



### Features:

- ❖ Hot-pluggable SFP+ footprint
- ❖ Supports 9.5 to 10.3Gb/s bit rates
- ❖ Single 3.3V power supply
- ❖ Maximum link length of 40km
- ❖ 1550nm EML transmitter, PIN photo-detector
- ❖ Duplex LC connector
- ❖ Power dissipation < 1.5W
- ❖ Built-in digital diagnostic functions
- ❖ Case temperature range : Standard:-5to +70°C, Industrial:-40 to +85°C

### Applications:

- ❖ 10GBASE-ER/EW
- ❖ 10G Ethernet

### Part Number Ordering Information

GZSX-C40	SFP+ 10Gbs 40km Tx1550nm LC DDM
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### Description:

GZSX-C40 is designed for use in 10-Gigabit Ethernet links up to 40km over single mode fiber. The module consists of 1550 EML Laser, InGaAs PIN and Preamplifier in a high-integrated optical sub-assembly. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF8472. The module data link is up to 40km in 9/125um single mode fiber.

### Standard:

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

### Absolute Maximum Ratings:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
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Storage Temperature	Ts	-40		85	°C	
Storage Ambient Humidity	HA	5		85	%	
Power Supply Voltage	VCC	-0.5		4	V	
Signal Input Voltage		-0.3		Vcc+0.3	V	
Receiver Damage Threshold		+4			dBm	

## Recommended Operating Conditions:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	Tcase	-5		70	°C	Note (1)
Ambient Humidity	HA	5		85	%	
Power Supply Voltage	VCC	3.14	3.3	3.46	V	
Power Supply Current	ICC			450	mA	
Power Supply Noise Rejection				100	mVp-p	100Hz to 1MHz
Transmission Distance				40	km	
Coupled fiber	Single mode fiber					ITU-T G.653

**Notes:** -10 to 60degC with 1.5m/s airflow

## Optical Characteristics:

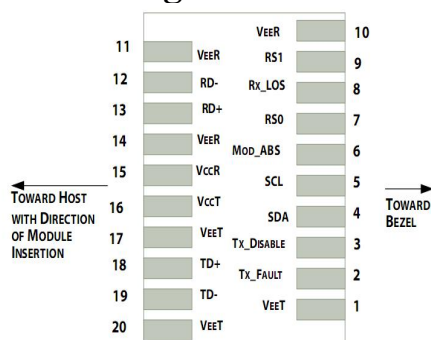
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
<b>Transmitter</b>						
Average Launched Power	PO	-1		3	dBm	Note (1)
Extinction Ratio	ER	6			dB	
Center Wavelength	$\lambda_c$	1530	1550	1565	nm	
Spectrum Band Width (RMS)	$\sigma$			1.0	nm	
SMSR		30			dB	
Transmitter OFF Output Power	POff			-40	dBm	
Optical Rise/Fall Time	tr/tf		100	260	ps	Note (2)
Transmitter and Dispersion	TDP			3.0	dB	

Penalty						
Output Eye Mask	Compliant with IEEE 0802.3ae					
Receiver						
Input Optical Wavelength	$\lambda$	1270		1610	nm	
Receiver Sensitivity				-16.4	dBm	Note (3)
Input Saturation Power (Overload)	Psat	-3			dBm	
LOS Detect -Assert Power	PA	-28			dBm	
LOS Detect - Deassert Power	PD			-19	dBm	
LOS Detect Hysteresis	PHYS	0.5		6	dB	

**Notes:**

- 1.Launched power (avg.) is power coupled into a single mode fiber with master connector. (Before of Life)
- 2.These are unfiltered 20-80% values.
- 3.Measured with conformance test signal for BER =  $10^{-12}$ .@10.3125Gbps, PRBS=2<sup>31</sup>-1,NRZ

**Pin Assignment :**



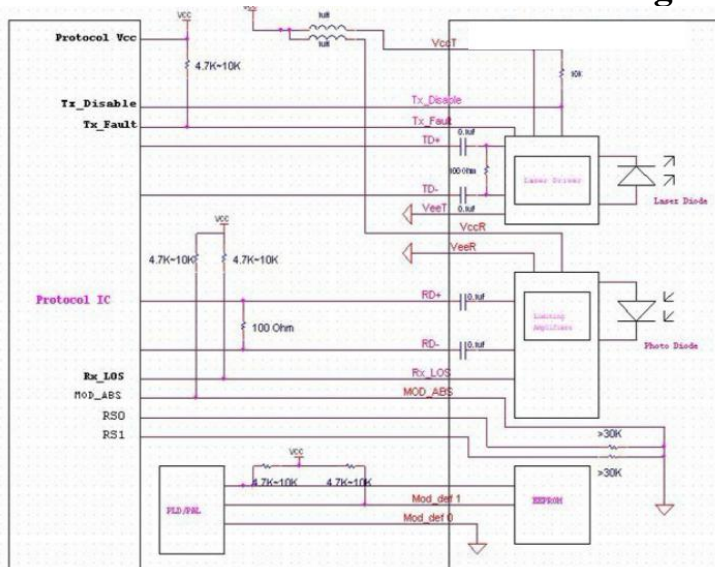
Pin	Symbol	Name/Description	Ref.
1	V <sub>EET</sub>	Transmitter Ground (Common with Receiver Ground)	1
2	T <sub>FAULT</sub>	Transmitter Fault.	2
3	T <sub>DIS</sub>	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	Rate Select 0	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6
9	RS1	No connection required	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.	

**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 4.7k  $\Omega$  - 10k  $\Omega$  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.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
<b>Transmitter</b>						
Differential line input Impedance	RIN		100		Ohm	
Differential Data Input Swing	VDT	300		700	mVp-p	
Transmit Disable Voltage	Vdis	2		Vcc	V	LVTTL
Transmit Enable Voltage	Ven	Vee		Vee+0.8	V	
<b>Receiver</b>						
Differential Data Output Swing	VDR	400		850	mVp-p	Note (1)
LOS Output Voltage-High	VLOSH	Vee		Vee+0.8	V	LVTTL
LOS Output Voltage-Low	VLOSL	2		VccHOS T	V	

## Host-Transceivers Interface Block Diagram



GZCOM GZSX-C40 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.

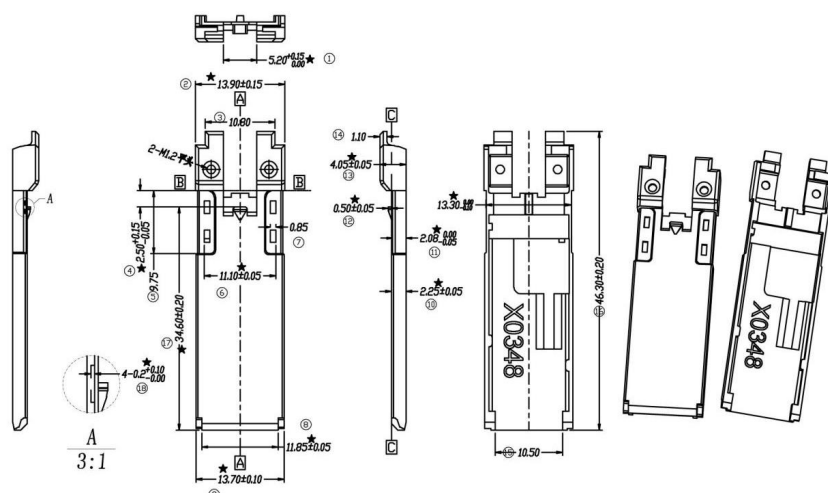
The SFP MSA defines a 256-byte memory map in EEPROM that is accessible over a 2-wire serial interface at the 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h), so the originally defined serial ID memory map remains unchanged.

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

## Mechanical Specifications:

Comply with SFF-8432 rev5.0, the improved Pluggable form factor specification



## Regulatory Compliance

Feature	Reference	Performance
Electrostatic discharge (ESD)	IEC/EN 61000-4-2	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class B (CISPR 22A)	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10, 1040.11 IEC/EN 60825-1, 2	Class 1 laser product
Component Recognition	IEC/EN 60950, UL	Compatible with standards
ROHS	2002/95/EC	Compatible with standards
EMC	EN61000-3	Compatible with standards

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