12Gbps Video SFP Optical Receiver, 20km Reach
GHR-12G-L2CDM

Features

- ✓ SD/HD/3G/6G/12G-SDI SFPReceiver
- ✓ ST 259, ST 292-1,ST 424, ST-2081 and ST-2082 compatible
- ✓ Metal enclosure for Lower EMI
- ✓ Supports video pathological patterns for SD-SDI, HD-SDI,
- ✓ 3G-SDI,6G-SDI and 12G SDI
- ✓ With reclocker in the module
- ✓ Compliant with SFP MSA
- ✓ RoHS compliant(lead free)
- ✓ single 3.3V power supply
- ✓ Hot-pluggable SFP footprint
- ✓ Operating case temperature range：0 to +70℃

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 Receiver is designed to receive 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 Receiver supports SDI pathological patterns signals.

The Receiver includes these sections: a PIN photodiode integrated with a trans-impedance preamplifier (TIA) , Reclocker , and a MCU controller. They are Compliant with SFP MSA

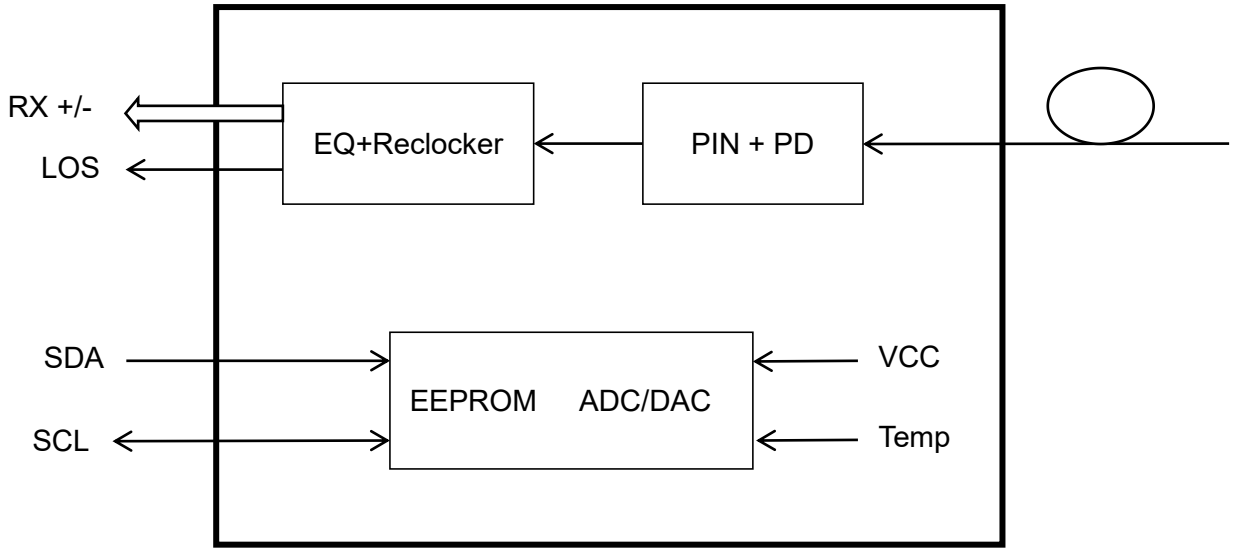

Figure 1. Module Block Diagram

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{cc}	-0.5	5.25	V
Storage Temperature	T_s	-40	+85	ºC
Operating Humidity	-	5	85	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	T_c	0		+70	ºC
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Power Supply Current	Icc		150		mA
Data Rate			12		Gbps

Optical and Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Center Wavelength	λ_c	1260		1580	nm	
Receiver Sensitivity@ 11.88Gbps				-11	dBm	1
Receiver Sensitivity@ 5.94Gbps				-13	dBm	
Receiver Sensitivity@ 2.97Gbps				-15	dBm	
Receiver Overload		1			dBm	2
LOS De-Assert	LOS_D			-18	dBm	
LOS Assert	LOS_A	-28			dBm	
LOS Hysteresis	LOS_H	1		4	dB	
Data Output Swing Differential	Vout	400	800	800	mV	3
LOS	High	2.0		Vcc	V	

	Low			0.8	V	

Note:

1. MeasuredWith Pathological Patterns 11.88Gpbs (4096*2160 P60,100% Bars);5.94Gpbs (4096*2160 P29.97,100% Bars);2.97Gpbs (2048*1080 P50,100% Bars).
2. Internally AC-coupled, minimum input overload power for SMPTE ST 2081-1, SMPTE ST 2082-1.
3. Rise and fall times, 20% to 80%,

Timing and Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Time To Initialize	t_init			300	ms
Serial ID Clock Rate	f_serial_clock		100		KHz
MOD_DEF (0:2)-High	V_H	2		Vcc	V
MOD_DEF (0:2)-Low	V_L			0.8	V

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
temperature	0 to +70	°C	±3°C	Internal / External
Voltage	3.0 to 3.6	V	±3%	Internal / External
RX Power	-24to +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	VEE	Ground	1	
2	VEE	Ground	3	
3	NC	Not Connected	3	
4	MOD_DEF(2)-SDA	2-wire Serial Interface Data Line	3	Note 1
5	MOD_DEF(1)-SCL	2-wire Serial Interface Clock	3	Note 1
6	MOD_DEF(0)-PRESENCE（VEE）	TTL Low	3	Note 1
7	Rate（NC）	Not Connected	3	
8	LOS	Loss of Signal	3	Note 2

9	VEE	Ground	3	
10	VEE	Ground	1	
11	VEE	Ground	1	
12	RX-	Receiver Inverted Data Output	3	Note 3
13	RX+	Receiver Non-Inverted Data Output	3	Note 3
14	VEE	Ground	1	
15	VCC	Receiver Power Supply	2	
16	VCC	Receiver Power Supply	2	
17	VEE	Ground	1	
18	NC	Not Connected	3	
19	NC	Not Connected	3	
20	VEE	Ground	1	

Note:

Plug Seq.: Pin engagement sequence during hot plugging.

1.Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.

Mod-Def 0 is grounded by the module to indicate that the module is present.

Mod-Def 1 is the clock line of two wire serial interface for serial ID.

Mod-Def 2 is the data line of two wire serial interface for serial ID.

2.LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host. Pull up voltage between 2.0V and Vcc+0.3V. Logic 1 indicates loss of signal; Logic 0 indicates normal operation. In the low state, the output will be pulled to less than 0.8V.

3.RX-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) on the host.

Pin Definition

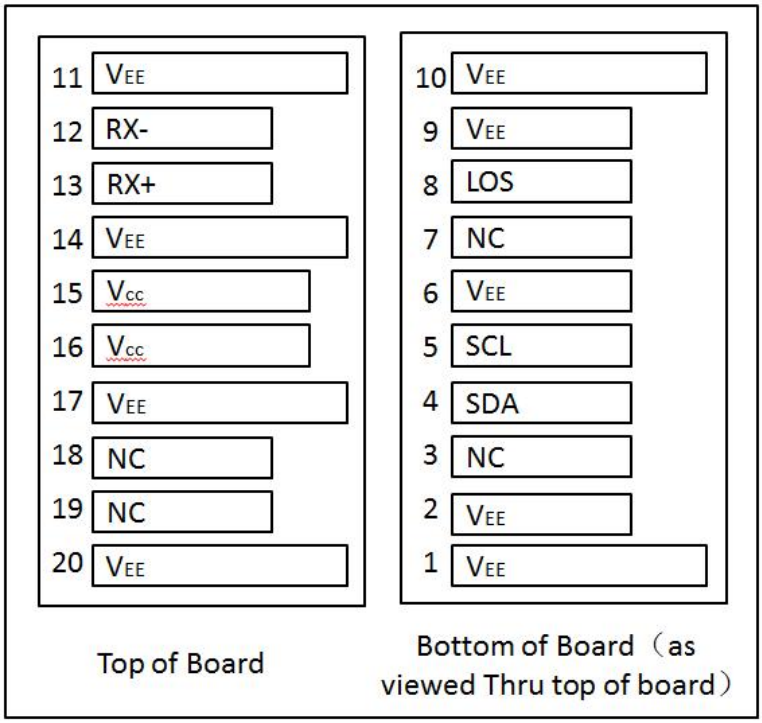

Figure 2. Electrical Pin-out Details

Mechanical Dimensions

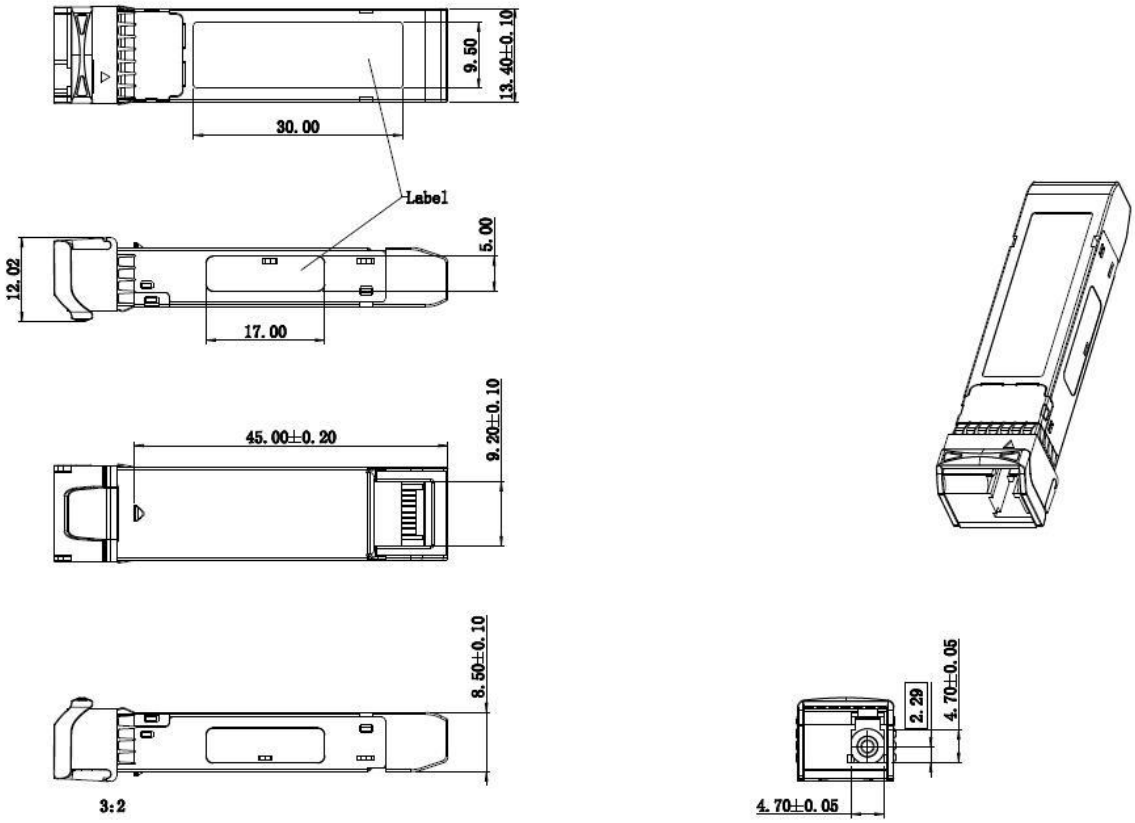

Figure 3. Mechanical Specifications

Regulatory Compliance

GigalightGHR-12G-L2CDM transceiver is Class 1 Laser Products. They are compliant with the following standards:

Feature	Standard
Laser Safety	IEC 60825-1:2014 (3rd 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

Ordering Information

Part Number	Product Description
GHR-12G-L2CDM	SD/HD/3G/6G/12G SDI Receiver, MSA , Reclocker

⚠CAUTION:

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

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 14, 2019	Advance Release.
V1	Oct 14, 2019	Modified current standards.
V2	April 19, 2021	Modify Regulatory Compliance