



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 bi-directional data links
- ✧ 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 <sub>S</sub>	-40		+85	°C	
Case Operating Temperature	T <sub>c</sub>	0		+70	°C	Commercial
Case Operating Temperature	T <sub>c</sub>	-20		+85	°C	Extended
Case Operating Temperature	T <sub>c</sub>	-40		+85	°C	Industrial
Maximum Supply Voltage	V <sub>cc</sub>	0		3.6	V	
Relative Humidity(Non-condensing)	RH	0		85	%	

● **Electrical Characteristics**

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	V <sub>cc</sub>	3.15		3.46	V	
Supply Current	I <sub>cc</sub>			550	mA	Industrial
Power Consumption	P			1.8	W	Industrial
Data Rate	R	-	25.8		Gb/s	
Fiber Length	L			10	KM	
<b>Transmitter Section:</b>						
Input differential impedance	R <sub>in</sub>		100		Ω	1
Differential input voltage swing	V <sub>in,pp</sub>	180		450	mV	2
Transmit Disable Voltage	V <sub>D</sub>	2		V <sub>cc</sub>	V	3
Transmit Enable Voltage	V <sub>EN</sub>	V <sub>ee</sub>		V <sub>ee</sub> +0.8	V	
<b>Receiver Section:</b>						
Single Ended Output Voltage Tolerance	V	-0.3		4	V	
Rx Output Diff Voltage	V <sub>o</sub>	180		450	mV	
LOS Fault	V <sub>LOS fault</sub>	2		V <sub>cc</sub>	V	4
LOS Normal	V <sub>LOS norm</sub>	V <sub>ee</sub>		V <sub>ee</sub> +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
<b>Transmitter Section:</b>						
Center Wavelength	λ <sub>t</sub>	λ -6.5	λ	λ +6.5	nm	
spectral width(-20dB)	Δλ			1	nm	
Average Optical Power	P <sub>avg</sub>	0		6	dBm	
Laser Off Power	P <sub>off</sub>			-30	dBm	
Side Mode Suppression Ratio		30				
Extinction Ratio	ER	3.5			dB	
Optical Return Loss Tolerance				-12	dB	
<b>Receiver Section:</b>						
Center Wavelength	λ <sub>r</sub>	1260		1370	nm	
Receiver Sensitivity	Sen			-14	dBm	1
Los Assert	LOS <sub>A</sub>	-30		-	dBm	
Los Dessert	LOS <sub>D</sub>			-15	dBm	
Los Hysteresis	LOS <sub>H</sub>	0.5			dB	
Overload		2			dBm	

Note:

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1. Measured with a PRBS 2<sup>31</sup>-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.

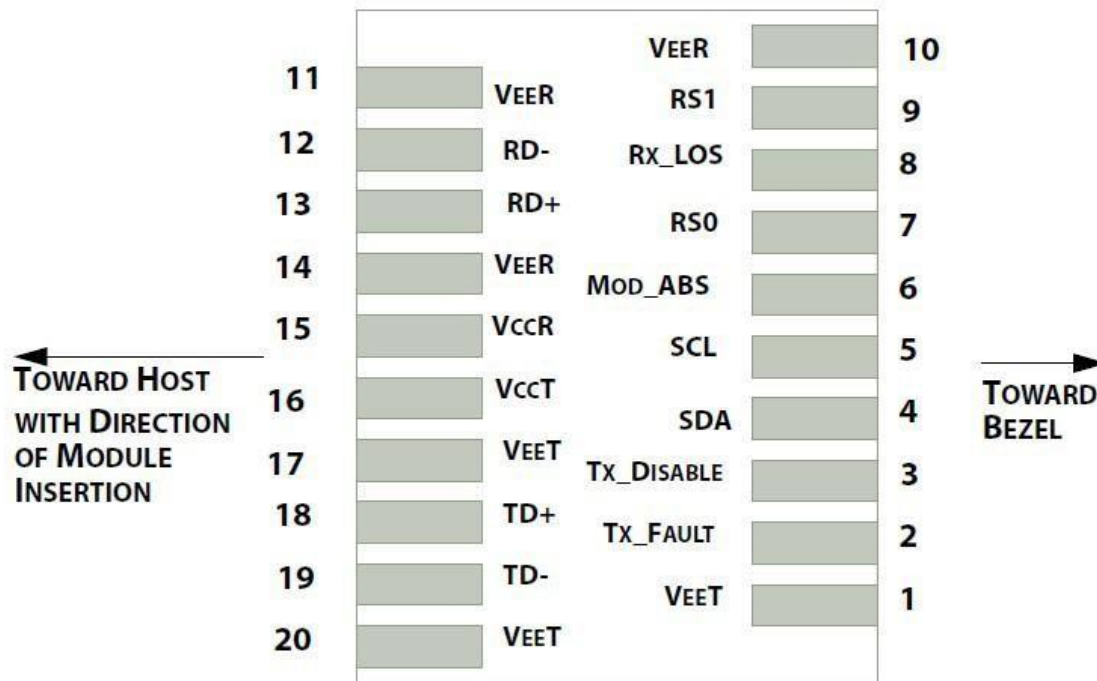
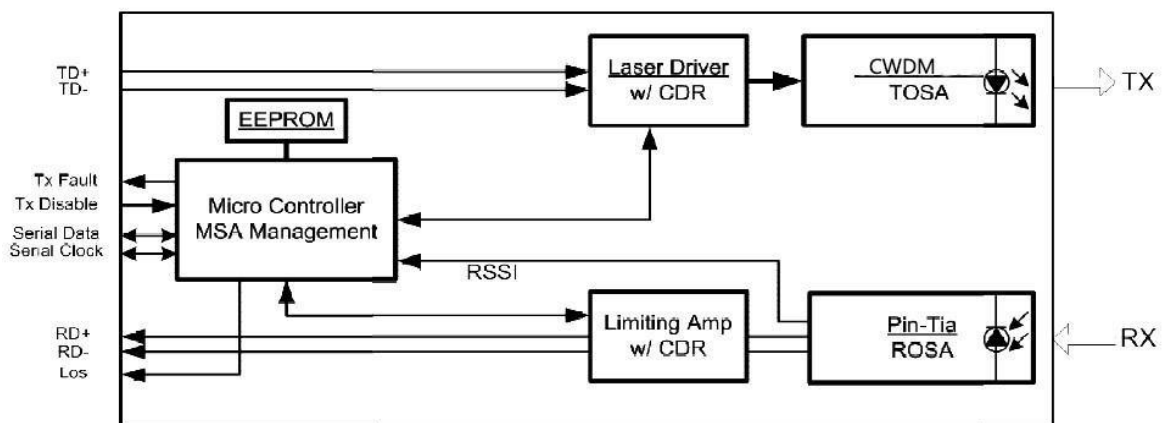


Diagram of Host Board Connector Block Pin Numbers and Names

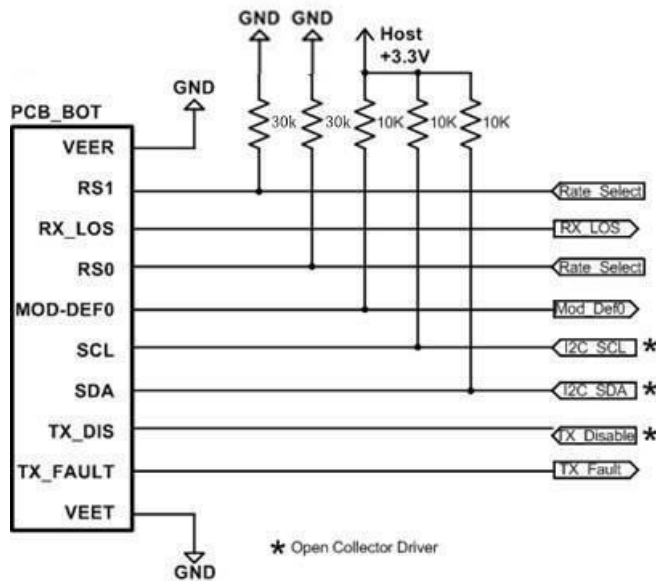
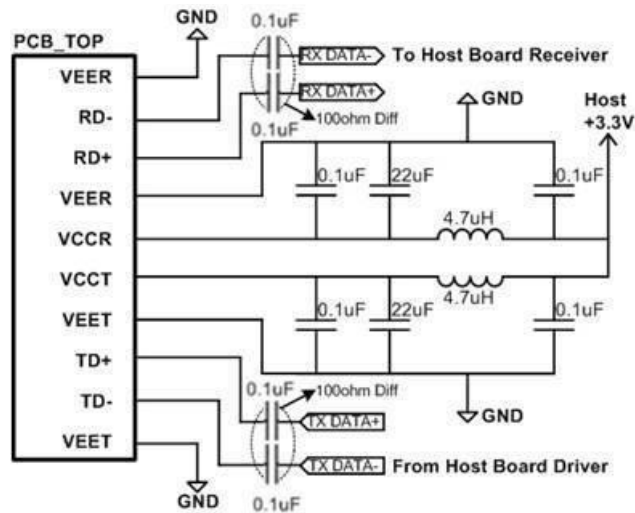
● **Digital Diagnostic Specifications**

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**

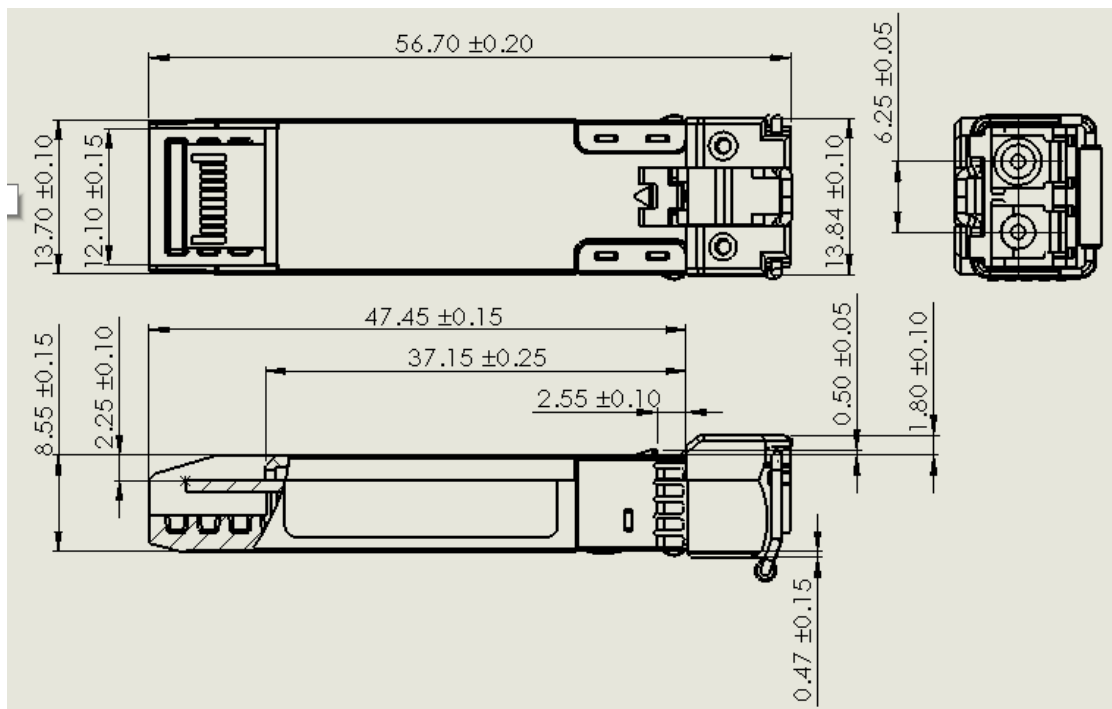


**Recommended Circuit:**



**Recommended High-speed Interface Circuit**

**Mechanical Dimensions:**



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