



Features:

- Support multi protocol from 9.95Gb/s to 11.3Gb/s
- Hot pluggable SFP+ footprint
- Compliant with SFF-8431 SFF-8432 and IEE802.3ae
- Transmission distance of 80km over single mode fiber

Description:

POFLink' PLS-10G-ZR Small Form Factor 10Gb/s (SFP+) transceivers are compliant with the current SFP+ Multi-Source Agreement (MSA) Specification. The high performance cooled 1550nm EML transmitter and APD receiver provide superior performance for 10G Fiber channel and Ethernet applications up to 80km optical links..

- Cooled 1550nm EML laser transmitter
- APD Receiver
- Duplex LC connector
- 2-wire interface for management and diagnostic monitor
- Single Power 3.3V supply voltages
- Temperature range -5°C to 70°C
- Power dissipation: <1.5W
- RoHS Compliant Part

Applications:

- 10GBASE-ER/EW Ethernet
- 80km 10G Fiber channel
- SONET OC19IR

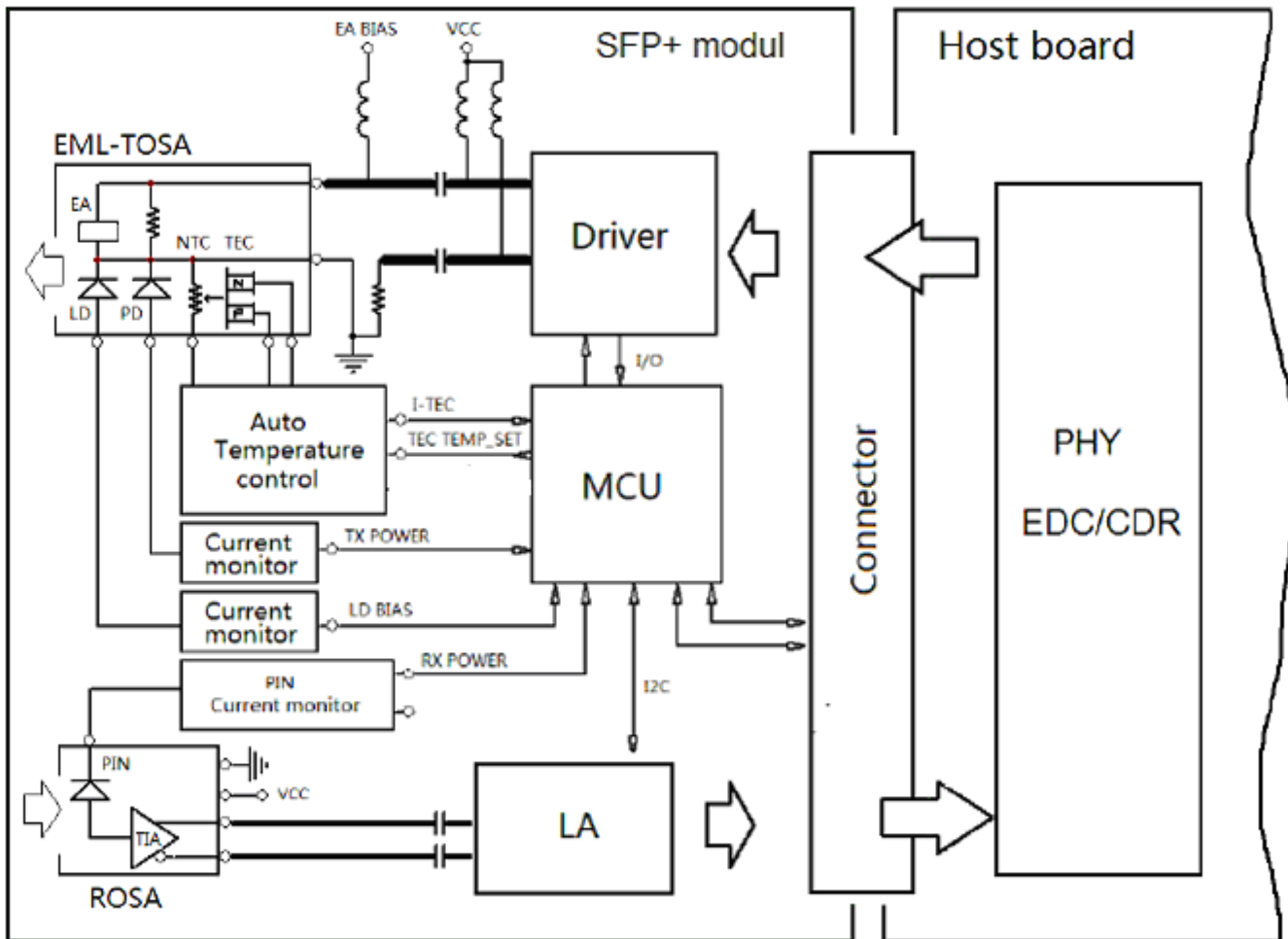


Figure1. Module Block Diagram

Specification:

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Storage Temperature	TST	-40	+85	°C
Operating Temperature	TIP	-5	+70	°C
Supply Voltage	VCC	-0.5	+4.0	V

Recommend Operation Environment:

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	VCC	+3.1	3.3	+3.5	V
Operating Temperature	TOP	-5	-	+70	°C

Electrical Characteristics (Condition: T_a=TOP)

Parameter	Symbol	Min	Typ	Max	Unit	Note
Supply Voltage	Vcc	3.13		3.45	V	
Supply Current	Icc			450	mA	
Module total power	P			1.5	W	
Transmitter						
Input differential impedance	Rin		100		Ω	1
Differential data input swing	V _{in,pp}	120		820	mV	
Transmit Disable Voltage	VD	2.0		Vcc	V	
Transmit Enable Voltage	VEN	GND		GND+ 0.8	V	
Transmit Disable Assert Time	T _{off}			10	us	
Tx Enable Assert Time	T _{on}			2	ms	
Receiver						
Differential data output swing	V _{out,pp}	340		850	mV	
Data output rise time	tr	24	-	-	ps	2
Data output fall time	tf	24	-	-	ps	2
LOS Fault	VLOS fault	Vcc - 0.5		VccHOST	V	3
LOS Normal	VLOS norm	GND		GND+0.4	V	3

1. After internal AC coupling.
2. 20 - 80 %
3. Loss Of Signal is open collector to be pulled up with a 4.7k - 10kohm resistor to 3.15 - 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

Optical Characteristics (Condition: T_a=TOP)

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Operating Data Rate	B	9.9		11.3	Gb/s	
Bit Error Rate	BER			10 ⁻¹²		
Output Power	Po	-1		+5	dBm	1
Optical Wavelength	λ	1530		1565	nm	
Optical Extinction Ratio	ER	6			dB	
Spectral Width	Δλ			1	nm	
Sidemode Supression ratio	SSRmin	30			dB	
Rise/Fall Time (20%~80%)	Tr/Tf			45	ps	
Average Launch power of OFF Transmitter	POFF			-30	dBm	
Transmitter and dispersion penalty	PD			3		
Tx Jitter	Txj	Per802.3ae requirements				
Optical Eye Mask		IEEE802.3ae				2

10G SFP+ ZR Transceiver (PLS-10G-ZR)
Duplex LC,1550nm, EML, APD Receiver, Single Mode, 80KM



Operating Data Rate	B	9.9		11.3	Gb/s	
Receiver sensitivity in 10.3Gbps(OMA)	RSENS1			-24	dBm	2
Stressed receiver sensitivity in 10.3Gbps(OMA)	RSENS2			-22	dBm	2
Maximum Input Power	PMAX	-7			dBm	2
Optical Center Wavelength	λ_C	1528		1565	nm	
Receiver Reflectance	Rrx			-27	dB	
LOS De-Assert	LOSD			-25	dBm	
LOS Assert	LOSA	-37			dBm	
LOS Hysteresis	-	0.5	-	6	dB	

Notes:

1. The optical power is launched into SMF.
2. Measured with a PRBS $2^{31}-1$ test pattern @11.1Gbps BER $<10^{-12}$

Pin Assignment:

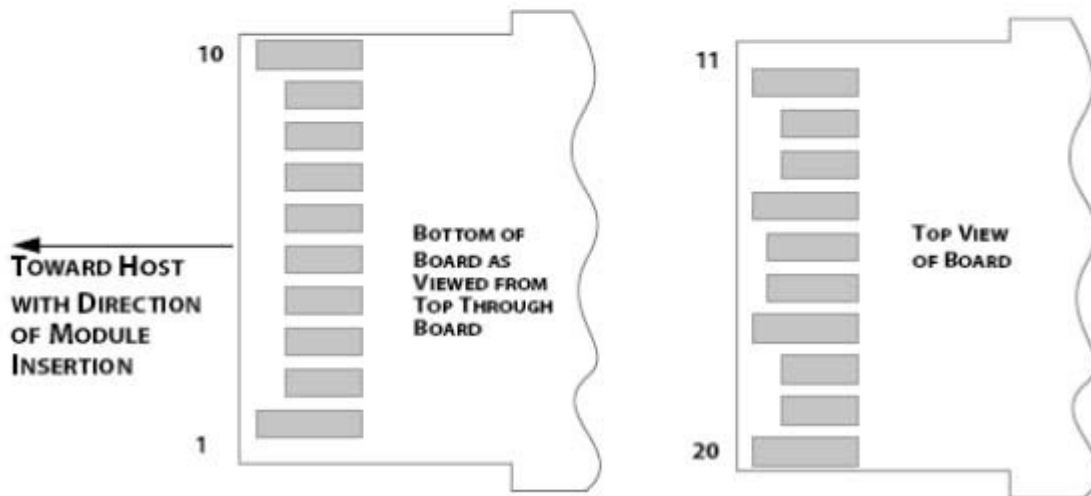
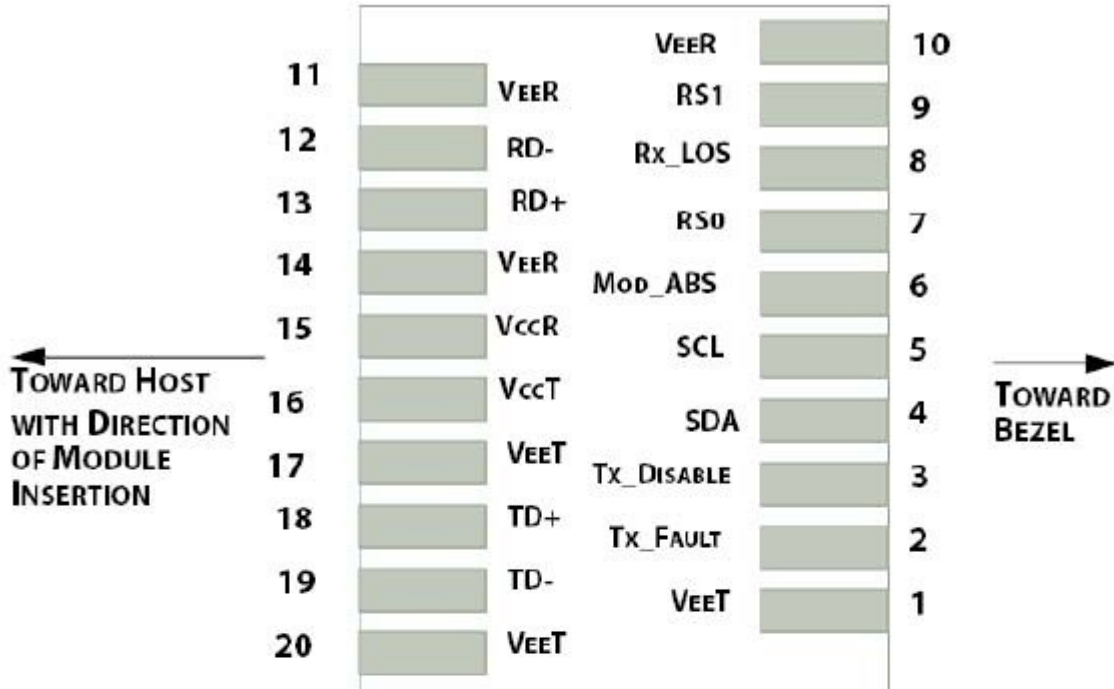


Figure2.Electrical Pin-out Details

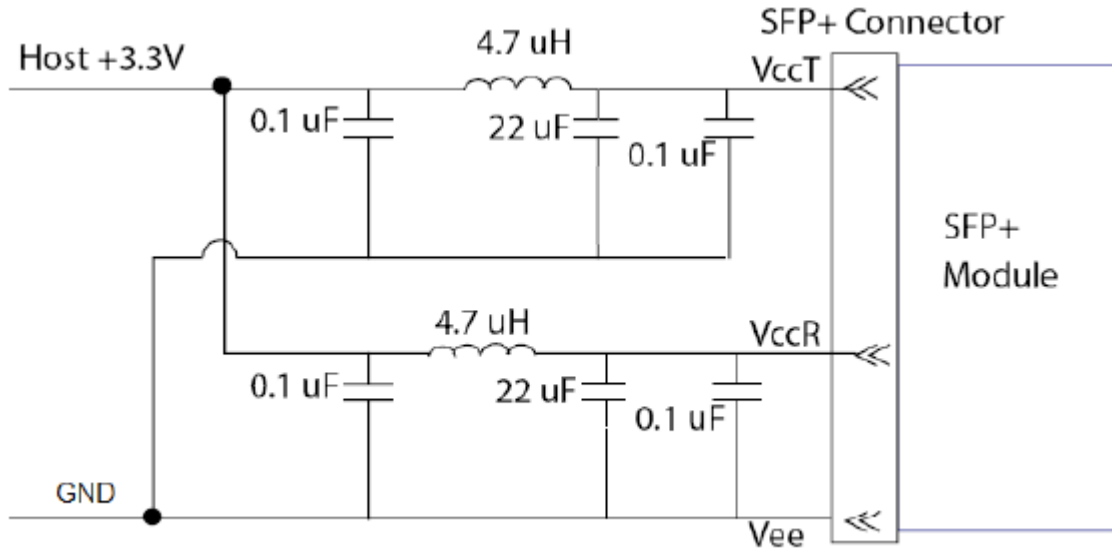
Pin Description:

Pin	Symbol	Name/Description	Ref.
1	V _{EET}	Transmitter Ground	1
2	T _{FAULT}	Transmitter Fault	2
3	T _{DIS}	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	2
5	SCL	2-wire Serial Interface Clock Line	2
6	MOD_ABS	Module Absent. Grounded within the module	2
7	RS0	Rate Select 0.	
8	RX_LOS	Loss of Signal indication. Logic 0 indicates normal operation.	4
9	RS1	Rate Select 1.	
10	V _{EER}	Receiver Ground	1
11	V _{EER}	Receiver Ground	1
12	RD-	Receiver Inverted DATA out. AC Coupled.	
13	RD+	Receiver Non-inverted DATA out. AC Coupled.	
14	V _{EER}	Receiver Ground	1
15	V _{CCR}	Receiver Power Supply	
16	V _{CCT}	Transmitter Power Supply	
17	V _{EET}	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V _{EET}	Transmitter Ground	1

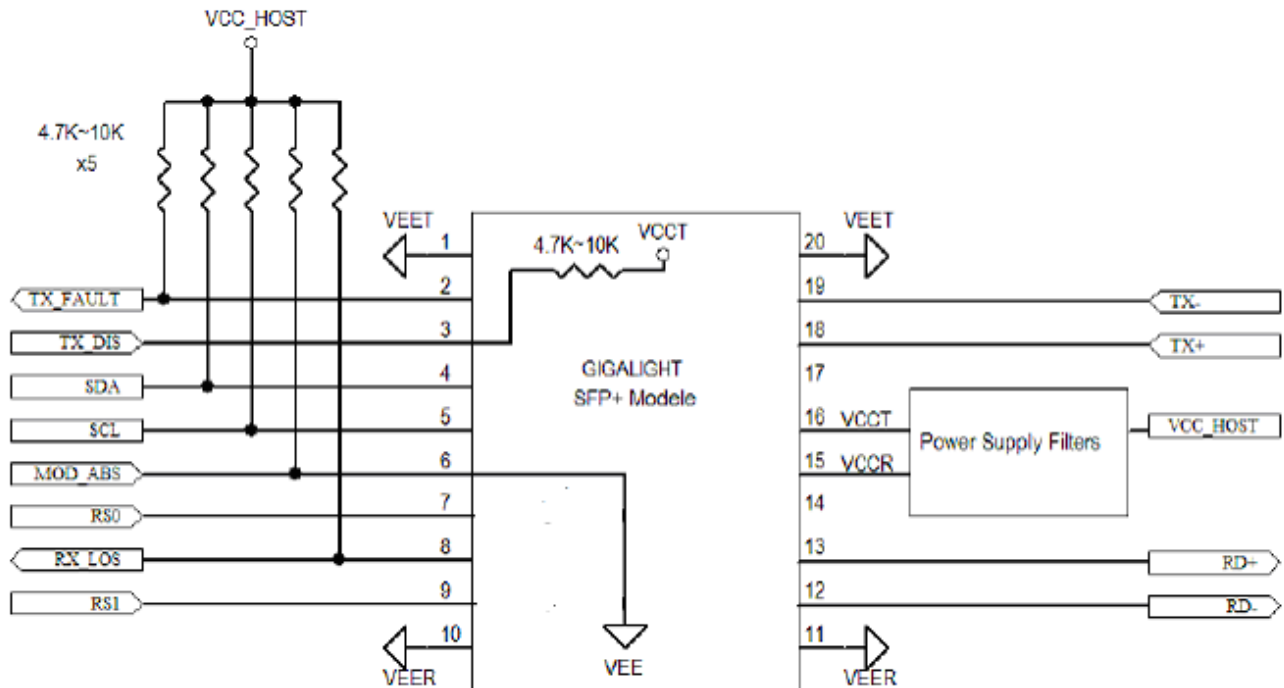
Notes:

1. Circuit ground is internally isolated from chassis ground.
2. T_{FAULT} is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on T_{DIS} >2.0V or open, enabled on T_{DIS} <0.8V.
4. LOS is open collector output. Should be pulled up with 4.7k – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Recommended Circuit:



Recommended Host Board Power Supply Circuit



Recommended High-speed Interface Circuit

Serial ID Memory Contents:

Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	10GBASE-ER
11	1	Encoding	64B66B
12	1	BR,Nominal	Nominal baud rate, unit of 100Mbps
13	1	Reserved	(0000h)
14	1	Length(9um,km)	Link length supported for 9/125um fiber, units of km
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name:
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number: "PLS-xx-xx" (ASCII)
56-59	4	Vendor rev	Revision level for part number
60-61	2	Wavelength	Laser wavelength
62	1	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62
Extended ID Fields			
64-65	2	Option	Indicates which optical SFP signals are implemented (001Ah =LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)
84-91	8	Date code	Manufacturing date code
92	1	Diagnostic Type	Diagnostics
93	1	Enhanced Options	Diagnostics
94	1	SFF-8472	Diagnostics
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	Vendor specific date, read only

Diagnostics Memory Contents(A2h):

Data Address	Length (Byte)	Name of Length	Description and Contents
Diagnostic and control/status fields			
0-39	40	A/W Thresholds	Diagnostic Flag Alarm and Warning Thresholds
40-55	16	Unallocated	
56-91	16	Ext Cal Constants	Diagnostic calibration constants for optional External Calibration
92-94	3	Unallocated	
95	1	CC_DMI	Check code for Base Diagnostic Fields (addresses 0 to 94)
96-105	10	Diagnostics	Diagnostic Monitor Data (internally or externally calibrated)
106-109	4	Unallocated	
110	1	Status/Control	Optional Status and Control Bits
111	1	Reserved	Reserved for SFF-8079
112-113	2	Alarm Flags	Diagnostic Alarm Flag Status Bits
114-115	2	Unallocated	
116-117	2	Warning Flags	Diagnostic Warning Flag Status Bits
118-119	2	Ext Status/Control	Extended module control and status bytes
General use fields			
120-127	8	Vendor Specific	Vendor specific memory addresses
128-247	120	User EEPROM	User writable non-volatile memory
248-255	8	Vendor Control	Vendor specific control addresses

Mechanical Dimensions:

