

## Product Specification

### 1.25Gbps BIDI SFP Optical Transceiver 10k m

#### 1. Feature:

- SFP package with LC connector
- 86231: 1310nm FP Laser and 1490nm PIN photodetector
- 86230: 1490nm DFB Laser and 1310nm PIN photodetector
- Up to 10km transmission on SMF
- +3.3V single power supply
- LVPECL compatible data input/output interface
- Low EMI and excellent ESD protection
- laser safety standard IEC-60825 compliant

#### 2. Application:

- Ethernet
- Telecom
- Fiber Channel

#### 3. Absolute Maximum Ratings:

Parameter	Symbol	Minimum	Maximum	Units
Storage Temperature	Tst	-40	+85	°C
Supply Voltage	Vcc	0	+3.6	V
Operating Relative Humidity	RH	5	95	%

#### 4. Operation Environment:

Parameter		Symbol	Min	Typical	Max	Units
Supply Voltage		Vcc	3.15	3.3	3.45	V
Operating Case Temperature	Commercial	Tc	0		+70	°C
	Industrial		-40		+85	
Power Dissipation					1	W
Data Rate				1.25		Gbps

#### 5. Optical Characteristics:

(Ambient Operating Temperature 0°C to +70°C, Vcc =3.3 V)

Parameter		Symbol	Min.	Typ.	Max.	Units
<b>Transmitter Section</b>						
Center Wavelength	Tx 1310	$\lambda_o$	1260	1310	1360	nm
	Tx 1490		1480	1490	1500	
Spectral Width(RMS)	Tx 1310	$\Delta\lambda$	-	-	4	nm
	Tx 1490				1	
Average Output Power	Tx 1310	Po	-8	-	-3	dBm
	Tx 1490		-8		-3	
Extinction Ratio		Er	10	-	15	dB
Rise/Fall Time(20%~80%)		Tr/Tf			0.26	ns
Total jitter		Tj			0.43	UI
Optical Eye Diagram		IEEE 802.3z and ANSI Fibre Channel Compatible				

Receiver Section						
Center Wavelength	Rx 1490	$\lambda_o$	1480	1490	1500	nm
	Rx 1310		1260	1310	1360	
Receiver Sensitivity		R <sub>sen</sub>			-24	dBm
Receiver Overload		R <sub>ov</sub>	-3			dBm
Return Loss			12			dB
LOS Assert		LOS <sub>A</sub>	-36			dBm
LOS Dessert		LOS <sub>D</sub>			-24	dBm
LOS Hysteresis			0.5		5	

## 6. Electrical Characteristics:

(Ambient Operating Temperature 0°C to +70°C, V<sub>cc</sub> = 3.3 V)

Parameter		Symbol	Min.	Typ.	Max.	unit
Transmitter Section						
Input Differential Impendence		Z <sub>in</sub>	90	100	110	Ohm
Data Input Swing Differential		V <sub>in</sub>	500		2400	mV
TX Disable	Disable		2.0		V <sub>cc</sub>	V
	Enable		0		0.8	V
TX Fault	Assert		2.0		V <sub>cc</sub>	V
	Deassert		0		0.8	V
Receiver Section						
Output differential impendence		Z <sub>out</sub>		100		Ohm
Data Input Swing Differential		V <sub>out</sub>	370		2000	mV
Rx_LOS	Assert		2.0		V <sub>cc</sub>	V
	Deassert		0		0.8	V

## 7. Pin Description:

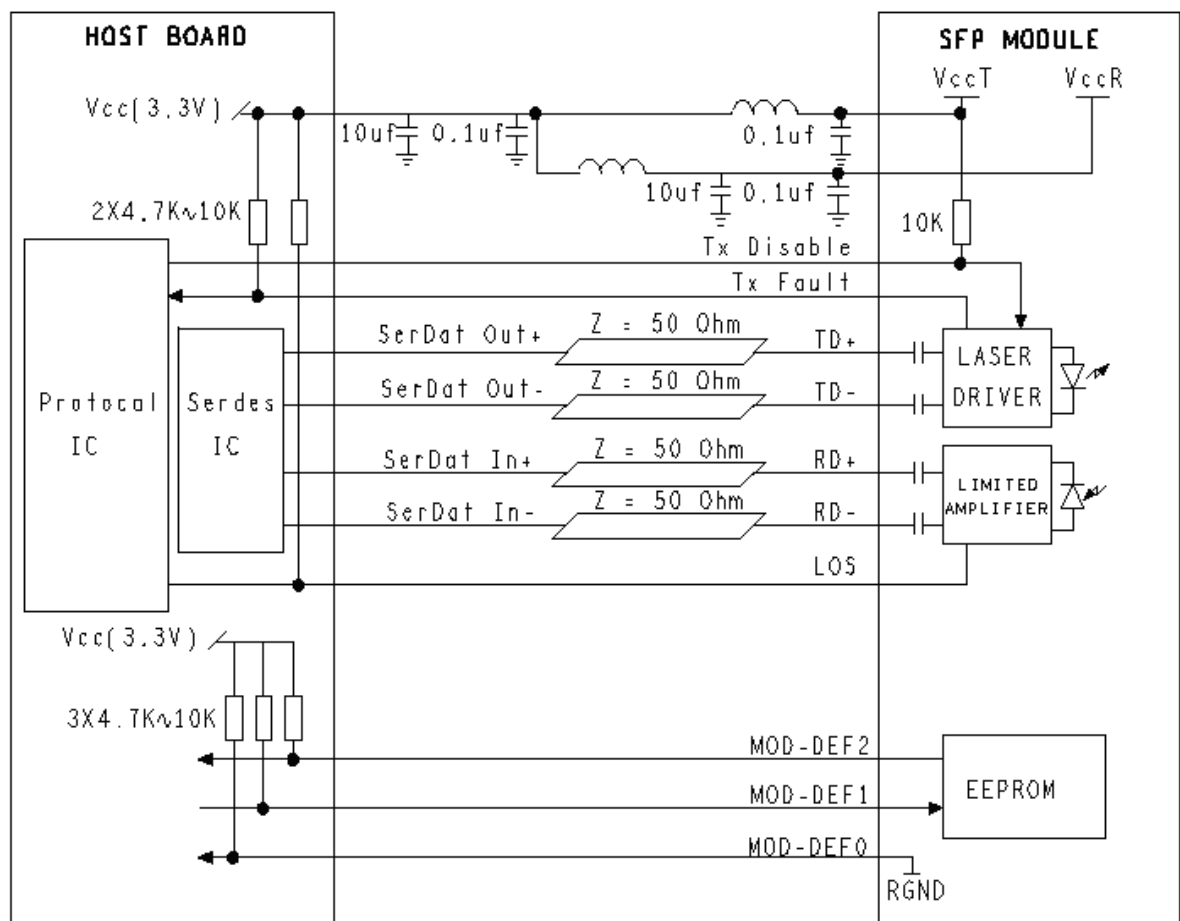
Pins	Name	Discription	NOTE
1	VeeT	Transmitter Ground	
2	Tx Fault	Transmitter Fault Indication	1
3	Tx Disable	Transmitter Disable	2
4	MOD DEF2	Module Definition 2	3
5	MOD DEF1	Module Definition 1	3
6	MOD DEF0	Module Definition 0	3
7	Rate Select	Not Connected	
8	LOS	Loss of Signal	4
9	VeeR	Receiver Ground	
10	VeeR	Receiver Ground	
11	VeeR	Receiver Ground	
12	RD-	Inv. Received Data Output	5
13	RD+	IReceived Data Output	5
14	VeeR	Receiver Ground	
15	VccR	Receiver Power	
16	VccT	Transmitter Power	
17	VeeT	Transmitter Ground	
18	TD+	Transmit Data Input	6
19	TD-	Inv. Transmit Data Input	6
20	VeeT	Transmitter Ground	

Notes:

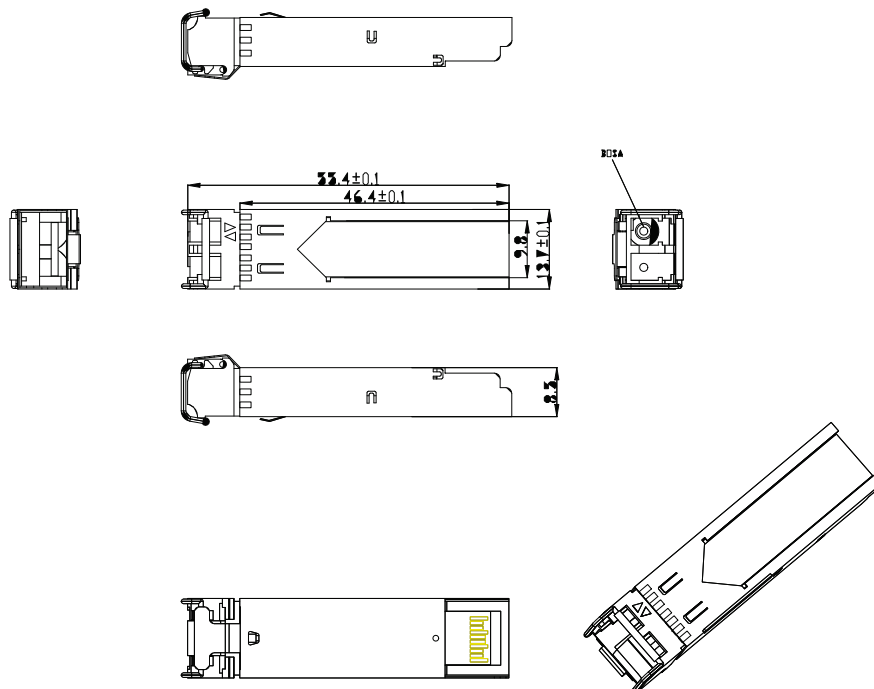
1. TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
2. TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:  
 Low (0~0.8V): Transmitter on  
 (>0.8V, <2.0V): Undefined  
 High (2.0~3.3V): Transmitter Disabled  
 Open: Transmitter Disabled
3. MOD-DEF 0,1,2 are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.

- MOD-DEF 0 is grounded by the module to indicate that the module is present  
MOD-DEF 1 is the clock line of two wire serial interface for serial ID  
MOD-DEF 2 is the data line of two wire serial interface for serial ID
4. LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates loss of signal. In the low state, the output will be pulled to less than 0.8V.
  5. These are the differential receiver output. They are internally AC-coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES.
  6. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module.

## 8. Recommended Application Circuit:



## 9. Outline drawing (mm):



## 10. Ordering information :

Model	Speed	Wavelength	Distance	Source	Temperature	DDM
86231	1.25G	1310/1490	10KM	FP+PIN	0~70°C	YES
86230	1.25G	1490/1310	10KM	DFB+PIN	0~70°C	YES