



Technical Specifications

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Switch Specifications

The following table lists the environmental specifications for the Cisco MDS 9132T switch:

Table 1: Environmental Specifications for the Cisco MDS 9132T Switch

Description	Specification
Temperature, ambient operating	32 to 104°F (0 to 40°C)
Temperature, ambient nonoperating and storage	-40 to 158°F (-40 to 70°C)
Humidity (RH), ambient (noncondensing) operating	10 to 90%
Humidity (RH), ambient (noncondensing) nonoperating and storage	10 to 95%
Altitude, operating	-197 to 6500 ft (-60 to 2000 m)

The following table lists the physical specifications for the Cisco MDS 9132T switch.

Table 2: Physical Specifications for the Cisco MDS 9132T Switch

Description	Specification
Dimensions (HxWxD)	1.72 x 17.3 x 20.11 in. (4.36 x 43.94 x 51.07 cm) excluding PSU and fan module handles
Rack Space	Chassis requires 1 RU (1.75 in. or 4.45 cm)
Weight	21.65 lb (9.82 kg)

Description	Specification
Power Supply	<ul style="list-style-type: none"> • 650-W AC, port-side exhaust variant (up to 2 per switch) • 650-W AC, port-side intake variant (up to 2 per switch) • AC input—100 to 240 V AC (10% range) • Frequency—50 to 60 Hz (nominal)
Airflow	<ul style="list-style-type: none"> • Back to front (toward ports) using port-side exhaust fans • Front to back (into ports) using port-side intake fans • 50 CFM (0.02 m³/s) through system fan assembly at 25°C • 100 CFM (0.04 m³/s) maximum <p>We recommend that you maintain a minimum air space of 2.5 in. (6.4 cm) between walls and chassis air vents and a minimum horizontal separation of 6 in. (15.2 cm) between two chassis to prevent overheating.</p>

Power Specifications

General Power Supply Specifications

The following table lists the specifications for the Cisco MDS 9132T switch AC input power supply:

AC Input Power	Specification
AC input voltage	100 to 240 VAC
AC input frequency	Nominal = 50 to 60 Hz
Power supply output capacity	650 W
Power supply output voltage	12 V +/- 5% up to 54 A
Output holdup time	20 ms

Power Supply Requirement Specifications

The following table provides a sample calculation of power for the Cisco MDS 9132T switch AC input power supply:

Table 3: Power Dissipation for AC Input Power Supply

Power Mode	Optics	Speed	LEM	Traffic Rate	Temperature	Voltage	PSU	Fan Modules	Power at 110 V/60 Hz (Watts)	Power at 220 V/50 Hz (Watts)
Idle	0	NA	No	0%	Room	Normal	1	2	76	74
Idle	0	NA	Yes	0%	Room	Normal	1	2	118	116
Typical	16	32G	No	50%	Room	Normal	1	2	100	98
Typical	24	32G	Yes	50%	Room	Normal	1	2	150	147
Typical	32	32G	Yes	50%	Room	Normal	1	2	159	156
Max in 55°C	32	32G	Yes	100%	50°C	+5%	2	4	231	226

Table 4: Power Supply Fuse Information

Part Number	PID	Type	Fuse Rated AMP	I2T	Fuse Melting Time
341-100716-02	DS-CAC-650WE	Fast acting	12.5 A	400	1000 s@20 A, 0.1 s@56 A
341-100717-02	DS-CAC-650W-I				

Component Power Requirements and Heat Dissipation

Consider heat dissipation when sizing the air-conditioning requirements for an installation. The power and heat associated with a Cisco MDS 9132T 32-Gbps 32-Port Fibre Channel Switch varies based on the following considerations:

- The environment (temperature) outside the chassis
- Internal chassis temperature
- Any hardware component failure in the chassis
- Average switching traffic levels

The following table lists the power requirements and heat dissipation for the components of the Cisco MDS 9132T 32-Gbps 32-Port Fibre Channel Switch.

Table 5: Power Requirements and Heat Dissipation for the Cisco MDS 9132T 32-Gbps 32-Port Fibre Channel Switch

Module Type/Product Number	Power Required (watts)	Heat Dissipation (BTU/hr)	Input Current		
			85VAC(amps)	110VAC(amps)	220VAC(amps)
Cisco MDS 9132T 32-Gbps 32-Port Fibre Channel Switch	180 maximum	614	2.12	1.64	0.82

SFP Transceiver Specifications

The Cisco MDS 9132T switch is compatible with SFP transceivers and cables that have LC connectors. Each transceiver must match the transceiver at the other end of the cable in terms of wavelength. The cable must not exceed the stipulated cable length for reliable communications to take place.

Cisco SFP transceivers support 850 to 1610 nm nominal wavelengths, depending upon the transceiver.

Use only Cisco SFP transceivers on the Cisco MDS 9132T switch. Each Cisco SFP transceiver is encoded with model information that enables the switch to verify that the SFP transceiver meets the requirements for the switch. For the list of supported SFP transceivers, see the [Cisco MDS 9000 Series Compatibility Matrix](#).

For details about SFP transceivers see the [Cisco MDS 9000 Family Pluggable Transceivers Data Sheet](#).

For information about safety, regulatory, and standards compliance, see the [Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family](#).

Cisco Fibre Channel SFP+ Transceivers

The following table lists the Fibre Channel SFP+ transceivers that are available through Cisco for the Cisco MDS 9132T switch:

Table 6: Cisco Fibre Channel SFP + Transceivers for the Cisco MDS 9132T Switch

Part Number	Description	Type
DS-SFP-FC32G-SW	32-Gbps Fibre Channel SW SFP+	Short wavelength
DS-SFP-FC32G-LW	32-Gbps Fibre Channel LW SFP+	Long wavelength
DS-SFP-FC16G-SW	16-Gbps Fibre Channel SW, SFP+	Short wavelength
DS-SFP-FC16G-LW	16-Gbps Fibre Channel LW, SFP+	Long wavelength
DS-SFP-FC16G-ELW	16-Gbps Fibre Channel ELW, SFP+	Extended long wavelength
DS-SFP-FC8G-SW	8-Gbps Fibre Channel SW, SFP+	Short wavelength
DS-SFP-FC8G-LW	8-Gbps Fibre Channel LW, SFP+	Long wavelength
DS-SFP-FC8G-ER	8-Gbps Fibre Channel ER SFP+	Extended Reach

Part Number	Description	Type
DS-CWDM8Gxxxx	8-Gbps Fibre Channel CWDM SFP+	Long Distance

General Specifications for Cisco Fibre Channel 32-Gbps SFP+ Transceivers

The following table summarizes cabling specifications for 32 Gbps.

Table 7: General Specifications for Cisco 32-Gbps Fibre Channel SFP+ Transceivers

SFP+	Wavelength (nm)	Fibre Type	Core Size (microns)	Baud Rate (GBd)	Cable Distance				
					OM2	OM3	OM4	OM5	
DS-SFP-FC32G-SW	850	MMF	50.0	28.05	65 ft (20 m)	230 ft (70 m)	328 ft (100 m)	328 ft (100 m)	
			62.5	14.025	—	—	—	—	
			50.0	14.025	— 115 ft (35 m) (OM2)	328 ft (100 m)	410 ft (125 m)	410 ft (125 m)	
			62.5	8.5	69 ft (21 m) (OM1)	—	—	—	—
			50.0	8.5	—	164 ft (50 m) (OM2)	492 ft (150 m)	623 ft (190 m)	623 ft (190 m)
DS-SFP-FC32G-LW	1310	SMF	9.0	28.05	10 km (6.2 mi)				
			9.0	14.025	10 km (6.2 mi)				
			9.0	8.5	10 km (6.2 mi)				
DS-SFP-FC32G-ELW	1310	SMF	G.652	32G	25 km (15.5 mi)	—	—	—	

Power Requirements and Environmental Conditions for 32-Gbps SFP+ Transceivers

The following table provides the optical parameters for 32-Gbps SFP+ transceivers:

Table 8: Optical Parameters for 32-Gbps SFP+ Transceivers

SFP+	Average Transmit Power (dBm)		Average Receive Power (dBm)		Fiber-Loss Budget (dB)			
	Min	Max	Min	Max	OM2	OM3	OM4	OM5

SFP+	Average Transmit Power (dBm)		Average Receive Power (dBm)		Fiber-Loss Budget (dB)			
DS-SFP-FC32G-SW	-6.2	2.0	-8.2	2.0	1.68 (8 Gbps)	2.04 (8 Gbps)	2.04 (8 Gbps)	2.04 (8 Gbps)
					1.63 (16 Gbps)	1.86 (16 Gbps)	1.95 (16 Gbps)	1.95 (16 Gbps)
					2.02 (32 Gbps)	1.86 (32 Gbps)	1.86 (32 Gbps)	1.86 (32 Gbps)
DS-SFP-FC32G-LW	-5.0	2.0	-11.4	2.0	6.4 (8 Gbps)			
					6.4 (16 Gbps)			
					6.4 (32 Gbps)			
DS-SFP-FC32G-ELW	7	30	-15.8	4.5	20			

The following table provides information on operating and storage temperature ranges for 32-Gbps SFP+ transceivers:

Table 9: Operating and Storage Temperature Ranges for 32-Gbps SFP+ Transceivers

SFP+	Operating		Storage	
	Min	Max	Min	Max
DS-SFP-FC32G-SW	0°C	70°C	-40°C	85°C
DS-SFP-FC32G-LW				
DS-SFP-FC32G-ELW				

General Specifications for Cisco Fibre Channel 16-Gbps SFP+ Transceivers

The following table summarizes cabling specifications for 16-Gbps SFP+ transceivers:

Table 10: General Specifications for 16-Gbps Fibre Channel SFP+ Transceivers

SFP+	Wavelength (nm)	Fibre Type	Core Size (microns)	Baud Rate (GBd)	Cable Distance		
					OM2	OM3	OM4
DSFP16GSW	850	MMF	62.5	14.025	35 m (115 ft)	100 m (328 ft)	125 m (410 ft)
			62.5	8.5	—	—	—
			50.0	8.5	50 m (164 ft)	150 m (492 ft)	190 m (623 ft)
			62.5	4.25	—	—	—
			50.0	4.25	150 m (492 ft)	380 m (1247 ft)	400 m (1312 ft)
DSFP16GLW	1310	SMF	9.0	14.025	10 km (6.2 mile)		
			9.0	8.5	10 km (6.2 mile)		
			9.0	4.25	10 km (6.2 mile)		
DSFP16GLW	1310	SMF	9.0	14.025	25 km (15.5 mile)		
			9.0	8.5	25 km (15.5 mile)		
			9.0	4.25	25 km (15.5 mile)		

Power Requirements and Environmental Conditions for 16-Gbps SFP+ Transceivers

The following table provides the optical parameters for 16-Gbps SFP+ transceivers:

Table 11: Optical Parameters for 16-Gbps SFP+ Transceivers

SFP+	Average Transmit Power (dBm)		Average Receive Power (dBm)		Fiber-Loss Budget (dB)			
	Min	Max	Min	Max	(50.0 microns [OM2])	(50.0 microns [OM3])	(50.0 microns [OM4])	(50.0 microns [OM5])

SFP+	Average Transmit Power (dBm)		Average Receive Power (dBm)		Fiber-Loss Budget (dB)			
DS-SFP-FC16G-SW	-7.8	-1.3	-10.3	0	2.08 (4 Gbps) 1.68 (8 Gbps) 1.63 (16 Gbps)	2.88 (4 Gbps) 2.04 (8 Gbps) 1.86 (16 Gbps)	2.04 (8 Gbps) 1.95 (16 Gbps) 1.86 (32 Gbps)	2.04 (8 Gbps) 1.95 (16 Gbps) 1.86 (32 Gbps)
DS-SFP-FC16G-LW	-5.0	2.0	-12.0	2.0	7.8 (4 Gbps) 6.4 (8 Gbps) 6.4 (16 Gbps)			
DS-SFP-FC16G-ELW	-2.0	5.0	-14.0	2.0	10 (16 Gbps)			

The following table provides information on operating and storage temperature ranges:

Table 12: Operating and Storage Temperature Ranges for 16-Gbps SFP+ Transceivers

SFP+	Operating		Storage	
	Min	Max	Min	Max
DS-SFP-FC16G-SW	0°C	70°C	-40°C	85°C
DS-SFP-FC16G-LW	0°C	70°C	-40°C	85°C
DS-SFP-FC16G-ELW	0°C	70°C	-40°C	85°C

General Specifications for Cisco Fibre Channel 8-Gbps SFP+ Transceivers

The following table summarizes cabling specifications for 8-Gbps transceivers:

Table 13: General Specifications for Cisco 8-Gbps Fibre Channel SFP+ Transceivers

SFP+	Wavelength (nm)	Fibre Type	Core Size (microns)	Baud Rate (GBd)	Cable Distance			
					OM1	OM2	OM3	OM4
DS-SFP-FC8G-SW	850	MMF	62.5	2.125	150 m (492 ft)	—	—	—
			62.5	4.250	70 m (230 ft)	—	—	—
			62.5	8.500	21 m (69 ft)	—	—	—
			50.0	2.125	—	300 m (984 ft)	500 m (1640 ft)	520 m (1706 ft)
			50.0	4.250	—	150 m (492 ft)	380 m (1246 ft)	400 m (1312 ft)
			50.0	8.500	—	50 m (164 ft)	150 m (492 ft)	190 m (623 ft)
DS-SFP-FC8G-LW	1310	SMF	9.0	2.125	10 km (6.2 miles)			
			9.0	4.250	10 km (6.2 miles)			
			9.0	8.500	10 km (6.2 miles)			
DS-SFP-FC8G-ER	1550	SMF	9.0	2.125	40 km (24.85 miles)			
			9.0	4.250	40 km (24.85 miles)			
			9.0	8.500	40 km (24.85 miles)			

Power Requirements and Environmental Conditions for 8-Gbps SFP+ Transceivers

The following table provides the optical parameters for 8-Gbps SFP+ transceivers:

Table 14: Optical Parameters for 8 Gbps SFP+ Transceivers

SFP+	Average Transmit Power (dBm)		Average Receive Power (dBm)		Fiber-Loss Budget (dB)		
	Min	Max	Min	Max	(62.5 microns [OM1])	(50.0 microns [OM2])	(50.0 microns [OM3])

SFP+	Average Transmit Power (dBm)		Average Receive Power (dBm)		Fiber-Loss Budget (dB)		
DS-SFP-FC8G-SW	-10 (2 Gbps)	-1.3	—	0	2.10 (2 Gbps)	2.08 (4 Gbps)	3.31 (2 Gbps)
	-9 (4 Gbps)				1.78 (4 Gbps)	1.68 (8 Gbps)	2.88 (4 Gbps)
	-8.2 (8 Gbps)				1.58 (8 Gbps)	1.63 (16 Gbps)	2.04 (8 Gbps)
DS-SFP-FC8 G-LW	-11.7 (2 Gbps)	-3 (2 Gbps)	—	-3 (2 Gbps)	—	-7.8 (2 Gbps)	—
	-8.4 (4 Gbps)	-1 (4 Gbps)		-1 (4 Gbps)		7.8 (4 Gbps)	
	-8.4 (8 Gbps)	0.5 (8 Gbps)		0.5 (8 Gbps)		6.4 (8 Gbps)	
DS-SFP-FC8G-ER	-4.7	4	-1		10.9	10.9	10.9

The following table provides information on operating and storage temperature ranges:

Table 15: Operating and Storage Temperature Ranges for 8-Gbps SFP+ Transceivers

SFP+	Operating		Storage	
	Min	Max	Min	Max
DS-SFP-FC8G-SW	0°C	70°C	-40°C	85°C
DS-SFP-FC8G-LW	0°C	70°C	-40°C	85°C

Optical Specifications for Cisco CWDM SFP Transceivers

The following table provides the optical specifications for CWDM SFP transceivers, which have an optical link budget of 28 decibels (db).



Note

- The parameters are specified over temperature and at end of life unless otherwise noted.
- When shorter distances of single-mode fiber are used, it might be necessary to insert an inline optical attenuator in the link to avoid overloading the receiver.

Parameter	Symbol	Min.	Typical	Max.	Units	Notes
Transmitter central wavelength	λ_c	(x-4)	(x+1)	(x+7)	nm	Available center wavelengths: 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610 nm
Wavelength temperature dependence			0.08	0.1	nm/° C	
Side-mode suppression ratio	SMSR	30			dB	
Transmitter optical output power	P_{out}	0.0		5.0	dBm	Average power coupled into single-mode fiber
Receiver optical input power (BER10^{-12} with PRBS <math>2^7-1< math>)<="" td=""> <td>P_{in}</td> <td>-28.0</td> <td></td> <td>-7.0</td> <td>dBm</td> <td>@ 2.12 Gbps, 140°F (60°C) case temp.</td> </math>2^7-1<>	P_{in}	-28.0		-7.0	dBm	@ 2.12 Gbps, 140°F (60°C) case temp.
Receiver optical input wavelength	λ_{in}	1450		1620	Nm	
Transmitter extinction ratio	OMI	9			dB	
Dispersion penalty at 60 km				2	dB	
Dispersion penalty at 100 km				2	db	@ 1.25 Gbps
				3	dB	@ 1.25 Gbps

The following table provides information on operating and storage temperature ranges for Cisco 8-Gbps CWDM SFP modules:

Table 16: Operating and Storage Temperature Ranges for Cisco 8-Gbps CWDM SFP+ Transceivers

SFP+	Operating		Storage	
	Min	Max	Min	Max
DS-CWDM8Gxxxx	0°C	70°C	-40°C	85°C