



Features:

- Support multi protocol from 9.95Gb/s to 10.3Gb/s
- Hot pluggable SFP+ footprint
- Compliant with SFF-8431 SFF-8432 and IEEE802.3ae

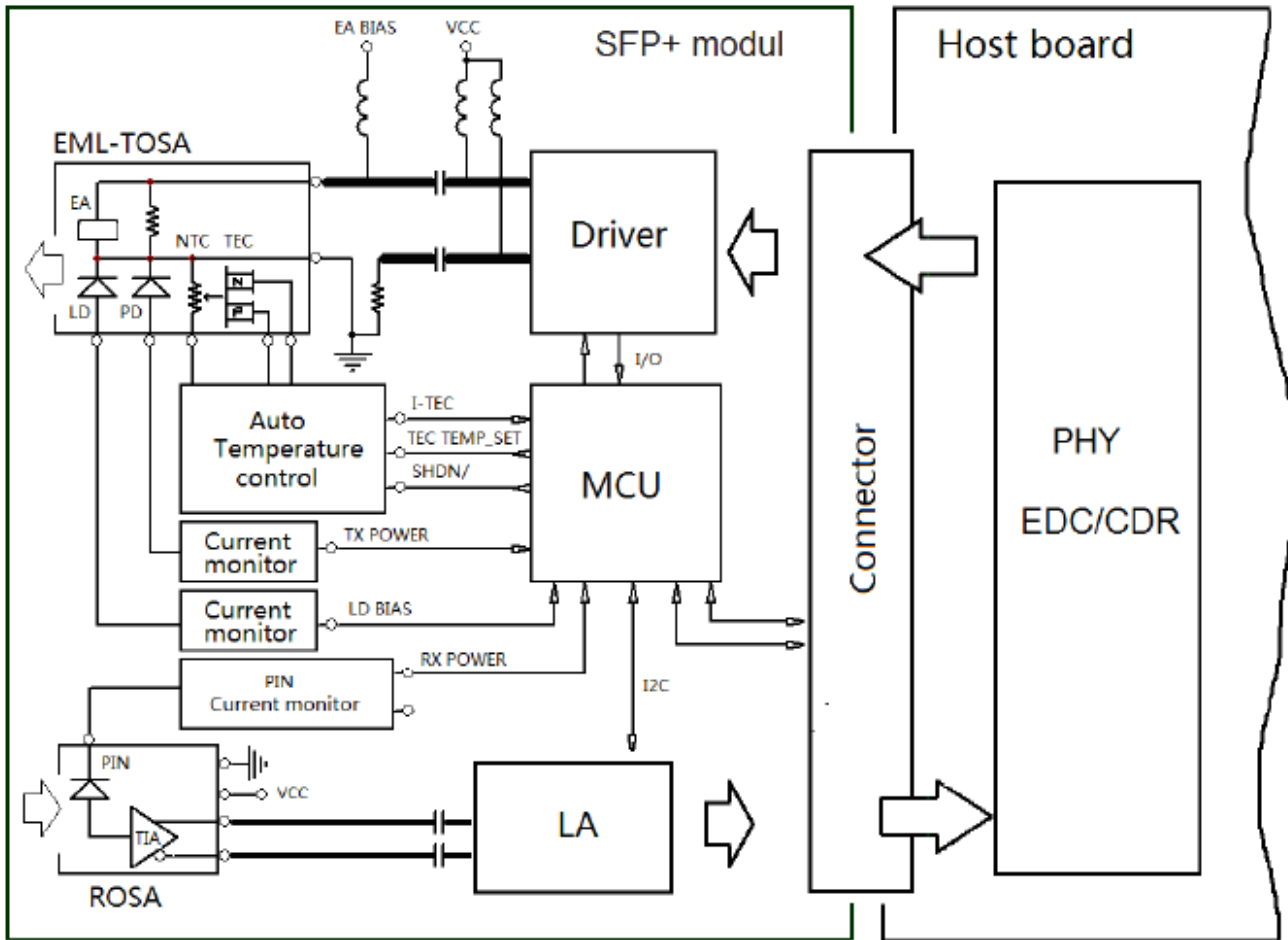
Description:

POFLink' PLS-10G-ER 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 high sensitivity PIN receiver provide superior performance for 10G Fiber channel and Ethernet applications up to 40km optical links..

- Transmission distance of 40km over single mode fiber
- 1550nm EML laser transmitter
- PIN 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
- 40km 10G Fiber channel



Gigalight 2011 --HHC

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: $T_a = T_{OP}$)

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	

10G SFP+ ER Transceiver (PLS-10G-ER)
Duplex LC,1550nm, EML, PIN Receiver, Single Mode, 40KM



Transmitter						
Input differential impedance	Rin		100		Ω	1
Differential data input swing	Vin,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	Vout,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: $T_a=T_{OP}$)

Parameter	Symbol	Min	Typ	Max	Unit	Ref.	
Transmitter							
Operating Date Rate	B	9.9		10.5	Gb/s		
Bit Error Rate	BER			10^{-12}			
Output Power	Po	-2		+4	dBm	1	
Optical Wavelength	λ	1530		1565	nm		
Optical Extinction Ratio	ER	8.2			dB		
Spectral Width	$\Delta\lambda$			1	nm		
Sidemode Supression ratio	SSRmin	30			dB		
Rise/Fall Time (20%~80%)	Tr/Tf			50	ps		
Average Launch power of OFF	POFF			-30	dBm		
Tx Jitter	Txj	Per802.3ae requirements					
Optical Eye Mask		IEEE802.3ae					
Receiver							
Operating Date Rate	B	9.9		10.5	Gb/s		
Receiver sensitivity in 10.3Gbps(OMA)	RSENS1			-14.1	dBm	2	
Stressed receiver sensitivity in 10.3Gbps(OMA)	RSENS2			-11.3	dBm	2	
Maximum Input Power	PMAX	-3			dBm	2	
Optical Center Wavelength	λ_C	1528		1565	nm		
Receiver Reflectance	Rrx			-27	dB		
LOS De-Assert	LOSD			-19	dBm		
LOS Assert	LOSA	-28			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} .

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Pin Assignment:

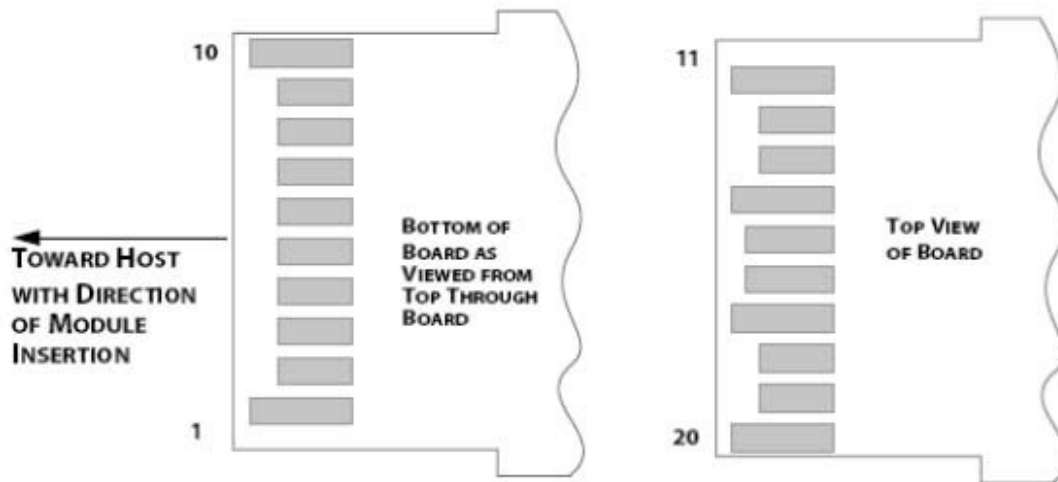
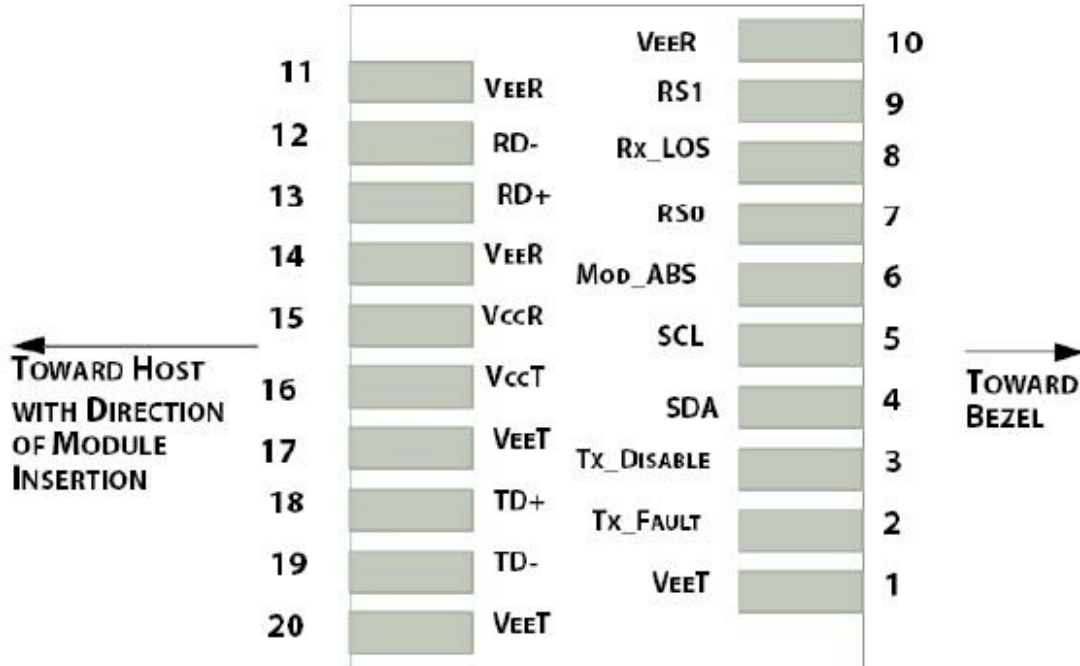


Figure2.Electrical Pin-out Details

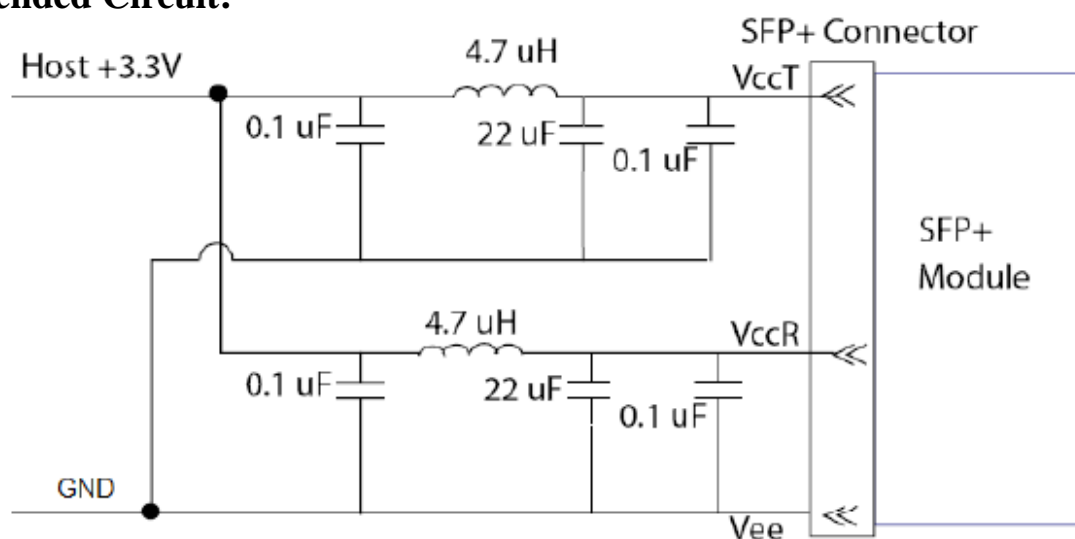
Pin Description:

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.	4
8	RX_LOS	Loss of Signal indication. Logic 0 indicates normal operation.	5
9	RS1	Rate Select 1.	4
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

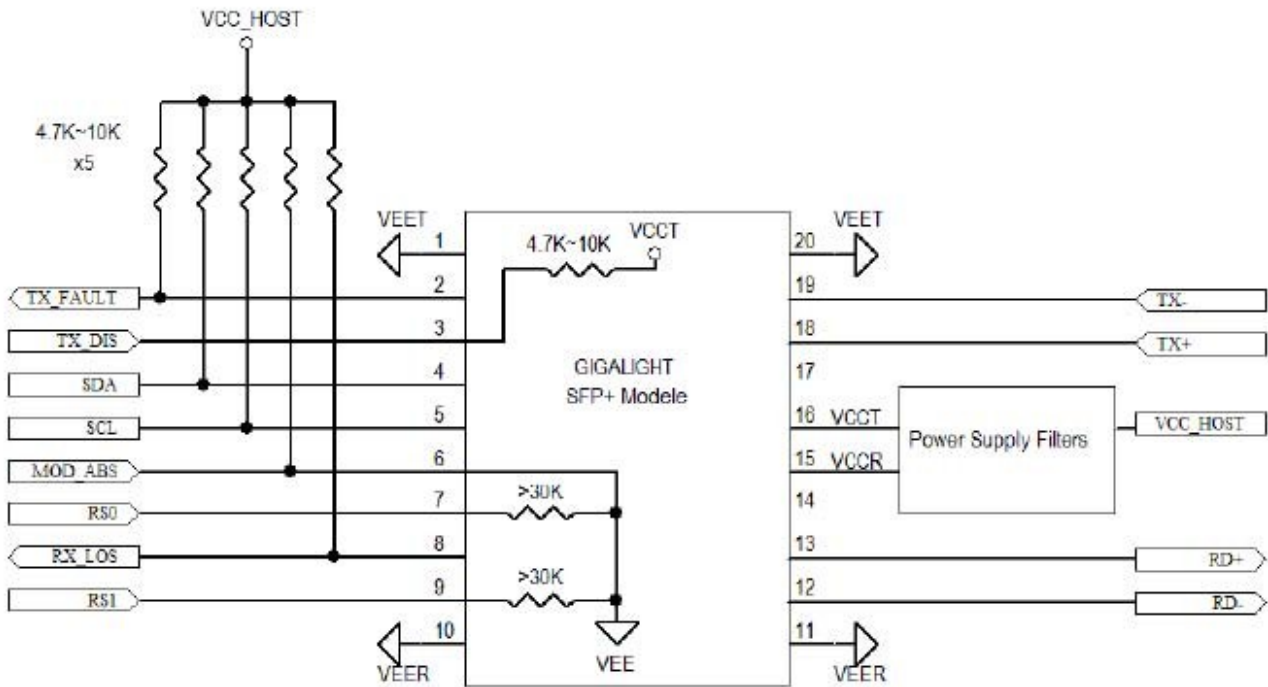
Notes:

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. Internally pulled down per SFF-8431 Rev 4.1.
5. 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-LR
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
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	Diagnostics
93	1	Enhanced	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 data, 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:

