

Product Features

- ✧ Compliant with SFF-8431, SFF-8432 and IEEE802.3ae
- ✧ Cooled EML transmitter and APD receiver
- ✧ Digital Diagnostic Monitor Interface
- ✧ Hot pluggable
- ✧ Dual CDR with 9.95-11.3Gb/s
- ✧ link length up to 100km
- ✧ 10GBASE-ER, and 2G/4G/ 8G/10G Fiber Channel applications.
- ✧ Low power consumption
- ✧ Operating case temperature: 0 to 70 °C



Applications

- ✧ 10G Ethernet
- ✧ 10G Fiber Channel

Ordering Information

| Part Number | Output Power | Rec. Sens | Data Rate | Wavelength | Distance |
|-----------------|--------------|-----------|-----------|------------|----------|
| FH-SP551TCDL100 | 0 ~ 5 db | -25db | 10G | 1550nm | 100KM |

General

FH-SP551TCDL100 transceiver is designed to transmit and receive optical data over single mode optical fiber for link length 100km. The transceiver consists of two sections: The transmitter section incorporates a colded EML laser. And the receiver section consists of a APD photodiode integrated with a TIA. All modules satisfy class I laser safety requirements. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage.

Absolute Maximum Ratings

| Parameter | Symbol | Min. | Max. | Unit | Note |
|---------------------|--------|------|------|------|------|
| Supply Voltage | Vcc | -0.5 | 4.0 | V | |
| Storage Temperature | | -40 | 85 | °C | |
| Relative Humidity | | | 85 | % | |

Note: Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

| Parameter | | Symbol | Min. | Type | Max. | Unit | Note |
|----------------------|---------------|------------------|------|---------|------|------|------|
| Data Rate | Ethernet | | | 10.3125 | | Gb/s | |
| | Fiber Channel | | | | | | |
| Supply Voltage | | Vcc | 3.13 | 3.3 | 3.47 | V | |
| | | Vcc | | | | V | |
| Supply Current | | Icc ₅ | | | | mA | |
| | | Icc ₃ | | | 450 | mA | |
| Operating Case Temp. | | Tc | 0 | | 70 | °C | |

Electrical Input/Output Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Unit | Notes |
|----------------------------|--------|------|---------|---------|------|-------|
| Transmitter | | | | | | |
| Diff. input voltage swing | | 120 | | 820 | mVpp | 1 |
| Tx Disable input | H | VIH | 2.0 | Vcc+0.3 | V | |
| | L | VIL | 0 | 0.8 | | |
| Tx Fault output | H | VOH | 2.0 | Vcc+0.3 | V | 2 |
| | L | VOL | 0 | 0.8 | | |
| Input Diff. Impedance | Zin | | 100 | | Ω | |
| Receiver | | | | | | |
| Diff. output voltage swing | | 340 | 650 | 800 | mVpp | 3 |
| Rx LOS Output | H | VOH | 2.0 | Vcc+0.3 | V | 2 |
| | L | VOL | 0 | 0.8 | | |

Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.

Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.

Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

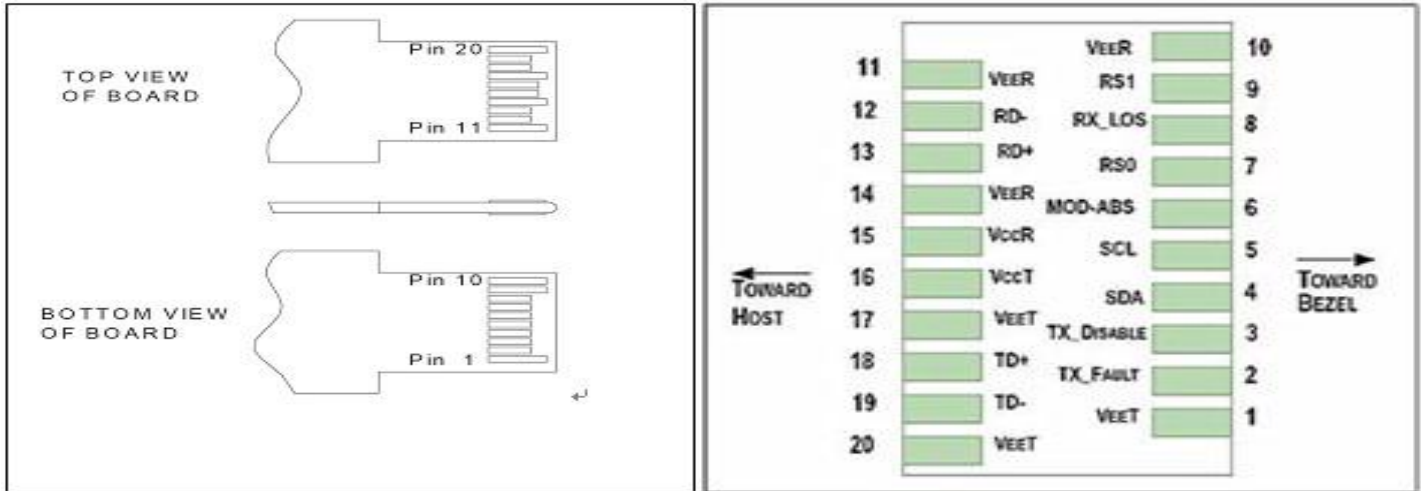
| Parameter | Symbol | Min. | Typical | Max. | Unit | Note |
|------------------------------|------------------------------|------|---------|------|------|------|
| Transmitter | | | | | | |
| Operating Wavelength | | 1530 | | 1565 | nm | |
| Ave. output power (Enabled) | Po | 0 | | 5 | dBm | 1 |
| Extinction Ratio | ER | 10 | | | dB | 1 |
| RMS spectral width | $\Delta\lambda$ | | | 1 | nm | |
| Rise/Fall time (20%~80%) | Tr/Tf | | | 50 | ps | 2 |
| SMSR | | | | >30 | dB | |
| Tx jitter(4m-80MHz) | | | | 0.1 | uipp | |
| Tx jitter(20k-80MHz) | | | | 0.3 | uipp | |
| Optical modulation amplitude | OMA | -6.2 | | | dBm | |
| Dispersion penalty | | | | 1 | dB | |
| Output Optical Eye | Compliant with IEEE 0802.3ae | | | | | |
| Receiver | | | | | | |
| Operating Wavelength | | 1260 | | 1600 | nm | |
| Sensitivity | Psen | | | -25 | dBm | 3 |
| Min. overload | Pimax | -7 | | | dBm | |
| LOS Assert | Pa | -32 | | | dBm | |
| LOS De-assert | Pd | | | -26 | dBm | |
| LOS Hysteresis | Pd-Pa | 0.5 | | 4 | dB | |

Note 1) Measured at 10.3125b/s with PRBS 2³¹ - 1 NRZ test pattern.

Note 2) 20%~80%

Note 3) Under the ER worst case, measured at 10.3125 Gb/s with PRBS 2³¹ - 1 NRZ test pattern for BER < 1x10⁻¹²

Pin Definitions And Functions



| Pin | Symbol | Name/Description |
|-----|--------------|---|
| 1 | VEET [1] | Transmitter Ground |
| 2 | Tx_FAULT [2] | Transmitter Fault |
| 3 | Tx_DIS [3] | Transmitter Disable. Laser output disabled on high or open |
| 4 | SDA [2] | 2-wire Serial Interface Data Line |
| 5 | SCL [2] | 2-wire Serial Interface Clock Line |
| 6 | MOD_ABS [4] | Module Absent. Grounded within the module |
| 7 | RS0 [5] | Rate Select 0 |
| 8 | RX_LOS [2] | Loss of Signal indication. Logic 0 indicates normal operation |
| 9 | RS1 [5] | Rate Select 1 |
| 10 | VEER [1] | Receiver Ground |
| 11 | VEER [1] | Receiver Ground |
| 12 | RD- | Receiver Inverted DATA out. AC Coupled |
| 13 | RD+ | Receiver DATA out. AC Coupled |



| | | |
|----|----------|--|
| 14 | VEER [1] | Receiver Ground |
| 15 | VCCR | Receiver Power Supply |
| 16 | VCCT | Transmitter Power Supply |
| 17 | VEET [1] | Transmitter Ground |
| 18 | TD+ | Transmitter DATA in. AC Coupled |
| 19 | TD- | Transmitter Inverted DATA in. AC Coupled |
| 20 | VEET [1] | Transmitter Ground |

Notes: [1] Module circuit ground is isolated from module chassis ground within the module.

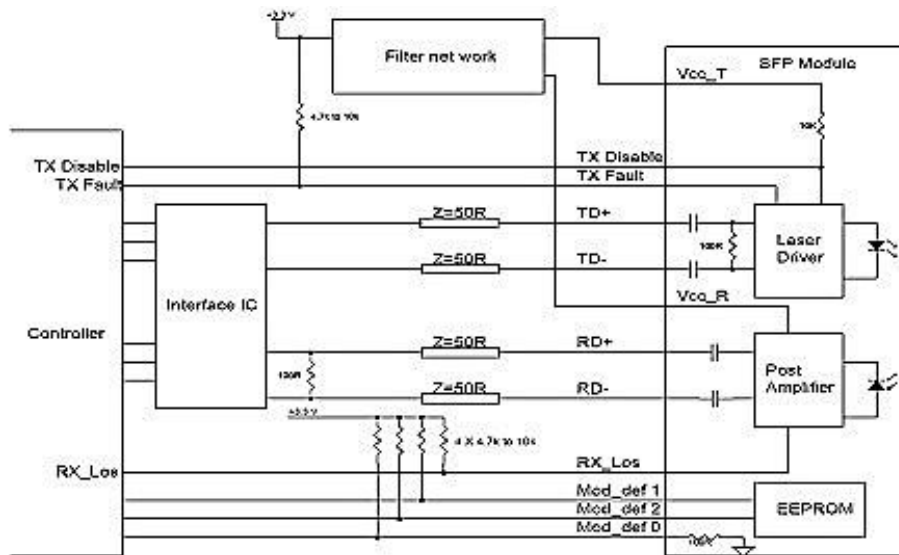
[2].should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.

[3]Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pullup to VccT inside the module.

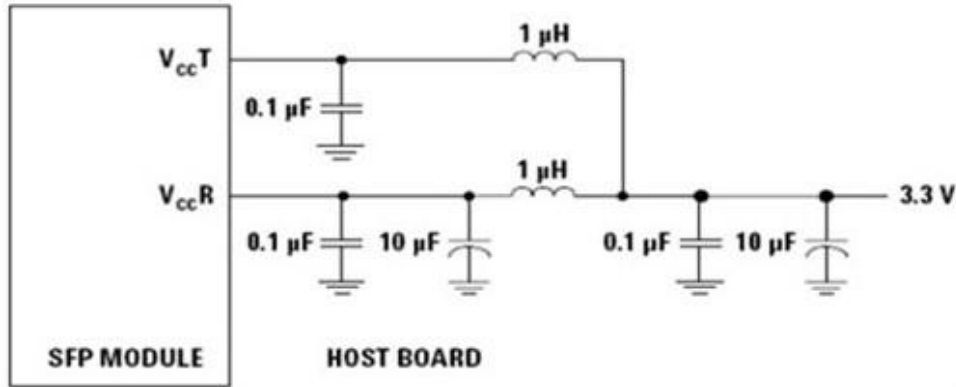
[4]Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc_Host with a resistor in the range 4.7 kΩ to 10 kΩ.Mod_ABS is asserted “High” when the SFP+ module is physically absent from a host slot.

[5] RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.

Typical Interface Circuit

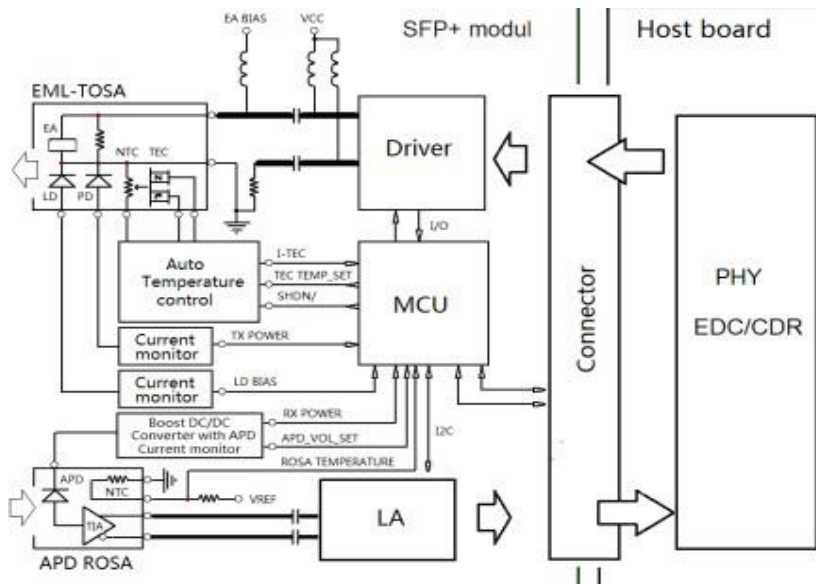


Recommended power supply filter



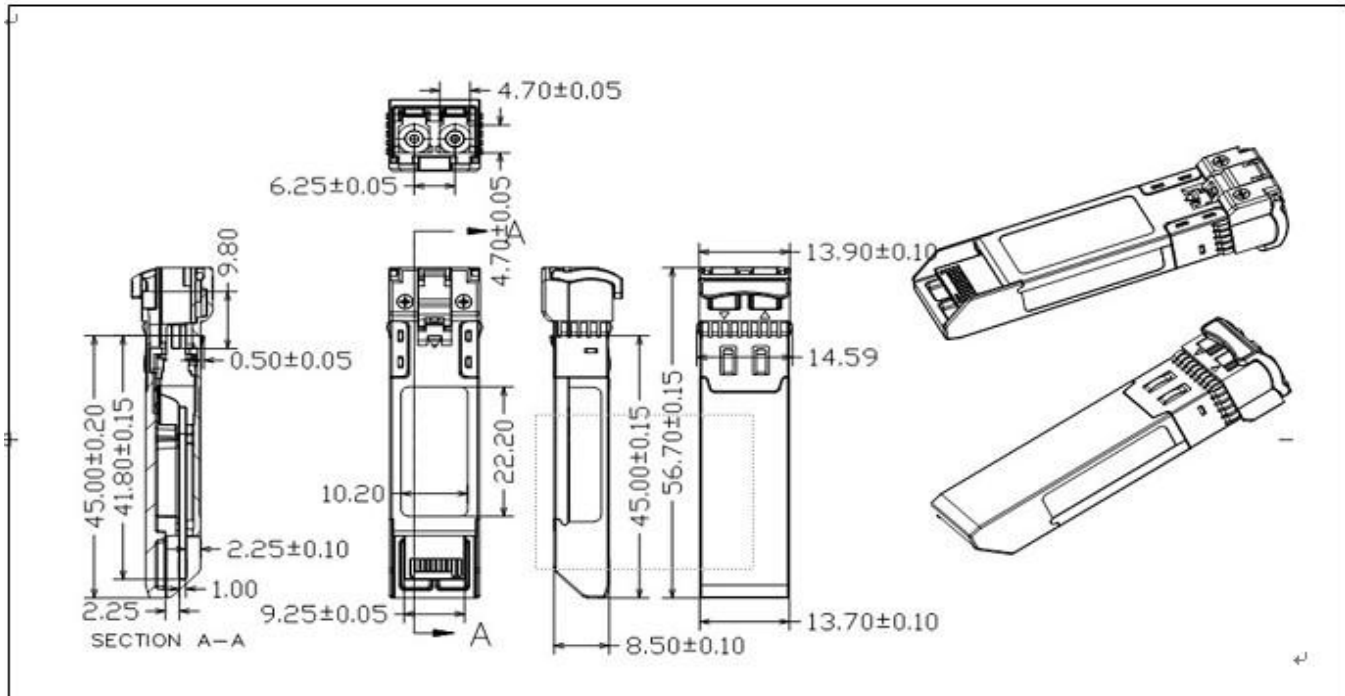
Note: Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30 mA greater than the steady state value

Functional Diagram





Package Dimensions



For More Information

FANG HANG TECH LIMITED

Add: Room 908, Jing yuan Building, 28 Bu long Rd, Long gang District, Shenzhen China

Tel: +86 755 89584520

Fax: +86 755 89584520

sales@fanghangtech.com

www.fanghangtech.com