TITLE 10G SFP+ ELR 20km Transceiver	**DOC No. DTRX-000020**	
	REVISION：02	**AUTHORIZED BY：Albert Lin**
	DATE：2023.08.21	**CLASSIFICATION：CONFIDENTIAL**

1. SCOPE

The scope of this specification is the definition of a high performance, cost effective modules, which is optimized for 10G ELR SFP+, and transmission distance up to 20Km. 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).

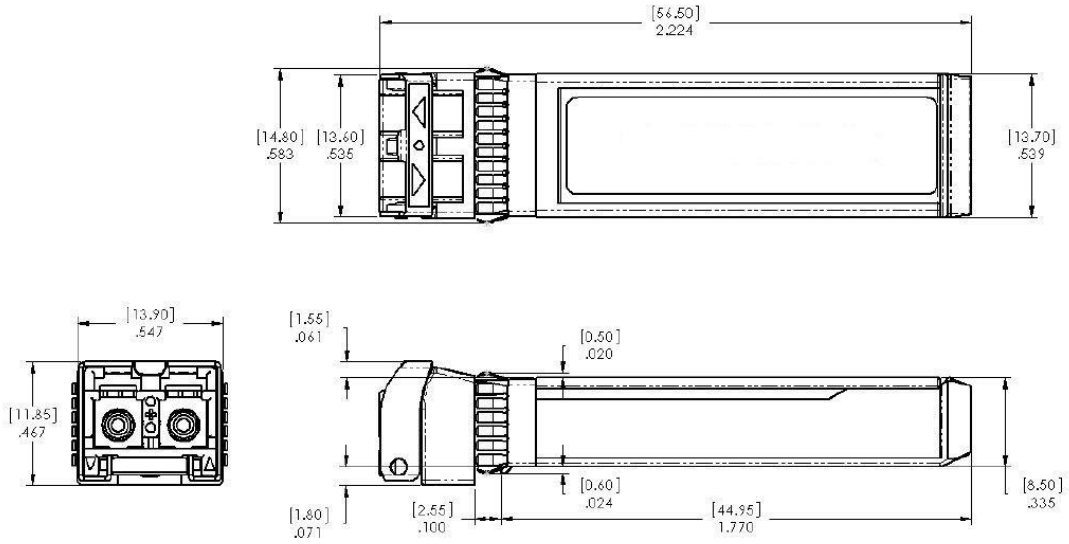
2. PRODUCT DESCRIPTION

2.1 PRODUCT NAME AND SERIES NUMBER(S)

10G SFP+ ELR Transceiver

Part Number	Data Rate	Wavelength (nm)	Distance	Media	Power (dBm)	Sen. (dBm)	Connector	Tem.
P58000BGIB20-1	10G	1310	20km	SMF	-5.0 ~ 0.5	-14.4	LC	-40~85

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

Compliant with SFP+ MSA

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

Electrostatic Discharge (ESD) to the Electrical Pins

Electrostatic Discharge (ESD) to the LC Connector

RoHS compliance

4. Absolute Maximum Ratings & Recommended Operating Conditions

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Maximum supply voltage	Vcc	0	4	V
Storage temperature	Ts	–20	85	°C
Relative humidity	RH	5	85	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Case Temperature	TS	-40	-	85	℃
Power Supply Voltage	VCC3	3.135	3.3	3.465	V
	ICC3	-	-	430	mA
Power Dissipation	PD	-	-	1.5	W
Data Rate	-	1	10.3125	11.3	Gbps
Transmitter Distance	-	-	-	20	Km

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Transmitter Operating Characteristic-Optical, Electrical

Parameter		Symbol	Min.	Typ.	Max.	Unit
Center Wavelength		λC	1260	1310	1360	nm
SMSR		SMSR	30			dB
-20dB Spectral width					1	nm
Launch Optical Power		Po	-5	-	0.5	dBm
Extinction Ratio		ER	4			dB
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
	Low		0		0.8	V
Tx Disable	VIH		2.0		VCCHOST	V
	VIL		0		0.8	V

Receiver Operating Characteristics-Optical, Electrical

Parameter	Symbol	Min.	Typ.	Max.	Unit
Center Wavelength	λr	1260	-	1610	nm
Receiver Sensitivity (Pavg)	S	-	-	-14.4	dBm
Receiver Overload (Pavg)	-	1	-	-	dBm
LOS Assert	LOS_A	-30	-	-	dBm
LOS Dessert	LOS_D	-	-	-17	dBm
LOS Hysteresis	-	0.5	-	-	dB

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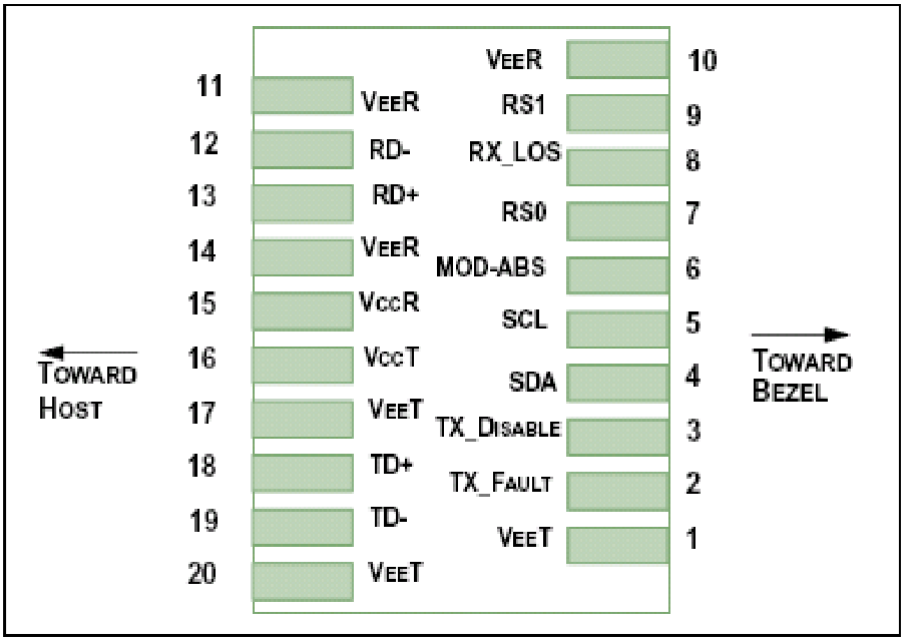
Receiver reflectance	-	-	-	-12	dB
Differential data output swing	-	300	-	850	mV

5. Applications Note:



Pin Definitions

Pin	Symbol	Description	Notes
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

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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.	
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+ module transmitter	
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

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.*

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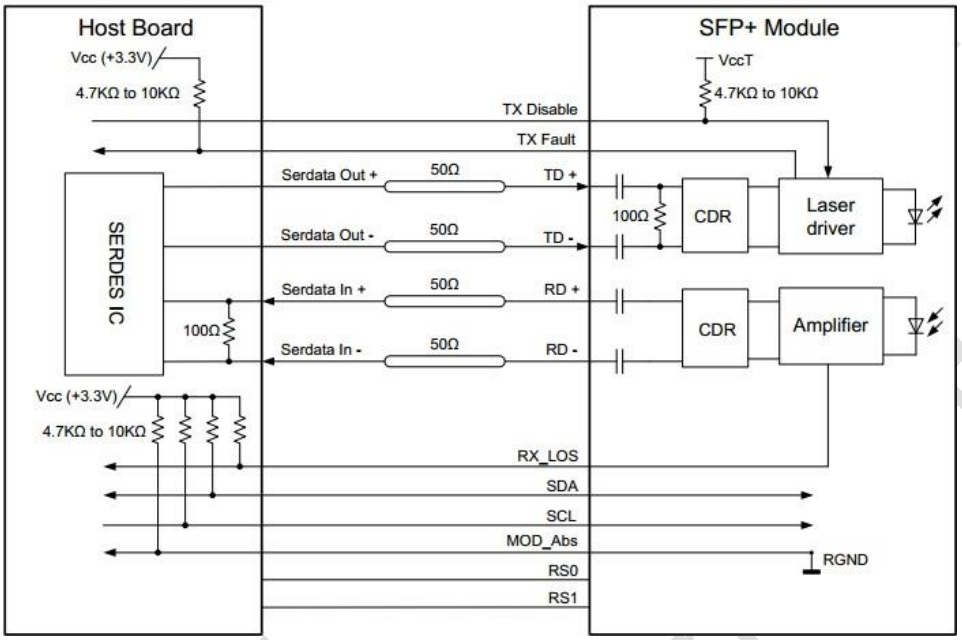
Recommended Application Interface Block Diagram



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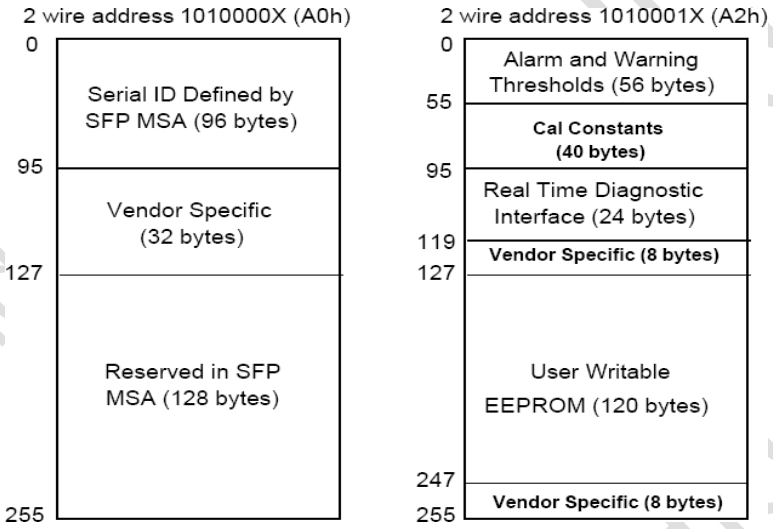
Digital Diagnostic Memory Map



6. Modification History

Rev.	Comments	Date	Originator	Approval
01	Initial	2019/06/03	Albert Lin	Mike Sun
02	Modify Temperature	2023/08/21	Albert Lin	Mike Sun

TITLE 100G QSFP28 40km ER4 Transceivers	**DOC No.**	**DTRX-180009**
	REVISION：01	**AUTHORIZED BY：Albert Lin**
	DATE：2022.08.23	**CLASSIFICATION：Optical Transceiver**