

10GBASE-BX SFP+ 1330nmTX/1270nmRX 10km Industrial DOM Transceiver

SFP-10G-BX-I



Application

- 10GBASE-LR/LW
- 10G Ethernet
- OBSAI rates 3.072 Gb/s, 6.144Gb/s
- CPRI rates 2.4576 Gb/s, 4.9152Gb/s, 6.144Gb/s, 9.8304 Gb/s

Features

- Compliant to SFP+ MSA
- Fully RoHS compliant
- Operating data rate 2.5 to 10.3Gb/s
- Transmission distance up to 10km
- 1270nm/1330nm DFB laser
- LC single connector
- Hot pluggable 20pin connector
- Wide temperature range
- Low power consumption <1W
- Single +3.3V±5% power supply
- Digital monitoring SFF-8472 Rev 10 compliant

Description

The 1270nm/1330nm 10Gb/s 10km bidirectional transceiver is designed to transmit and receive serial optical data links up from 2.5 to 10.3 Gb/s data rate over G.652 single mode fiber. The transceiver is compliant with SFF-8432, and applicable portions of SFF-8431. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

Product Specifications

I. General Specifications

Parameter	Symbol	Min	Typ.	Max	Unit
Bit Rate	BR	2.5		10.3	Gb/s
Max. Supported Link Length	L_{max}			10	km

II. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature Range	T_s	-40	+85	°C
Relative Humidity	RH	5	95	%
Supply Voltage	V	-0.3	4.0	V_{CC}

III. Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit	Ref.
Supply Voltage	V_{CC}	3.14	3.3	3.46	V	
Supply Current	I_{CC}			290	mA	
Power Consumption	P_C			1.0	W	
Transmitter						
Input Differential Impedance	R_{IN}	80	100	120	Ω	1
Differential Data Input Swing	V_{IN}	180		700	mVp-p	
Transmit Disable Voltage	V_{DIS}	2		V_{CCHOST}	V	
Transmit Enable Voltage	V_{EN}	$V_{EE}-0.3$		$V_{EE}+0.4$	V	
Transmit Fault Assert Voltage	V_{FA}	2		V_{CCHOST}	V	
Transmit Fault De-Assert Voltage	V_{FDA}	V_{EE}		$V_{EE}+0.4$	V	
Receiver						
Differential Data Output Swing	V_{OD}	450	600		850	
Output Rise Time	t_{RISE}	28				
Output Fall Time	t_{FALL}	28				
LOS Fault	V_{LOSFT}	2			V_{CCHOST}	
LOS Normal	V_{LOSNR}	V_{EE}			$V_{EE}+0.8$	

IV. Optical Characteristics

(1270nm DFB & PIN/TIA)

Parameter	Symbol	Unit	Min	Typ	Max	Ref.
Transmitter (Tx)						
Data Rate		Gbps	2.5		10.3	
Transmission Distance	L	km			10	
Center Wavelength	λ	nm	1260	1270	1280	
Spectral Width(-20dB)	$\Delta\lambda_{rms}$	nm			1	1
SMSR		dB	30			
Optical Output Power	PO	dBm	-8.2		0.5	2
Average Launch Power of OFF Transmitter	POFF	dBm			-30	
Extinction Ratio	ER	dB	5			
Relative Intensity Noise	RIN	dB/Hz			-128	
Optical Output Eye					Compliant with IEEE 802.3ae Optical Output Eye	
Receiver (Rx)						
Data Rate		Gbps	2.5		10.3	
Center Wavelength	λ_C	nm	1320	1330	1340	
Receiver Sensitivity	R_{SEN}	dBm			-14.4	3
Receiver Overload		dBm	0.5			3
Receiver Reflectance	R_{REFL}	dB			-12	

LOS	Optical Assert	LOSA	dBm	-30		
	Optical Dessert	LOSD	dBm			-15
LOS Hysteresis	-	dB	0.5		6	

(1330nm DFB & PIN/TIA)

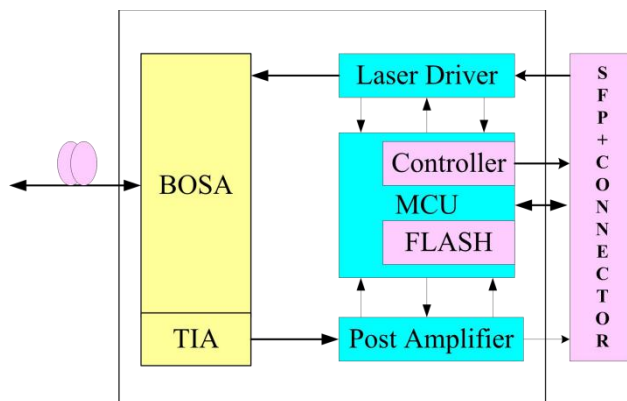
Parameter	Symbol	Unit	Min	Typ	Max	Ref.
Transmitter (Tx)						
Data Rate		Gbps	2.5		10.3	
Transmission Distance	L	km			10	
Center Wavelength	λ	nm	1320	1330	1340	
Spectral Width(-20dB)	$\Delta\lambda_{rms}$	nm			1	1
SMSR		dB	30			
Optical Output Power	PO	dBm	-8.2		0.5	2
Average Launch Power of OFFTransmitter	POFF	dBm			-30	
Extinction Ratio	ER	dB	5			
Relative Intensity Noise	RIN	dB/Hz			-128	
Optical Output Eye			Compliant with IEEE 802.3ae Optical Output Eye			

Receiver (Rx)						
Data Rate		Gbps	2.5		10.3	
Center Wavelength	λ_c	nm	1260	1270	1280	
Receiver Sensitivity	R_{SEN}	dBm			-14.4	3
Receiver Overload		dBm	0.5			3
Receiver Reflectance	R_{REFL}	dB			-12	

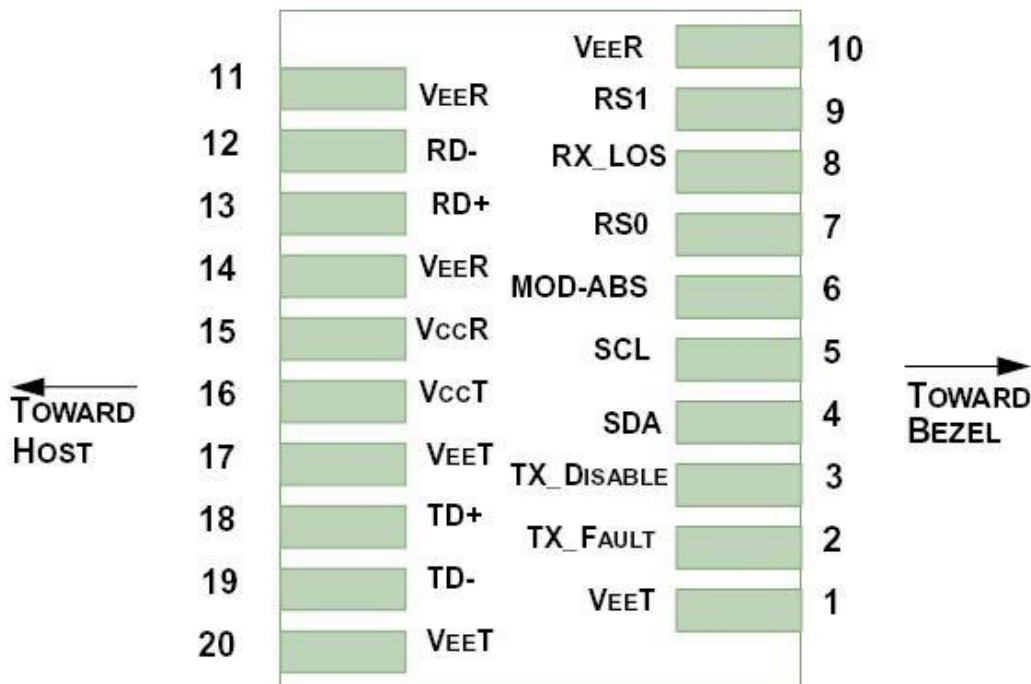
Notes:

1. Spectral width has to be defined over -20dB.
2. Minimum output optical level is at end of life.
3. Sensitivity for PRBS 231-1 and BER better than or equal to 10⁻¹².

V. Principle diagram



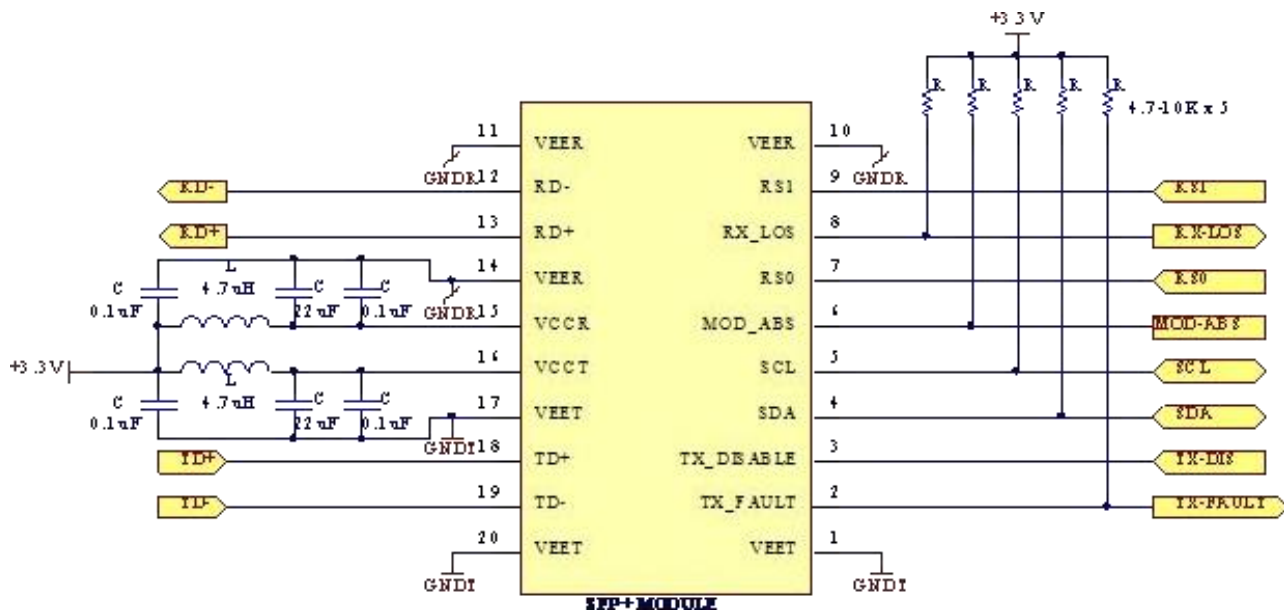
VI. Pin Description



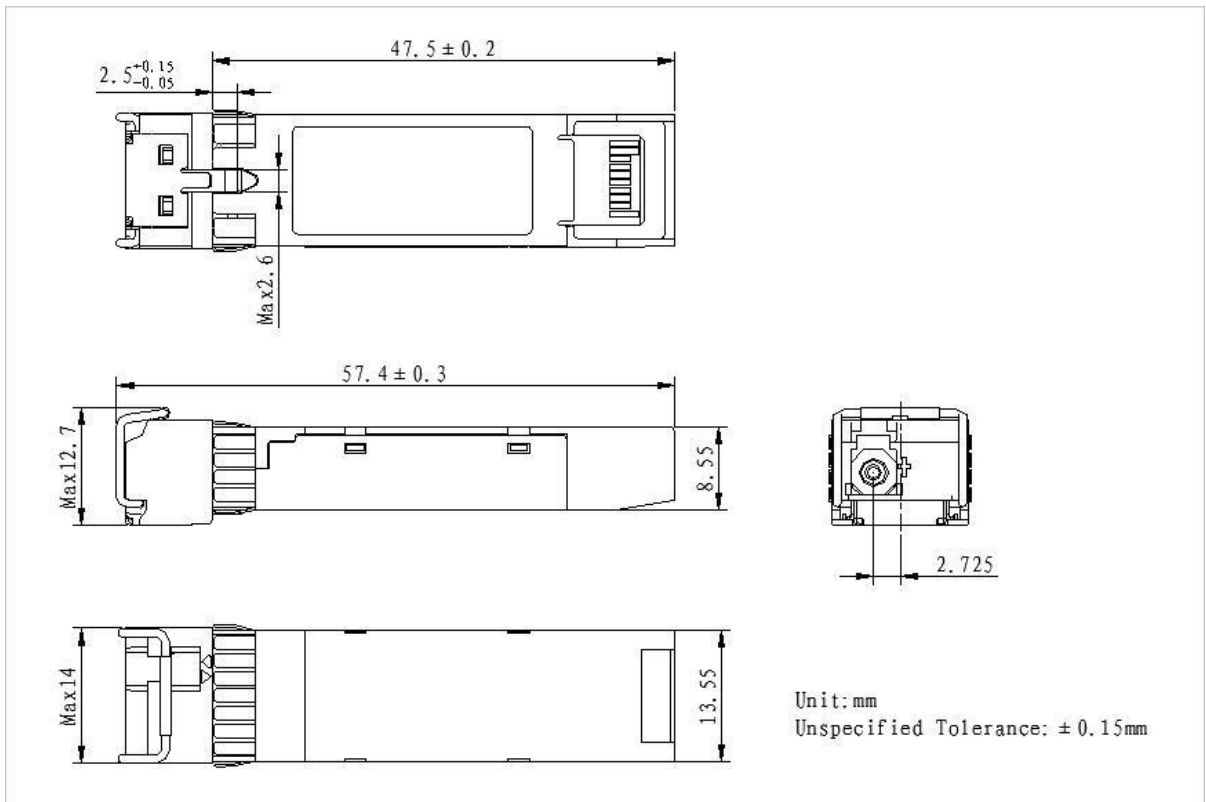
Pin Num.	Symbol	Name	Description
1,17,20	VeeT	Transmitter Signal Ground	These pins should be connected to signal ground on the host board.
2	TX Fault	Transmitter Fault Out (OC)	Logic "1" Output = Laser Fault (Laser off before t _{fault}). Logic "0" Output = Normal Operation. This pin is open collector compatible, and should be pulled up to Host Vcc with a 10kΩ resistor.
3	TX Disable	Transmitter Disable In (LVTTL)	Logic "1" Input (or no connection) = Laser off. Logic "0" Input = Laser on. This pin is internally pulled up to VccT with a 10 kΩ resistor.
4	SDA	Module Definition Identifiers	Serial ID with SFF 8472 Diagnostics
5	SCL		Module Definition pins should be pulled up to Host Vcc with 10 kΩ resistors.
6	MOD-ABS		
7	RS0		These pins have an internal 33kΩ pull-down to ground. A signal on either of these pins will not affect module performance.
9	RS1		

8	LOS	Loss of Signal Out (OC)	Sufficient optical signal for potential BER < 1×10^{-12} = Logic "0" Insufficient optical signal for potential BER < 1×10^{-12} = Logic "1" This pin is open collector compatible, and should be pulled up to Host Vcc with a 10k Ω resistor.
10,11,14	VeeR	Receiver Signal Ground	These pins should be connected to signal ground on the host board.
12	RD-	Receiver Negative DATA Out (CML)	Light on = Logic "0" Output Receiver DATA output is internally AC coupled and series terminated with a 50 Ω resistor.
13	RD+	Receiver Positive DATA Out (CML)	Light on = Logic "1" Output Receiver DATA output is internally AC coupled and series terminated with a 50 Ω resistor.
15	VccR	Receiver Power Supply	This pin should be connected to a filtered +3.3V power supply on the host board. See Figure 3. Recommended power supply filter.
16	VccT	Transmitter Power Supply	This pin should be connected to a filtered +3.3V power supply on the host board. See Figure 3. Recommended power supply filter.
18	TD+	Transmitter Positive DATA In (CML)	Logic "1" Input = Light on Transmitter DATA inputs are internally AC coupled and terminated with a differential 100 Ω resistor.
19	TD-	Transmitter Negative DATA In (CML)	Logic "0" Input = Light on Transmitter DATA inputs are internally AC coupled and terminated with a differential 100 Ω resistor.

VII. Principle diagram



VIII. Package Outline



Test Center

FS.COM transceivers are tested to ensure connectivity and compatibility in our test center before shipped out. FS.COM test center is supported by a variety of mainstream original brand switches and groups of professional staff, helping our customers make the most efficient use of our products in their systems, network designs and deployments.

The original switches could be found nowhere but at FS.COM test center, eg: Juniper MX960 & EX 4300 series, Cisco Nexus 9396PX & Cisco ASR 9000 Series, HP 5900 Series & HP 5406R ZL2 V3(J9996A), Arista 7050S-64, Brocade ICX7750-26Q & ICX6610-48, Avaya VSP 7000 MDA 2, etc.



Cisco ASR 9000 Series(A9K-MPA-1Y40GE)



ARISTA 7050S-64(DCS-7050S-64)



Juniper MX960



Brocade ICX 7750-26Q



Extreme Networks X670V VIM-40G4X



Mellanox M3601Q



Dell N4032F



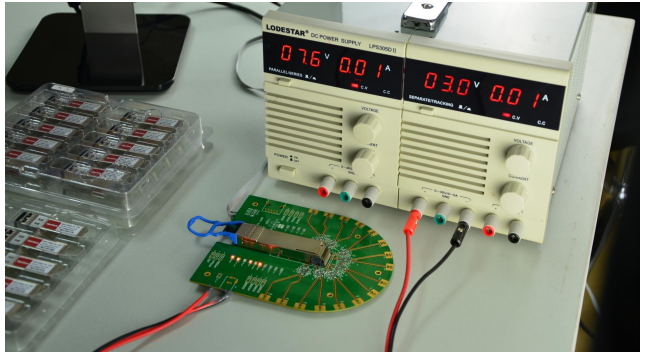
HP 5406R ZL2 V3(J9996A)



AVAYA 7024XLS(7002QQ-MDA)

Test Assured Program

FS.COM truly understands the value of compatibility and interoperability to each optics. Every module FS.COM provides must run through programming and an extensive series of platform diagnostic tests to prove its performance and compatibility. In our test center, we care of every detail from staff to facilities—professionally trained staff, advanced test facilities and comprehensive original-brand switches, to ensure our customers to receive the optics with superior quality.



Our smart data system allows effective product management. Our in-house coding facility programs all of our parts to and quality control according to the unique serial number, standard OEM specs for compatibility on all major vendors and properly tracing the order, shipment and every part. systems such as Cisco, Juniper, Brocade, HP, Dell, Arista and so on.



With a comprehensive line of original-brand switches, we can The last test assured step to ensure our products to be shipped recreate an environment and test each optics in practical with perfect package. application to ensure quality and distance.

Order Information

Part Number	Specifications									Application
	Package	Data rate	Laser	Optical Power	Detector	Sensitivity	Temp	Reach	Others	
RTXM228-461	SFP+	2.5~10.3Gb/1270nm s	1330nm DFB	-8.2~ +0.5dBm	1330nm PIN	<-14.4dBm	-40~85oC	10km	DDM	10GBASE- LR/LWOBSAI/ CPRI
RTXM228-462	SFP+	2.5~10.3Gb/1330nm s	1330nm DFB	-8.2~ +0.5dBm	1270nm PIN	<-14.4dBm	-40~85 oC	10km	DDM	10GBASE- LR/LWOBSAI/ CPRI



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