

TITLE**10G SFP+ LR Transceiver****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

- Hot-pluggable SFP+ cable ends
- Supports 9.95 to 10.5 Gb/s bit rates
- RoHS-6 compliant(lead-free)
- Power dissipation<1W
- Maximum link length of 10Km
- Single 3.3V power supply
- Receiver limiting electrical interface
- Commercial temperature range: -5°C to 70°C
- Duplex LC connector
- Uncooled 1310nm DFB laser

TITLE
10G SFP+ LR Transceiver

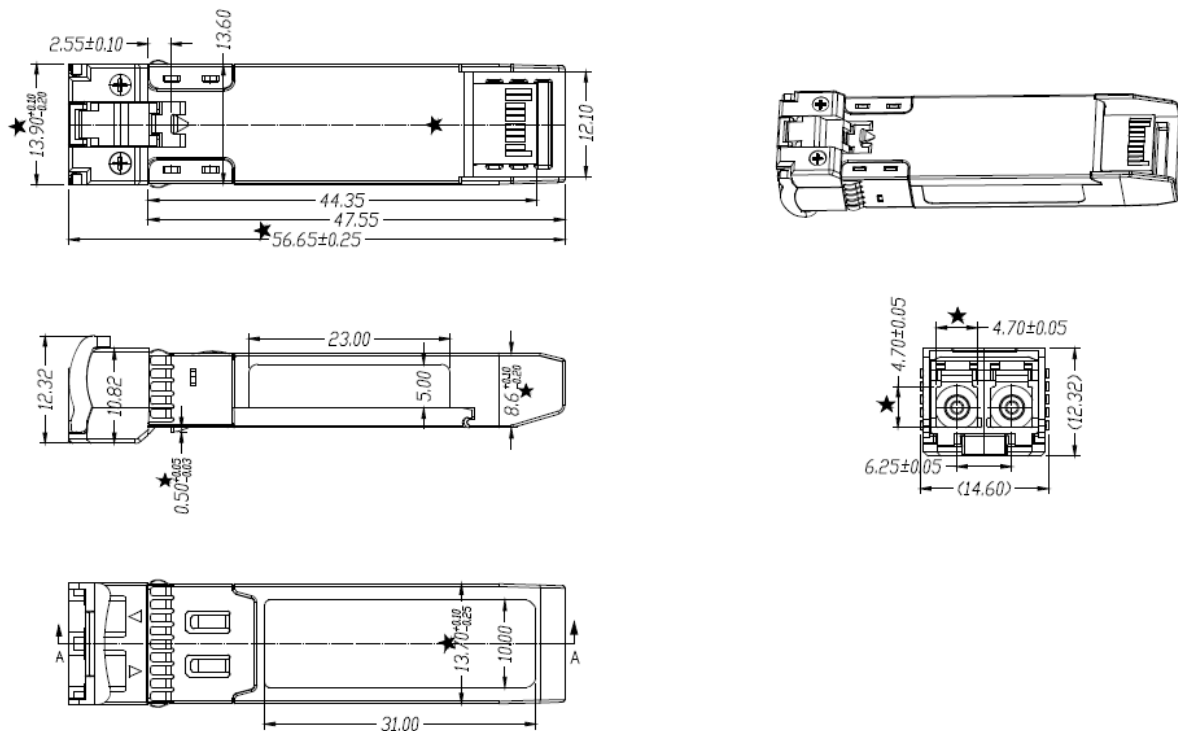
3. PRODUCT DESCRIPTION

3.1 PRODUCT NAME AND SERIES NUMBER(S)

10G LR SFP+ Transceiver

Part Number	Data Rate	Wavelength (nm)	Distance	Media	Power (dBm)	Sen. (dBm)	Connector	Tem.
ZFTCLRC1310A1ST	10G	1310	10km	SMF	-8 ~ 0.5	-14.4	LC	C

3.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING



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

TITLE**10G SFP+ LR Transceiver****4. APPLICABLE DOCUMENTS AND SPECIFICATIONS**

- Compliant with SFP+ MSA
- 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

TITLE
10G SFP+ LR Transceiver

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	-8	-	0.5	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

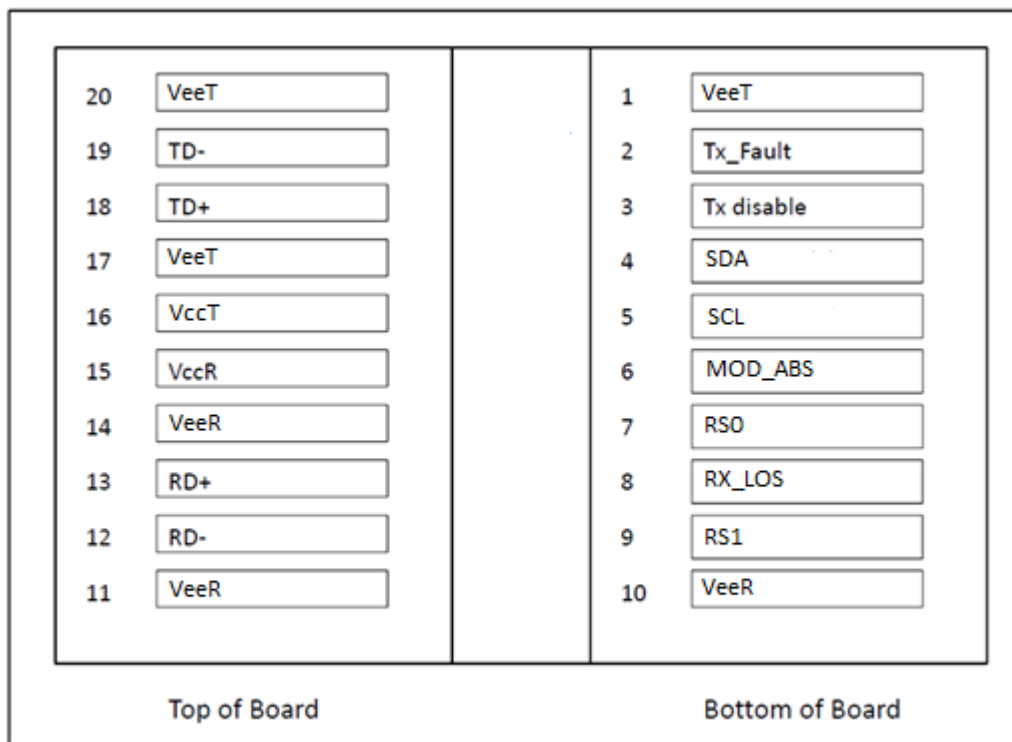
Receiver Operating Characteristic-Optical, Electrical						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Center Wavelength	λ_r	1260	1310	1360	nm	
Receiver Sensitivity (Pavg)	S			-14.4	dBm	1
Receiver Overload (Pavg)		1			dBm	
LOS Assert	LOS_A	-30		-	dBm	

TITLE
10G SFP+ LR Transceiver

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

<p>TITLE</p> <p>10G SFP+ LR Transceiver</p>

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

Notes:

1. The module signal ground pins, VeeR and VeeT, shall be isolated from the module case.

TITLE

10G SFP+ LR Transceiver

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.

Recommended Application Interface Block Diagram

