



- ✧ 1331nm DFB laser transmitter for OP5010DI-3327
- ✧ Up to 10km on 9/125m SMF
- ✧ 2-wire interface for management 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: -5~85°C  
Industrial: -40~ 85°C
- ✧ RoHS compliant

**Features:**

- ✧ UP to 25.78Gb/s bi-directional data links
- ✧ Hot-Pluggable SFP28 footprint
- ✧ Duplex LC connector
- ✧ 1271nm DFB laser transmitter for OP5010DI-2733

**Applications:**

- ✧ 25GE LR
- ✧ eCPRI&CPRI

**Part Number Ordering Information**

OP5010DI-2733	SFP28 LR 10km BIDI optical transceiver with full real-time digital diagnostic monitoring ,1271nm Transmitter&1331nm Receiver,-40~85°C, 25GE
OP5010DI-3327	SFP28 LR 10km BIDI optical transceiver with full real-time digital diagnostic monitoring , 1331nm Transmitter&1271nm Receiver, -40~85°C, 25GE
OP5010DE-2733	SFP28 LR 10km BIDI optical transceiver with full real-time digital diagnostic monitoring ,1271nm Transmitter&1331nm Receiver,-5~85°C, 25GE
OP5010DE-3327	SFP28 LR 10km BIDI optical transceiver with full real-time digital diagnostic monitoring , 1331nm Transmitter&1271nm Receiver, -5~85°C, 25GE
OP5010D-2733	SFP28 LR 10km BIDI optical transceiver with full real-time digital diagnostic monitoring ,1271nm Transmitter&1331nm Receiver, 0~70°C, 25GE
OP5010D-3327	SFP28 LR 10km BIDI optical transceiver with full real-time digital diagnostic monitoring , 1331nm Transmitter&1271nm Receiver, 0~70°C, 25GE

**Description:**

OPWAY's OP5010DI-XXXX 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.

**Shenzhen Opway Communication Co., Ltd.**

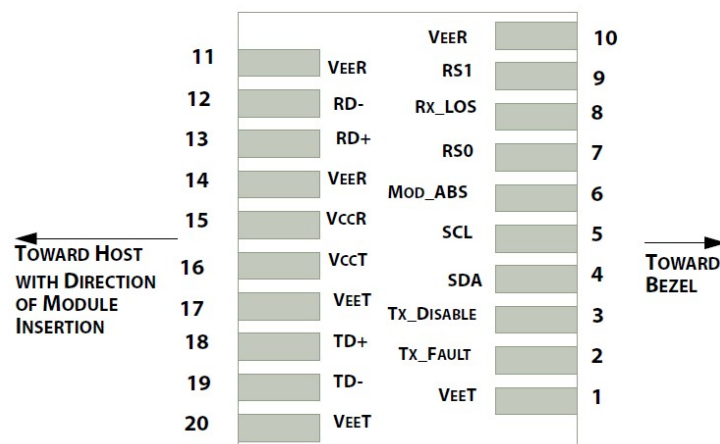
## PRODUCT SELECTION

### ● Pin Function Definitions

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 out put	
19	TD-	Transmitter inverted data out put	
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**

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### ● Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Storage Temperature	$T_S$	-40		+85	°C	
Case Operating Temperature	$T_A$	0		+70	°C	Commercial
		-5		+85	°C	Extended
		-40		+85	°C	Industrial
Maximum Supply Voltage	$V_{CC}$	0		3.6	V	
Relative Humidity(Non-condensing)	RH	0		85	%	

### ● Electrical Characteristics (VCC = 3.15 to 3.46 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	$V_{CC}$	3.14		3.46	V	
Supply Current	$I_{CC}$			300	mA	Commercial
				360	mA	Extended
				360	mA	Industrial
Power Consumption	$P$			1	W	Commercial
				1.2	W	Extended
				1.2	W	Industrial
Data Rate	$R$	24.3		26.5	Gb/s	
Fiber Length	$L$			10	KM	
<b>Transmitter Section:</b>						
Input differential impedance	$R_{in}$		100		$\Omega$	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	
<b>Receiver Section:</b>						
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		$V_{CC_{HOS}} - V_T$	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 – 10k $\Omega$  on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 5.5V.

### ● Optical Characteristics (VCC = 3.15 to 3.46 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
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Transmitter Section:						
Center Wavelength	$\lambda_t$	1265	1271	1277	nm	
		1325	1331	1337	nm	
spectral width(-20dB)	$\Delta \lambda$			1	nm	
Average Optical Power	$P_{avg}$	-5.0		+2.0	dBm	1
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	$\lambda_r$	1325	1331	1337	nm	
		1265	1271	1277	nm	
Receiver Sensitivity	Sen			-9	dBm	2
Los Assert	$LOS_A$	-30		-	dBm	
Los Dessert	$LOS_D$			-16	dBm	
Los Hysteresis	$LOS_H$	0.5			dB	
Overload		2			dBm	

Note:

1. Average power figures are informative only, per IEEE802.3cc.
2. Receiver sensitivity is informative. Shall be measured with conformance test signal for . BER =5x 10<sup>-5</sup>.

### ● Timing Characteristics

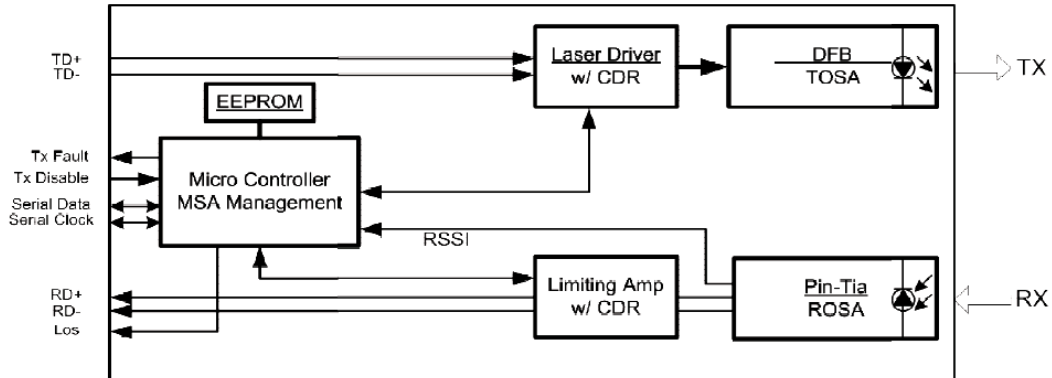
Parameter	Symbol	Min.	Typical	Max.	Unit
TX_Disable Assert Time	t_off			100	us
TX_Disable Negate Time	t_on			2	ms
Time to Initialize 2-wire interface	t_2w_start_up			300	ms
Time to Initialize	t_start_up			300	ms
Time to Initialize cooled module and time to power up a cooled module to Power level II	t_start_up_cooled			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

### ● Digital Diagnostic Specifications

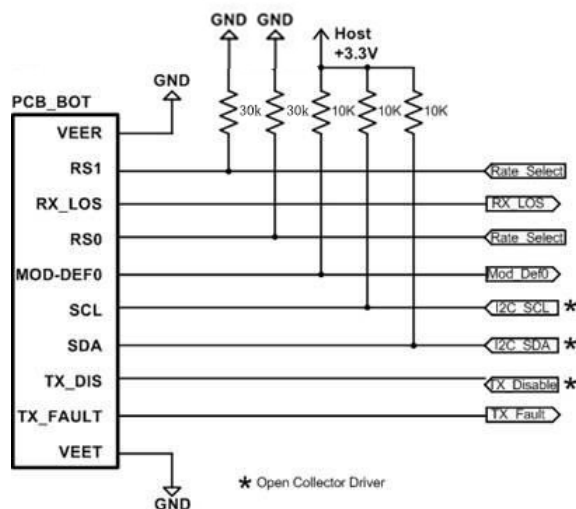
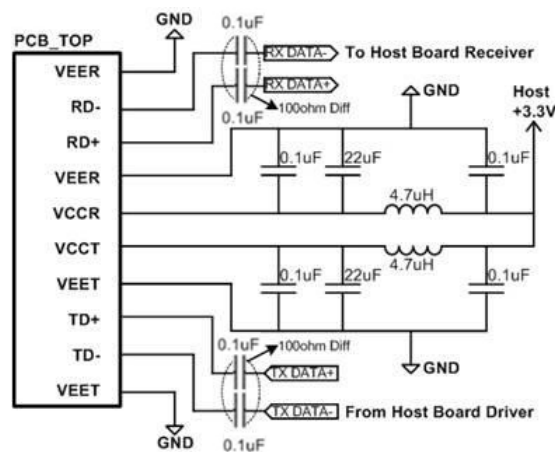
Parameter	Symbol	Units	Min	Max	Accuracy	Note
Transceiver Temperature	DDDTemp	°C	-40	+85	±5°C	Industrial
			-5	+85	±5°C	Extended
			0	+70	±5 °C	Commercial
Transceiver Supply Voltage	DDDVoltage	V	3.15	3.45	±3%	
Transmitter Bias Current	DDDBias	mA	0	35	±10%	

Transmitter Output Power	DDDTx-Power	dBm	-5	+5	±3dB	
Receiver Average Optical Input Power	DDDRx-Power	dBm	-16	-3	±3dB	

● Transceiver Block Diagram

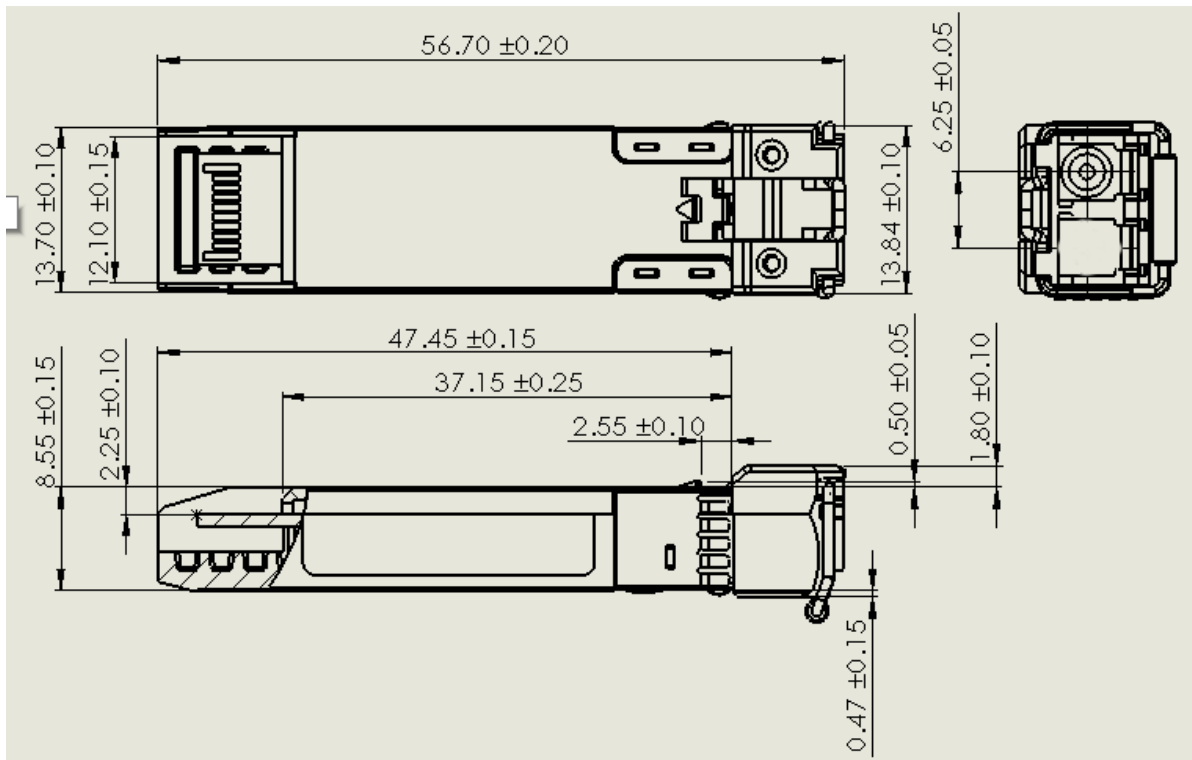


Recommended Circuit:



Recommended High-speed Interface Circuit

### Mechanical Dimensions:



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