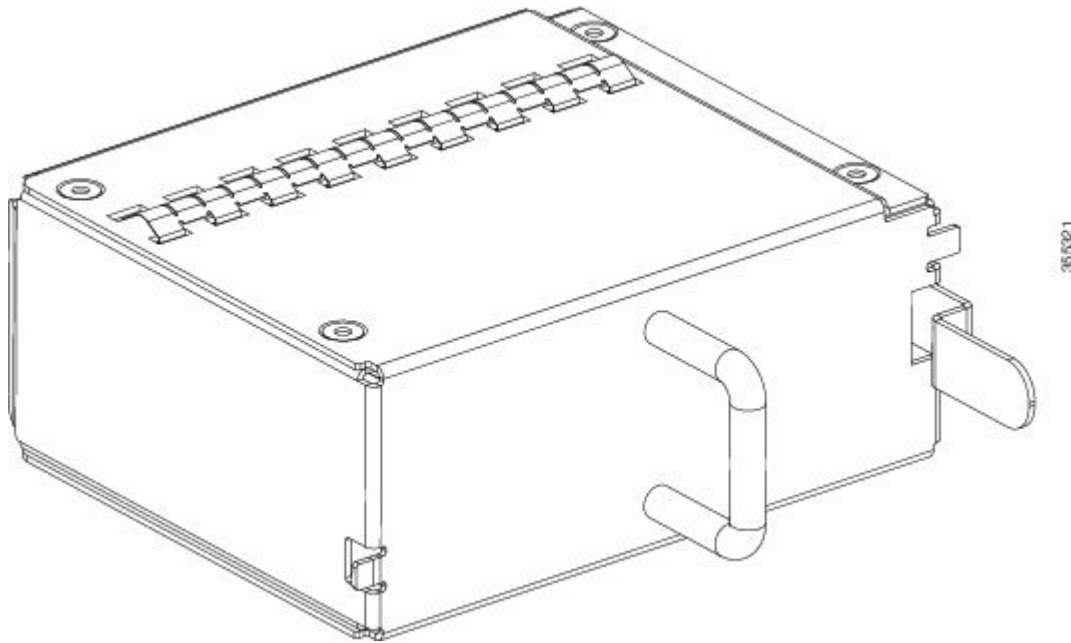


**Note** The direction of PSU airflow must match the direction of the fan module airflow.

All PSUs in the switch must be of the same airflow type. Do not mix port-side intake, port-side exhaust, or bidirectional airflow PSUs in the same switch.

The following figure shows a power supply blank module:

Figure 9: Power Supply Blank Module



For more information on installing and removing PSUs, see [Installing and Removing Power Supply Units](#).

## Supported SFP, SFP+, and QSFP+ Transceivers

SFP, SFP+, and QSFP+ transceivers are field replaceable. You can use any combination of SFP, SFP+, or QSFP+ transceivers that are supported by the switch. The only restrictions are that shortwave (SW) transceivers must be paired with SW transceivers on the peer device, and longwave (LW) transceivers with LW transceivers on the peer device, and the cable must not exceed the stipulated cable length for reliable communications.

For a list of SFP, SFP+, and QSFP+ transceivers supported on the Cisco MDS 9220i Switch, see [SFP, SFP+, or QSFP+ Transceiver Specifications](#). SFP, SFP+, and QSFP+ transceivers can be ordered either separately or with the Cisco MDS 9220i Switch.




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**Note** Use only Cisco SFP, SFP+, or QSFP+ transceivers in the Cisco MDS 9220i switches. Each Cisco SFP, SFP+, or QSFP+ transceiver is encoded with model information that enables the switch to verify that the SFP, SFP+, and QSFP+ transceiver meets the requirements for the switch.

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