

10G BASE BX-100km SFP+ Transceiver modules PN: WST-SFP+BXH-xx



Applications:

- 10G Ethernet
- OTU2/2e
- Other Optical Links

Standards:

- Compliant with SFP+ SFP-8431
- Compliant with SFP-8432
- Compliant with SFP-8472 SFP+ MSA
- Compliant with IEEE802.3ae

Features:

- Up to 11.3Gbps Data Links
- Up to 100km transmission on SMF
- Power dissipation<1.8W for IT version
- Power dissipation<1.5W for CT version
- 1490nm/1550nm EML laser and APD receiver
- EEPROM with Serial ID functionality
- 2-Wire interface with integrated Digital Diagnostic monitoring
- Hot-pluggable
- Single Mode LC receptacle BI-directional Transceiver
- Compliant with SFP+MSA with LC connector
- Single +3.3V Power Supply
- Temperature Range:
0°C ~+70°C: WST-SFP+BXH-xC
-40°C ~+85°C: WST-SFP+BXH-xI
- Compliant with RoHS

Absolute Maximum Ratings

Parameters	Symbol	Min.	Max.	Unit
Storage temperature	Ts	-40	85	°C
Relative Humidity - Storage	RH	0	95	%
Supply voltage	Vcc	-0.5	3.6	V

Recommended Operating Conditions

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Temperature	Top	0		70	°C	WST-SFP+BXH-xC
		-40		85		WST-SFP+BXH-xI
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Data Rate	BR		10.3125	11.3	Gbps	
Transmission Distance	TD			100	km	
Coupled fiber	Single mode fiber					9/125um SMF

Electrical Characteristics

Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	Vcc	3.135		3.465	V	
Supply Current	Icc			450	mA	WST-SFP+BXH-xC
				540		WST-SFP+BXH-xI
Power Consumption	P			1.5	W	WST-SFP+BXH-xC
				1.8		WST-SFP+BXH-xI
Transmitter						
CML Inputs(Differential)	Vin	150		1200	mVpp	1
Input Impedance(Differential)	Zin	85	100	115	ohm	
TX_DIS Disable		2		Vcc+0.3	V	
TX_DIS Enable		0		0.8	V	
TX_FAULT Fault		2		Vcc+0.3	V	
TX_FAULT Normal		0		0.5	V	
Receiver						
CML Outputs (Differential)	Vout	350		700	mVpp	1
Output Impedance (Differential)	Zout	85	100	115	Ohm	
RX_LOS LOS		2		Vcc+0.3	V	2
RX_LOS Normal		0		0.8	V	2
MOD_DEF (0:2) VoH		2.5			V	With Serial ID
MOD_DEF (0:2) VoL		0		0.5	V	With Serial ID

Note:

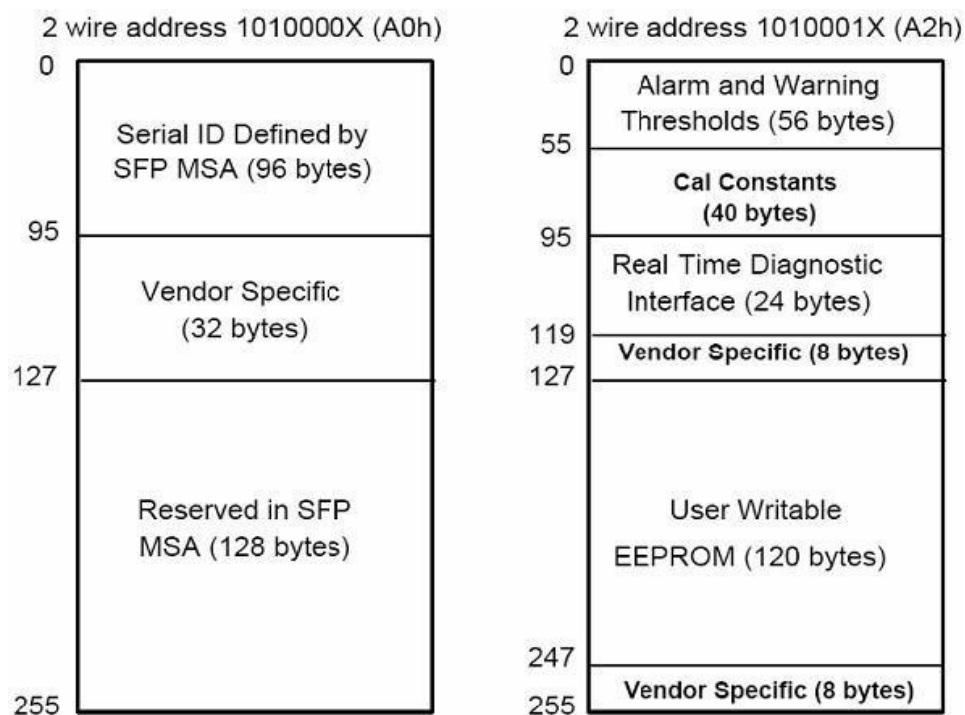
1. CML logic, internally AC coupled.
2. Loss Of Signal is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

Optical Characteristics

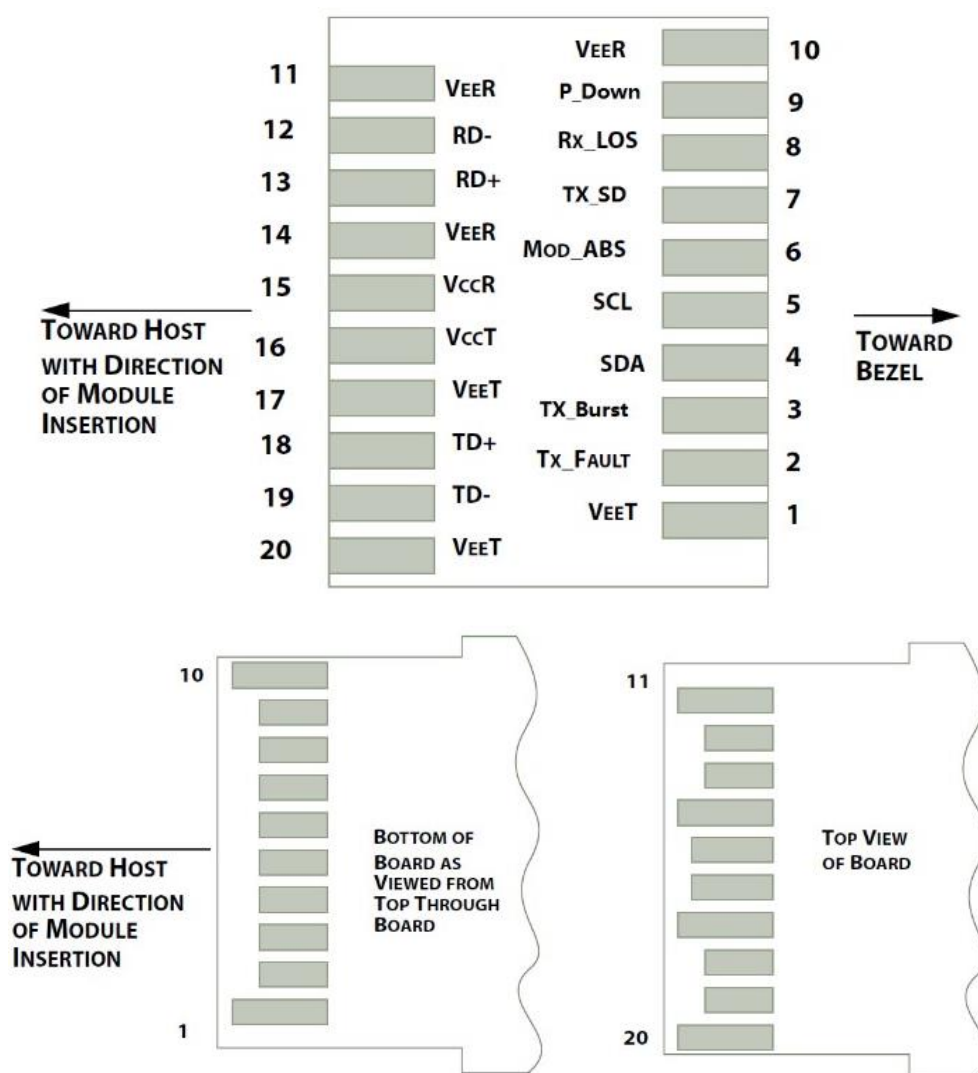
Parameters	Symbol	Min.	Typ.	Max.	Unit	Note
Data Rate			10.3125	11.3	Gbps	
Transmitter						
Centre Wavelength	λ_c	1480	1490	1500	nm	WST-SFP+BXH-Ux
		1540	1550	1560		WST-SFP+BXH-Dx
Spectral Width (-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Output Power	P _{out}	0		5	dBm	1
Extinction Ratio	ER	8.2			dB	
Average Power of OFF Transmitter	P _{off}			-30	dBm	
Relative Intensity Noise	RIN			-128	dB/Hz	2
Receiver						
Wavelength	λ_c	1540	1550	1560	nm	WST-SFP+BXH-Ux
		1480	1490	1500		WST-SFP+BXH-Dx
Receiver Sensitivity	P _{min}			-24.5	dBm	
Receiver Overload	P _{max}	-6			dBm	2
LOS De-Assert	LOSD			-24	dBm	
LOS Assert	LOSA	-38			dBm	
LOS-Hysteresis	Phys	0.5		6	dB	

Note:

1. Output is coupled into a 9/125um SMF.
2. 12dB reflection.
3. Measured with worst ER, BER less than 1E-12 and PRBS 2³¹-1 at 10.3125Gbps.

EEPROM Memory Map**Digital Diagnostic Monitoring Characteristics**

Parameter	Accuracy	Unit	Note
Temperature	±3	°C	Commercial: 0 to 70°C Industrial: -40 to 85°C
Supply Voltage	±3	%	3.0 to 3.6V
TX Bias Current	±10	%	30 to 100mA
TX Output Power	±3	dB	-1 to 4dBm
RX Received Optical Power	±3	dB	-23 to -6dBm

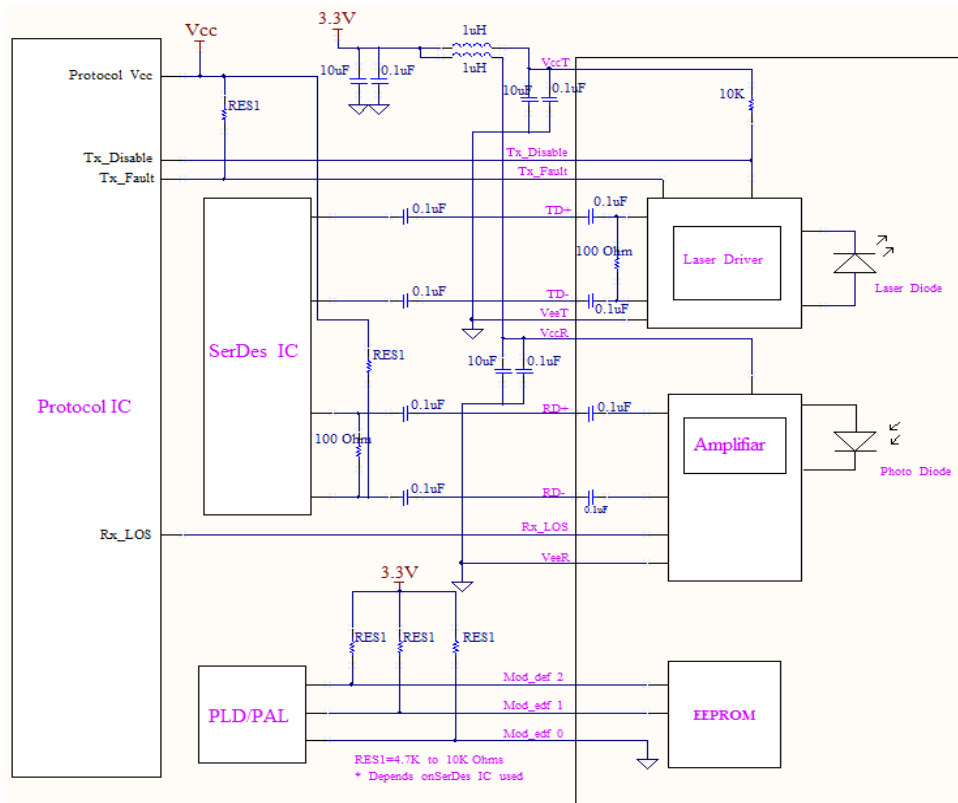
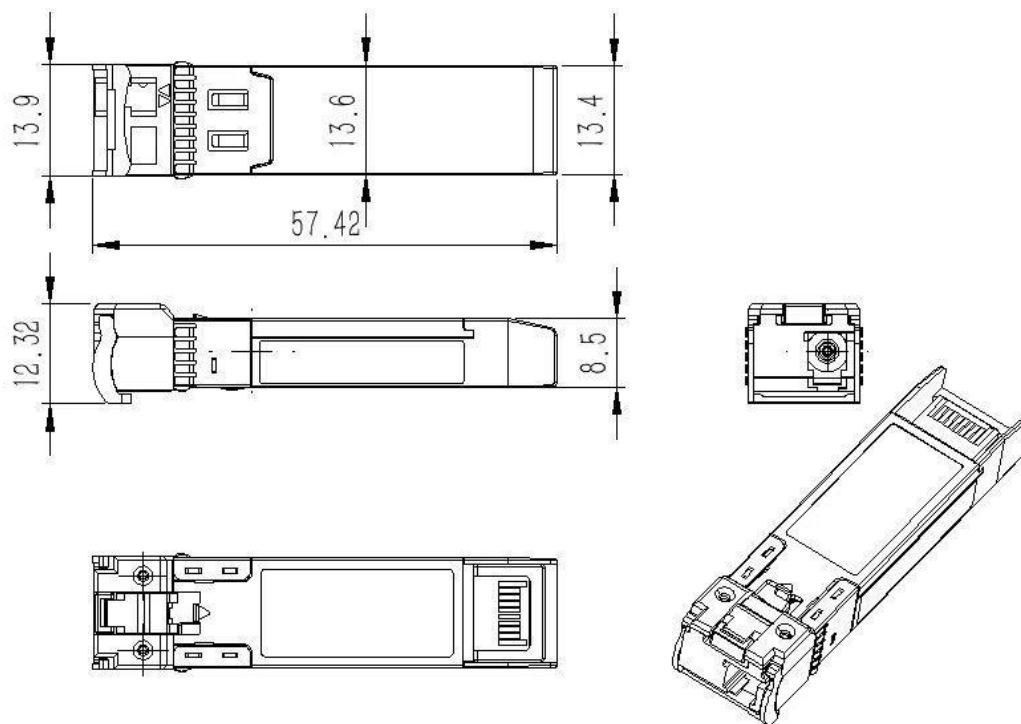
Pin Definition and Descriptions

Pin	Name	Description	Ref.
1	VeeT	Module transmitter ground	1
2	TX_Fault	Module transmitter fault	2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	3
4	SDL	2 wire serial interface data input/output (SDA)	4
5	SCL	2 wire serial interface clock input (SCL)	4
6	MOD_ABS	Module Absent, connect to VeeR or VeeT in the module	4
7	RS0	Rate select0, optionally control SFP+ receiver. When high, input data rate >4.5Gb/ s; when low, input data rate <=4.5Gb/s	5
8	RX_LOS	Receiver Loss of Signal Indication	6

9	RS1	Rate select0, optionally control SFP+ transmitter. When high, input data rate >4.5Gb/s; when low, input data rate <=4.5Gb/s	1
10	VeeR	Module receiver ground	1
11	VeeR	Module receiver ground	1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	VeeR	Module receiver ground	1
15	VccR	Module receiver 3.3V supply	
16	VccT	Module transmitter 3.3V supply	
17	VeeT	Module transmitter ground	1
18	TD+	Transmitter inverted data out put	
19	TD-	Transmitter non-inverted data out put	
20	VeeT	Module transmitter ground	1

Notes:

1. Circuit ground is internally isolated from chassis ground
2. Tx FAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on Tx DIS >2.0V or open, enabled on Tx DIS <0.8V.
4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5. Internally pulled down per SFF-8431 Rev 4.1.
6. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Recommend Circuit Schematic**Mechanical Design Diagram**

Unit: mm

Ordering Information

Part No	Specification										
	Package	Data rate	Laser	Optical Power	Detector	Max. Receive Sensitivity	Temp	Reach	Other	Bail Latch color	Application code
WST-SFP+BXH-UI	SFP+	10.3125 Gbps	1490nm EML	0 ~ 5 dBm	APD	-24.5 dBm	-40~85℃	100km	DDM; RoHS	Purple	10GBASE-BX-U
WST-SFP+BXH-DI	SFP+	10.3125 Gbps	1550nm EML	0 ~ 5 dBm	APD	-24.5 dBm	-40~85℃	100km	DDM; RoHS	Yellow	10GBASE-BX-D
WST-SFP+BXH-UC	SFP+	10.3125 Gbps	1490nm EML	0 ~ 5 dBm	APD	-24.5 dBm	0~70℃	100km	DDM; RoHS	Purple	10GBASE-BX-U
WST-SFP+BXH-DC	SFP+	10.3125 Gbps	1550nm EML	0 ~ 5 dBm	APD	-24.5 dBm	0~70℃	100km	DDM; RoHS	Yellow	10GBASE-BX-D

Modification History

Revision	Date	Description	Originator	Review	Approved
V1.0	28-Dec-2022	New Issue	ShaoYu Lee	Tom Tang	Wayne Liao



Taipei Headquarters
16F-5, No. 75, Sec. 1,
Xintai 5th Rd., Xizhi
Dist., New Taipei City
22101, Taiwan
Tel: +886-2-2698-7208
Fax: +886-2-2698-7210

U.S. Branch
2080 Rancho Higuera Ct.
Fremont, CA 94539,
USA
Tel: 510-651-7800
Fax: 510-651-7822

ShenZhen Branch
610#, 6F, No.204
Building, 2nd Industrial
zone Nanyou, Nanshan
district, Shenzhen,
Guangdong China
518054
Tel: +86-755-86265980