



S28130202R0FAAX

Cisco® Compatible 10/25GBase-LR SFP28 Transceiver (SMF, 1310nm, 20km, LC, DOM)

Product Description

This Cisco® compatible SFP28 transceiver provides 25GBase-LR throughput up to 20km over single-mode fiber (SMF) using a wavelength of 1310nm 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:

- Supports 24.33Gbps and 25.78Gbps Operating Data Rate with CDR Engaged Mode
- 1310nm Uncooled DFB-LD Transmitter
- Supports 9.95Gbps and 10.31Gbps Operating Data Rate with CDR Bypassed Mode
- Single 3.3V Power Supply
- Duplex LC Connector Interface
- Up to 20km Distance
- Power Dissipation: 1.2W
- Hot-Pluggable
- RoHS Compliant and Lead-Free
- Operating Temperature: 0 to 70 Celsius



Applications:

- 25GBase Ethernet
- 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.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Data Rate	DR	24.33		25.78	Gbps	1
	DR	9.95		10.31		2
Operating Case Temperature	Tc	0		70	°C	
Storage Temperature	Tstg	-40		85	°C	
Maximum Voltage	Vcc	-0.5		4.0	V	
Relative Humidity (Non-Condensing)	RH	0		85	%	
9µm Core Diameter SMF				20	km	

Notes:

1. CDR engaged mode.
2. CDR bypassed mode.
3. Exceeding any one of these values may destroy the device permanently.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	Vcc	3.135		3.465	V	
Supply Current	Icc			360	mA	
Transmitter						
CML Inputs (Differential)	VIN	200		900	mVp-p	1
Input Impedance (Differential)	ZIN		100		Ω	2
Tx_Disable Input Voltage - High		2		Vcc + 0.3	V	
Tx_Disable Input Voltage - Low		-0.3		0.8	V	
Receiver						
CML Outputs (Differential)	VOUT	300		1000	mVp-p	3
Rx_LOS Output Voltage - High		2		Vcc + 0.3	V	
Rx_LOS Output Voltage - Low		-0.3		0.8	V	

Notes:

1. AC coupled inputs.
2. Connected directly to Tx pins.
3. AC coupled outputs.

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λ_C	1295	1310	1325	nm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Average Output Power @25.78Gbps	POUT	-0.5		5	dBm	
Output Power (OMA) @25.78Gbps	POMA	-1		5	dBm	
OMA Minus TDP	OMA-TDP	-2			dBm	
Extinction Ratio	ER	4			dB	
Transmitter Dispersion Penalty	TDP			2.7	dB	
Relative Intensity Noise	RIN			-130	dB/HZ	
Transmitter Reflectance				-26	dB	
Transmitter Eye Mask Definition: {X1, X2, X3, Y1, Y2, Y3} Hit Ratio 5E ⁻⁵ Hits Per Sample		{0.31, 0.40, 0.45, 0.34, 0.38, 0.4}				
Receiver						
Center Wavelength	λ_C	1295	1310	1365	nm	
Receiver Sensitivity (OMA)	RX _{OMA}			-14	dBm	1
Receiver Overload	P _{MAX}	2.5			dBm	2
Receiver Reflectance				-26	dB	
LOS De-Assert	LOSD			-16	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis	LOSH	0.5			dB	

Notes:

1. Measured with data rate @25.78Gbps with BER less than $5E^{-5}$ and PRBS $2^{31}-1$.
2. Targeted for long reach applications with high-power transmitter. Please ensure at least 3dB optical attenuation for optical loopback test.

Pin Descriptions

Pin	Symbol	Name/Description	Plug Seq.	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	Module Definition 2. Data Line for Serial ID.	3	
5	SCL	Module Definition 1. Clock Line for Serial ID.	3	
6	MOD_ABS	Module Definition 0.	3	3
7	RS0	Rx Rate Select (LVTTTL). Rate Select 0. Optionally controls SFP28 module receiver. This pin is pulled “low” to VeeT with a >30k resistor.	3	
8	Rx_LOS	Loss of Signal.	3	4
9	RS1	Tx Rate Select (LVTTTL). Rate Select 1. Optionally controls SFP28 module transmitter. This pin is pulled “low” to VeeT with a >30k resistor.	1	
10	VeeR	Receiver Ground.	1	5
11	VeeR	Receiver Ground.	1	5
12	RD-	Inverted Received Data Out.	3	6
13	RD+	Received Data Out.	3	6
14	VeeR	Receiver Ground.	1	5
15	VccR	3.3V $\pm$ 5% Receiver Power.	2	7
16	VccT	3.3V $\pm$ 5% Transmitter Power.	2	7
17	VeeT	Transmitter Ground.	1	5
18	TD+	Transmit Data In.	3	8
19	TD-	Inverted Transmit Data In.	3	8
20	VeeT	Transmitter Ground.	1	5

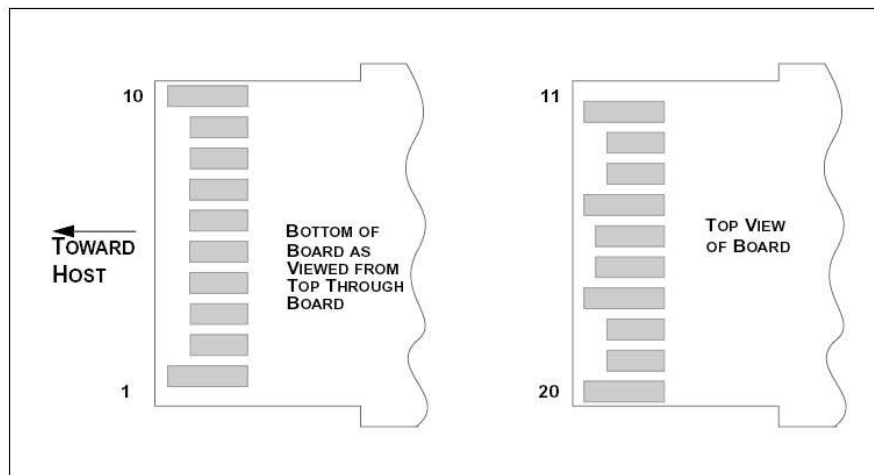
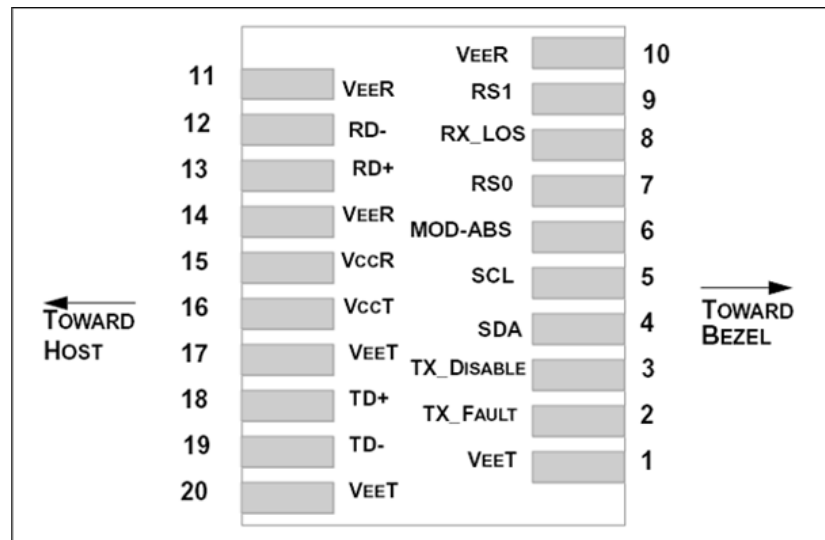
Notes

1. Tx_Fault is an open collector/drain output that should be pulled up with a 4.7k Ω to 10k Ω resistor on the host board. Pull-up voltage between 2.4V and VccT/R+0.3V. When “high,” the output indicates a laser fault of some kind. “Low” indicates normal operation. In the “low” state, the output will be pulled to <0.4V.
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 4.7k Ω to 10k Ω resistor. Its states are:
Low (-0.3V to 0.8V): Transmitter On
(>0.8V, <2.0V): Undefined
High (2.0V to VccT/R+0.3V): Transmitter Disabled
Open: Transmitter Disabled.
3. Modulation Absent. Connected to the VeeT or VeeR in the module.
4. Rx_LOS (Loss of Signal) is an open collector/drain output that should be pulled up with a 4.7k Ω to 10k Ω resistor. Pull-up voltage between 2.4V and VccT/R+0.3V. When “high,” this output indicates that 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 <0.4V.
5. VeeR and VeeT may be internally connected within the SFP module.
6. RD-/+. These are the differential receiver outputs. They are AC-coupled, 100 Ω differential lines which should be terminated with 100 Ω (differential) at the user SERDES. The AC coupling is done

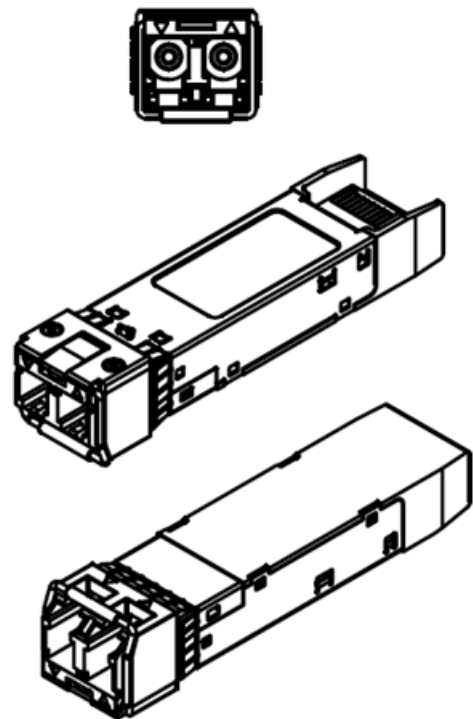
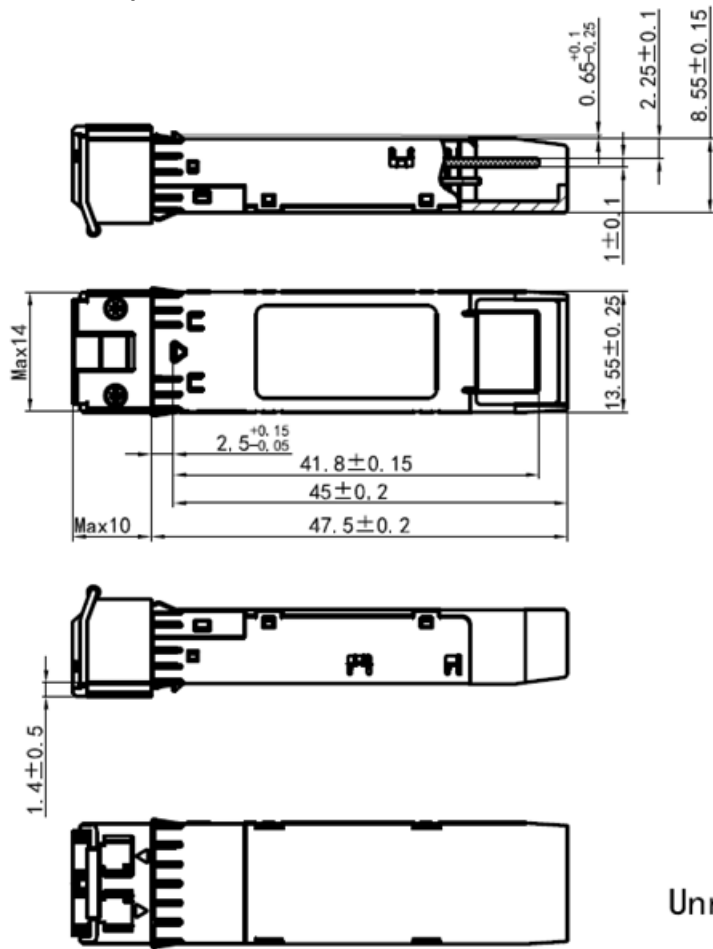
inside the module and is thus not required on the host board. The voltage swing on these lines will be between 150mV to 500mV single-ended when properly terminated.

7. VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V $\pm$ 5% at the SFP+ connector pin. Maximum supply current is 360mA. Inductors with DC resistance of less than 1 Ω should be used in order to maintain the required voltage at the SFP28 input pin with 3.3V supply voltage. When the recommended supply-filtering network is used, hot-plugging of the SFP28 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 SFP28 transceiver module.
8. TD-/+. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100 Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board. The inputs will accept swings of 100mV to 450mV single-ended, though it is recommended values that is less than 900mV differential swing be used for best EMI performance.

Pin-Out Details



Mechanical Specifications



Unremarked tolerances $\pm 0.2\text{mm}$

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.

