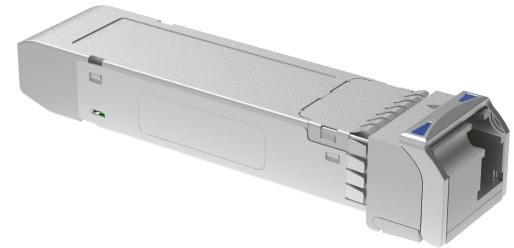


12Gbps Video SFP Optical Receiver, 20km Reach

FFB-V12K20CN

Features

- SD/HD/3G/6G/12G-SDI SFP Receiver
- ST 259, ST 292-1, ST 424, ST-2081 and ST-2082 compatible
- Metal enclosure for Lower EMI
- Supports SDI pathological patterns for SD-SDI, HD-SDI, 3G SDI, 6G SDI and 12G SDI
- With reclocker in the module
- 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 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). FIBERSTAMP'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.

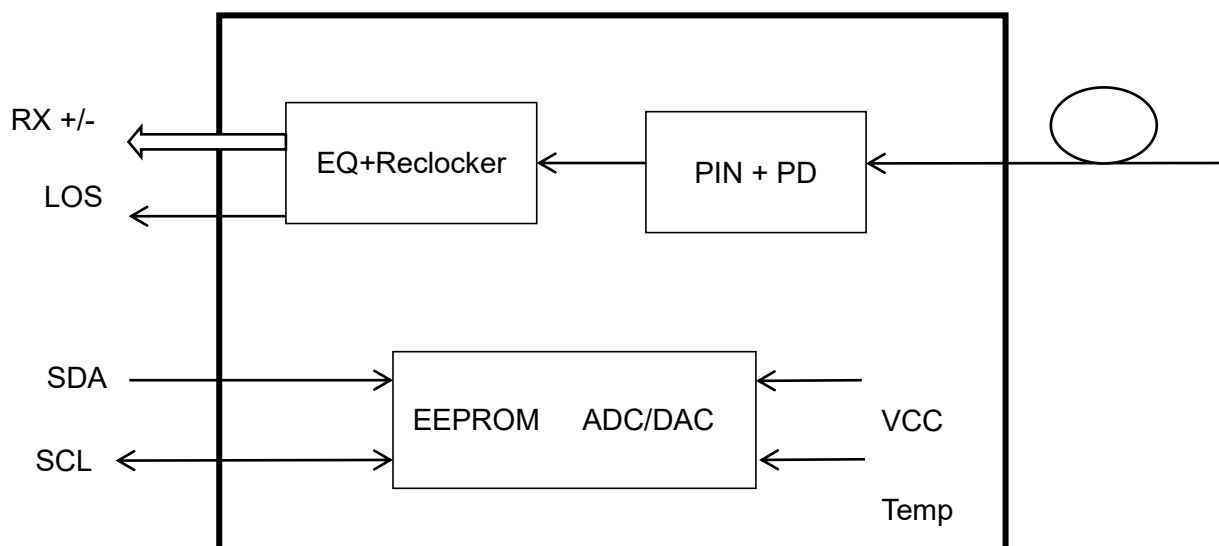


Figure 1. Module Block Diagram



Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|---------------------|--------|------|------|------|
| Supply Voltage | Vcc | -0.5 | 5.25 | V |
| Storage Temperature | Ts | -40 | +85 | °C |
| Operating Humidity | - | 5 | 85 | % |

Recommended Operating Conditions

| Parameter | Symbol | Min | Typical | Max | Unit |
|----------------------------|--------|------|---------|------|------|
| Operating Case Temperature | Tc | 0 | | +70 | °C |
| 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 | LOSD | | | -18 | dBm | |
| LOS Assert | LOSA | -28 | | | dBm | |
| LOS Hysteresis | LOSH | 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. Measured With Pathological Patterns 11.88Gbps (4096*2160 P60, 100% Bars); 5.94Gbps (4096*2160 P29.97, 100% Bars); 2.97Gbps (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%, are measured following a fourth-order Bessel-Thompson filter with a bandwidth of 0.75 x clock frequency corresponding to the serial data rate.

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 | VH | 2 | | Vcc | V |
| MOD_DEF (0:2)-Low | VL | | | 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. SCL,SDA. They should be pulled up with a 4.7k~10k Ω resistor on the host board.

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.

2. LOS is an open collector output, which should be pulled up with a 4.7k~10k Ω 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 100 Ω (differential) on the host.

Pin Definition

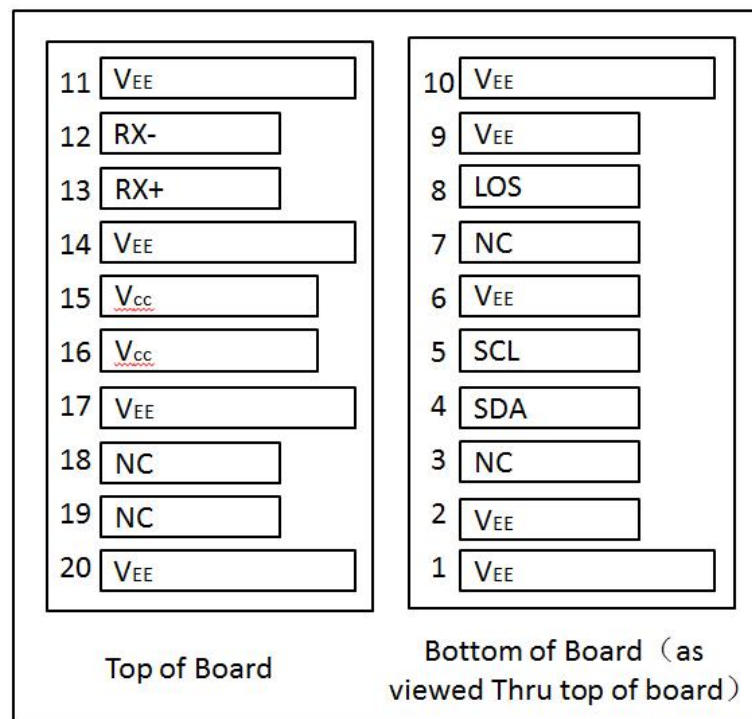


Figure 2. Electrical Pin-out Details

Mechanical Dimensions

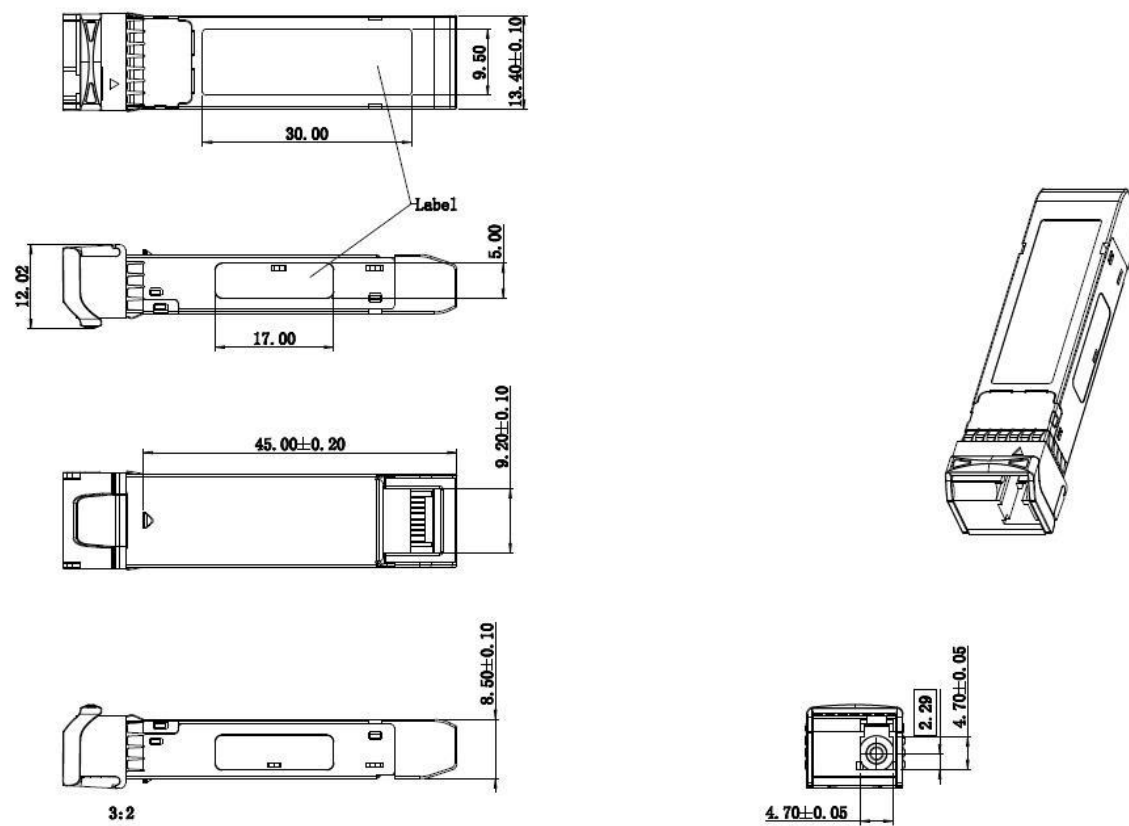


Figure 3. Mechanical Specifications



Regulatory Compliance

| Feature | Standard |
|--------------------------|--|
| 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 |
|--------------|---|
| FFB-V12K20CN | SD/HD/3G/6G/12G SDI Receiver, NON-MSA , Reclocker |

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