



### Features:

- ❖ Optical interface compliant to IEEE 802.3ae 10GBASE-LR
- ❖ Electrical interface compliant to SFF-8431
- ❖ Hot Pluggable
- ❖ 1310nm DFB transmitter, PIN photo-detector
- ❖ Low power consumption
- ❖ Applicable for 20KM SMF connection
- ❖ All-metal housing for superior EMI performance
- ❖ Advanced firmware allow customer system encryption information to be stored in transceiver
- ❖ Cost effective SFP+ solution, enables higher port densities and greater bandwidth
- ❖ RoHS6 compliant (lead free) Case
- ❖ Operating temperature range:  
Standard:-5 to+70°C  
Industrial:-40 to +85°C

### Applications:

- ❖ 10GBASE-LR at 10.3125Gbps
- ❖ Other optical links

### Part Number Ordering Information

GZSX-C20	SFP+ 10Gbs 20km Tx1310nm LC DDM
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### Description:

This 1310nm DFB 10Gbps SFP+ transceiver is designed to transmit and receive optical data over single mode optical fiber for link length 20km.

The SFP+ 10km module electrical interface is compliant to SFI electrical specifications. The transmitter input and receiver output impedance is 100 Ohms differential. Data lines are internally AC coupled. The module provides differential termination and reduce differential to common mode conversion for quality signal termination and low EMI. SFI typically operates over 200 mm of improved FR4 material or up to about 150mm of standard FR4 with one connector.

### Standard:

- ❖ Compliant with SFF-8472 SFP+ MSA.
- ❖ Compliant to SFP+ SFF-8431 and SFF-8432.
- ❖ Compliant to 802.3ae 10GBASE-LR.
- ❖ RoHS Compliant.

## Absolute Maximum Ratings:

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		4.7	V	
Storage Temperature	TS	-40		85	°C	
Case Operating Temperature	TOP	-5		70	°C	

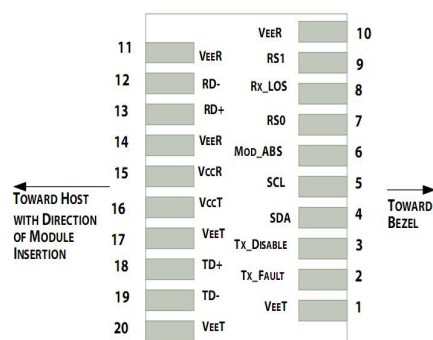
## Optical Characteristics:

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Opt. Pwr	POUT	-6		-0.5	dBm	1
Optical Wavelength	$\lambda$	1260	1310	1355	nm	
Wavelength Temperature Dependence			0.08	0.125	nm/°C	
Spectral Width (-20dB)	$\sigma$			1	nm	
Optical Extinction Ratio	ER	3.5			dB	
Transmitter and Dispersion Penalty	TDP			3.2	dB	
Optical Rise/Fall Time	tr/ tf		0.1	0.26	ns	
RIN	RIN			-128	dB/Hz	
Output Eye Mask	Compliant with IEEE 0802.3ae					
Receiver						
Rx Sensitivity	RSENS			-15	dBm	2
Input Saturation Power (Overload)	Psat	-3			dBm	
Wavelength Range	$\lambda_c$	1270		1610	nm	
LOS De -Assert	LOSD			-17	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5	1.0		dB	

### Notes:

1. Class 1 Laser Safety per FDA/CDRH and IEC-825-1 regulations.
2. with worst-case extinction ratio. Measured with a PRBS 223-1 test pattern, @1.25Gb/s, BER<10<sup>-12</sup>

## Pin Assignment :



Pin	Symbol	Name/Description	Ref.
1	V <sub>EET</sub>	Transmitter Ground (Common with Receiver Ground)	1
2	T <sub>FAULT</sub>	Transmitter Fault.	2
3	T <sub>DIS</sub>	Transmitter Disable. Laser output disabled on high or open.	3
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	4
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	4
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	4
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	5
9	V <sub>EER</sub>	Receiver Ground (Common with Transmitter Ground)	1
10	V <sub>EER</sub>	Receiver Ground (Common with Transmitter Ground)	1
11	V <sub>EER</sub>	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	V <sub>EER</sub>	Receiver Ground (Common with Transmitter Ground)	1
15	V <sub>CCR</sub>	Receiver Power Supply	
16	V <sub>CCT</sub>	Transmitter Power Supply	
17	V <sub>EET</sub>	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	V <sub>EET</sub>	Transmitter Ground (Common with Receiver Ground)	1

#### Notes:

- 1)Circuit ground is internally isolated from chassis ground.
- 2)TFAULT is an open collector/drain output, which should be pulled up with a 4.7k $\Omega$  - 10 k $\Omega$  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 TDIS>2.0V or open, enabled on TDIS<0.8V.
- 4)Should be pulled up with 4.7k $\Omega$  - 10k $\Omega$  on 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 4.7k $\Omega$  - 10k $\Omega$  on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

## Electrical Interface Characteristics

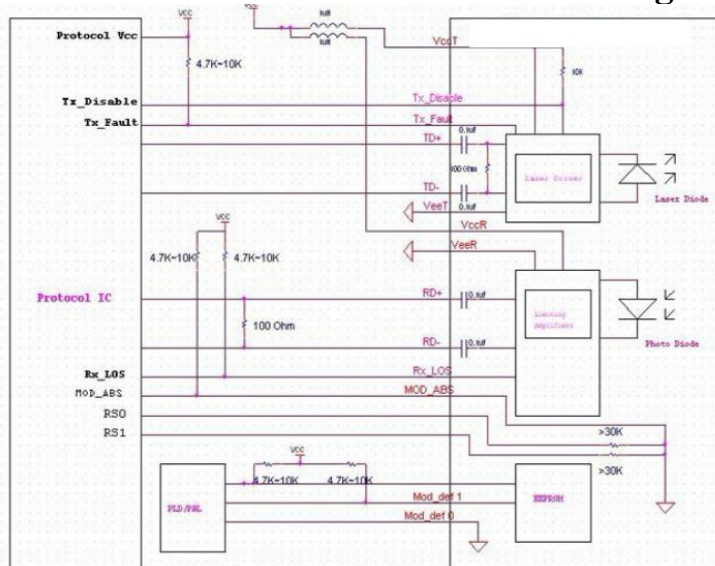
Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Supply Voltage	Vcc	3.14	3.3	3.46	V	
Supply Current	Icc			250	mA	

Transmitter						
Input differential impedance	Rin		100		$\Omega$	1
Single ended data input swing	Vin,pp	180		700	mV	
Transmit Disable Voltage	VD	Vcc-1.3		Vcc	V	
Transmit Enable Voltage	VEN	Vee		Vee+ 0.8	V	2
Transmit Disable Assert Time				10	us	
Receiver						
Differential data output swing	Vout,pp	300		850	mV	3
Data output rise time	tr	28			ps	4
Data output fall time	tf	28			ps	4
LOS Fault	VLOS fault	Vcc-1.3		VccHOST	V	5
LOS Normal	VLOS norm	Vee		Vee+0.8	V	5
Power Supply Rejection	PSR	100			mVpp	6

**Notes:**

- 1)Connected directly to TX data input pins. AC coupled thereafter.
- 2)Or open circuit.
- 3)Into 100 ohms differential termination.
- 4)These are unfiltered 20-80% values
- 5)Loss Of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
- 6)Receiver sensitivity is compliant with power supply sinusoidal modulation of 20 Hz to 1.5 MHz up to specified value applied through the recommended power supply filtering network.

## Host-Transceivers Interface Block Diagram



## Digital Diagnostic Functions

GZCOM GZSX-C20 transceivers support the 2-wire serial communication protocol as defined in the SFP MSA1.

The standard SFP serial ID provides access to identification information that describes the transceiver's capabilities, standard interfaces, manufacturer, and other information.

Additionally, GZCOM SFP+ transceivers provide a unique enhanced digital diagnostic monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, and received optical power and transceiver supply voltage. It also defines a sophisticated system of alarm and warning flags, which alerts end-users when particular operating parameters are outside of a factory set normal range.

