#### SFP-10GB-BX-D-20-FT-OPC

Fortinet® Compatible TAA 10GBase-BX SFP+ Transceiver (SMF, 1330nmTx/1270nmRx, 20km, LC, DOM)

#### **Features**

- SFF-8432 and SFF-8472 Compliance
- Simplex LC Connector
- Single-mode Fiber
- Commercial Temperature 0 to 70 Celsius
- Hot Pluggable
- Metal with Lower EMI
- Excellent ESD Protection
- RoHS Compliant and Lead Free



#### **Applications:**

- 10GBase-BX Ethernet
- 8x/10x Fibre Channel
- Access, Metro and Enterprise

#### **Product Description**

This Fortinet® compatible SFP+ transceiver provides 10GBase-BX throughput up to 20km 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 complementing wavelengths. It can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Fortinet®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

# **Absolute Maximum Ratings**

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5		4	V	1
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Тс	0		70	°C	
Data Rate	DR	9.83		11.3	Gbps	
Bit Error Rate	BER			10 <sup>-12</sup>		

## Notes:

- 1. For the electrical power interface.
- 2. IEEE 802.3ae.

## **Electrical Characteristics**

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes		
Power Supply Voltage	Vcc	3.14	3.3	3.46	V			
Power Supply Current	Icc		250	360	mA			
Transmitter								
Input Differential Impedance	RIN		100		Ω			
Differential Data Input Swing	VIN,pp	180		700	mV			
Transmit Disable Voltage	VD	2		Vcc	V			
Transmit Enable Voltage	VEN	Vee		Vee+0.8	V			
Receiver								
Differential Data Output Swing	VOUT,pp	300		850	mV			
Data Output Rise/Fall Time (20-80%)	Tr/Tf	28			ps			
LOS Assert	VLOSA	2		Host_Vcc	V			
LOS De-Assert	VLOSD	Vee		Vee+0.5	V			

**Optical Characteristics** 

Parameter	Symbol	Min.	Тур.	Max.	Unit	Notes
Transmitter						
Output Optical Power	PTx	-8.2		0.5	dB	1
Optical Center Wavelength	λC	1320	1330	1340	nm	
Extinction Ratio	ER	3.5			dB	
Spectral Width (-20dB)	Δλ			0.6	nm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Transmitter Dispersion Penalty	TDP			3.2	dB	
Launch Power of Off Transmitter	Poff			-30	dBm	2
Transmitter Jitter		According to IEEE 802.3ae Requirements				
Receiver						
Receiver Overload	Pol	0.5			dBm	
Optical Center Wavelength	λC	1260	1270	1280	nm	
Receiver Sensitivity	Rx_sen			-14.4	dBm	3
Receiver Reflectance	TRrx			-12	dB	
LOS Assert	LOSA	-30			dBm	
LOS De-Assert	LOSD			-17	dBm	
LOS Hysteresis	LOSH	0.5			dB	

## Notes:

- 1. Average. Normal temperature optical power range: -2~0.5dBm.
- 2. Average.
- 3. Average. Measured with worst ER: BER<10 $^{-12}$  and 2 $^{31}$ -1 PRBS.

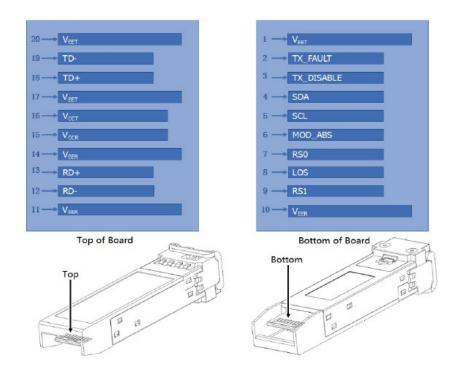
## **Pin Descriptions**

Pin	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground (Common with Receiver Ground).	1
2	Tx_Fault	Transmitter Fault.	2
3	Tx_Disable	Transmitter Disable.	3
4	SDA	2-Wire Serial Interface Data.	4
5	SCL	2-Wire Serial Interface Clock.	4
6	MOD_ABS	Module Absent. Grounded within the module.	4
7	RS0	No Connection Required.	
8	LOS	Loss of Signal Indication. "Logic 0 " indicates normal operation.	5
9	RS1	No Connection Required.	1
10	VeeR	Receiver Ground (Common with Transmitter Ground).	1
11	VeeR	Receiver Ground (Common with Transmitter Ground).	1
12	RD-	Receiver Inverted Data Out. AC Coupled.	
13	RD+	Receiver Non-Inverted Data Out. AC Coupled.	
14	VeeR	Receiver Ground (Common with Transmitter Ground).	1
15	VccR	Receiver Power Supply.	
16	VccT	Transmitter Power Supply.	
17	VeeT	Transmitter Ground. Common with Receiver Ground.	1
18	TD+	Transmitter Non-Inverted Data In. AC Coupled.	
19	TD-	Transmitter Inverted Data In. AC Coupled.	
20	VeeT	Transmitter Ground (Common with Receiver Ground).	1

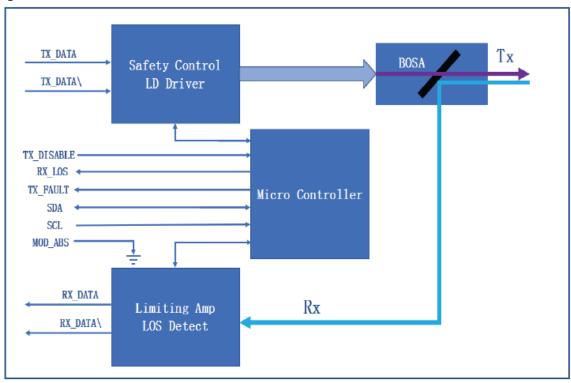
#### Notes:

- 1. The circuit ground is isolated from the chassis ground.
- 2. Tx\_Fault is the open collector output and should be pulled up with  $4.7k\Omega$  to  $10k\Omega$  on the host board to a voltage between 2V and Vcc+0.3V.
- 3. Disabled: Tdis>2V or open. Enabled: Tdis<0.8V.
- 4. Should be pulled up with  $4.7k\Omega$  to  $10k\Omega$  on the host board to a voltage between 2V and Vcc+0.3V.
- 5. LOS is open collector output and should be pulled up with  $4.7k\Omega$  to  $10k\Omega$  on the host board to a voltage between 2V and Vcc0.3V. Logic "0" indicates normal operation. Logic "1" indicates that the receiver signal is lost.

## **Pin Assignments**



## **Block Diagram of Transceiver**



# **Mechanical Specifications**

