



### Features:

- ◇ Single Mode bi-directional Transmission
- ◇ SFP Multi-source Package with LC Receptacle
- ◇ Up to 3.125Gb/s Data Links
- ◇ Hot-Pluggable Capability
- ◇ Up to 40 km on 9/125μm SMF
- ◇ CWDM DFB LD and PIN Receiver

### Description:

GLSF-CXX30-40D(I) Bi-Directional transceiver is a high performance, cost effective module ,which is compliant with LC Optics interface with built in WDM for Bi-Directional serial optical data communication applications.

This module is designed for Single-Mode single fiber, operates at the normal wavelength of 1310nm. Standard AC coupled CML for high speed signal and LVTTTL control and monitor signals. The transmitter section incorporates DFB and driver IC with temperature compensation and automatic power control circuit, which make the transmitter section output power and Extinction ration stabled in operation temperature. The receiver section incorporates an efficient InGaAs photodiode and transimpedance with AGC for wide dynamic range.

- ◇ Single +3.3V Power Supply
- ◇ Built-in WDM
- ◇ Isolation > 30dB, Cross Talk < -45dB
- ◇ Monitoring Interface Compliant with SFF-8472
- ◇ Metal Enclosure, Excellent EMI & ESD Protection
- ◇ Operation Temperature Range: 0~70°C.
- ◇ Compliant with Specifications for IEEE802.3z
- ◇ Compliant with Bellcore TA-NWT-000983
- ◇ Eye Safety Designed to Meet Laser Class1, Compliant with IEC60825-1
- ◇ RoHS Compliant

### Applications:

- ◇ SDH STM-16
- ◇ SONET OC-48
- ◇ 1X/2X Fiber Channel
- ◇ WDM Application
- ◇ Compliant with CPRI/OBSAI

## ● Absolute Maximum Ratings

Parameter		Symbol	Min.	Typical	Max.	Unit
Storage Temperature		$T_S$	-40		+85	°C
Supply Voltage		$V_{CC,T,R}$	0		5.5	V
Relative Humidity		RH	0		85	%
Case Operating Temperature	Industrial	Top	-40		85	°C
	Extended					
	Commercial		0		70	

### ● Recommended Operating Environment:

Parameter		Symbol	Min.	Typical	Max.	Unit
Case operating Temperature	Industrial	$T_C$	-40		+85	°C
	Extended		-20		85	
	Commercial		0		70	
Supply Voltage		$V_{CCT,R}$	3.1	3.3	3.5	V
Power Supply Rejection			100			mV <sub>P-P</sub>

### ● Electrical Characteristics ( $T_{OP} = T_c$ , $V_{CC} = 3.135$ to $3.465$ Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	$V_{CC}$	3.14	3.30	3.47	V	
Supply Current	$I_{CC}$			300	mA	
Inrush Current	$I_{surge}$			$I_{CC}+30$	mA	
Maximum Power	$P_{max}$			1.0	W	
<b>Transmitter Section:</b>						
Input differential impedance	$R_{in}$	90	100	110	$\Omega$	1
Single ended data input swing	$V_{in,PP}$	400		2000	mV <sub>p-p</sub>	
Transmit Disable Voltage	$V_D$	$V_{CC} - 1.3$		$V_{CC}$	V	2
Transmit Enable Voltage	$V_{EN}$	$V_{EE}$		$V_{EE} + 0.8$	V	
Transmit Disable Assert Time	$T_{dessert}$			10	us	
<b>Receiver Section:</b>						
Single ended data output swing	$V_{out,pp}$	600	800		mv	3
Data output rise time	$t_r$			150	ps	4
Data output fall time	$t_f$			150	ps	4
LOS Fault	$V_{losfault}$	$V_{CC} - 0.5$		$V_{CC\_host}$	V	5
LOS Normal	$V_{losnorm}$	$V_{EE}$		$V_{EE} + 0.5$	V	5
Power Supply Rejection	PSR	100			mV <sub>pp</sub>	6
Deterministic Jitter Contribution	$RX\Delta DJ$			51.7	ps	7
Total Jitter Contribution	$RX\Delta TJ$			122.4	ps	

#### Note:

1. AC coupled.
2. Or open circuit.
3. Into 100 ohm differential termination.
4. 20 – 80 %
5. LOS is LVTTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

6. All transceiver specifications are compliant with a power supply sinusoidal modulation of 20 Hz to 1.5MHz up to specified value applied through the power supply filtering network shown on page 23 of the Small Form-factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September 14, 2000.
7. Measured with DJ-free data input signal. In actual application, output DJ will be the sum of input DJ and DJ.

● **Optical Parameters(T<sub>OP</sub> = T<sub>c</sub>, V<sub>CC</sub> = 3.135 to 3.465 Volts)**

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
<b>Transmitter Section:</b>						
Center Wavelength	$\lambda_c$	$\lambda -6.5$	1270	$\lambda -6.5$	nm	
Spectral Width (-20dB)	$\sigma$			<1	nm	
Optical Output Power	P <sub>out</sub>	-3.5		2	dBm	
Optical Rise/Fall Time	t <sub>r</sub> / t <sub>f</sub>			0.18	ns	
Extinction Ratio	ER	6			dB	
Deterministic Jitter Contribution	TX $\Delta$ DJ			56.5	ps	
Total Jitter Contribution	TX $\Delta$ TJ			119	ps	
Eye Mask for Optical Output	Compliant with ITU-T G.957					
Relative Intensity Noise	RIN			-120	dB/Hz	
<b>Receiver Section:</b>						
Optical Input Wavelength	$\lambda$	$\lambda -6.5$	1610	$\lambda -6.5$	nm	
Optical Input Power	P <sub>in</sub>	-20		0	dBm	
Receiver Reflectance		12			dB	
Receiver Overload	P <sub>ol</sub>	-3			dBm	
RX Sensitivity	Sen			-19	dBm	
RX_LOS Assert	LOS <sub>A</sub>	-35			dBm	
RX_LOS Deassert	LOS <sub>D</sub>			-20	dBm	
RX_LOS Hysteresis	LOS <sub>H</sub>	0.5			dB	
<b>General Specifications</b>						
Data Rate	BR		3072		Mb/s	
Bit Error Rate	BER			10 <sup>-12</sup>		
Max. Supported Link Length on 9/125 $\mu$ m SMF@3.125Gb/s	LMAX		40		km	
Total System Budget	LB	8			dB	

● **Digital Diagnostic Monitor Characteristics**

The following digital diagnostic characteristics are defined over the Recommended Operating Environment unless otherwise specified. It is compliant to SFF8472 Rev10.2 with internal calibration mode. For external calibration mode please contact our sales staff..

Parameter	Symbol	Min.	Max.	Unit	Calibration
Temperature monitor absolute error	DMI_Temp	-3	3	degC	internal
Laser power monitor absolute error	DMI_TX	-3	3	dB	internal
RX power monitor absolute error	DMI_RX	-3	3	dB	internal

Supply voltage monitor absolute error	DMI_VCC	-0.1	0.1	V	internal
Bias current monitor absolute error	DMI_Ibias	-10%	10%	mA	internal

● **Block Diagram of Transceiver:**

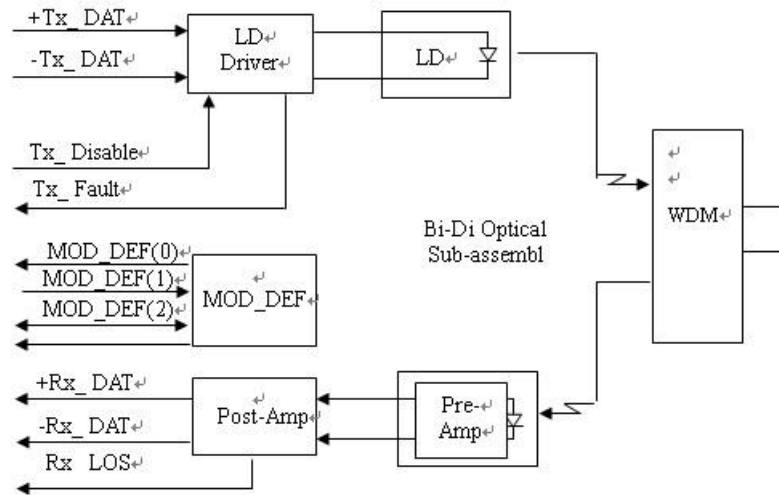


Figure1: Block Diagram

● **Pin Assignment:**

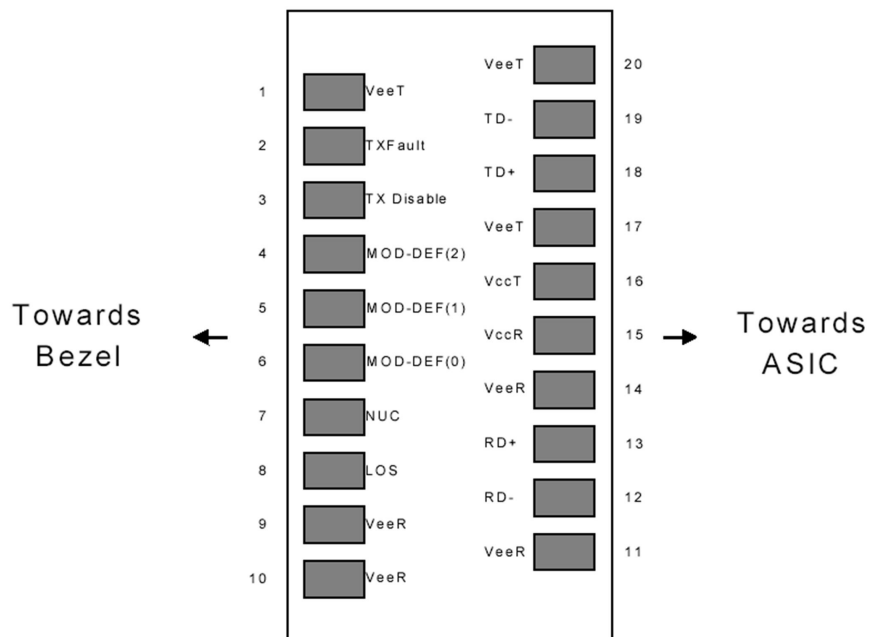


Figure2: Diagram of Host Board Connector Block Pin Numbers and Names

● **Pin Description:**

Pin No	Name	Function	Plug Seq	Notes
1	VeeT	Transmitter Ground	1	1
2	TX Fault	Transmitter Fault Indication	3	
3	TX Disable	Transmitter Disable	3	2
4	MOD-DEF2	Module Definition	2	3
5	MOD-DEF1	Module Definition 1	3	3

6	MOD-DEF0	Module Definition 0	3	3
7	Rate Select	Not Connected	3	4
8	LOS	Loss of Signal	3	5
9	VeeR	Receiver Ground	1	1
10	VeeR	Receiver Ground	1	1
11	VeeR	Receiver Ground		1
12	RD-	Inv. Received Data Out	3	6
13	RD+	Received Data Out	3	6
14	VeeR	Receiver Ground	3	1
15	VccR	Receiver Power	2	1
16	VccT	Transmitter Power	2	
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data In	3	6
19	TD-	Inv. Transmit In	3	6
20	VeeT	Transmitter Ground	1	

**Notes:**

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7k – 10k ohms on host board to a voltage between 2.0V and 3.6V. MOD\_DEF(0) pulls line low to indicate module is plugged in.
4. Rate select is not used
5. LOS is open collector output. Should be pulled up with 4.7k – 10 k ohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
6. AC Coupled

● **Recommended Circuit:**

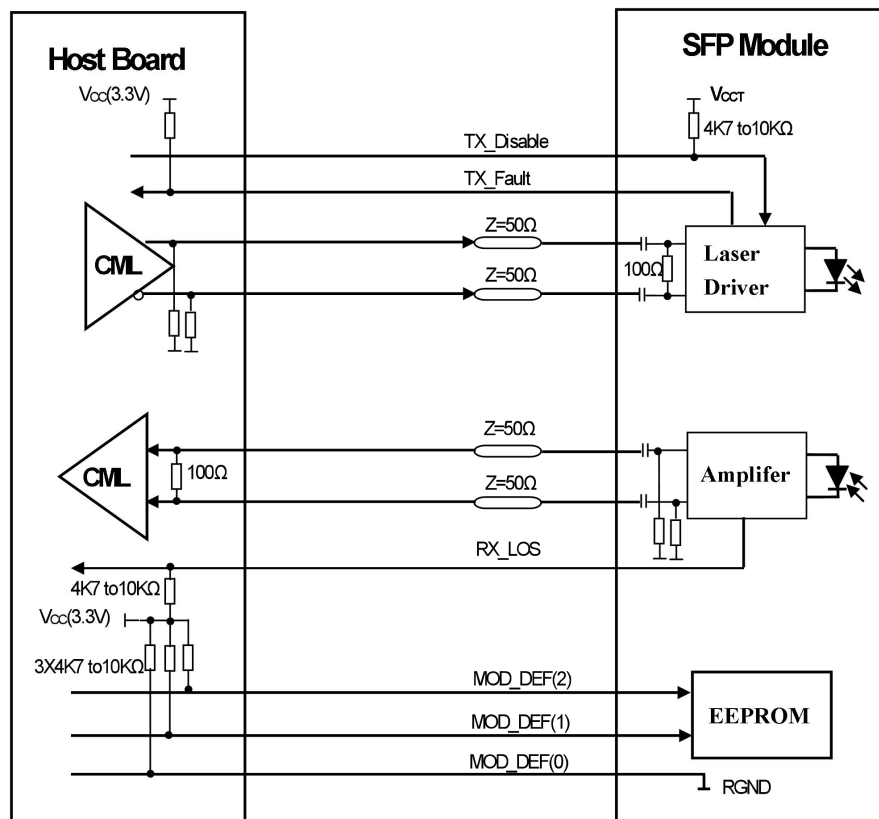


Figure 5. SFP Host Recommended Circuit

● **Serial ID Memory Contents:**

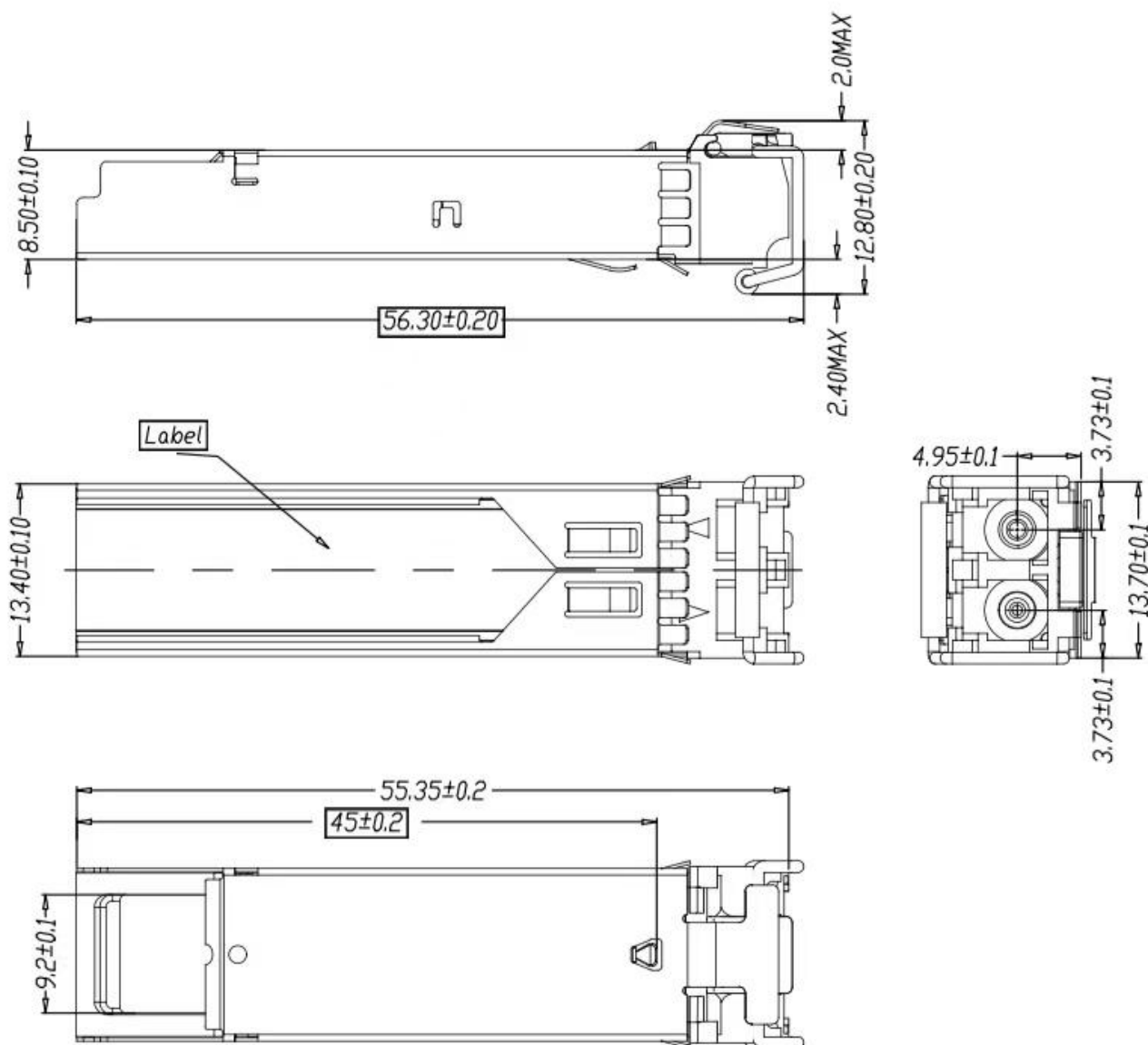
Data Address	Length (Byte)	Name of Length	Description and Contents
<b>Base ID Fields</b>			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	SONET
11	1	Encoding	SONET Scrambled
12	1	BR,Nominal	Nominal baud rate, unit of 100Mbps
13	1	Reserved	(0000h)
14	1	Length(9um,km)	Link length supported for 9/125um fiber, units of km
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name:
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number: "OPXXXXXX" (ASCII)
56-59	4	Vendor rev	Revision level for part number
60-61	2	Wavelength	Laser wavelength
62	1	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62
<b>Extended ID Fields</b>			
64-65	2	Option	Indicates which optical SFP signals are implemented(001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	Manufacturing date code
92	1	Diagnostic Type	Diagnostics
93	1	Enhanced Options	Diagnostics
94	1	SFF-8472	Diagnostics
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
<b>Vendor Specific ID Fields</b>			
96-127	32	Readable	Vendor specific data, read only

● **Diagnostics Memory Contents(A2h):**

Data Address	Length (Byte)	Name of Length	Description and Contents
<b>Diagnostic and control/status fields</b>			
0-39	40	A/W Thresholds	Diagnostic Flag Alarm and Warning Thresholds
40-55	16	Unallocated	

56-91	16	Ext Cal Constants	Diagnostic calibration constants for optional External Calibration
92-94	3	Unallocated	
95	1	CC_DMI	Check code for Base Diagnostic Fields (addresses 0 to 94)
96-105	10	Diagnostics	Diagnostic Monitor Data (internally or externally calibrated)
106-109	4	Unallocated	
110	1	Status/Control	Optional Status and Control Bits
111	1	Reserved	Reserved for SFF-8079
112-113	2	Alarm Flags	Diagnostic Alarm Flag Status Bits
114-115	2	Unallocated	
116-117	2	Warning Flags	Diagnostic Warning Flag Status Bits
118-119	2	Ext Status/Control	Extended module control and status bytes
<b>General use fields</b>			
120-127	8	Vendor Specific	Vendor specific memory addresses
128-247	120	User EEPROM	User writable non-volatile memory
248-255	8	Vendor Control	Vendor specific control addresses

● **Mechanical Dimensions:**



**Figure 6. Mechanical Drawing**

**Shenzhen GLight Communication Technology Co., Ltd.**

5F, Building 3, Chao Hui Lou Industrial Park, No.119 Da Lang Hua Ting Road  
 Longhua district, Shenzhen, Guangdong, China 518000

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SFP 3.125Gb/s CWDM Transceiver (GLSF-CXX30-40D(I))  
Hot Pluggable, LC, +3.3V 1270nm~1610nm DFB-LD, DDMI, 40km

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