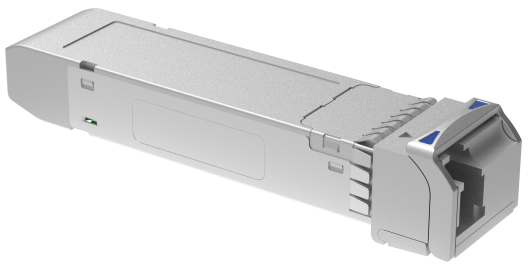
12Gbps Video SFP Optical Transmitter, 20km Reach

FGB-V1231K20CN

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
- 1310nm 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

FIBERSTAMP’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). FIBERSTAMP’s Video transceiver supports SDI pathological patterns signals.

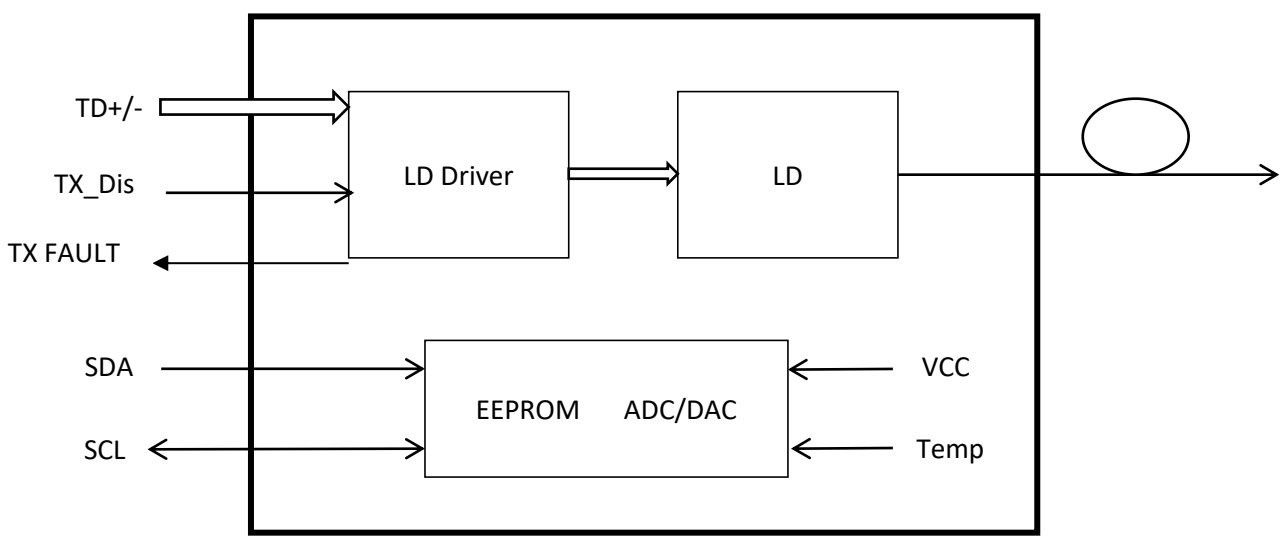


Figure 1. Module Block Diagram

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.5	4	V
Storage Temperature	Ts	-40	+85	℃
Operating Humidity	-	5	85	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Tc	0		+70	℃
Power Supply Voltage	Vcc	3.13	3.3	3.47	V
Power Supply Current	Icc		160		mA
Data Rate			12		Gbps

Optical and Electrical Characteristics

Parameter		Symbol	Min	Typical	Max	Unit	Notes
Transmitter							
Center Wavelength		λc	1300	1310	1320	nm	
Spectral Width (-20dB)		σ			1	nm	
Side Mode Suppression Ratio		SMSR	30			dB	
Average Output Power		Pout	-3		1	dBm	1
Extinction Ratio		ER	3.5			dB	
Data Input Swing Differential		VIN	400		1000	mV	2
Input Differential Impedance		ZIN	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
	Timing Jitter HD-SDI				1		
	Timing Jitter 3G-SDI				2		
	Timing Jitter 6G-SDI				4		
	Timing Jitter 12G-SDI				8		
	Alignment Jitter SD-SDI				0.2		
	Alignment Jitter HD-SDI				0.2		
	Alignment Jitter 3G-SDI				0.3		
	Alignment Jitter 6G-SDI				0.3		
	Alignment Jitter 12G-SDI				0.3		

Parameter		Symbol	Min	Typical	Max	Unit	Notes
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	℃	±3℃	Internal / External
Voltage	3.0 to 3.6	V	±3%	Internal / External
Bias Current	0 to 100	mA	±10%	Internal / External
TX Power	-3 to +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	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX_DIS	Transmitter Disable	3	Note 2
4	MOD_DEF(2)-SDA	2-wire Serial Interface Data Line	3	Note 3
5	MOD_DEF(1)-SCL	2-wire Serial Interface Clock	3	Note 3
6	MOD_DEF(0)-PRESENCE（VEE）	TTL Low	3	Note 3
7	Rate（NC）	Not Connected	3	
8	NC	Not Connected	3	
9	VEE	Ground	1	
10	VEE	Ground	1	
11	VEE	Ground	1	

Pin	Signal Name	Description	Plug Seq.	Notes
12	NC	Not Connected	3	
13	NC	Not Connected	3	
14	VEE	Ground	1	
15	VCC	Module 3.3 V Supply	2	
16	VCC	Module 3.3 V Supply	2	
17	VEE	Ground	1	
18	TD+	Transmitter Non-Inverted Data Input	3	Note 4
19	TD-	Transmitter Inverted Data Input	3	Note 4
20	VEE	Ground	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

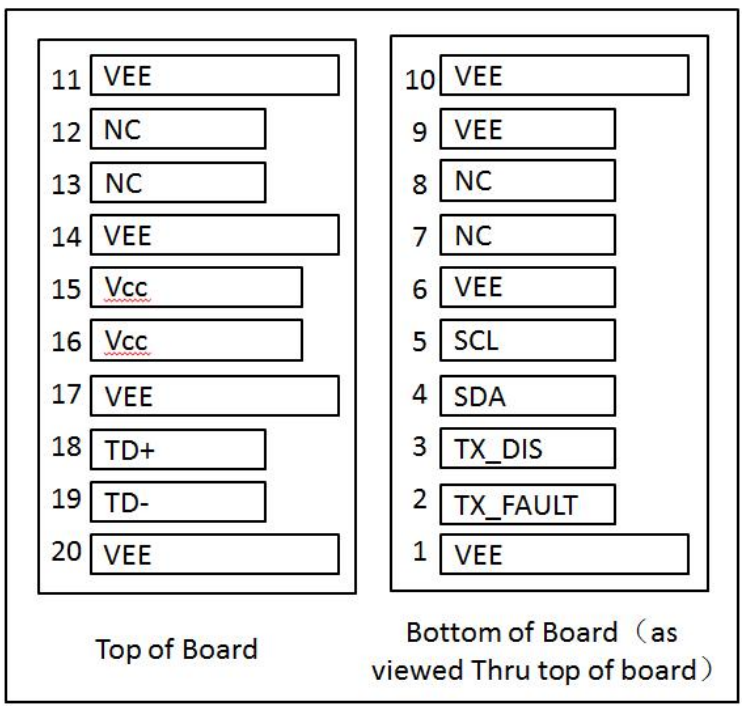


Figure2. Electrical Pin-out Details

Mechanical Dimensions

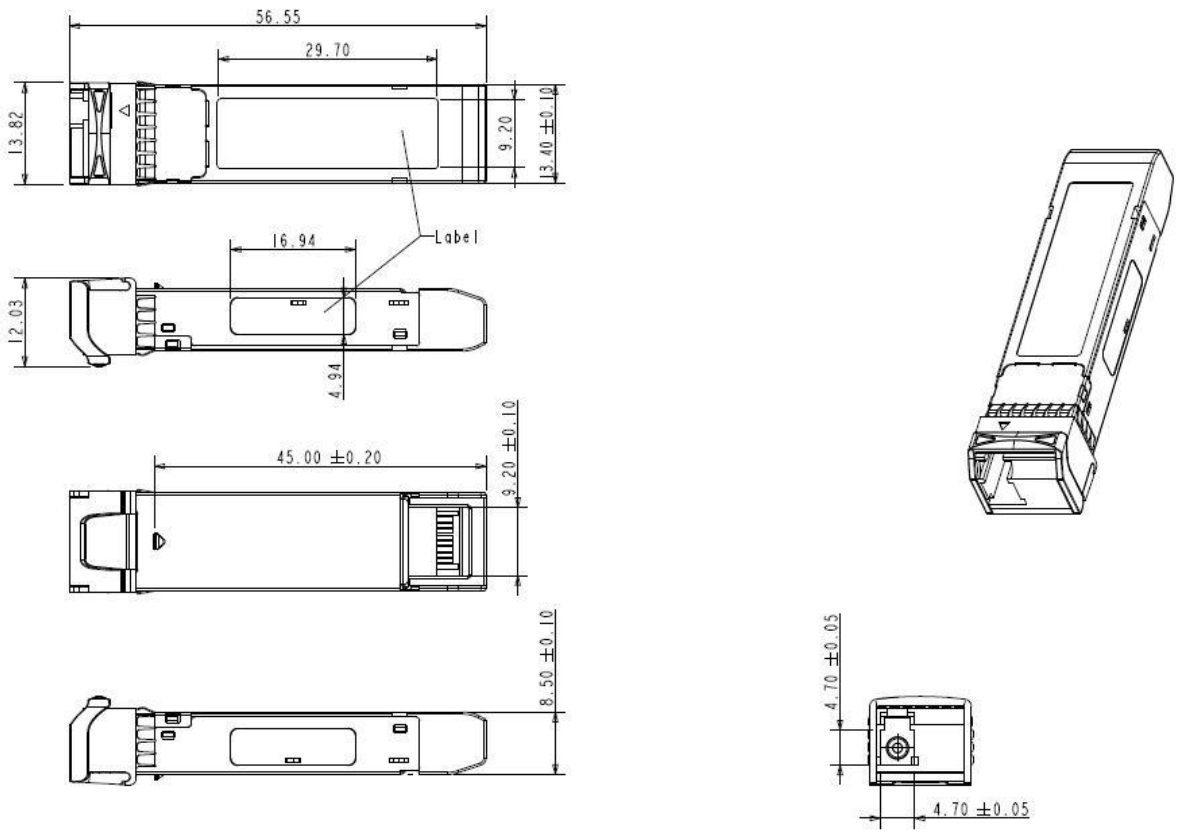


Figure 3. Mechanical Specifications

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
FGB-V1231K20CN	1310nm,10/20km,SD/HD/3G/6G/12G SDI Single Transmitter,NON- MSA

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