

10Gb/S SFP+ LR Transceiver

P/N: TSFPP-ACxF13A



Product Features

- Compliant with IEEE802.3ae 10GBASE-LR
- Compliant with SFP+ MSA
- 1.063Gb/s to 11.3Gb/s serial optical interface
- Up to 10km distance
- Maximum power consumption 1.0W
- SFP MSA package with duplex LC connector
- Very low EMI and excellent ESD protection
- DFB 1310nm LD for the transmitter and PIN for the receiver
- Single 3.3V power supply
- SFP mechanical interface
- Digital Diagnostic Monitor Interface
- RoHS-6 Compliant

Application

- 10G Base-LR/LW
- 10G Fiber Channel

Absolute Maximum Rating

Parameter	Min	Max	Unit	Note
Storage Temperature	-40	85	°C	
3.3V Power Supply Voltage	-0.5	4.0	V	
Relative Humidity		85	%	

Recommended Operating Conditions

Parameter	Min	Typical	Max	Unit	Note
Case Operating Temperature	0		70	°C	TSFPP-AC1F13A
	-40		85	°C	TSFPP-AC5F13A
Power Supply Voltage	3.135	3.3	3.465	V	
Data Rate	Ethernet	10.3125		Gbps	
	Fiber Channel	10.518			
Supply Current			350	mA	
Link Distance			10	km	

Electrical Characteristics

Parameter	Min	Typical	Max	Unit	Note
Transmitter					
Differential Input Voltage	120		820	mVpp	
Tx Disable input	H	2.0	V _{CC} +0.3	V	
	L	0	0.8		
Tx Fault output	H	2.0	V _{CC} +0.3	V	
	L	0	0.8		
Input Differential Impedance		100		Ω	
Receiver					
Differential output voltage swing	340	650	800	mVpp	
Rx LOS Output	H	2.0	V _{CC} +0.3	V	
	L	0	0.8		

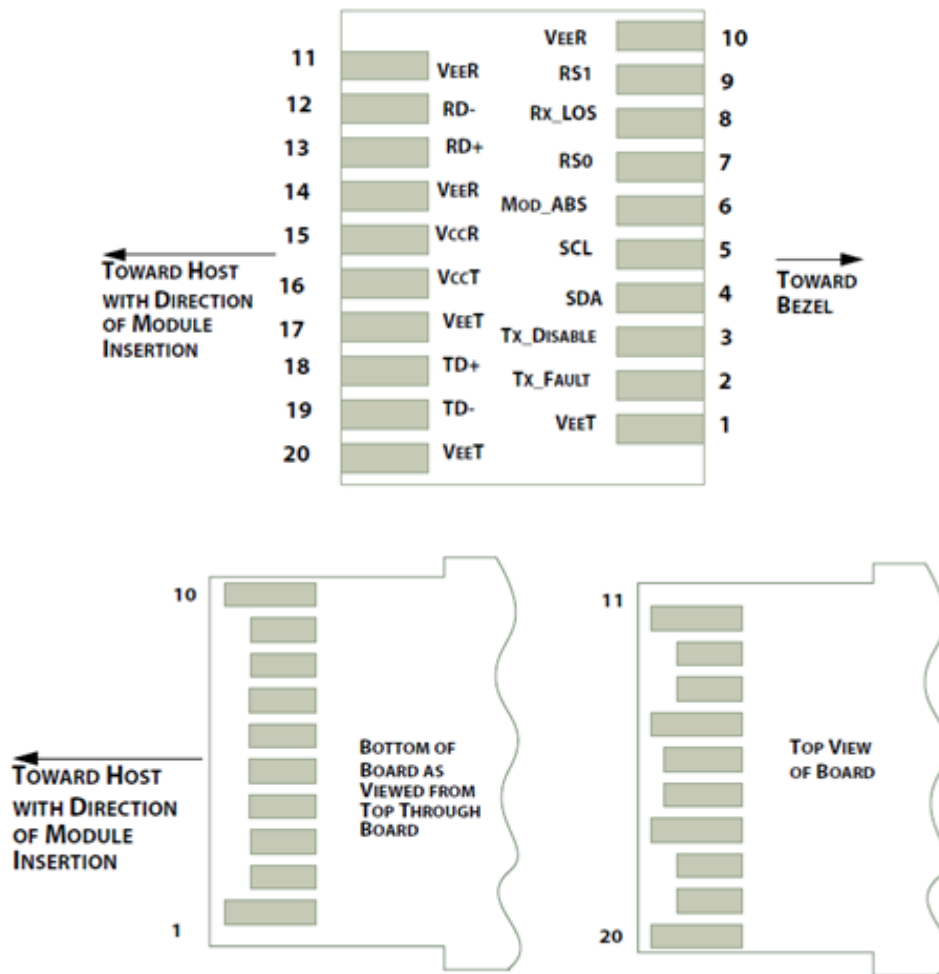
Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Note
Transmitter Optical Characteristics						
Center Wavelength	λ	1270	1310	1355	nm	
Spectral Width – RMS	$\Delta\lambda$			1	nm	
Average Launch Optical Power	LOP	-7		0.5	dBm	1
Optical Modulation Amplitude	OMA	-6.2			dBm	
Extinction Ratio	ER	3.5			dB	1
Rise/Fall time (20%~80%)				50	ps	
Dispersion penalty				1	dB	
Output Optical Eye		IEEE 802.3-2005 Compliant				
Receiver Optical Characteristics						
Center Wavelength	λ	1260	1310	1565	nm	
Sensitivity	Psen			-14.4	dBm	2
Min. overload		0.5			dBm	
LOS Assert	LOSA	-30			dBm	
LOS De-assert	LOSD			-16	dBm	
LOS Hysteresis	LOSH	0.5		4	dB	

Notes

1. Measured at 10.3125b/s with PRBS $2^{31} - 1$ NRZ test pattern
2. Under the ER worst case, measured at 10.3125 Gb/s with PRBS $2^{31} - 1$ NRZ test pattern for BER $< 1 \times 10^{-12}$

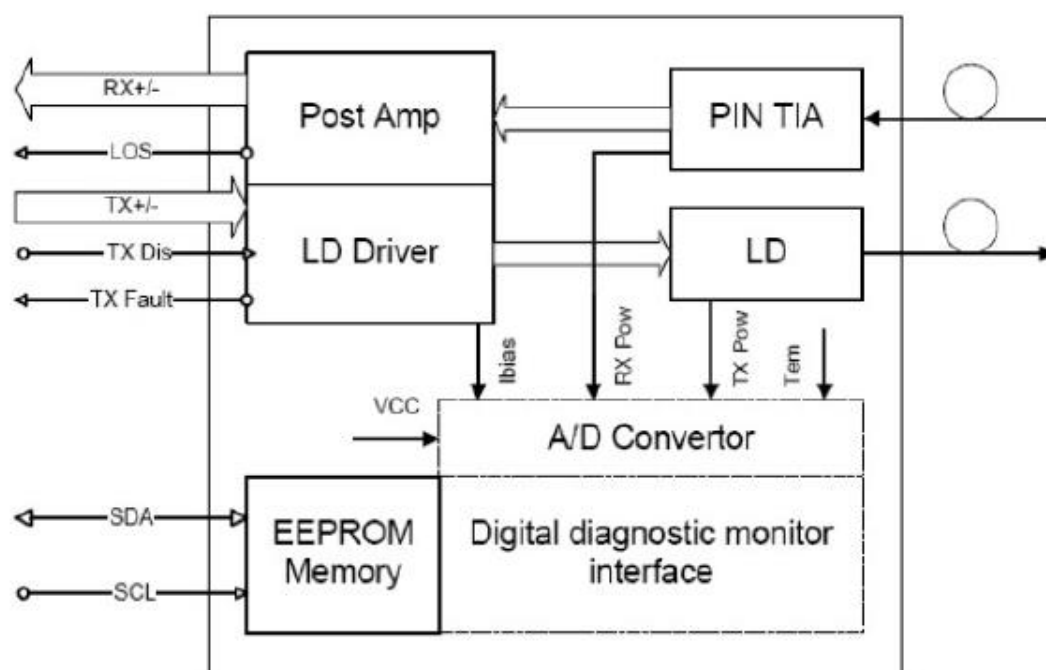
SFP+ Module Pad Assignments and Descriptions



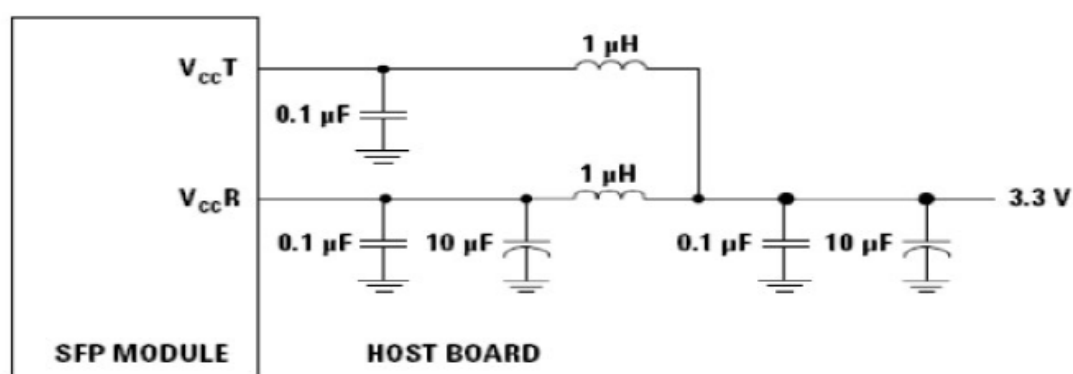
PIN	Logic	Symbol	Name / Description	Note
1		VeeT	Module Transmitter Ground	
2	LVTTL-O	TX_Fault	Module Transmitter Fault	
3	LVTTL-I	TX_Dis	Transmitter Disable; Turns off transmitter laser output	
4	LVTTL-I/O	SDA	2-Wire Serial Interface Data Line	
5	LVTTL-I	SCL	2-Wire Serial Interface Clock	
6		MOD_DEF0	Module Definition, Grounded in the module	
7	LVTTL-I	RS0	Receiver Rate Select, default is high for 8G/10G application, when set to low by system, transceiver will set the bandwidth to under 4.25G to improve the sensitivity at low data rate	

8	LVTTL-O	RX_LOS	Receiver Loss of Signal Indication Active LOW	
9	LVTTL-I	RS1	Transmitter Rate Select, default input is high for 8G/10G application, when set to low by system, transceiver will set the TX optical output to be compliant with low data rate fiber channel specifications	
10		VeeR	Module Receiver Ground	
11		VeeR	Module Receiver Ground	
12	CML-O	RD-	Receiver Inverted Data Output	
13	CML-O	RD+	Receiver Data Output	
14		VeeR	Module Receiver Ground	
15		VccR	Module Receiver 3.3 V Supply	
16		VccT	Module Transmitter 3.3 V Supply	
17		VeeT	Module Transmitter Ground	
18	CML-I	TD+	Transmitter Non-Inverted Data Input	
19	CML-I	TD-	Transmitter Inverted Data Input	
20		VeeT	Module Transmitter Ground	

Transceiver Block Diagram



Recommended Host Board Power Supply Circuit



Mechanical Design Diagram

Unit: mm

