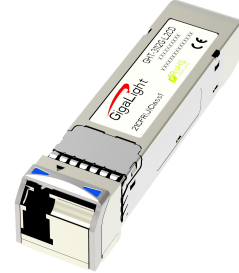


## 12G-SDI CWDM SFP Tx 1270nm-1570nm 10km Single-Transmitter Optical Module (Non-MSA Pin-out) GHTC-xx12G-L1CD

### Features

- ✓ SD/HD/3G/6G/12G-SDI SFP Transmitter
- ✓ ST 259, ST 292-1, ST 424, ST-2081 and ST-2082 compatible
- ✓ Metal enclosure for Lower EMI
- ✓ 1270nm-1570nm CWDM DFB laser transmitter
- ✓ Supports SDI pathological patterns for SD-SDI, HD-SDI, 3G-SDI, 6G-SDI and 12G SDI
- ✓ ROHS compliant(lead free)
- ✓ single 3.3V power supply
- ✓ Hot-pluggable SFP footprint
- ✓ Operating case temperature range: 0 to +70°C

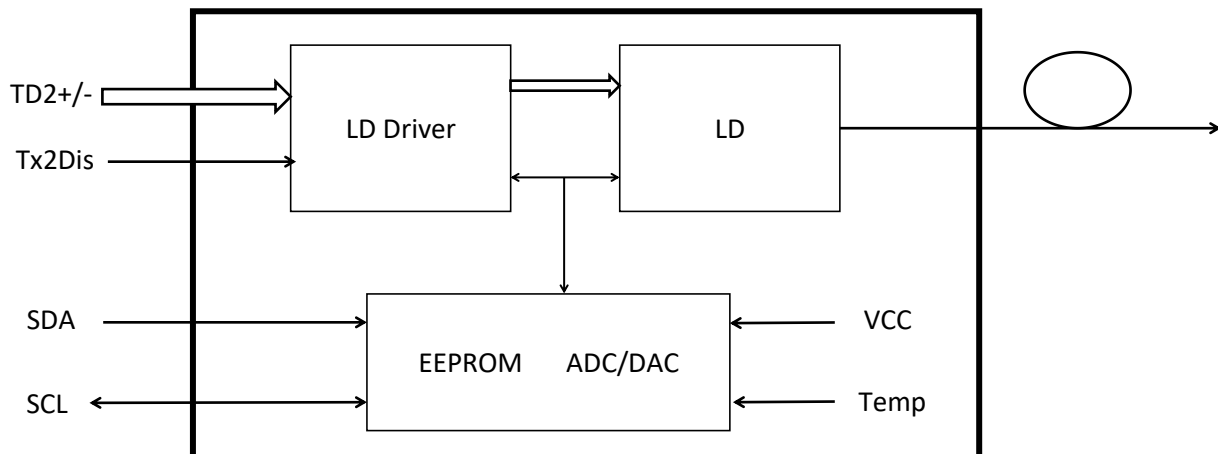


### Applications

- ✓ Serial Digital Fiber Transmission System for SMPTE ST 259, SMPTE ST 344, SMPTE ST 292-1/2, SMPTE ST 424, SMPTE ST 2081-1 and SMPTE ST 2082-1 Signals
- ✓ UHDTV/HDTV/SDTV Service Interfaces

### Description

Gigalight's Video transmitter is designed to transmit data rates from 50Mbps to 11.88Gbps, compliant with SMPTE ST 2082-1 (12G UHD-SDI), ST 2081-1 (6G UHD-SDI), ST424 (3G SDI), ST 292-1 (HD-SDI), and ST 259 (SD-SDI). Gigalight's Video transceiver supports SDI pathological patterns signals.



**Figure 1. Module Block Diagram**
**Absolute Maximum Ratings**

Parameter	Symbol	Min	Max	Unit
Supply Voltage	$V_{cc}$	-0.5	4	V
Storage Temperature	$T_s$	-40	+85	°C
Operating Humidity	-	5	85	%

**Recommended Operating Conditions**

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	$T_c$	0		+70	°C
Power Supply Voltage	$V_{cc}$	3.13	3.3	3.47	V
Power Supply Current	$I_{cc}$		160		mA
Data Rate			12		Gbps

**Optical and Electrical Characteristics**

Parameter		Symbol	Min	Typical	Max	Unit	Notes
<b>Transmitter</b>							
Spectral Width (-20dB)		$\sigma$			1	nm	
Side Mode Suppression Ratio		SMSR	30			dB	
Average Output Power		$P_{out}$	-3		1	dBm	1
Extinction Ratio		ER	3.5			dB	
Data Input Swing Differential		$V_{IN}$	400		1000	mV	2
Input Differential Impedance		$Z_{IN}$	90	100	110	$\Omega$	
Rise/Fall Time (20%~80%)	SD-SDI	tr/tf			1500	ps	3
	HD-SDI				270		
	3G-SDI				135		
	6G-SDI				80		
	12G-SDI				45		
Output Jitter	Timing Jitter	SD-SDI			0.2	UI	4
		HD-SDI			1		
		3G-SDI			2		
		6G-SDI			4		
		12G-SDI			8		

	Alignment Jitter	SD-SDI				0.2		
		HD-SDI				0.2		
		3G-SDI				0.3		
		6G-SDI				0.3		
		12G-SDI				0.3		
TX Disable	Disable			2.0		Vcc	V	
	Enable			0		0.8	V	
TX Fault	Fault			2.0		Vcc	V	
	Normal			0		0.8	V	

**Note:**

1. The optical power is launched into SMF.
2. PECL input, internally AC-coupled and terminated.
3. Rise and fall times, 20% to 80%,
4. UI means one period.

**Diagnostics Specification**

Parameter	Range	Unit	Accuracy	Calibration
Tx Disable Negate Time	0 to +70	°C	±3°C	Internal / External
Voltage	3.0 to 3.6	V	±3%	Internal / External
Bias Current	0 to 100	mA	±10%	Internal / External
TX Power	-3to +1	dBm	±3dB	Internal / External

**I2C Bus Interface**

The I2C bus interface uses the 2-wire serial CMOS E2PROM protocol. The serial interface meets the following specifications:

- 1.Support a maximum clock rate of 280Khz.
2. Input/Output levels comply with LVCMOS/LVTTL or compatible logics.

Low: 0 – 0.8 V

High: 2.0 – 3.3 V

Undefined: 0.8 – 2.0 V

## Pin Description

Pin	Signal Name	Description	Plug Seq.	Notes
1	V <sub>EE</sub>	Ground	1	
2	V <sub>EE</sub>	Ground	3	
3	NC	Not Connected	3	
4	V <sub>EE</sub>	Ground	3	
5	SCL	2-wire Serial Interface Clock	3	Note 2
6	SDA	2-wire Serial Interface Data Line	3	Note 2
7	V <sub>EE</sub>	Ground	3	
8	NC	Not Connected	3	
9	NC	Not Connected	1	
10	NC	Not Connected	1	
11	V <sub>EE</sub>	Ground	1	
12	NC	Not Connected	3	
13	NC	Not Connected	3	
14	V <sub>EE</sub>	Ground	1	
15	V <sub>CC</sub>	Module 3.3 V Supply	2	
16	V <sub>CC</sub>	Module 3.3 V Supply	2	
17	V <sub>EE</sub>	Ground	1	
18	TX+	Transmitter Non-Inverted Data Input	3	Note 3
19	TX-	Transmitter Inverted Data Input	3	Note 3
20	TX_DIS	Transmitter Disable	1	Note 1

### Note:

Plug Seq.: Pin engagement sequence during hot plugging.

1. TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:

Low (0 ~ 0.8V):	Transmitter on
(0.8V~2.0V):	Undefined
High (2.0 ~ 3.46V):	Transmitter Disabled
Open:	Transmitter Disabled

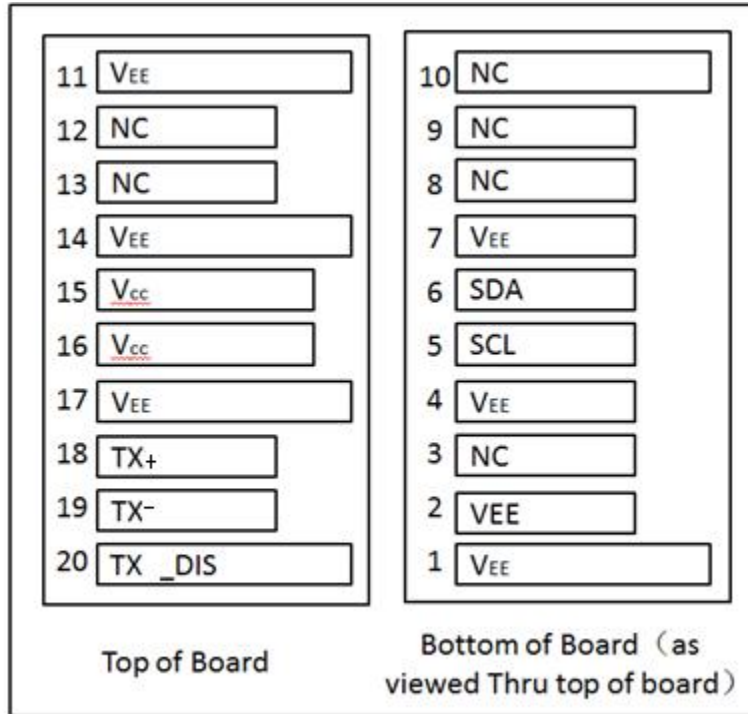
2. SCL,SDA:They should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 3.15V and 3.6V.

SCL is the clock line of two wire serial interface for serial ID.

SDA is the data line of two wire serial interface for serial ID.

3. TX-/+ : These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

## Pin Definition



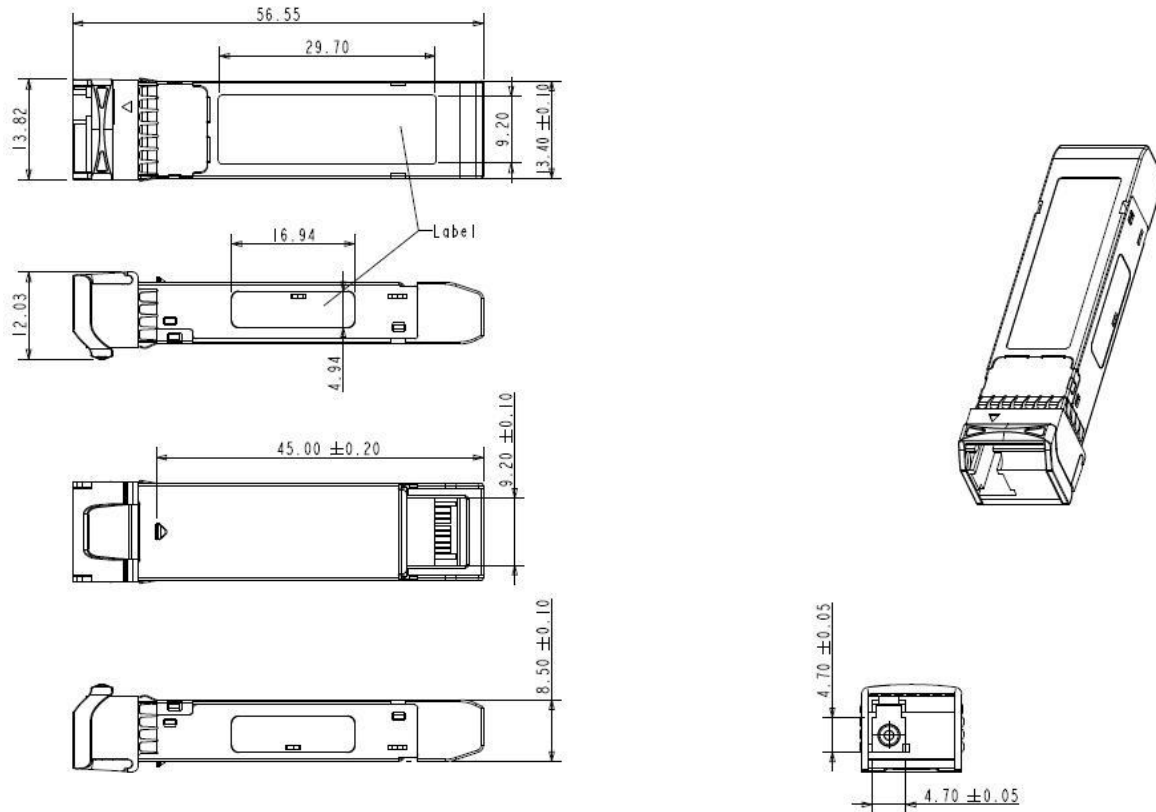
**Figure 2. Electrical Pin-out Details**

## CWDM Wavelength(0~70°C)

Band	Suffix	Wavelength (nm)
0-band Original	A	1270
	B	1290
	C	1310
	D	1330
	E	1350
E-band Extended	F	1370
	G	1390
	H	1410
	I	1430
	J	1450
S-band Short Wavelength	K	1470
	L	1490
	M	1510

	N	1530
C-band Conventional	O	1550
L-band Long Wavelength	P	1570

### Mechanical Dimensions



**Figure 3. Mechanical Specifications**

### Regulatory Compliance

Feature	Standard
Laser Safety	IEC 60825-1:2014 (Third Edition)
Environmental protection	2011/65/EU
CE EMC	EN55032: 2015 EN55035: 2017 EN61000-3-2:2014 EN61000-3-3:2013
FCC	FCC Part 15, Subpart B; ANSI C63.4-2014

Product Safety

EN/UL 60950-1, 2nd Edition, 2014-10-14

**⚠ CAUTION:**

Use of controls or adjustment or performance of procedures other than those specified herein may result in hazardous radiation exposure.

**Ordering Information**

Part Number	Product Description
GHTC-xx12G-L1CD	CWDM,10km,SD/HD/3G/6G/12G SDI Single Transmitter, NON-MSA

**Important Notice**

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E-mail: [sales@gigalight.com](mailto:sales@gigalight.com)Official Site: [www.gigalight.com](http://www.gigalight.com)**Revision History**

Revision	Date	Description
V0	May-27- 2020	Advance Release.