

## SFP-10GB-BX-D-AU-AO

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

### Features

- Operating Data Rate up to 10.31Gbps
- Single 3.3V Power Supply and TTL Logic Interface
- 1330nm DFB Transmitter/1270nm PIN Receiver
- LC Connector Interface
- Power Dissipation: 1.5W
- Hot Pluggable
- RoHS Compliant and Lead-Free
- Operating temperature: 0C to 70C



### Applications

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

### Product Description

This Aruba Networks® SFP+ transceiver provides 10GBase-BX throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1330nmTx/1270nmRx via an LC connector. It is guaranteed to be 100% compatible with the equivalent Aruba Networks® 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. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

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

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



## Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature	Tstg	-40		85	°C	
Operating Case Temperature	Tc	0		70	°C	
Relative Humidity	RH	5		95	%	
Supply Voltage	Vcc	-0.5		3.6	V	
Data Rate			9.953/10.3125			
Power Budget			12		dB	

## Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.15	3.3	3.45	V	
Power Supply Current	Icc			455	mA	
Surge Current	I <sub>surge</sub>			30	mA	
<b>Transmitter</b>						
Differential CML Inputs	V <sub>IN</sub>	150		1200	mVp-p	1
Input AC Common-Mode Voltage		0		25	mV	RMS
Differential Input Impedance	Z <sub>IN</sub>	85	100	115	Ω	2
Tx_Disable	High	2		Vcc	V	
	Low	0		0.8		
Tx_Fault	High	2		Vcc+0.3	V	3
	Low	0		0.5		
<b>Receiver</b>						
Differential CML Outputs	V <sub>OUT</sub>	350		700	mVp-p	4
Differential Output Impedance	Z <sub>OUT</sub>	85	100	115	Ω	
Rx_LOS	High	2		Vcc+0.3		3
	Low	0		0.8		
MOD_DEF (0.2)	VOH	2.5			V	With Serial ID
	VOL	0		0.5		

### Notes:

1. AC coupled inputs.
2. R<sub>IN</sub>>100kΩ @DC.
3. I<sub>o</sub>=400μA: Host\_Vcc. I<sub>o</sub>=-4.0mA.
4. AC coupled outputs.

## Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter</b>						
Center Wavelength	$\lambda_C$	1320	1330	1340	nm	
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Average Output Power	POUT	-2		3	dBm	1
Extinction Ratio	ER	3.5			dB	
Average Power of Off Transmitter	Poff			-30	dBm	
Side-Mode Suppression Ratio	SMSR	30			dB	
Transmitter Dispersion Penalty	TDP			2	dB	
Tx_Disable Assert Time	T_off			10	us	
<b>Receiver</b>						
Center Wavelength	$\lambda_C$	1260	1270	1280	nm	
Receiver Sensitivity	Pmin			-14	dBm	2
Receiver Overload	Pmax	0.5			dBm	
LOS De-Assert	LOSD			-16	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis	LOSH	0.5			dB	

### Notes:

1. Output is coupled into a 9/125 $\mu$ m SMF.
2. Minimum average optical power. Measured at BER less than  $1E^{-12}$ . The measured pattern is PRBS  $2^{31}-1$ .

## 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	MOD_DEF2	Transmitter Disable. 2-Wire Serial ID Interface.	3	3
5	MOD_DEF1	Module Definition 2. 2-Wire Serial ID Interface.	3	3
6	MOD_DEF0	Module Definition 1.	3	3
7	Rate Select	Rx Rate Select. LVTTTL. Rate Select 0 optionally controls SFP+ module receiver. This pin is pulled low to VeeT with a >30K resistor.	3	
8	LOS	Loss of Signal.	3	4
9	VeeR	Tx Rate Select. LVTTTL. Rate Select 1 optionally controls SFP+ 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-	Inverse Received Data Out.	3	6
13	RD+	Received Data Out.	3	6
14	VeeR	Receiver Ground.	1	5
15	VccR	3.3V ± 5% Receiver Power.	2	7
16	VccT	3.3V ± 5% Transmitter Power.	2	7
17	VeeT	Transmitter Ground.	1	5
18	TD+	Transmit Data In.	3	8
19	TD-	Inverse Transmit Data In.	3	8
20	VeeT	Transmitter Ground.	1	5

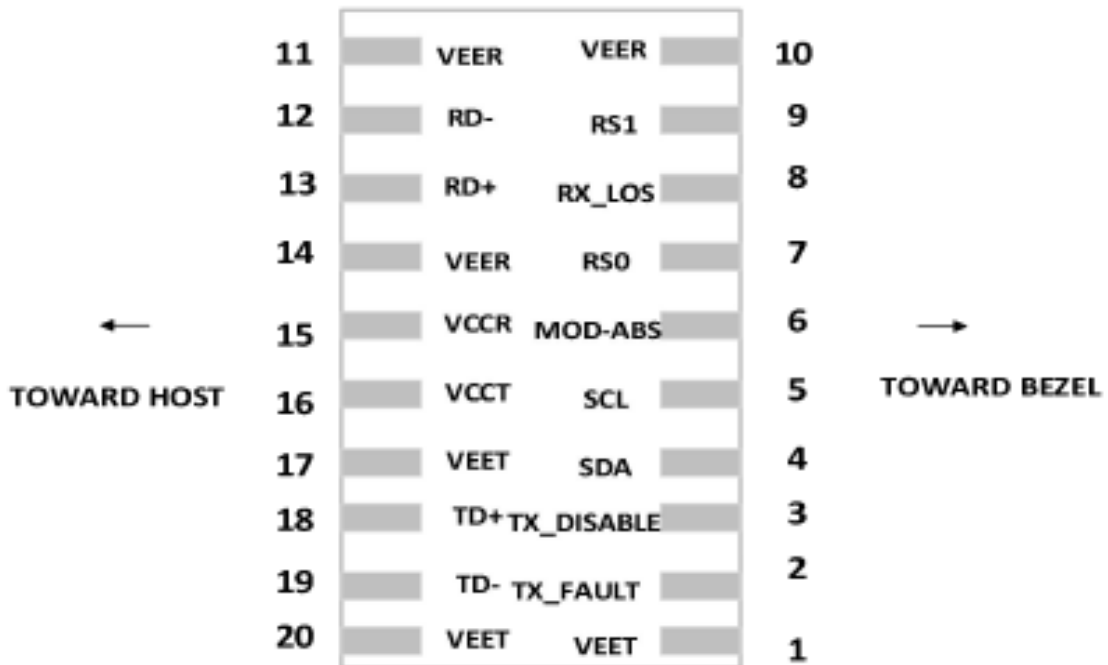
### Notes:

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 to 0.8V): Transmitter On
  - (>0.8V and <2V): Undefined
  - High (2.0V to 3.465V): Transmitter Disabled
  - Open: Transmitter Disabled.
3. Modulation absent. Connected to the VeeT or 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

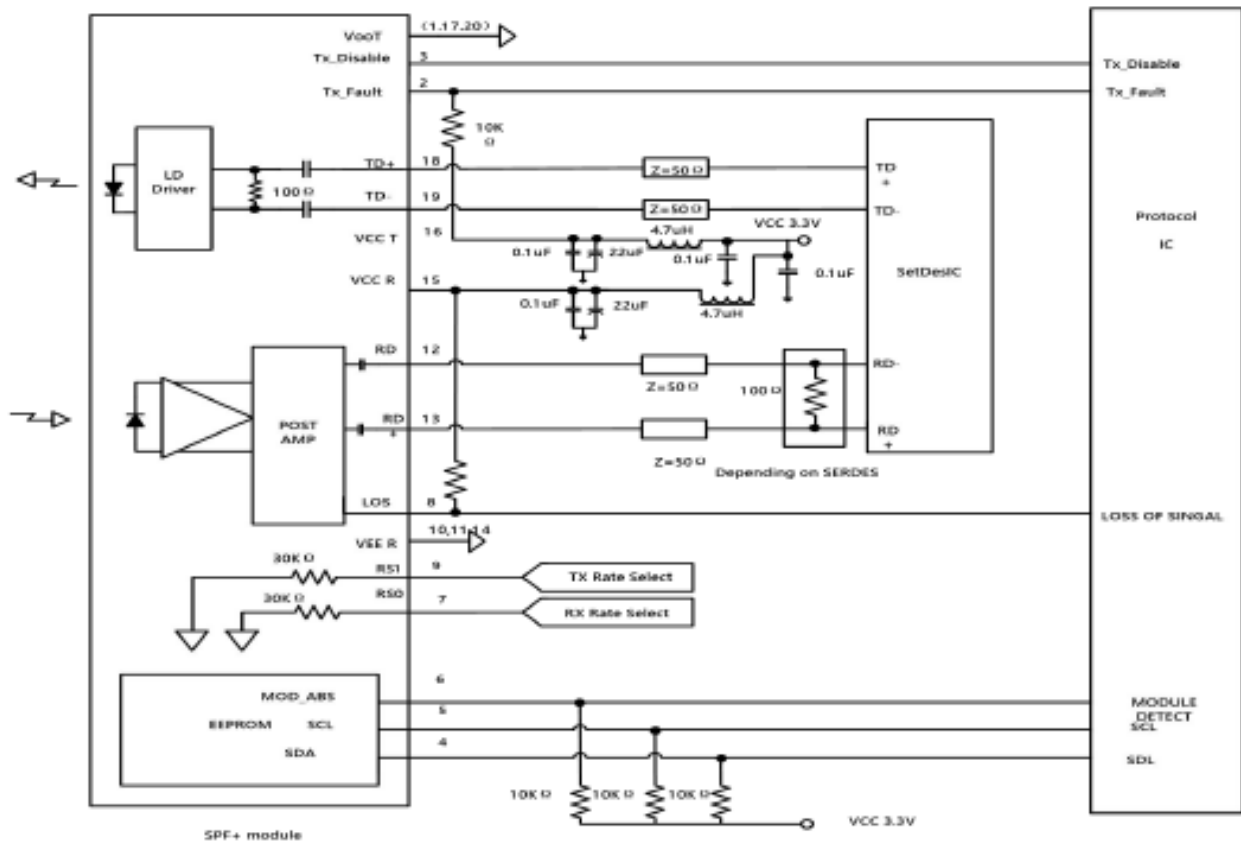
indicates normal operation in the low state. The output will be pulled to <0.8V.

5. VeeR and VeeT may be internally connected within the SFP module.
6. RD-/+. These are the differential receiver outputs. They are AC-coupled, 100 differential lines which should be terminated with 100 (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 and 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. 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 termination inside the module.

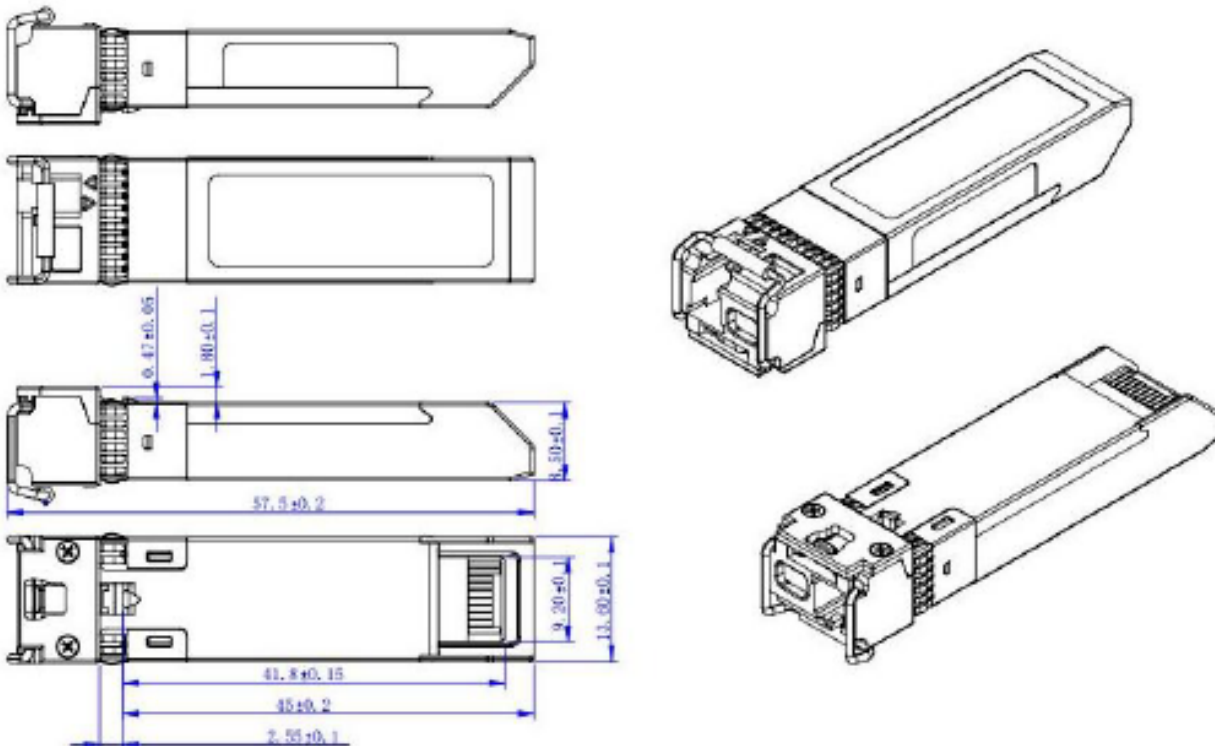
### Host Board Connector



## Recommended Circuit Schematic



## Mechanical Specifications



## About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is engrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.



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