

Cisco Compatible QSFP-100G-LX4-FL Quick Spec:

Part Number:	QSFP-100G-LX4-FL QSFP-100G-LX4-EXT-FL QSFP-100G-LX4-IND-FL
Form Factor:	QSFP28
TX Wavelength:	LX4
Reach:	2km
Cable Type:	SMF/MMF
Rate Category:	100GBase
Interface Type:	LX4
DDM:	Yes
Connector Type:	Dual-LC



Cisco Compatible QSFP-100G-LX4-FL Features:

- Hot pluggable QSFP28 MSA form factor
- Aggregate bit rate: 103.125 Gbps
- Up to 2km reach for G.652 SMF
- Up to 100m for OM3 (MMF)
- Single +3.3V power supply
- Transmitter: uncooled 4x25.78 Gbps
- Receiver: 4x25 Gbps PIN ROSA
- 4x25G Electrical Serial Interface
- Maximum power consumption 3.5W
- RoHS-6 compliant (lead-free)
- Duplex LC receptacle
- I²C interface with integrated Digital Diagnostic Monitoring
- Operating Case Temperature
 - Standard: 0°C to +70 °C
 - Extended -5°C to +85 °C
 - Industrial -40°C to +85 °C

Cisco Compatible QSFP-100G-LX4-FL Applications:

- 100G Ethernet

Cisco Compatible QSFP-100G-LX4-FL Overview

The QSFP28-100GBASE-LX4 is designed for use in 100 Gigabit Ethernet links over single-mode fiber and multi-mode fiber. They are compliant with the QSFP28 MSA and IEEE 802.3ba 100GBASE-LX4. Module-level digital diagnostic functions are available via an I2C interface, as specified by the QSFP28 MSA. The optical transceiver is compliant per the RoHS Directive 2011/6

Specification:

Absolute Maximum Ratings

The operation in excess of any absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Max	Unit
Storage Temperature	T_s	-40	+85	°C
Operating Case Temp (Standard)	TOP	0	70	°C
Operating Case Temp (Industrial)	TOP	-40	85	°C
Power Supply Voltage	Vcc	-0.5	3.6	V
Relative Humidity (non-condensation)	RH	5	95	%
Signal Input Voltage		-0.3	Vcc+0.3	V
Receiver Damage Threshold		+3.4		dBm

Electrical Characteristics

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Supply Voltage	Vcc	3.15		3.45	V	
Supply Current	ICC			1000	mA	
Input different impedance	Rin	90	100	110	Ω	2
Single ended data input swing	Vin, pp	120		820	mV	
Transmitter Disable Voltage	VDIS	2		VCC	V	3
Transmitter Enable Voltage	VEN	0		0.8	V	
Output different impedance	Rout	90	100	110	Ω	2
Single ended data output swing	Vout, pp	340		850	mV	4
LOS Asserted	VLOSA	2		VCCHOST	V	5
LOS De-asserted	VLOSD	0		0.8	V	5
Power Supply Rejection	PSR	50			mVpp	

Notes:

1. Maximum total power value is specified across the full temperature and voltage range.
2. Connected directly to TX data input pins. AC coupled thereafter.
3. Or open circuit.
4. Into 100Ω differential termination.
5. LossOf Signal is LVTTTL. Logic “0” indicates normal operation; logic “1” indicates no signal detected.

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Lane Wavelength	L0	1264.5	1270	1277.5	nm
	L1	1284.5	1290	1297.5	
	L2	1304.5	1310	1317.5	
	L3	1324.5	1330	1337.5	

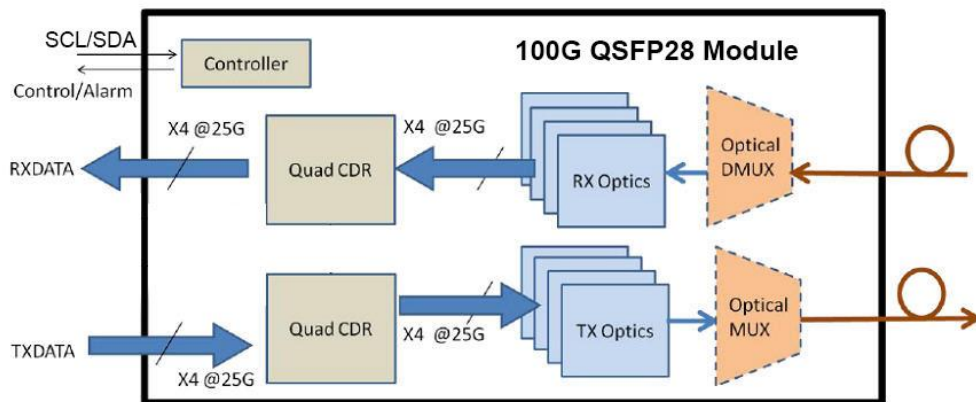
Optical Characteristics-Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Total Average Launch Power for SMF	POUT			8.3	dBm	
Total Average Launch Power for MMF				9.5	dBm	
Average Output Power per lane for SMF	Pave	-7.0		2.3	dBm	
Average Output Power per lane for MMF		-5.0		3.5	dBm	
Transmit OMA per Lane for SMF	TxOMA	-6.0		3.5	dBm	
Transmit OMA per Lane for MMF		-4.0		4.5	dBm	
Extinction Ratio	ER	3.5			dB	
Sidemode Suppression ratio	SMSR	30			dB	
Transmitter and Dispersion Penalty	TDP			2.6	dB	
Transmitter OFF Output Power	POff			-30	dBm	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.31, 0.40, 0.45, 0.34, 0.38, 0.4}				

Optical Characteristics-Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Rx Sensitivity (OMA) per lane for SMF	RSENS1			-8.6	dBm	
Rx Sensitivity (OMA) per lane for MMF				-8.6	dBm	
Input Saturation Power (Overload) for SMF	PSAT			+2.3	dBm	
Input Saturation Power (Overload) for MMF				+3.5		
Receiver Reflectance	Rfl			-26	dBm	
Loss of Signal Assert	PA	-30			dBm	
Loss of Signal De-assert	PD			-12.5	dBm	
LOS Hysteresis	PD - PA	0.5		6	dB	

Block Diagram of Transceiver



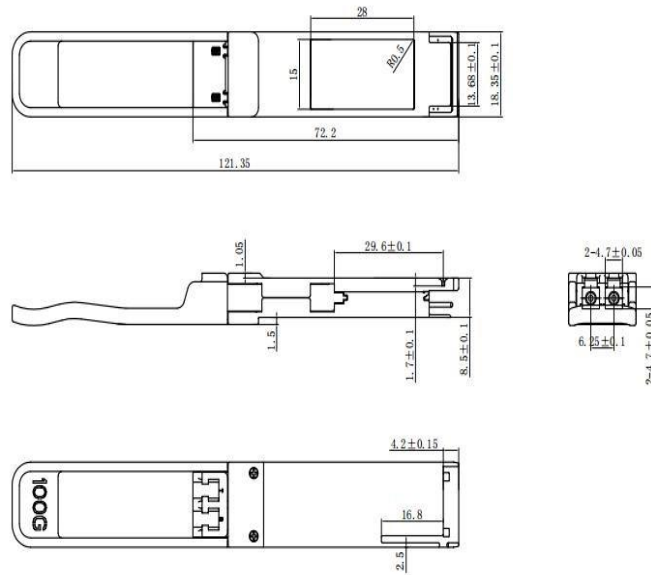
Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the normal operating conditions unless otherwise specified.

Parameter	Symbol	Min	Max	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-5	5	°C	
Supply voltage monitor absolute error	DMI_VCC	-0.1	0.1	V	
Channel RX power monitor absolute error	DMI_RX_Ch	-3	3	dB	
Channel Bias current monitor	DMI_Ibias_Ch	-10%	10%	mA	
Channel TX power monitor absolute error	DMI_TX_Ch	-3	3	dB	

Mechanical Dimensions

Units: nm



PIN Assignment and Function Definitions



PIN Definition

PIN	Signal Name	Description
1	GND	Ground (1)
2	Tx2n	CML-I Transmitter 2 Inverted Data Input
3	Tx2p	CML-I Transmitter 2 Non-Inverted Data Input
4	GND	Ground (1)
5	Tx4n	CML-I Transmitter 4 Inverted Data Input
6	Tx4p	CML-I Transmitter 4 Non-Inverted Data Input
7	GND	Ground (1)
8	ModSelL	LVTTLL-I Module Select
9	ResetL	LVTTLL-I Module Reset
10	VCCRx	+3.3V Power Supply Receiver (2)
11	SCL	LVC MOS-I/O 2-Wire Serial Interface Clock
12	SDA	LVC MOS-I/O 2-Wire Serial Interface Data
13	GND	Ground (1)
14	Rx3p	CML-O Receiver 3 Non-Inverted Data Output
15	Rx3n	CML-O Receiver 3 Inverted Data Output
16	GND	Ground (1)
17	Rx1p	CML-O Receiver 1 Non-Inverted Data Output
18	Rx1n	CML-O Receiver 1 Inverted Data Output
19	GND	Ground (1)
20	GND	Ground (1)
21	Rx2n	CML-O Receiver 2 Inverted Data Output
22	Rx2p	CML-O Receiver 2 Non-Inverted Data Output
23	GND	Ground (1)

24	Rx4n	CML-O Receiver 4 Inverted Data Output
25	Rx4p	CML-O Receiver 4 Non-Inverted Data Output
26	GND	Ground (1)
27	ModPrsL	Module Present
28	IntL	Interrupt
29	VCCTx	+3.3V Power Supply Transmitter (2)
30	VCC1	+3.3V Power Supply
31	LPMMode	LVTTLL-I Low Power Mode
32	GND	Ground (1)
33	Tx3p	CML-I Transmitter 3 Non-Inverted Data Input
34	Tx3n	CML-I Transmitter 3 Inverted Data Input
35	GND	Ground (1)
36	Tx1p	CML-I Transmitter 1 Non-Inverted Data Input
37	Tx1n	CML-I Transmitter 1 Inverted Data Input
38	GND	Ground (1)

Notes:

1. All Ground (GND) are common within the QSFP+ module and all module voltages are referenced to this potential unless noted otherwise. Connect these directly to the host board signal common ground plane.
2. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. The connector pins are each rated for a maximum current of 500mA.

ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all other electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

Laser Safety

This is a Class 1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

Licensing

The following U.S. patents are licensed by Finisar to FluxLight, Inc.:

U.S. Patent Nos: 7,184,668, 7,079,775, 6,957,021, 7,058,310, 6,952,531, 7,162,160, 7,050,720