TITLE	DOC No. RFD-20220829004-003	
1G SFP Bidi 80km 1490/1550 & 1550/1490 Transceiver	REVISION：01	AUTHORIZED BY：Albert Lin
	DATE：2022.09.06	CLASSIFICATION：CONFIDENTIAL

1. PRODUCT FEATURES

- Up to 1.25Gbps Data Links
- 1550nm(1490nm) DFB laser transmitter and PIN/TIA receiver
- Maximum link length of 80km on 9/125um SMF
- Hot-pluggable SFP footprint
- LC receptacles
- Low power dissipation
- RoHS compliant and lead-free
- Support Digital Diagnostic Monitor interface
- Single +3.3V power supply
- Compliant with SFF-8472
- Case operating temperature: Commercial: 0°C to +70°C / Industrial: -40°C to +85°C

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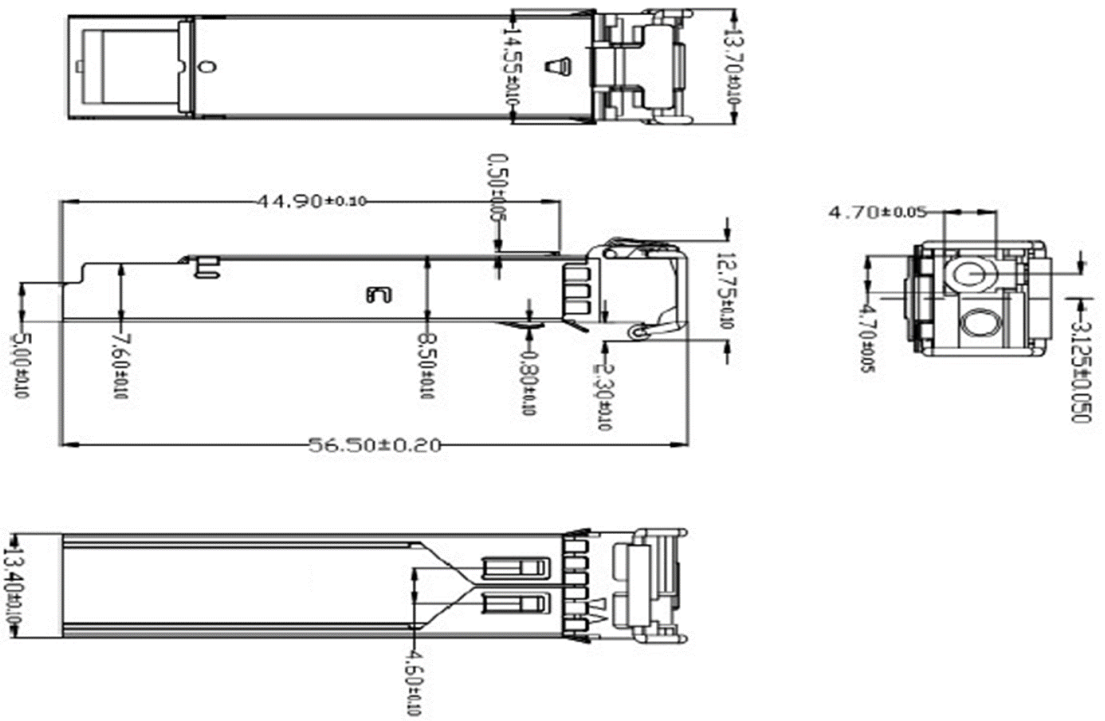
2. PRODUCT DESCRIPTION

2.1 PRODUCT NAME

1.25G SFP Bidi 80km Transceiver

Data Rate	Wavelength (nm)	Optical Power	Sensitivity	Connector	Temp.
1G	1490/1550	-2 ~3 dBm	-24 dBm	LC	**C**
1G	1490/1550	-2 ~3 dBm	-24 dBm	LC	**I**
1G	1550/1490	-2 ~3 dBm	-24 dBm	LC	**C**
1G	1550/1490	-2 ~3 dBm	-24 dBm	LC	**I**

2.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING



Unit is millimeter. All dimensions are ±0.1mm unless otherwise specified.

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3. APPLICABLE DOCUMENTS AND SPECIFICATIONS

- Fast Ethernet
- Router/Server Interface
- Switch to Switch Interface
- Other Optical Links

4. Absolute Maximum Ratings & Recommended Operating Conditions

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Maximum Supply Voltage	Vcc	-0.5	3.6	V
Storage Temperature	Ts	-40	85	°C
Case Operating Temperature (Commercial)	Top	0	70	°C
Case Operating Temperature (Industrial)		-40	85	
Relative Humidity	RH	0	85	%

Notes:

1.Limited by the fiber cable jacket, not the active ends.

2.Non-condensing.

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Transmitter Optical Specification

Parameter	Symbol	Min.	Typical	Max.	Unit
Center Wavelength	λc	1540	1550	1560	nm
		1480	1490	1500	
Spectral Width(-20dB)	Pm			1	nm
Side-mode Suppression Ration	SMSR	30			dB
Average Output Power	Pavg	-2		3	dBm
Extinction Ratio	ER	9			dB
Return Loss		12			dB
Transmitter OFF Output Power	POff			-30	dBm

Receiver Optical Specification

Parameter	Symbol	Min.	Typical	Max.	Unit
Center Wavelength	λc	1470	1490	1510	nm
		1530	1550	1570	
Receiver Sensitivity, Average Power				-24	dBm
Receiver Saturation Power	Psat			0	dBm
Loss of Signal Assert	P_A	-35			dBm
Loss of Signal De-assert	P_D			-26	dBm
LOS Hysteresis	P_D- P_A	0.5			dB

Electrical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	Vcc	3.135	3.3	3.465	V
Supply Current	Icc			300	mA
Transmitter					
Input differential impedance	Rin		100		

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Differential data input swing	Vin, pp	200		1000	mV
Transmit Disable Voltage	V_D	2		V_{CC}	V
Transmit Enable Voltage	V_{EN}	Vee		Vee+0.8	V
Receiver					
Differential data output swing	Vout, pp	200		1000	mV
LOS Fault	V_{LOS_fault}	2		Vcc	V
LOS Normal	V_{LOS_norm}	Vee		Vee+0.8	V
Power Supply Noise Tolerance	V_{CCT}/V_{CCR}	Per SFP MSA			mVpp

Notes:

1. Connected directly to TX data input pins.AC coupling from pins into laser driver IC.

2. Into 100Ω differential termination.

3. Loss of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

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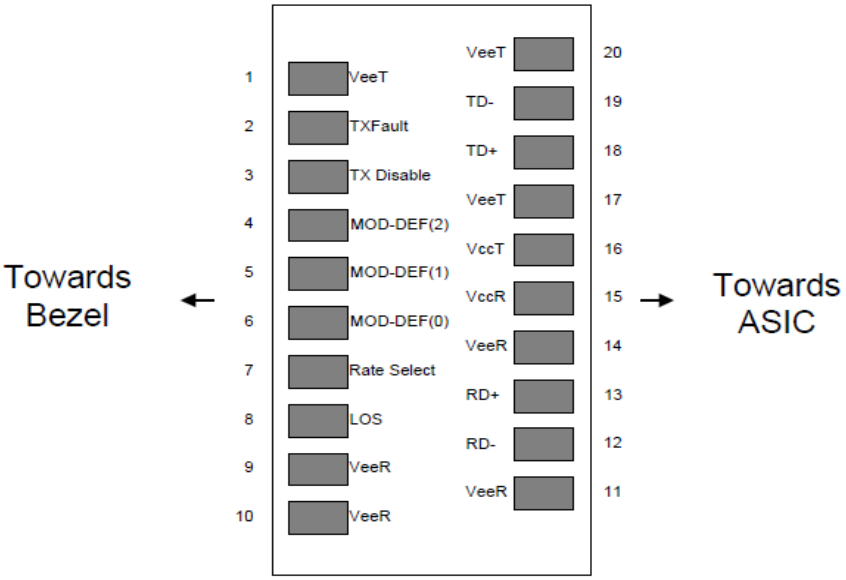
5. Applications Note:



Pin Definitions

Pin Assignment

Pin	Symbol	Name / Description	Ref
1	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T_{FAULT}	Transmitter Fault.	2
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open.	3
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	4
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	4
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	4
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic “0” indicates normal operation.	5
9	V_{EER}	Receiver Ground (Common with Transmitter Ground)	
10	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out (CML). AC Coupled	
13	RD+	Receiver Non-inverted DATA out (CML). AC Coupled	
14	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1

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15	V_{CCR}	Receiver Power Supply	
16	V_{CCT}	Transmitter Power Supply	
17	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.

2. T_{FAULT} is an open collector/drain output, which is pulled up with a 4.7kΩ – 10kΩ resistor on the host board but is grounded inside the SFP cable plug.

3. Laser output disabled on T_{DIS} >2.0V or open, enabled on T_{DIS} <0.8V.

4. Mod-Def 0,1,2. These 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

5. LOS is open collector output. Should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Digital Diagnostic Monitoring Information

Parameter	Unit	Accuracy
Case Temperature	℃	±3
Supply Voltage	V	±3%
Tx Bias Current	mA	±10%
Tx Optical Power	dB	±3
Rx Optical Power	dB	±3

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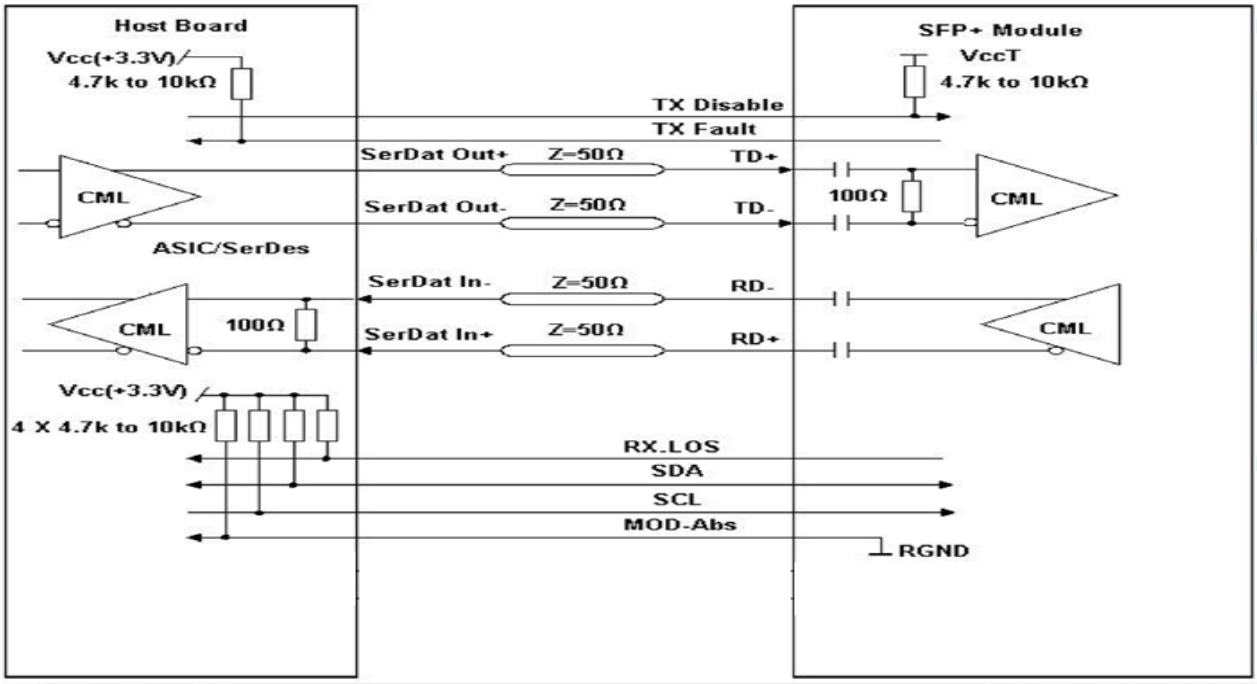
Recommended Interface Circuit



7. Modification History

Rev.	Comments	Date	Originator	Approval
01	Initial	2022.09.06	Albert Lin	Mike Sun