Features

- ❑ SFP+ Type Dual LC Transceiver
- ❑ 1310nm FP Laser
- ❑ PIN Photo Detector
- ❑ 1.4Km transmission with SMF
- ❑ 3.3V single power supply
- ❑ Compliant with SFP+ MSA
- ❑ Compliant with IEEE 802.3ae
- ❑ Hot pluggable
- ❑ Serial ID information support
- ❑ Digital diagnostic SFF-8472 compliant
- ❑ Compliant with RoHS
- ❑ Compliant with UL & TUV
- ❑ Compliant with SFF-8431

Applications

- ❑ 10GBASE-LR Ethernet (9.95 to 10.31Gbps)
- ❑ CPRI 7 (9830.4 Mibit/s)
- ❑ CPRI 8 (10137.6 Mibit/s)

Ordering Information

Form Factor	Date Rate	Media	Distance	Wavelength (nm)	TX Power (dBm)	RX Sensitivity (dBm)	Voltage (V)	Coupling	Signal Detect	DDM (Y/N)	Temperature (°C)	Part Number
SFP+LR Lite	10G	SMF	1.4Km	1310	-8.2 ~ 0.5	< -14.4	3.3	AC/AC	TTL	Y	-40 ~ +90	A7ELBN13ADOA0796

Absolute Maximum Ratings

Parameter	Symbol	Conditions	Min	Max	Unit
Storage Temperature	T_S	--	-40	90	°C
Storage Relative Humidity	RH	--	5	95	%
Supply Voltage	V_{CC}	--	0	4.0	V

Recommended Operating Conditions

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating Temperature (Case)	T_C	--	-40	--	90	°C
Supply Voltage	V_{CC}	--	3.14	3.3	3.46	V
Supply Current	$I_{TX} + I_{RX}$	--	--	--	330	mA
Data Rate	DR	--	--	9.95	10.31	Gbps

Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Transmitter						
Differential Input Impedance	R_{DI}	--	--	100	--	Ohm
Differential Input Voltage	V_{DI}	AC-Coupled, peak to peak	150	--	1200	mV
Tx Disable Input-High	V_{DISH}	--	2.0	--	V_{CC}+0.3	V
Tx Disable Input-Low	V_{DISL}	--	0	--	0.8	V
Tx Fault Output-High	V_{FOH}	--	2.0	--	V_{CC}	V
Tx Fault Output-Low	V_{FOL}	--	0	--	0.8	V
Receiver						
Differential Output Impedance	R_{DO}	--	--	100	--	Ohm
Differential Output Voltage	V_{DO}	AC-Coupled, peak to peak	300	--	850	mV
Rx LOS Output-High	V_{LOSH}	--	2.00	--	V_{CC}+0.3	V
Rx LOS Output-Low	V_{LOSL}	--	0.00	--	0.80	V

Optical Characteristics

(Vcc=3.14V to 3.46V, 9/125um SMF)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Transmitter						
Optical Center Wavelength	λc	--	1260	1310	1360	nm
Spectral Width	Δλ	(-20)	--	--	3	nm
Optical Output Power	P_o	(Avg.)	-8.2	--	0.5	dBm
Optical Extinction Ratio	ER	--	3.5	--	--	dB
Optical Modulation Amplitude	OMA	--	-5.2	--	--	dBm
Relative Intensity Noise	$RIN_{12}OMA$	--	--	--	-128	dB/Hz
Eye Mask		Compliant with IEEE 802.3ae				
Receiver						
Operating Wavelength	λ	--	1260	1310	1360	nm
Receiver Overload	$P_{IN}MAX$	1	0.5	--	--	dBm
Rx Sensitivity (Avg.) @10.31Gbps	$P_{IN}MIN$	1	--	--	-14.4	dBm
Rx Sensitivity (OMA) @10.31Gbps	$P_{IN}MIN$	1	--	--	-12.6	dBm
Rx LOS Assert	LOS_A	--	-30	--	--	dBm
Rx LOS De-Assert	LOS_D	--	--	--	-17	dBm
Rx LOS Hysteresis		--	0.5	--	--	dB
Receiver Reflectance		--	--	--	12	dB

1. Measured with PRBS $2^{31} - 1$ at 10^{-12} BER

Pin Description
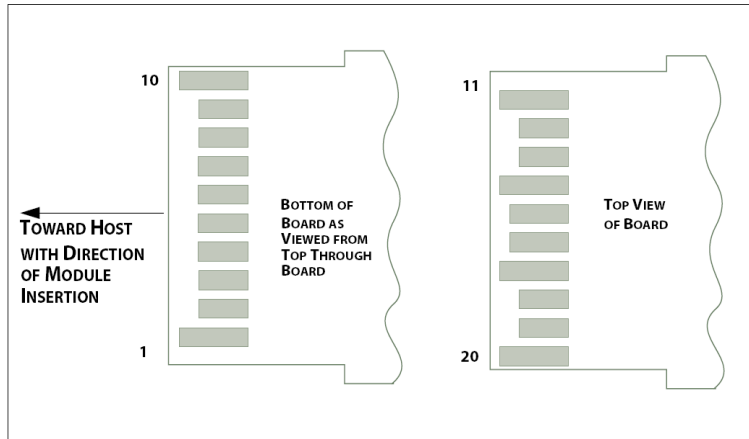
SFP+ Transceiver Electric Pad Layout
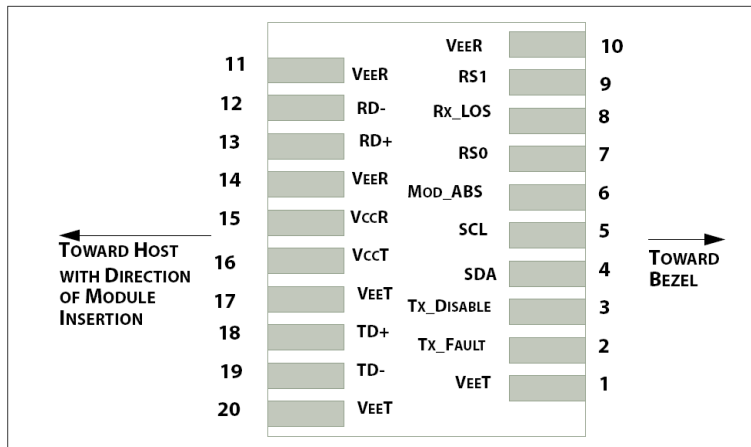

SFP+ Transceiver Host PCB PAD Assignment

Pin Function Definitions

Pin No.	Pin Name	Function/Description	Power Sequence Order	Note
1	VeeT	Transmitter Ground	1st	1
2	Tx_Fault	Transmitter Fault	3rd	2
3	Tx_Disable	Transmitter Disable; Turns off transmitter laser output	3rd	3
4	SDA	2-wire Serial Interface Data Line (MOD-DEF2)	3rd	
5	SCL	2-wire Serial Interface Clock (MOD-DEF1)	3rd	
6	Mod_ABS	Module Absent, connected to VeeT or VeeR in the module	3rd	4
7	RS0	Rate Select 0, (not functional)	3rd	
8	Rx_LOS	Receiver Loss of Signal Indication	3rd	2
9	RS1	Rate Select 1, (not functional)	3rd	
10	VeeR	Receiver Ground	1st	1
11	VeeR	Receiver Ground	1st	1
12	RD-	Receiver Inverted Data Output	3rd	
13	RD+	Receiver Non-Inverted Data Output	3rd	
14	VeeR	Module Receiver Ground	1st	1
15	VccR	Receiver 3.3 V Supply	2nd	
16	VccT	Transmitter 3.3 V Supply	2nd	
17	VeeT	Transmitter Ground	1st	1
18	TD+	Transmitter Non-Inverted Data Input	3rd	
19	TD-	Transmitter Inverted Data Input	3rd	
20	VeeT	Transmitter Ground	1st	1

Notes:

1. The module signal ground contacts, VeeR and VeeT, should be isolated from the module case.

2. This contact is an open collector/drain output contact and shall be pulled up with a 4.7k to 10k Ohms resistor to host_Vcc on the host board. Pull ups can be connected to one of several power supplies, however the host board design shall ensure that no module contact has voltage exceeding module VccT/R + 0.5 V.

3. This contact is an input contact with a 4.7 kΩ to 10k Ohms pull up to VccT inside the module.

4. This contact shall be pulled up with a 4.7k to 10k Ohms resistor to host_Vcc on the host board.

Mechanical Design Diagram

UNIT:mm
Tolerance:±0.2mm
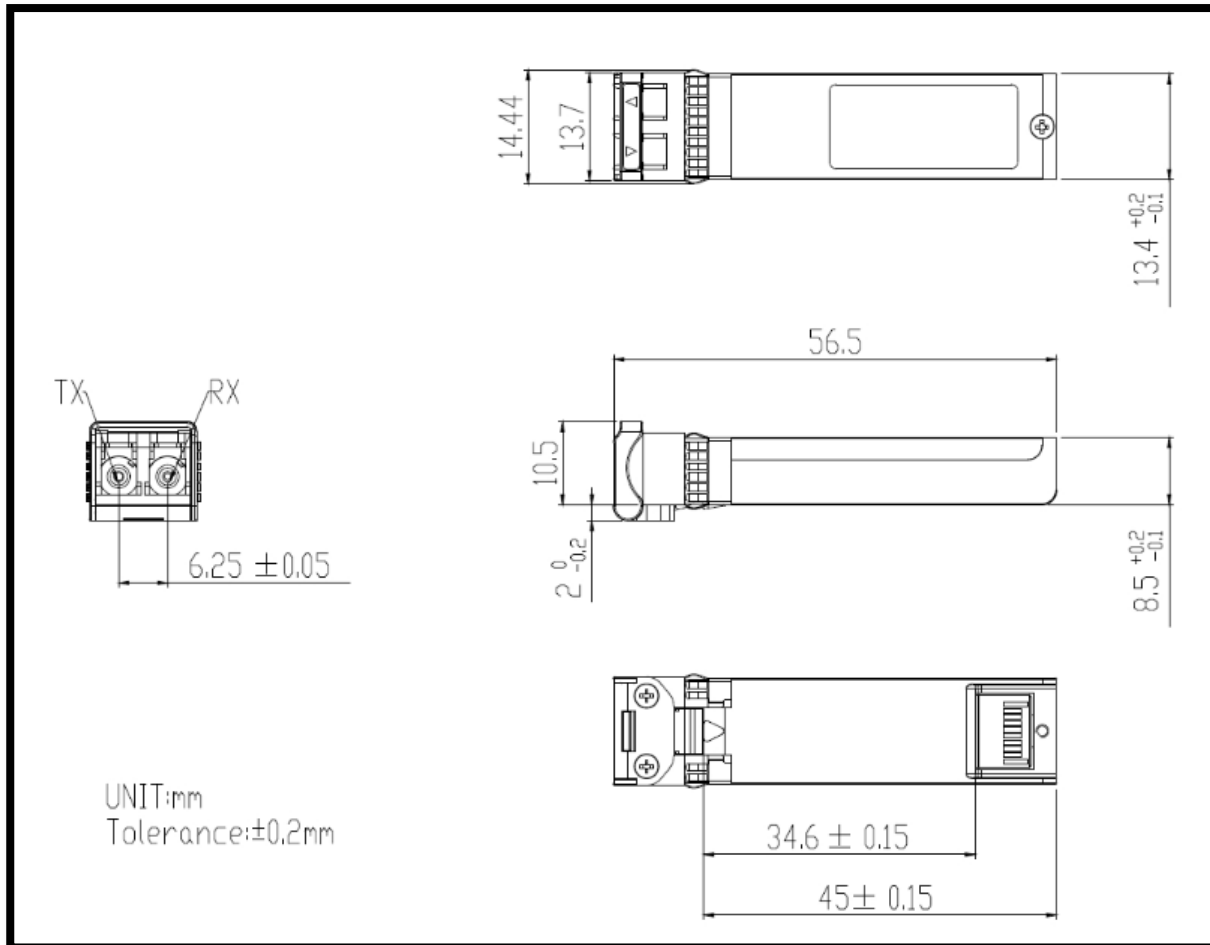
Regulatory Compliance

Item	Standard
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022 Class B (CISPR 22B) VCCI Class B
Electrostatic Discharge to the Electrical Pins (ESD)	MIL-STD-883E Method 3015.7
Electrostatic Discharge to the Receptacle (ESD)	IEC 61000-4-2
RoHS	2011/65/EU
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11
Component Recognition	UL and TUV

Laser Safety Information

All versions of this laser are Class 1 laser products per IEC[1]/EN[2] 60825-1. Users should observe safety precautions such as those recommended by ANSI[3] Z136.1, ANSI Z36.2 and IEC 60825-1.

This product conforms to FDA (CDRH) 21 CFR 1040.10 and 1040.11 except for deviations of laser safety class designation pursuant to 'Laser Notice No.50'.

Product labeling:

    Class 1 Laser Product
    Compliance with 21 CFR
    1040.10 and 1040.11

If labeling is not affixed to the module due to size constraints; then rather, labeling is placed on the outside of the shipping box.

This product is not shipped with a power supply.

Caution: use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Certifications

UL	**60950-1 (E243407)**
TUV	**EN60950-1, EN 60825-1, EN 60825-2**

Documentation is available upon request.

(1) IEC is a registered trademark of the International Electrotechnical Commission

(2) Within Europe the IEC standard has been adopted as a European Normative standard known as EN 60825, and each European country will have its own version of this standard, for example, the British Standards version known as BS EN 60825. There can be small differences between the different countries versions of EN 60825, and these are in part caused by the process of translating the standard into the native language of that country.

(3) ANSI is a registered trademark of the American National Standards Institute

Note : All information contained in this document is subject to change without notice.