



### Features:

- ❖ Up to 11.3Gbps Data Links
- ❖ DWDM DFB transmitter and PIN receiver
- ❖ Metal enclosure, for lower EMI
- ❖ Single +3.3V power supply
- ❖ Hot-pluggable
- ❖ Compliant with SFP+ MSA with LC connector
- ❖ Operating temperature range: Commercial: -5°C~+70°C
- ❖ RoHS Compliant
- ❖ 2-wire interface with integrated Digital Diagnostic monitoring
- ❖ Up to 20km transmission distance over Single Mode Fiber(SMF)
- ❖ Low power dissipation: 1.2W

### Applications:

- ❖ 10GBASE-ER/EW
- ❖ 10G Ethernet
- ❖ SDH STM64

### Standard:

- ❖ Compliant with MSA SFP+ specification(SFF-8431)
- ❖ Compliant with SFF-8472
- ❖ Compliant with SFP+ MSA
- ❖ Compliant to IEEE 802.3ae

### Part Number Ordering Information

GZSDxxX-C20	10.3125Gbps DWDM SFP+ 20km Transceiver LC DDM
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### Product selection:

Channel	Wavelength (nm)	Frequency(THZ)	Channel	Wavelength (nm)	Frequency(THZ)
C17	1563.86	191.70	C39	1546.12	193.90
C18	1563.05	191.80	C40	1545.32	194.00
C19	1562.23	191.90	C41	1544.53	194.10
C20	1561.42	192.00	C42	1543.73	194.20
C21	1560.61	192.10	C43	1542.94	194.30
C22	1559.79	192.20	C44	1542.14	194.40
C23	1558.98	192.30	C45	1541.35	194.50

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C24	1558.17	192.40	C46	1540.56	194.60
C25	1557.36	192.50	C47	1539.77	194.70
C26	1556.55	192.60	C48	1538.98	194.80
C27	1555.75	192.70	C49	1538.19	194.90
C28	1554.94	192.80	C50	1537.40	195.00
C29	1554.13	192.90	C51	1536.61	195.10
C30	1553.33	193.00	C52	1535.82	195.20
C31	1552.52	193.10	C53	1535.04	195.30
C32	1551.72	193.20	C54	1534.25	195.40
C33	1550.92	193.30	C55	1533.47	195.50
C34	1550.12	193.40	C56	1532.68	195.60
C35	1549.32	193.50	C57	1531.90	195.70
C36	1548.51	193.60	C58	1531.12	195.80
C37	1547.72	193.70	C59	1530.33	195.90
C38	1546.92	193.80	C60	1529.55	196.00
Non-ITU	Peak wavelength between 1528.77nm-1563.86		C61	1528.77	196.10

## Specification:

Absolute Maximum Ratings					
Parameter	Symbol	Min	Max	Unit	
Storage temperature	TS	-40	85	°C	
Power Supply Voltage	Vcc3	-0.3	+4	V	
Relative Humidity	RH	5	95	%	
Signal Input Voltage		Vcc-0.3	Vcc+0.3	V	
Recommended Operating Conditions					
Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature (Commercial)	Tc	-5		70	°C
Power Supply Voltage	Vcc3	3.13	3.3	3.47	V
Supply Current	Icc3	400		430	mA
Data Rate			10.3125		Gbps
Fiber Length 9/125µm core SMF		-	20	-	km

Electrical Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter differential input voltage	Vin,pp	180		700	m V	
Receiver differential output Voltage	Vout,pp	400		800	m V	
Input differential impedance	Rin		100		Ω	1

LOS Fault	VLOS fault	2.0		V <sub>CCHost</sub>	V	2
LOS Normal	VLOS norm	V <sub>ee</sub>		V <sub>ee</sub> +0.8	V	2
Transmit disable voltage	VIH	2.0		V <sub>cc</sub>	v	
Transmit enable voltage	VIL	V <sub>ee</sub>		V <sub>ee</sub> +0.8	v	
Data output rise time	Tr	28			ps	
Data output fall time	Tf	28			ps	
Transmit Disable Assert Time				10	us	
Power Supply Rejection	PSR	100			mVpp	3

**Notes:**

- 1) Connected directly to TX data input pins. AC coupled thereafter.
- 2) Loss Of Signal is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
- 3) 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.

Optical transmitter Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Launched Power (avg.)	P <sub>out</sub>	-6		0.5	dBm	1
Operating Wavelength Range	$\lambda_c$	$\lambda-0.1$		$\lambda+0.1$	nm	2
Center Wavelength Spacing			100		GHZ	
Spectral Width(-20dB)	$\Delta\lambda$			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	

Transmitter OFF Output Power	P <sub>Off</sub>			-30	dB	
Extinction Ratio	ER	8.2			dB	
Transmitter and Dispersion Penalty	TDP			2	dB	
Output Eye Diagram	Compliant with ITU-T G.691 eye mask and IEEE802.3ae eye mask					

Optical receiver Characteristics						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver Sensitivity	S			-14.4	dBm	3
Wavelength Range	$\lambda_c$	1270		1610	nm	
Optical Power Input Overload	P <sub>in-max</sub>	0			dBm	
LOS	Optical De-assert	P <sub>d</sub>		-17	dBm	
	Optical Assert	P <sub>a</sub>	-30			
LOS hysteresis		0.5			dB	

**Notes:**

- 4) Class 1 Laser Safety per FDA/CDRH and IEC-825-1 regulations.
- 5) “ $\lambda$ ” refer to wavelength selection.
- 6) Receiver Reflectance Measured with a PRBS 2<sup>31</sup>-1 test pattern, @10.3125Gbps, ER=8.2dB, BER<10<sup>-12</sup>.

## Digital Diagnostic Monitoring Information

GZCOM GZSDxxX-C20 transceivers support the 2-wire serial communication protocol as defined in the SFP+MSA. 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, 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.

The SFP+ MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged.

The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through a 2-wire serial interface. When the serial protocol is activated, the serial clock signal (SCL, Mod Def 1) is generated by the host. The positive edge clocks data into the SFP transceiver into those segments of the E2PROM that are not write-protected. The negative edge clocks data from the SFP transceiver. The serial data signal (SDA, Mod Def 2) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

### Pin Descriptions

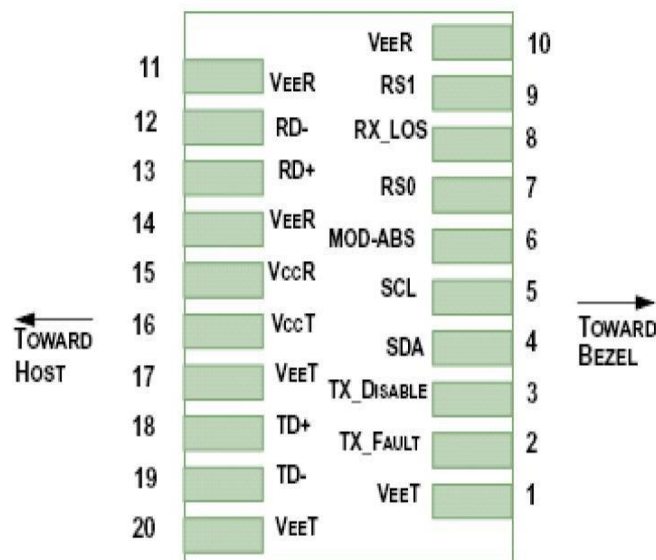


Diagram of Host Board Connector Block Pin Numbers and Name

### Pin Assignment

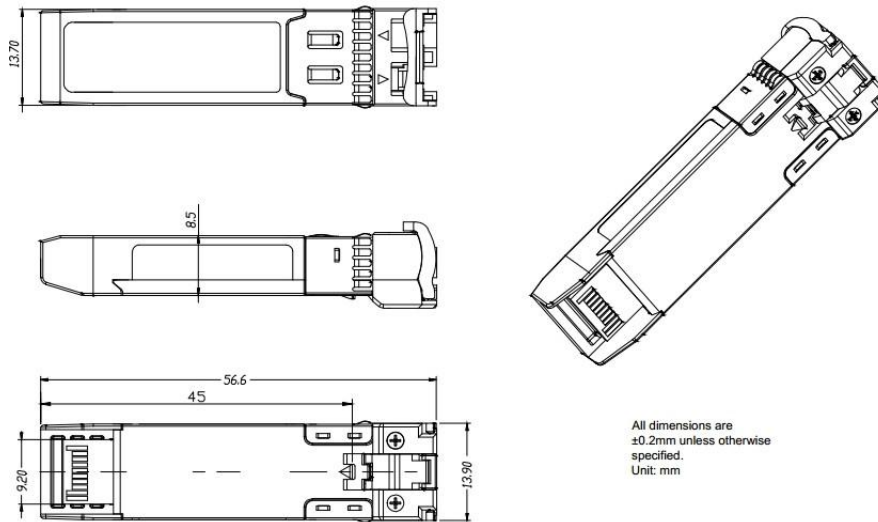
Pin	Symbol	Description	Notes
1	VeeT	Module Ground(Common with Receiver Ground)	1
2	TX_Fault	Transmitter Fault, Low: normal; High: abnormal	2
3	TX_Disable	Transmitter Disable High: Transmitter off Low: Transmitter on	3
4	SDA	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i)	4
5	SCL	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i)	4
6	Mod_ABS	Module Absent, Connect to VeeT or VeeR in Module	4
7	RS0	Rate Select 0, optionally controls SFP+ module receiver	5
8	RX_LOS	Receiver Loss of Signal indication High: loss of signal Low: signal detected	6
9	RS1	No connection required	1
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Receiver Inverted DATA out. AC Coupled. CML-O	
13	RD+	Receiver Non-inverted DATA out. AC Coupled. CML-O	
14	VeeR	Receiver Ground	1
15	VccR	Receiver Power Supply	
16	VccT	Transmitter Power Supply	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled. CML-I	
19	TD-	Transmitter Inverted DATA in. AC Coupled. CML-I	
20	SDA	Transmitter Ground	1

**Notes:**

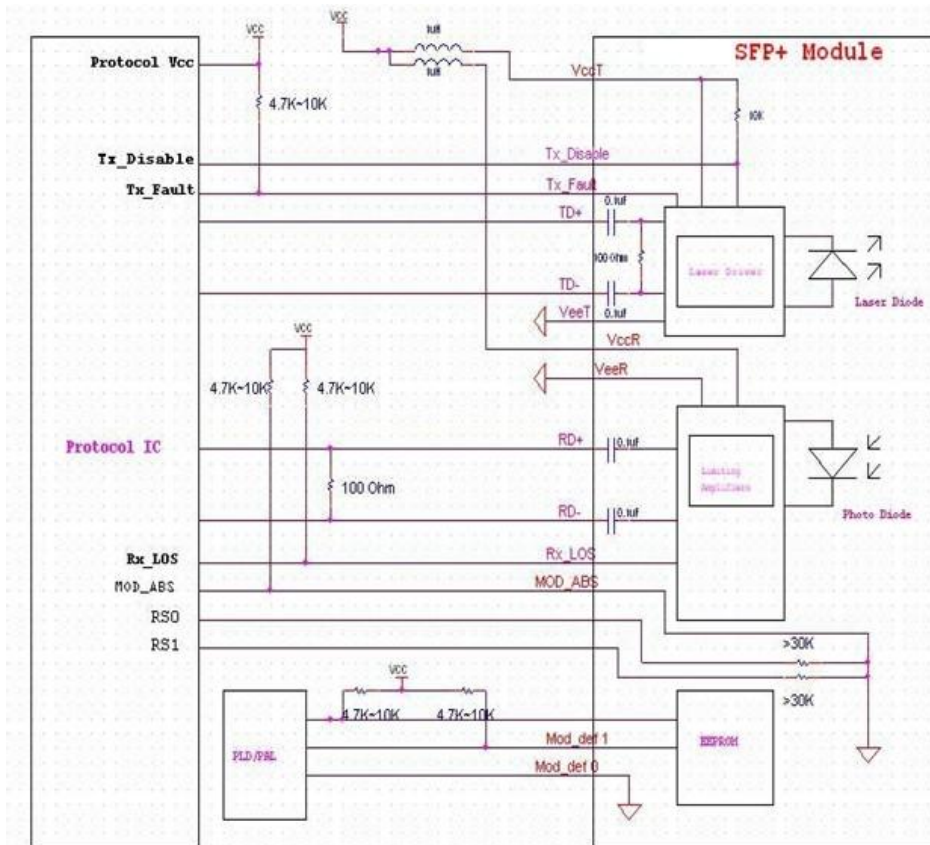
- 1)Circuit ground is internally isolated from chassis ground.
- 2)TFAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V.A high output indicates a transmitter fault 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 TDIS >2.0V or open, enabled on TDIS <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.

**Package Outline**

Dimensions are in millimeters. All dimensions are ±0.1mm unless otherwise specified. (Unit: mm)



### Block Diagram



## Regulatory Compliance

Feature	Test	Method
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 1(>1000V for SFI pins, >2000V for other pins.)
Electrostatic Discharge (ESD) Immunity	IEC61000-4-2	Class 2(>4.0kV)
Electromagnetic Interference (EMI)	CISPR22 ITE Class B FCC Class B CENELEC EN55022 VCCI Class 1	Comply with standard
Immunity	IEC61000-4-3	Comply with standard
Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1,2	Compatible with Class I laser Product

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