



SPC27B14101D139

Cisco® Compatible 10GBase-CWDM SFP+ Transceiver (SMF, 1270nm, 10km, LC, DOM, -40 to 85C)

Product Description

This Cisco® SFP+ transceiver provides 10GBase-CWDM throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1270nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Cisco® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

Features:

- SFF-8432 and SFF-8472 Compliance
- Temperature-stabilized EML transmitter and PIN receiver
- Duplex LC Connector
- Industrial Temperature -40 to 85 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



Applications:

- 10x Gigabit Ethernet over CWDM
- Access and Enterprise

For your product safety, please read the following information carefully before any manipulation of the transceiver:



ESD

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



LASER SAFETY

This is a Class1 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).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

CWDM Available Wavelengths

Wavelengths	Min.	Typ.	Max.
27	1264.5	1271	1277.5
29	1284.5	1291	1297.5
31	1304.5	1311	1317.5
33	1324.5	1331	1337.5
35	1344.5	1351	1357.5
37	1364.5	1371	1377.5
39	1384.5	1391	1397.5
41	1404.5	1411	1417.5
43	1424.5	1431	1437.5
45	1444.5	1451	1457.5
47	1464.5	1471	1477.5
49	1484.5	1491	1497.5
51	1504.5	1511	1517.5
53	1524.5	1531	1537.5
55	1544.5	1551	1557.5
57	1564.5	1571	1577.5
59	1584.5	1591	1597.5
61	1604.5	1611	1617.5

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5		3.6	V
Storage Temperature	Tstg	-40		85	°C
Operating Temperature	Tc	-40		85	°C
Operating Relative Humidity	RH			85	%
Power Supply Current	Icc			545	mA
Data Rate	DR		9.953/10.3125		Gbps

Electrical Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage		V _{CC}	3.15	3.3	3.45	V	
Transmitter							
Differential CML Inputs		V _{IN}	150		1200	mVp-p	1
Input AC Common-Mode Voltage			0		25	mV	2
Differential Input impedance		Z _{IN}	85	100	115	Ω	3
Tx_Disable	High		2		V _{CC}	V	
	Low		0		0.8	V	
Tx_Fault	High		2		V _{CC} +0.3	V	4
	Low		0		0.5	V	5
Receiver							
Differential CML Outputs		V _{OUT}	350		700	mVp-p	6
Differential Output Impedance		Z _{OUT}	85	100	115	Ω	
Rx_LOS	High		2		V _{CC} +0.3	V	4
	Low		0		0.8		5
MOD_DEF(0.2)		V _{OH}	2.5			V	7
		V _{OL}	0		0.5		

Notes:

1. AC Coupled Inputs.
2. RMS.
3. R_{IN}>100kΩ @DC.
4. I_o = 400μA (Host_V_{CC}).
5. I_o = -4.0mA.
6. AC Coupled Outputs.
7. With Serial ID.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λ_C	$\lambda_C-6.5$	λ_C	$\lambda_C+6.5$	nm	
Spectral Width (RMS)	$\Delta\lambda$			1	nm	
Output Average Power (DFB)	POUT	0		5	dBm	1
Output Average Power (EML)	POUT	-2		4	dBm	1
Extinction Ratio	ER	3.5			dB	
Average Power of Off Transmitter	Poff			-30	dBm	
Relative Intensity Noise	RIN			-128	dB/Hz	
Side-Mode Suppression Ratio	SMSR	30			dB	
Transmitter Dispersion Penalty	TDP			3 (1271 – 1451nm)	dB	
				5 (1471 – 1531nm)	dB	
				6 (1551 – 1551nm)	dB	
				3 (1571 – 1611nm)	dB	
Tx_Disable Assert Time	T_off			10	us	
Receiver						
Center Wavelength	λ_C	1260		1620	nm	
Receiver Sensitivity (DFB)	Pmin			-14.4	dBm	
Receiver Sensitivity (EML)	Pmin			-16	dBm	
Receiver Overload	Pmax	0			dBm	
LOS De-Assert	LOSD			-17	dBm	
LOS Assert	LOSA	-28			dBm	
LOS Hysteresis		0.5			dB	

Notes:

1. Output power is power coupled into a 9/125 μ m single-mode fiber.
2. Average received power: BER is less than $1E^{-12}$ with a PRBS $2^{31}-1$ test pattern.

Pin Descriptions

Pin	Symbol	Name/Description	Plug Sequence	Notes
1	VeeT	Transmitter Ground.	1	5
2	Tx_Fault	Transmitter Fault Indication.	3	1
3	Tx_Disable	Transmitter Disable. Module disables on "high" or "open."	3	2
4	SDA	Transmitter Disable. 2-Wire Serial ID Interface.	3	3
5	SCL	Module Definition 2. 2-Wire Serial ID Interface.	3	3
6	MOD_ABS	Module Definition 1.	3	3
7	RSO	Rx Rate Select (LVTTL).	3	9
8	LOS	Loss of Signal.	3	4
9	RS1	Tx Rate Select (LVTTL).	1	10
10	VeeR	Receiver Ground.	1	5
11	VeeR	Receiver Ground.	1	5
12	RD-	Inverse Received Data Out.	3	6
13	RD+	Receiver Data Out.	3	6
14	VeeR	Receiver Ground.	1	5
15	VccR	3.3 ± 5% Receiver Power.	2	7
16	VccT	3.3 ± 5% Transmitter Power.	2	7
17	VeeT	Transmitter Ground.	1	5
18	TD+	Transmitter Data In.	3	8
19	TD-	Inverse Transmit Data In.	3	8
20	VeeT	Transmitter Ground.	1	5

Notes:

1. Tx_Fault is an open collector/drain output that should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board. Pull-up voltage between 2.0V and VccT/R+0.3V. When "high," output indicates a laser fault of some kind. "Low" indicates normal operation. In the "low" state, the output will be pulled to <0.8V.
2. Tx_Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7kΩ to 10kΩ resistor. Its states are:
 - Low (0V – 0.8V): Transmitter On
 - (>0.8V, <2.0V): Undefined
 - High (2.0V – 3.465V): Transmitter Disabled
 - Open: Transmitter Disabled.
3. Modulation Absent. Connected to the VeeT and VeeR in the module.
4. LOS (Loss of Signal) is an open collector/drain output that should be pulled up with a 4.7kΩ to 10kΩ resistor. Pull-up voltage between 2.0V and VccT/R+0.3V. When "high," this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). "Low" indicates normal operation. In the "low" state, the output will be pulled to <0.8V.

5. VeeR and VeeT may be internally connected within the SFP module.
6. RD-/+. These are the differential receiver outputs. They are AC-coupled 100Ω differential lines that should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board. The voltage swing on these lines will be between 400mV and 2000mV differential (200mV –1000mV single-ended) when properly terminated.
7. VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V±5% at the SFP connector pin. The maximum supply current is 545mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply-filtering network is used, hot plugging of the SFP transceiver module will result in an in-rush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP transceiver module.
8. TD-/+. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 differential terminations inside the module.
9. Rate Select 0. Optionally controls the SFP+ module receiver. This pin is pulled low to the VeeT with a >30K resistor.
10. Rate Select 1. Optionally controls the SFP+ module transmitter. This pin is pulled low to the VeeT with a >30K resistor.

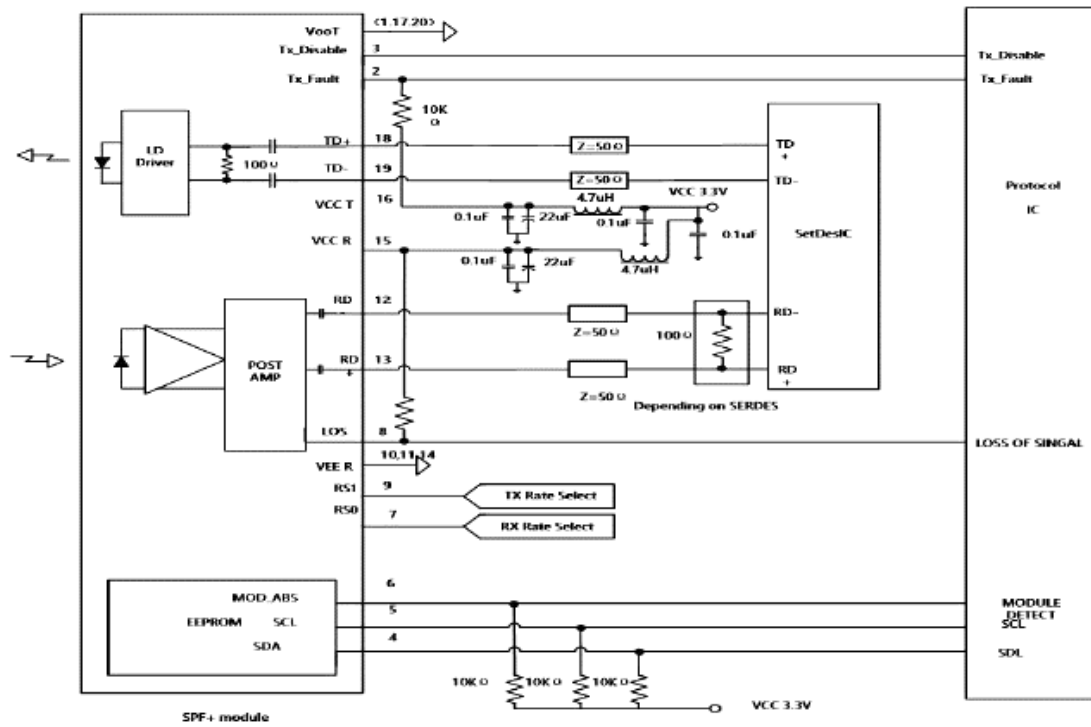
Electrical Pin-Out Details

11	VEER	VEER	10
12	RD-	RS1	9
13	RD+	RX_LOS	8
14	VEER	RS0	7
15	VCCR	MOD-ABS	6
16	VCCT	SCL	5
17	VEET	SDA	4
18	TD+ TX_DISABLE		3
19	TD- TX_FAULT		2
20	VEET	VEET	1

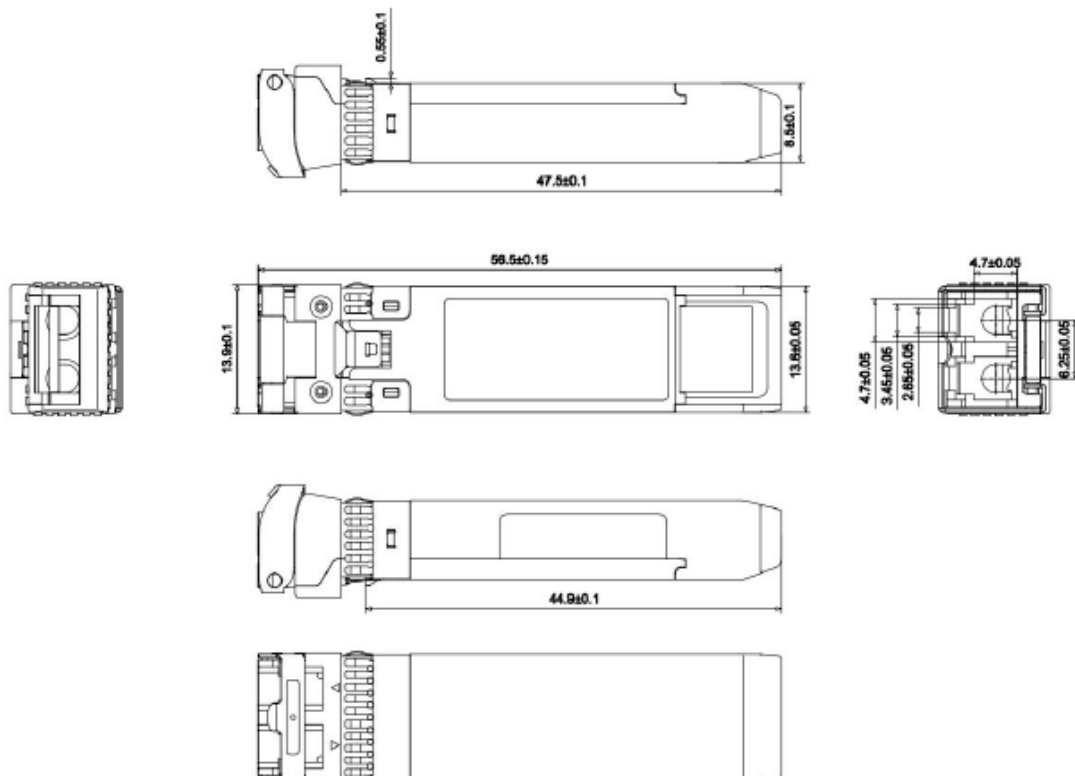
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TOWARD HOST
TOWARD BEZEL

Recommended Circuit Schematic



Mechanical Specifications



About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

