



S2B32010250FNZV

Fortinet® Compatible 25GBase-BX SFP28 Transceiver (SMF, 1330nmTx/1270nmRx, 10km, LC)

Product Description

This Fortinet® Compatible SFP28 transceiver provides 25GBase-BX throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1330nmTx/1270nmRx via an LC connector. This bidirectional unit must be used with another transceiver or network appliance of complimenting wavelengths. It is guaranteed to be 100% compatible with the equivalent Fortinet® 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-8402 and SFF-8472 Compliance
- Simplex LC Connector
- Commercial Temperature 0 to 70 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



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.

Regulatory Compliance

- Electromagnetic Interference (EMI) compatible with standards: FCC Part 15 Class B, EN 55022:2010, Class B
- Electromagnetic susceptibility (EMS) compatible with standards: EN 55024:2010
- Laser Eye Safety compatible with Class I laser product FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2
- RoHS compliant with EU RoHS 2.0 directive 2015/863/EU

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Maximum Supply Voltage	V _{CC}	-0.5	3.6	V
Storage Temperature	T _S	-40	85	°C
Operating Case Temperature	T _C	0	70	°C
Operating Humidity (non-condensing)	RH	5	95	%
Receiver Power	R _{MAX}		-12	dBm
Maximum Bitrate	B _{max}		28	Gbps

Electrical Characteristics (TOP=25°C, V_{CC}=3.3Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V _{CC}	3.135	3.30	3.465	V	
Power Supply Current @ 3.3V	I _{CC}			350	mA	
Power Consumption	P _{DISS}			1.5	W	
Transmitter						
Differential data input swing	V _{in,pp}	180		700	mV	
Transmitter Enable Voltage	V _{EN}	-0.3		0.8	V	
Transmitter Disable Voltage	V _D	2.0		V _{CC} +0.3	V	
Receiver						
Differential data output swing	V _{out,pp}	450		1050	mV	
LOS Low Voltage	V _{Lout}			0.4	V	
LOS High Voltage	V _{Hout}	2.0			V	

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Support Data Rate				28	Gbps	
Peak Wavelength	λp	1320	1330	1340	nm	
Spectral Width (-20dB)				1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Optical Output Power	Po	-5		2	dBm	
Optical Extinction Ratio	ER	3.5			dB	
Transmitter and Dispersion Penalty	TDP			3	dB	
Output Power with Transmitter Disabled	Poff			-30	dBm	
Optical Return Loss Tolerance				-12	dB	
Output Eye Diagram	Compliant with IEEE 802.3					1
Receiver						
Support data rate				28	Gbps	
Operate Wavelength		1260	1270	1280	nm	
Receiver Sensitivity @25Gbps	Sen			-12	dBm	2
Saturation	Psat	2			dBm	2
LOS Asserted	T_loss_on	-30			dBm	High level: Alarm
LOS De-Asserted	T_loss_off			-13	dBm	
LOS Hysteresis	T_loss_Hs	0.5		5.0	dB	

Notes:

1. At least 1000 waveforms acquired, with minimum 5% margin against 802.3 mask
2. Test at 25.78125Gb/s, PRBS 2³¹-1, BER of 5E-5, NRZ and including back to back

Pin Descriptions

Pin	Symbol	Name/Descriptions	Ref.
1	VeeT	Transmitter Ground	
2	TX Fault	Transmitter Fault Indication	1
3	TX Disable	Transmitter Disable	2, Module disables on high or open
4	SDA	2-wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i)	
5	SCL	2 Wire Serial Interface Data Line (Same as MOD-DEF1 as defined in the INF-8074i)	
6	MOD-ABS	Module Absent, Connected to VeeT or VeeR in the module.	3
7	RS0	SFP+ RX Rate Select, optional	Rate Select 0, Not used. 9
8	LOS	Loss of Signal	4
9	RS1	SFP+ TX Rate Select, optional	Rate Select 1, Not used. 9
10	VeeR	Receiver Ground	5
11	VeeR	Receiver Ground	5
12	RD-	Inv. Received Data Out	6
13	RD+	Received Data Out	6
14	VeeR	Receiver Ground	5
15	VccR	Receiver Power	7, 3.3V 5%
16	VccT	Transmitter Power	7, 3.3V 5%
17	VeeT	Transmitter Ground	5
18	TD+	Transmit Data In	8
19	TD-	Inv. Transmit Data In	8
20	VeeT	Transmitter Ground	5

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

1. TX Fault is an open collector/drain output, which should be pulled up with a 4.7K–10KΩ resistor on the host board. Pull up voltage between 2.0V and VccT +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 < 0.4V.
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 4.7–10 KΩ resistor. Its states are:
Low (-0.3–0.8V): Transmitter on (>0.8, < 2.0V): Undefined
High (2.0–VccT+0.3V): Transmitter Disabled Open: Transmitter Disabled
3. Mod-ABS shall be pulled up with a 4. 7K–10KΩ resistor on the host board. The pull -up voltage shall VccT or VccR.
4. LOS (Loss of Signal) is an open collector/ drain output, which should be pulled up with a 4.7K–10KΩ

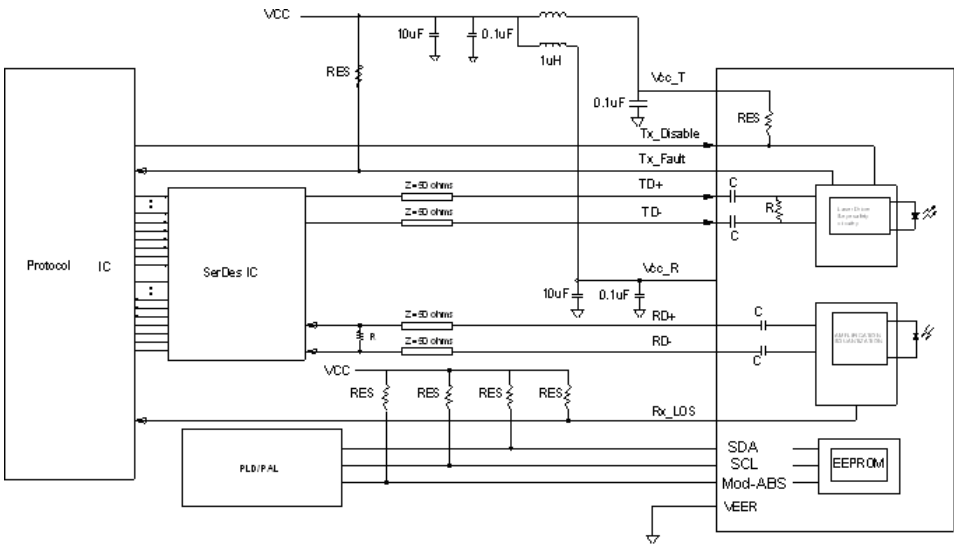
resistor. Pull up voltage between 2.0V and VccR+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to < 0.4V.

5. VeeR and VeeT may be internally connected within the SFP module.
6. RD-/+: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which 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.
7. VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V 5% at the SFP connector pin. Maximum supply current is 300mA. 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 inrush current of no more than 30 mA 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 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.
9. Internally pulled down per SFF-8431 Rev 4.1.



Pin-out of connector Block on Host board

Recommended Circuit Schematic



NOTE: 4.7K ohms<RES<10K ohms

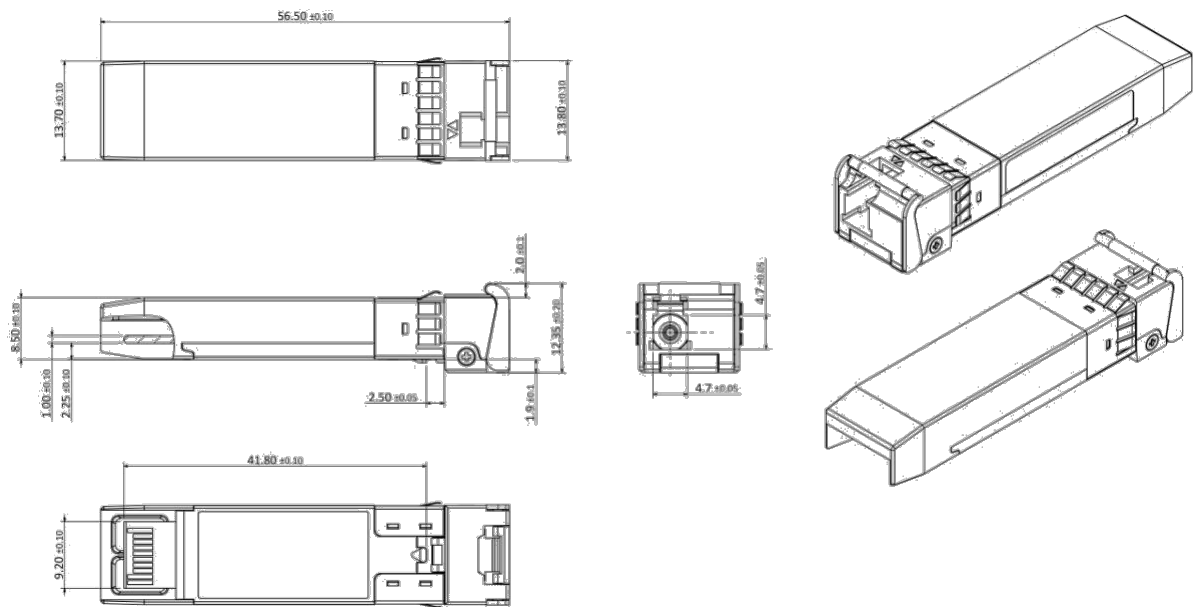
Digital Diagnostic Functions

Digital diagnostics monitoring function is available on this module. A 2-wire serial interface provides user to contact with module. It is compliant to SFF-8472 Rev10.2 with internal calibration mode.

Parameter	Symbol	Min.	Max.	Unit	Notes
Temperature monitor absolute error	DMI_Temp	-3	+3		
Supply voltage monitor absolute error	DMI_VCC	-3%	+3%	V	
TX power monitor absolute error	DMI_RX	-3	+3	dB	
RX power monitor absolute error	DMI_RX	-3	+3	dB	
Bias current monitor	DMI_Ibias	-10%	+10%	mA	

Mechanical Specifications

Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



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.

