

TITLE 10G SFP+ LRL 2km Transceiver	DOC No. RFD-20220517013-002	
	REVISION : 01	AUTHORIZED BY : Mike Sun
	DATE : 2022.05.17	CLASSIFICATION : CONFIDENTIAL

1. SCOPE

The scope of this specification is the definition of a high performance, cost effective modules, which is optimized for 10G LR SFP+, and transmission distance up to 10Km. The transceiver consists of two sections: The transmitter section incorporates a 1310nm DFB. The receiver section consists of a PIN photodiode integrated with a trans-impedance preamplifier (TIA).

2. PRODUCT FEATURES

- Compliant to SFP+ MSA
- Fully RoHS Compliant
- All metal housing for superior EMI performance
- Operating data rate up to 11.1Gbps
- High sensitivity Pin photodiode and TIA
- LC duplex connector
- Hot pluggable 20pin connector
- Low power consumption <1 W
- Temperature range: Tc 0°C to 70°C / Tl -40°C to 85°C
- Single +3.3V±5% power supply
- Digital Monitoring SFF-8472 Rev 10.2 compliant

3. PRODUCT DESCRIPTION

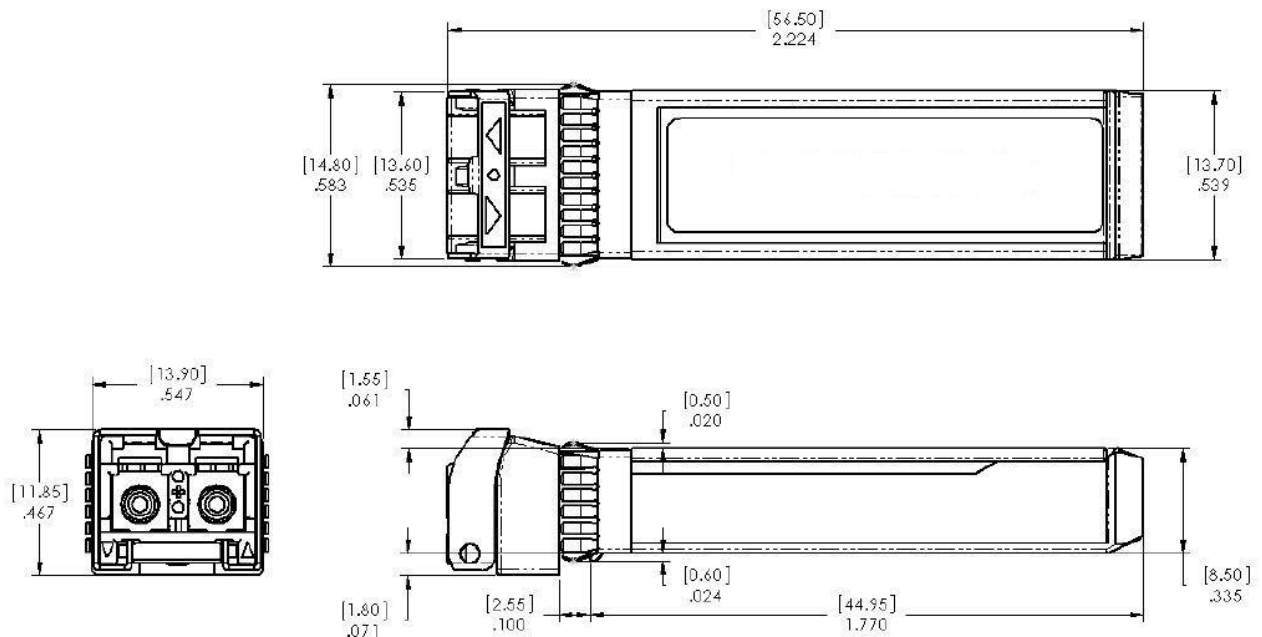
3.1 PRODUCT NAME AND SERIES NUMBER(S)

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10G LRL SFP+ Transceiver

Part Number	Data Rate	Wavelength (nm)	Distance	Media	Power (dBm)	Sen. (dBm)	Connector	Tem.
P58000BGCB02-1	10G	1310	2km	SMF	-6 ~ 2	< -14	LC	C
P58000BGIB02-1	10G	1310	2km	SMF	-6 ~ 2	< -14	LC	I

3.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING



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

4. APPLICABLE DOCUMENTS AND SPECIFICATIONS

- 10GBASE-LR/LW
- 10G Fiber Channel
- SFP+ MSA (SFF-8472)

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- 10Gbps IEEE 802.3ae 10GBASE-LR and 10GBASE-LW compliant

5. QUALIFICATION

- Electrostatic Discharge (ESD) to the Electrical Pins
- Electrostatic Discharge (ESD) to the LC Connector
- RoHS compliance

6. Absolute Maximum Ratings & Recommended Operating Conditions

Absolute Maximum Ratings				
Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	+85	°C
Supply Voltage	VCC3	-0.5	4	V
Relative Humidity(Non-condensing)	RH	0	85	%

Recommended Operating Conditions					
Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TC	0	25	70	°C
Operating Case Temperature	Tl	-40	25	85	°C
Power Supply Voltage	VCC3	3.135	3.3	3.465	V
	ICC3			300	mA
Power Dissipation	Pd			1	W
Transmission Distance				10	Km

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Transmitter Operating Characteristic-Optical, Electrical

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Center Wavelength	λ_c	1260	1310	1360	nm	
SMSR	SMSR	30			dB	
Operating Data Rate			10.3125		Gbps	
-20dB Spectral width				1	nm	
Launch Optical Power	Po	-6	-	2	dBm	
OMA Optical Power	POMA	-5	-		dBm	
Extinction Ratio	ER	3.5			dB	
Optical Eye Mask Margin		20			%	1
Pout @TX-Disable Asserted	Poff			-30	dBm	
Relative Intensity Noise	RIN12OMA	-	-	-128	dB/Hz	
Input differential impedance			100		Ω	
Differential data input swing		180		1000	mV	
Tx_Fault	High	2.0		VCCHOST	V	Tx_Fault,
	Low	0		0.8	V	
Tx Disable	VIH	2.0		VCCHOST	V	Tx Disable
	VIL	0		0.8	V	

Note 1: The test result are measured by ZYXEL XS3800-28

Receiver Operating Characteristic-Optical, Electrical

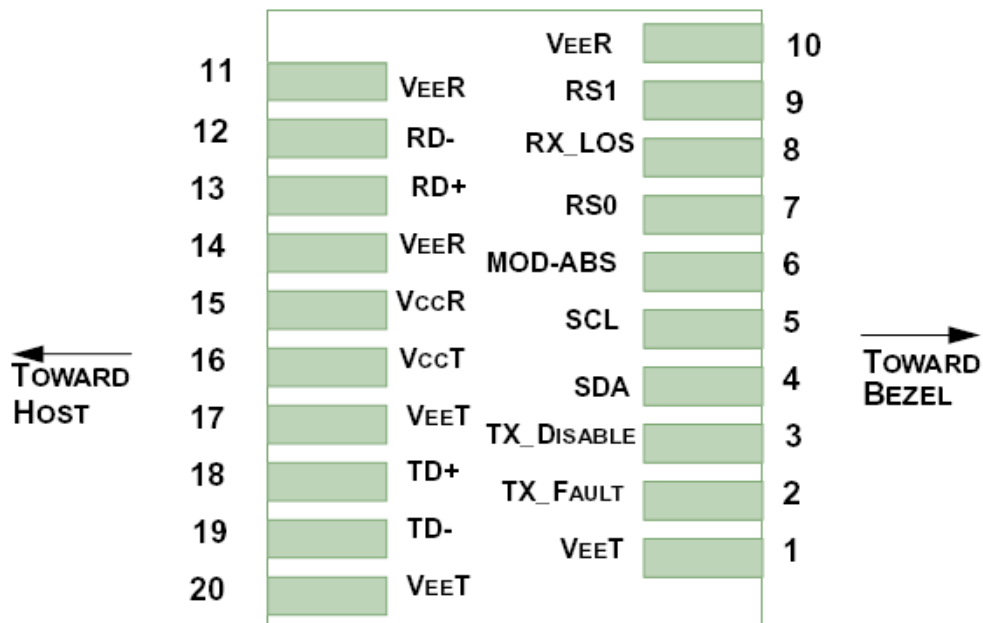
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Center Wavelength	λ_r	1260	1310	1620	nm	
Receiver Sensitivity (Pavg)	S			-14.4	dBm	1

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Receiver Overload (Pavg)		1			dBm	
LOS Assert	LOS_A	-30		-	dBm	
LOS Dessert	LOS_D			-17	dBm	
LOS Hysteresis		0.5		-	dB	
Receiver reflectance				-12	dB	
Operating Data Rate			10.3125		Gbps	
Differential data output swing		300		850	mV	

Note 1: Measured with worst ER , BER < 10¹² , 2³¹-1 PRBS

7. Applications Note :



Pin Definitions

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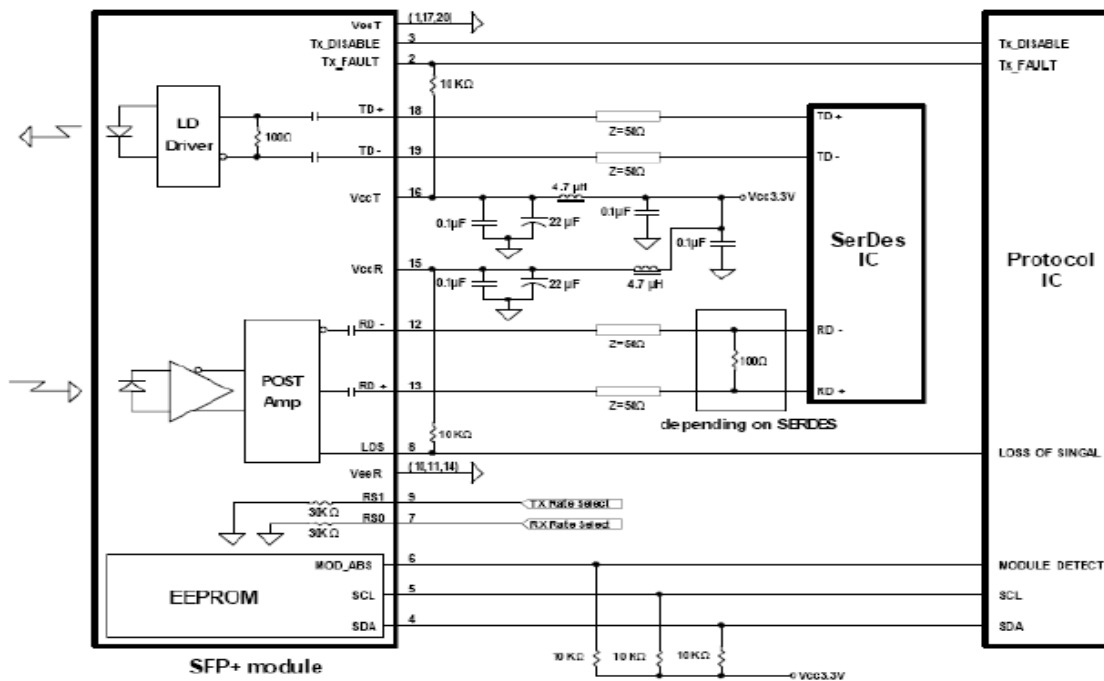
Pin Assignment

Pin	Symbol	Name/Description	Note
1	VeeT	Module Transmitter Ground	Note1
2	TX_Fault	Module Transmitter Fault	Note2
3	TX_Disable	Transmitter Disable; Turns off transmitter laser output	Note3
4	SDA	2-wire Serial Interface Data Line (Same as MOD-DEF2 as defined in the INF-8074i)	Note4
5	SCL	2-wire Serial Interface Clock (Same as MOD-DEF1 as defined in the INF-8074i)	Note4
6	MOD_ABS	Module Absent, connected to VeeT or VeeR in the module	Note5
7	RS0	Rate Select 0, optionally controls SFP+ module receiver. When High input data rate 10.3GBd and when LOW input data rate 1.25 GBd.	
8	RX_LOS	Receiver Loss of Signal Indication (In FC designated as RX_LOS, in SONET designated as LOS, and in Ethernet designated at Signal Detect)	Note2
9	RS1	Rate Select 1, optionally controls SFP+ transmitter. When High input data rate 10.3GBd and when LOW input data rate 1.25 GBd.	
10	VeeR	Module Receiver Ground	Note1
11	VeeR	Module Receiver Ground	Note1
12	RD-	Receiver Inverted Data Output	
13	RD+	Receiver Non-Inverted Data Output	
14	VeeR	Module Receiver Ground	Note1
15	VccR	Module Receiver 3.3 V Supply	
16	VccT	Module Transmitter 3.3 V Supply	
17	VeeT	Module Transmitter Ground	Note1
18	TD+	Transmitter Non-Inverted Data Input	
19	TD-	Transmitter Inverted Data Input	
20	VeeT	Module Transmitter Ground	Note1

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Notes:

1. The module signal ground pins, VeeR and VeeT, 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. Pull ups can be connected to multiple power supplies, however the host board design shall ensure that no module pin has voltage exceeding module VccT/R + 0.5 V.
3. This pin is an open collector/drain input pin and shall be pulled up with 4.7k-10kohms to VccT in the module.
4. See sff-8431 4.2 2-wire Electrical Specifications .
5. This pin shall be pulled up with 4.7k-10kohms to Host_Vcc on the host board.



8. Modification History

Rev.	Comments	Date	Originator	Approval
01	Preliminary Draft	2022.05.17	Hawk Rong	Mike Sun