OSP4G-3110DxR

4G Fibre Channel (4GFC) SFP Optical Transceiver, Single Mode, 1310nm, 10km Reach

Features

- Up to 4.25Gb/s data links
- 1310nm DFB transmitter and PIN photo-detector
- 2-wire interface for management Specifications compliant with SFF 8472
- Hot-pluggable SFP footprint
- Duplex LC/UPC type pluggable optical interface
- Low power dissipation
- Single +3.3V power supply
- Support Digital Diagnostic Monitoring interface
- RoHS compliant and Lead Free
- Operating Temperature: Standard 0~70ºC Extended -10~85ºC Industrial -40~85ºC

Applications

- 4xFC at 4.25Gbps
- 2xFC at 2.125Gbps
- 1xFC at 1.0625Gbps
- 1000BASE-LX Ethernet
- Other optical transmission systems

Description

Optcore's OSP4G-3110DxR is a high performance small form factor pluggable SFP transceiver module for 4.25Gb/s, 2.125Gb/s and 1.06Gb/s Fibre Channel (4GFC, 2GFC, 1GFC) applications in storage area networks. This 4G FC SFP storage transceiver provides 10km transmission distance over 9/125μm Single Mode fiber at a nominal wavelength of 1310nm. The 4G SFP module features a highly reliable 1310nm DFB transmitter and PIN photo-detector into duplex LC optical connector. It is comply with SFP MSA specifications (SFF-8074i, SFF-8472) and Fibre Channel FC-PI-2 Rev.8.0 specifications. It's suitable for use with SAN switches, routers, network interface cards (NICs) and other storage networking equipment.

Additionally, the 4G Fibre Channel SFP storage transceiver module has been integrated with an enhanced digital diagnostic monitoring interface (DDMI) per SFF-8472, which providing real-time monitoring of the transceiver temperature, laser bias current, optical power, received optical power and transceiver supply voltage.

There are three versions of the series 4G Fibre Channel SFP 1310nm optical transceiver modules for different applications. The Standard grade (0~70ºC) is for commonly commercial application, the Extended grade (-10~85ºC) is for Extended temperature application, and the Industrial grade (-40~85ºC) is made with robust and reliable components to meet the needs of Industrial Ethernet application under harsh environmental conditions.

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Maximum Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature	T_S	-40	85	°C	

Operating Humidity	RH	5	85	%	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	Vcc	3.13	3.3	3.47	V	
Power Supply Current	Icc			360	mA	
Operating Case Temperature	Tc	0		70	°C	Standard
		-10		85	°C	Extended
		-40		85	°C	Industrial
Data Rate	DR	1.06		4.25	Gbps	Fibre Channel
Transmission Distance				10	km	9/125μm SMF

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Center Wavelength	λ_C	1270	1310	1360	nm	
Average Output Power	P_{out}	-8		0	dBm	1
Spectral Width (RMS)	σ			1	nm	
Extinction Ratio	ER	5			dB	1
RIN	RIN			-128	dB/Hz	
Transmitter Jitter (peak to peak)	FC-PI-4 requirements					
Receiver						
Center Wavelength	λ_C	1270	-	1610	nm	
Receiver Sensitivity	Pmin	4xFC		-18	dBm	
		2xFC		-21		
		GBE/FC		-22		
Receiver Overload		-3			dBm	2
LOS De-Assert	LOSD			-19	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5	1.0		dB	

Note :

1. Filtered, measured with a PRBS 2^7-1 test pattern @4.25Gbps
2. Measured at 4.25Gbps with PRBS 2^7– 1 NRZ test pattern for BER < $1x10^{-12}$

Electrical Characteristics ($T_{OP(C)}$ = 0 to 70°C, $T_{OP(I)}$ =-40 to 85°C,V_{CC} = 3.13 to 3.47 V)

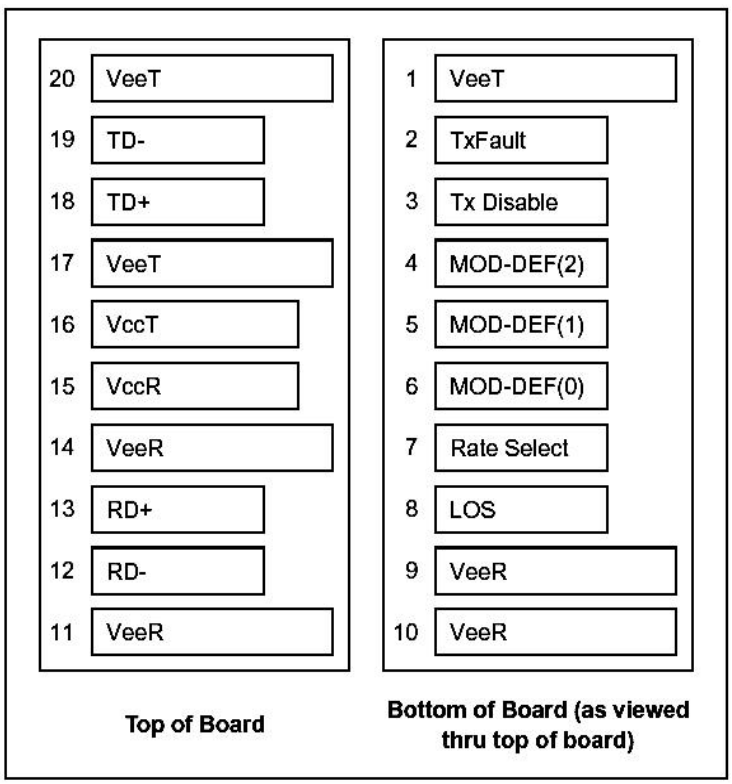
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Differential data input swing	VIN,PP	180		700	mVpp	1

Tx Disable Input-High	VIH	2.0		Vcc+0.3	V	
Tx Disable Input-Low	VIL	0		0.8	V	
Tx Fault Output-High	VOH	2.0		Vcc+0.3	V	2
Tx Fault Output-Low	VOL	0		0.8	V	2
Input differential impedance	Rin		100		Ω	
Receiver						
Differential data output swing	Vout,pp	300		850	mVpp	3
Rx LOS Output-High	VROH	2.0		Vcc+0.3	V	2
Rx LOS Output-Low	VROL	0		0.8	V	2

Notes:

1. TD+/- are internally AC coupled with 100Ω differential termination inside the module.
2. Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
3.RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Pin Definitions



Pin Descriptions

Pin	Signal Name	Description	Plug Seq.	Notes
1	V_{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	MOD_DEF(2)	SDA Serial Data Signal	3	Note 3
5	MOD_DEF(1)	SCL Serial Clock Signal	3	Note 3

6	MOD_DEF(0)	Model present indication	3	Note 3
7	Rate Select	Not Connected	3	
8	LOS	Loss of Signal	3	Note 4
9	V_{EER}	Receiver ground	1	
10	V_{EER}	Receiver ground	1	
11	V_{EER}	Receiver ground	1	
12	RD-	Inverse Received Data Out	3	Note 5
13	RD+	Received Data Out	3	Note 5
14	V_{EER}	Receiver ground	1	
15	V_{CCR}	Receiver Power Supply	2	
16	V_{CCT}	Transmitter Power Supply	2	
17	V_{EET}	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 6
19	TD-	Inv. Transmit Data In	3	Note 6
20	V_{EET}	Transmitter Ground	1	

Notes:

1. TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
2. TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:

   Low (0 to 0.8V): Transmitter on (>0.8V, < 2.0V): Undefined

   High (2.0 to 3.465V): Transmitter Disabled Open:Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.

   Mod-Def 0 is grounded by the module to indicate that the module is present

   Mod-Def 1 is the clock line of two wire serial interface for serial ID

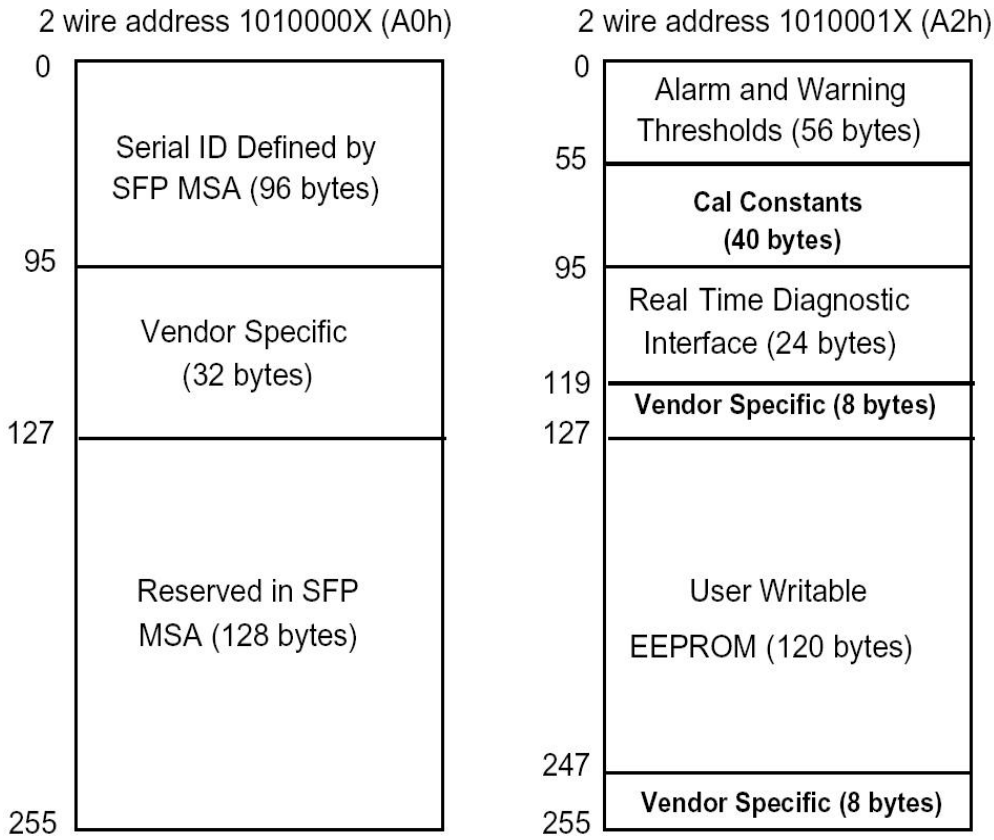
   Mod-Def 2 is the data line of two wire serial interface for serial ID
4. LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor. Pull up voltage between 2.0V and Vcc+0.3V. Logic 1 indicates loss of signal; Logic 0 indicates normal operation. In the low state, the output will be pulled to less than 0.8V.
5. RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.
6. TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

Digital Diagnostic Functions

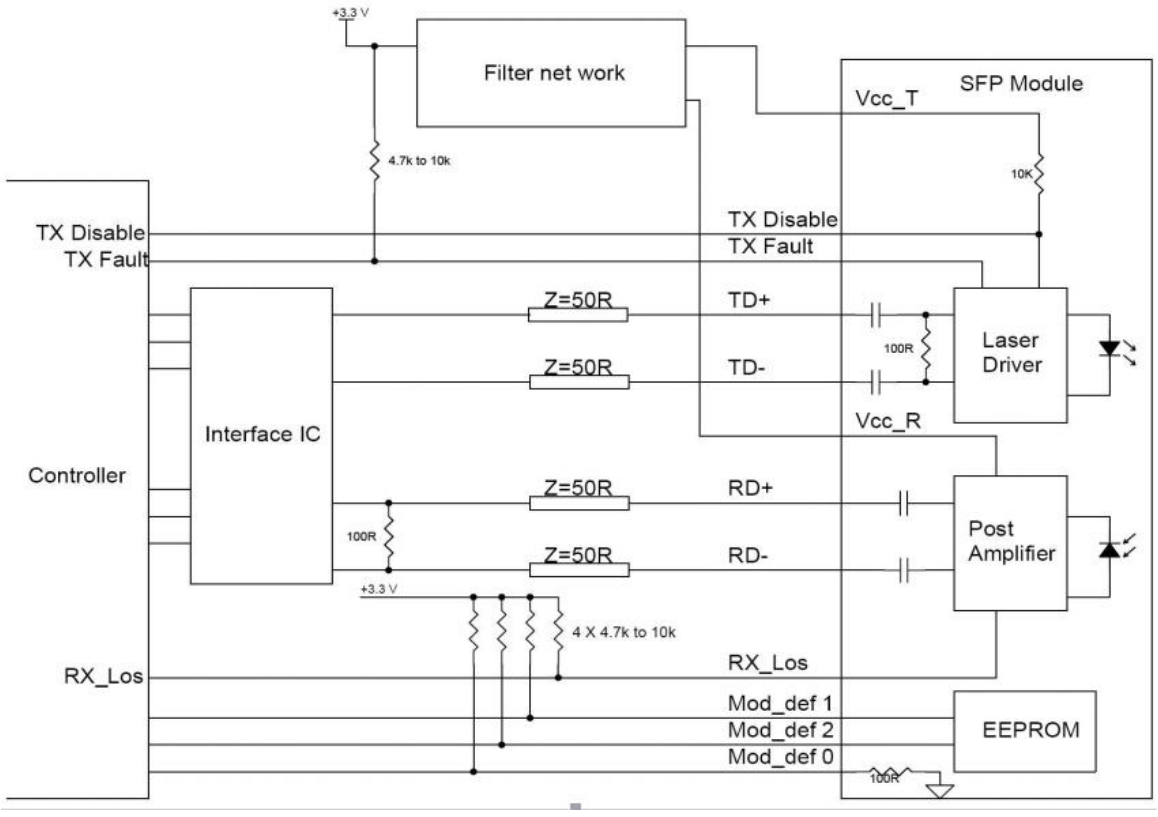
The 4GFC SFP transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The diagnostic information with internal calibration or external calibration all are implemented, including received

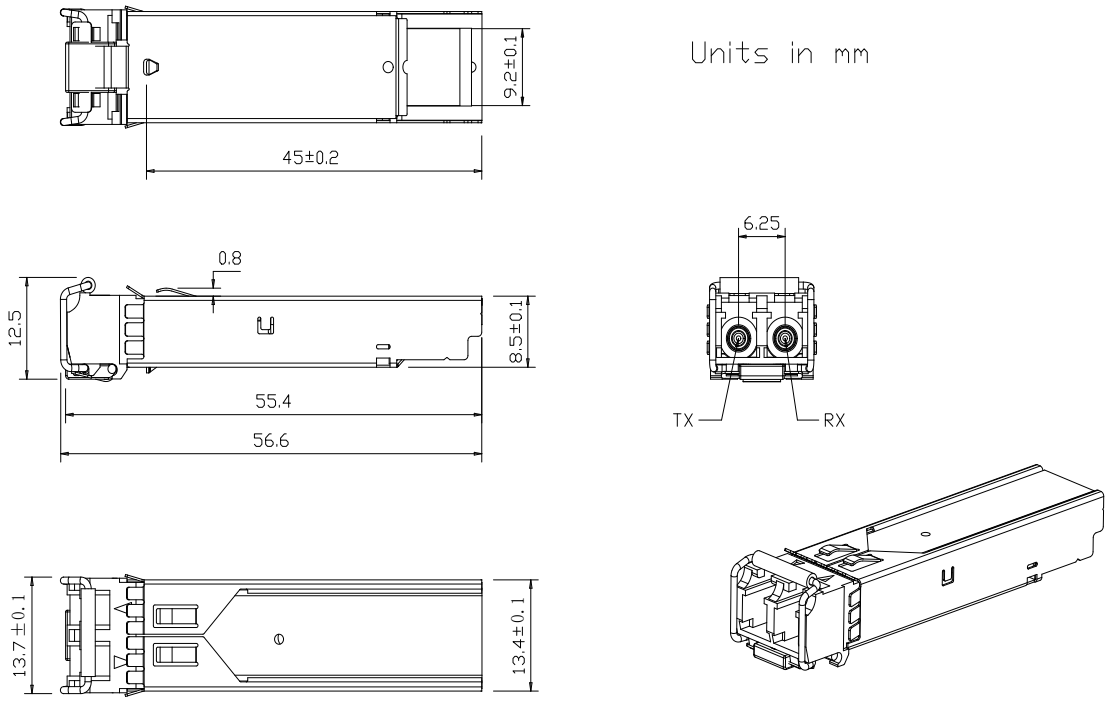
power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring.



Recommended Interface Circuit



Mechanical Dimensions



Ordering information

Part number	Description
OSP4G-3110DCR	4G Fibre Channel SFP Transceiver, SMF, 1310nm, 10km, LC, DDM, 0ºC~+70ºC
OSP4G-3110DER	4G Fibre Channel SFP Extended Transceiver, SMF, 1310nm, 10km, LC, DDM,-10ºC~+85ºC
OSP4G-3110DTR	4G Fibre Channel SFP Industrial Transceiver, SMF, 1310nm, 10km, LC, DDM,-40ºC~+85ºC

Warnings

Process plug

The transceiver optics is supplied with a dust cover. This plug protects the transceiver optics during standard manufacturing processes by preventing contamination from air borne particles.It is recommended that the dust cover remain in the transceiver whenever an optical fiber connector is not inserted.

Handling Precautions

The transceiver optics is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety

The transceiver optics is a Class 1 laser product per international standard IEC 60825-1. Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

For more product information, visit us on the web at www.optcore.net