

12G-SDI SFP+ 2TX 1310nm/1310nm 20km Dual-Transmitter Optical Module P/N: GTT-313112G-L2CD

Features

- ✓ SD/HD/3G/6G/12G-SDI SFP+ dual-transmitter module
- ✓ ST 259, ST 292-1, ST 424, ST-2081 and ST-2082 compatible
- ✓ Metal enclosure for Lower EMI
- ✓ Dual 1310nm DFB laser transmitters
- ✓ Supports SDI pathological patterns for SD/HD/3G/6G/12G-SDI
- ✓ RoHS compliant (lead free)
- ✓ Single 3.3V power supply
- ✓ Hot-pluggable SFP footprint
- ✓ Case operating temperature range: 0 to 70°C



Applications

- ✓ SD/HD/3G/6G/12G-SDI over Fiber
- ✓ UHDTV/HDTV/SDTV Services

Description

GIGALIGHT's Video Dual 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.

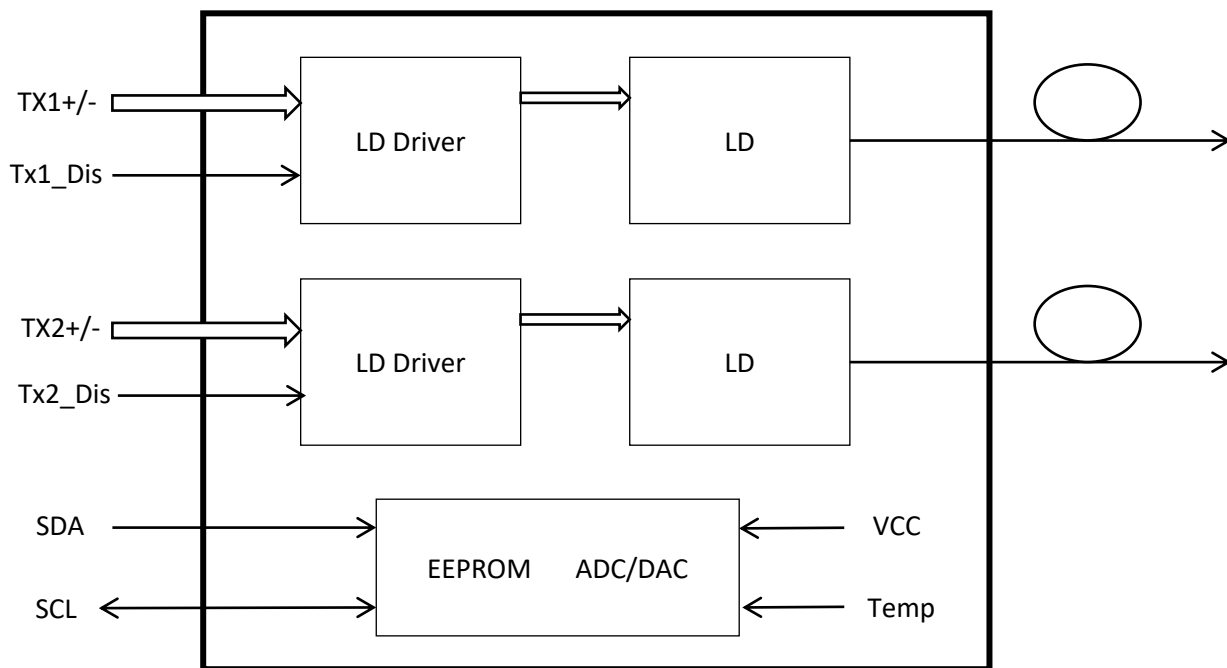


Figure 1. Module Block Diagram

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}		320		mA
Data Rate			12		Gbps

Optical and Electrical Characteristics

Parameter			Symbol	Min	Typical	Max	Unit	Notes
Center Wavelength			λ_c	1300	1310	1320	nm	
Spectral Width (-20dB)			σ			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	Ω	
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		V _{cc}	V	
		Enable		0		0.8	V	
TX Fault		Fault		2.0		V _{cc}	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 _{EE}	Ground	1	
2	NC	Not Connected	3	
3	NC	Not Connected	3	
4	V _{EE}	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 _{EE}	Ground	3	
8	TX2+	Transmitter Non-Inverted Data Input2	3	Note 3
9	TX2-	Transmitter Inverted Data Input2	1	Note 3
10	TX2_DIS	Transmitter2 Disable	1	Note 1
11	V _{EE}	Ground	1	
12	NC	Not Connected	3	
13	NC	Not Connected	3	

14	V _{EE}	Ground	1	
15	V _{CC}	Module 3.3 V Supply	2	
16	V _{CC}	Module 3.3 V Supply	2	
17	V _{EE}	Ground	1	
18	TX1+	Transmitter Non-Inverted Data Input1	3	Note 3
19	TX1-	Transmitter Inverted Data Input1	3	Note 3
20	TX1_DIS	Transmitter1 Disable	1	Note 1

Note:

1. Plug Seq.: Pin engagement sequence during hot plugging.
2. TXn_DIS 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 to 0.8V):	Transmitter on
(0.8V~2.0V):	Undefined
High (2.0 to 3.465V):	Transmitter Disabled
Open:	Transmitter Disabled
3. SCL,SDA. They should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 3.15V and 3.46V.
 - 1) SCL is the clock line of two wire serial interface for serial ID.
 - 2) SDA is the data line of two wire serial interface for serial ID.
4. TX1-/+, TX2-/+: They are the differential transmitter inputs, internally AC-coupled, differential 100Ω termination inside the module.

Pin Definition

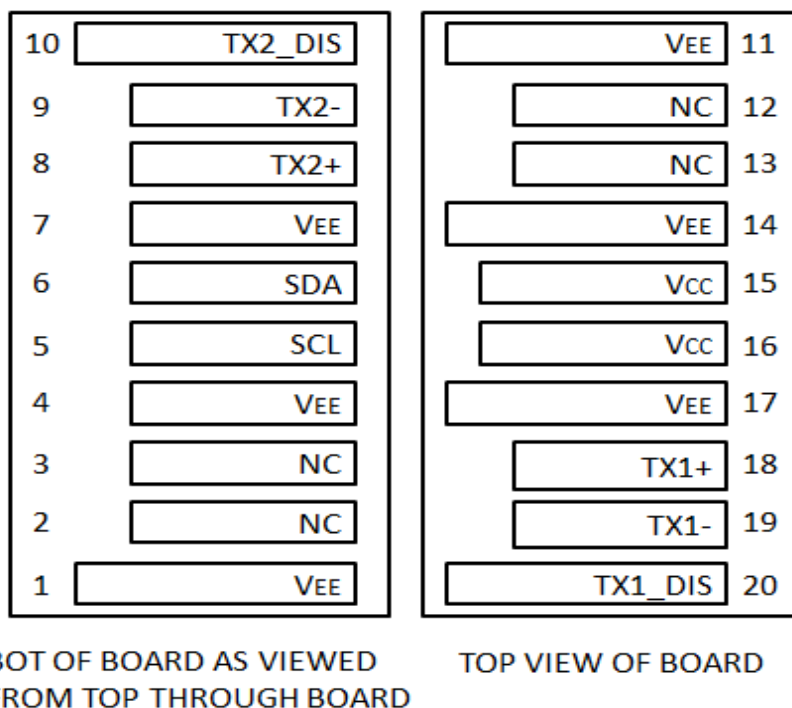


Figure 2. Electrical Pin-out Details

Mechanical Dimensions

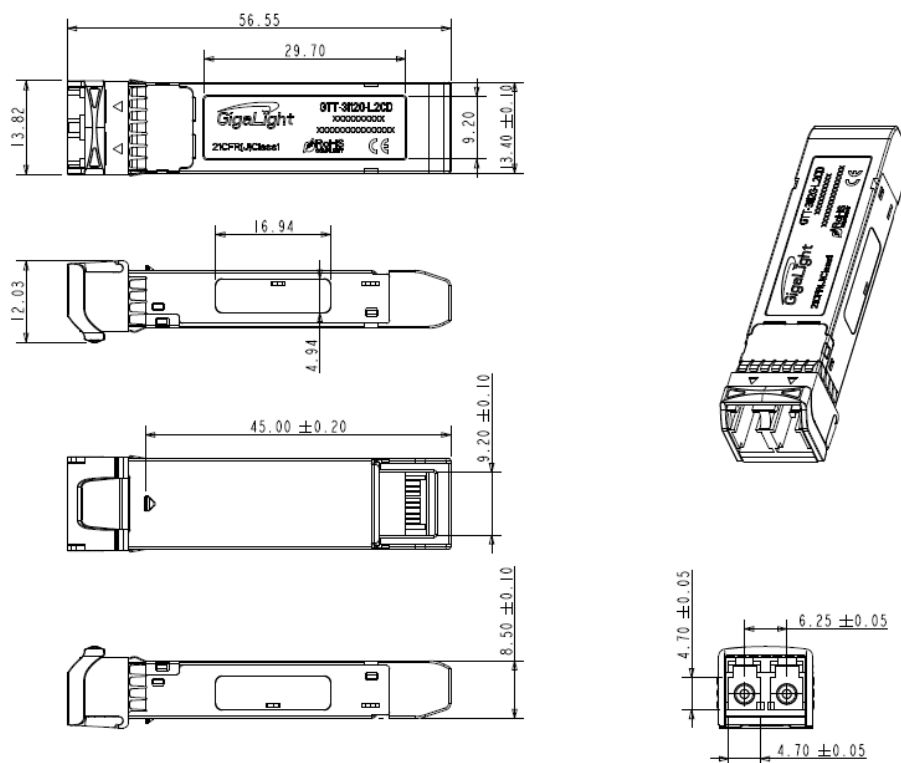


Figure 3. Mechanical Specifications

Regulatory Compliance

GIGALIGHT GTT-313112G-L2CD transceiver modules are Class 1 Laser Products. They meet the requirements of the following standards:

Feature	Standard
Laser Safety	IEC 60825-1:2014 (3 rd Edition) IEC 60825-2:2004/AMD2:2010 EN 60825-1-2014 EN 60825-2:2004+A1+A2
Electrical Safety	EN 62368-1: 2014 IEC 62368-1:2014 UL 62368-1:2014
Environmental protection	Directive 2011/65/EU with amendment(EU)2015/863
CE EMC	EN55032: 2015 EN55035: 2017 EN61000-3-2:2014 EN61000-3-3:2013
FCC	FCC Part 15, Subpart B ANSI C63.4-2014

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
GTT-313112G-L2CD	1310nm, 10/20km, SD/HD/3G/6G/12G-SDI Dual-Transmitter Optical Module

Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by GIGALIGHT before they become applicable to any particular order or contract. In accordance with the GIGALIGHT policy of continuous improvement specifications may change without notice.

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Revision History

Revision	Date	Description
V0	Mar-19- 2019	Advance Release.
V1	Oct-14-2019	Modified current and E.R. standards
V2	Apr-25-2022	Modify Figure 2: Electrical Pin-out Details; Modify Regulatory Compliance.
V3	Oct-8-2022	Update product model: GTT-313112G-L2CD