



specifications compliant with SFF
8472 digital diagnostic monitoring
interface for optical transceivers

- ✧ Power Supply :+3.3V
- ✧ Operating case temperature Range:
Commercial: 0~ 70°C
Extended: -20~ 85°C
Industrial: -40~ 85°C
- ✧ RoHS compliant

Features:

- ✧ UP to 25.78Gb/s bit rates
- ✧ Hot-Pluggable SFP28 footprint
- ✧ Duplex LC connector
- ✧ CWDM DFB laser transmitter
- ✧ Up to 10km on 9/125m SMF
- ✧ 2-wire interface for management

Applications:

- ✧ 25GE LR
- ✧ eCPRI&CPRI

Part Number Ordering Information

| | |
|-------------|--|
| OP3010D-XX | 25GE, SFP28 LR 10km CWDM 1271~1371nm optical transceiver, 0~70°C, XX:27,29,31,33,35,37 |
| OP3010DE-XX | 25GE, SFP28 LR 10km CWDM 1271~1371nm optical transceiver, -20~85°C, XX:27,29,31,33,35,37 |
| OP3010DI-XX | 25GE, SFP28 LR 10km CWDM 1271~1371nm optical transceiver, -40~85°C, XX:27,29,31,33,35,37 |

Description:

OPWAY's **OP3010DX-XX** SFP28 transceivers are designed for use in Ethernet links up to 25.78 Gb/s data rate and up to 10 km link length. They are compliant SFF-8472 , and compatible with SFF-8432 and applicable portions of SFF-8431. The product is RoHS compliant and lead-free per Directive 2011/96/EU.

● **Absolute Maximum Ratings**

| Parameter | Symbol | Min. | Typical | Max. | Unit | Note |
|-----------------------------------|-----------------|------|---------|------|------|------------|
| Storage Temperature | T _S | -40 | | +85 | °C | |
| Case Operating Temperature | T _c | 0 | | +70 | °C | Commercial |
| Case Operating Temperature | T _c | -20 | | +85 | °C | Extended |
| Case Operating Temperature | T _c | -40 | | +85 | °C | Industrial |
| Maximum Supply Voltage | V _{cc} | 0 | | 3.6 | V | |
| Relative Humidity(Non-condensing) | RH | 0 | | 85 | % | |

● Electrical Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Unit | Note |
|---------------------------------------|------------------------|-----------------|---------|----------------------|------|------------|
| Supply Voltage | V _{cc} | 3.15 | | 3.46 | V | |
| Supply Current | I _{cc} | | | 550 | mA | Industrial |
| Power Consumption | P | | | 1.8 | W | Industrial |
| Data Rate | R | - | 25.8 | | Gb/s | |
| Fiber Length | L | | | 10 | KM | |
| Transmitter Section: | | | | | | |
| Input differential impedance | R _{in} | | 100 | | Ω | 1 |
| Differential input voltage swing | V _{in,pp} | 180 | | 450 | mV | 2 |
| Transmit Disable Voltage | V _D | 2 | | V _{cc} | V | 3 |
| Transmit Enable Voltage | V _{EN} | V _{ee} | | V _{ee} +0.8 | V | |
| Receiver Section: | | | | | | |
| Single Ended Output Voltage Tolerance | V | -0.3 | | 4 | V | |
| Rx Output Diff Voltage | V _o | 180 | | 450 | mV | |
| LOS Fault | V _{LOS fault} | 2 | | V _{cc} | V | 4 |
| LOS Normal | V _{LOS norm} | V _{ee} | | V _{ee} +0.8 | V | 4 |

Note:

1. Connected directly to TX data input pins. AC coupling from pins into laser driver IC.
2. Per SFF-8431 Rev 3.0
3. Into 100 ohms differential termination.
4. LOS is an open collector output. Should be pulled up with 4.7k – 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 5.5V.

● Optical Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Unit | Note |
|-------------------------------|------------------|--------|---------|--------|------|------|
| Transmitter Section: | | | | | | |
| Center Wavelength | λ _t | λ -6.5 | λ | λ +6.5 | nm | |
| spectral width(-20dB) | Δλ | | | 1 | nm | |
| Average Optical Power | P _{avg} | 0 | | 6 | dBm | |
| Laser Off Power | P _{off} | | | -30 | dBm | |
| Side Mode Suppression Ratio | | 30 | | | | |
| Extinction Ratio | ER | 3.5 | | | dB | |
| Optical Return Loss Tolerance | | | | -12 | dB | |
| Receiver Section: | | | | | | |
| Center Wavelength | λ _r | 1260 | | 1370 | nm | |
| Receiver Sensitivity | Sen | | | -14 | dBm | 1 |
| Los Assert | LOS _A | -30 | | - | dBm | |
| Los Dessert | LOS _D | | | -15 | dBm | |
| Los Hysteresis | LOS _H | 0.5 | | | dB | |
| Overload | | 2 | | | dBm | |

Note:

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1. Measured with a PRBS 2³¹-1 test pattern, @25.78Gb/s, BER<5E-5.

● Timing Characteristics

| Parameter | Symbol | Min. | Typical | Max. | Unit |
|---|--------------------|------|---------|------|------|
| TX_Disable Assert Time | t_off | | | 100 | us |
| TX_Disable Negate Time | t_on | | | 2 | ms |
| Time to Initialize 2-wire interface | t_2w_start_up | | | 300 | ms |
| Time to Initialize | t_start_up | | | 300 | ms |
| Time to Initialize cooled module and time to power up a cooled module to Power level II | t_start_up_cooled | | | 90 | s |
| Time to Power Up to Level II | t_power_level2 | | | 300 | ms |
| Time to Power Down from Level II | t_power_down | | | 300 | ms |
| Tx_Fault assert | Tx_Fault_on | | | 1 | ms |
| Tx_Fault assert for cooled module | Tx_Fault_on_cooled | | | 50 | ms |
| TX_FAULT Reset | t_reset | 10 | | | us |
| Rx_LOS assert delay | t_los_on | | | 100 | us |
| Rx_LOS negate delay | t_los_off | | | 100 | us |

● Pin Function Definition

| PIN # | Name | Function | Notes |
|-------|---------|--|-------|
| 1 | VeeT | Module transmitter ground | 1 |
| 2 | Fault | Module transmitter Fault | 2 |
| 3 | Disable | Transmitter Disable; Turns off transmitter laser output | 3 |
| 4 | SDL | 2 wire serial interface data input/output (SDA) | 4 |
| 5 | SCL | 2 wire serial interface clock input (SCL) | 4 |
| 6 | MOD-ABS | Module Absent, connect to VeeR or VeeT in the module | 2 |
| 7 | RS0 | Rate select0: module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module. | |
| 8 | LOS | Receiver Loss of Signal Indication | |
| 9 | RS1 | Rate select1: module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module. | |
| 10 | VeeR | Module receiver ground | 1 |
| 11 | VeeR | Module receiver ground | 1 |
| 12 | RD- | Receiver inverted data out put | |
| 13 | RD+ | Receiver non-inverted data out put | |
| 14 | VeeR | Module receiver ground | 1 |
| 15 | VccR | Module receiver 3.3V supply | |
| 16 | VccT | Module transmitter 3.3V supply | |
| 17 | VeeT | Module transmitter ground | 1 |
| 18 | TD+ | Transmitter non-inverted data output | |
| 19 | TD- | Transmitter inverted data output | |
| 20 | VeeT | Module transmitter ground | 1 |

Note:

1. The module ground pins shall be isolated from the module case.
2. This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.
3. This pin shall be pulled up with 4.7K-10Kohms to VccT in the module.
4. This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host_Vcc on the host board.

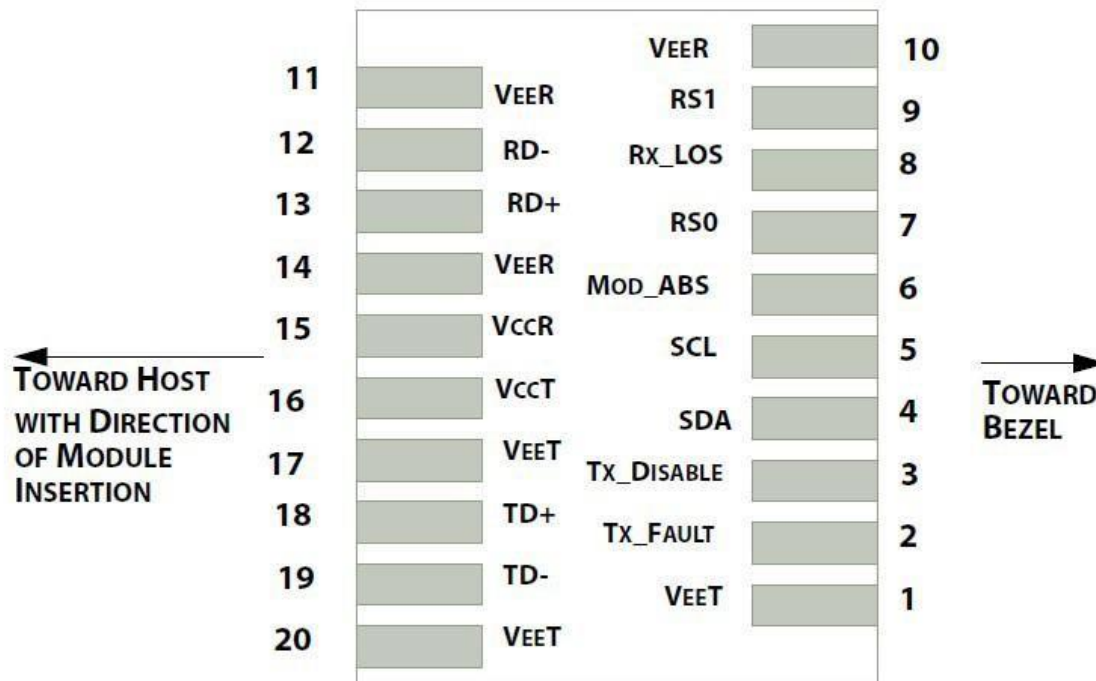
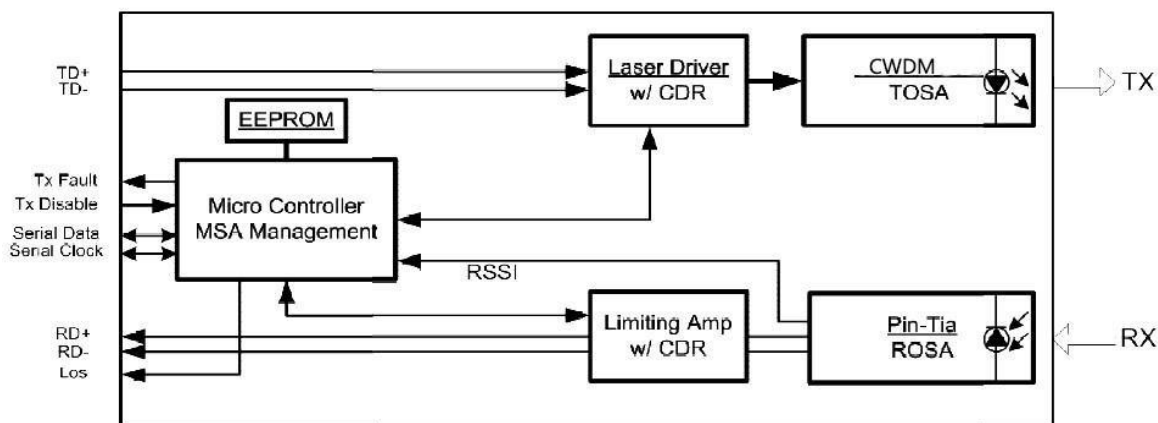


Diagram of Host Board Connector Block Pin Numbers and Names

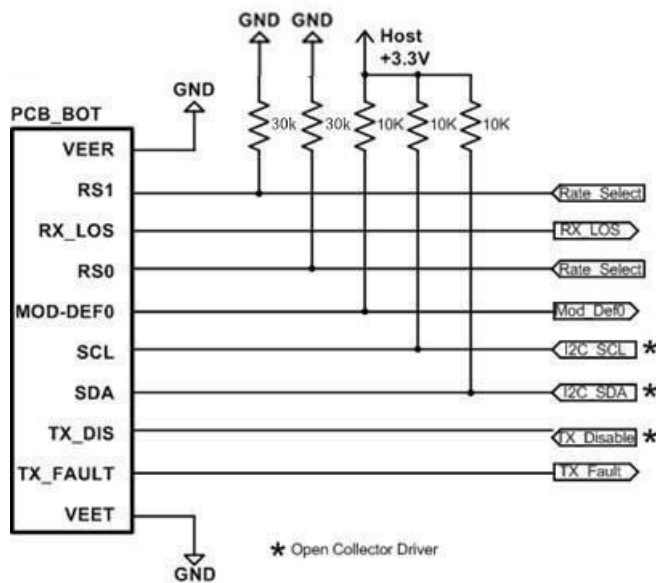
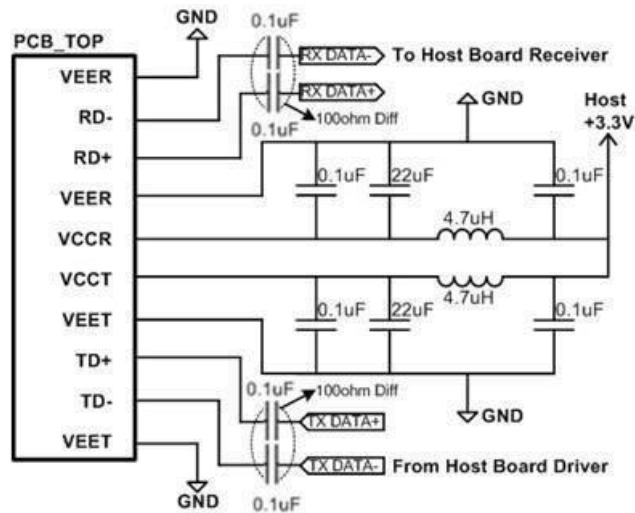
● **Digital Diagnostic Specifications**

| Parameter | Symbol | Units | Min | Max | Accuracy |
|--------------------------------------|----------|-------|------|------|----------|
| Transceiver Temperature | Temp | °C | -40 | +85 | ±5°C |
| Transceiver Supply Voltage | Voltage | V | 3.15 | 3.45 | ±3% |
| Transmitter Bias Current | Bias | mA | 0 | 35 | ±10% |
| Transmitter Output Power | Tx-Power | dBm | 0 | +6 | ±3dB |
| Receiver Average Optical Input Power | Rx-Power | dBm | -14 | +1 | ±3dB |

● **Transceiver Block Diagram**

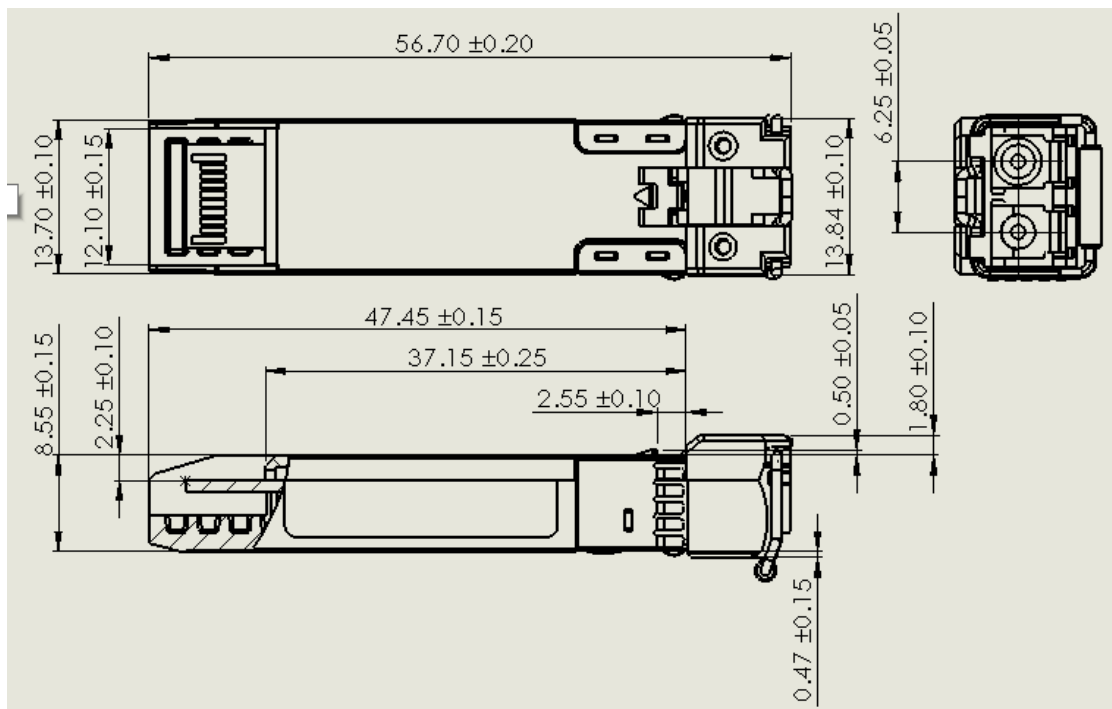


Recommended Circuit:



Recommended High-speed Interface Circuit

Mechanical Dimensions:



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