10Gb/s XFP Optical Transceiver Module

SXP3104SV-M

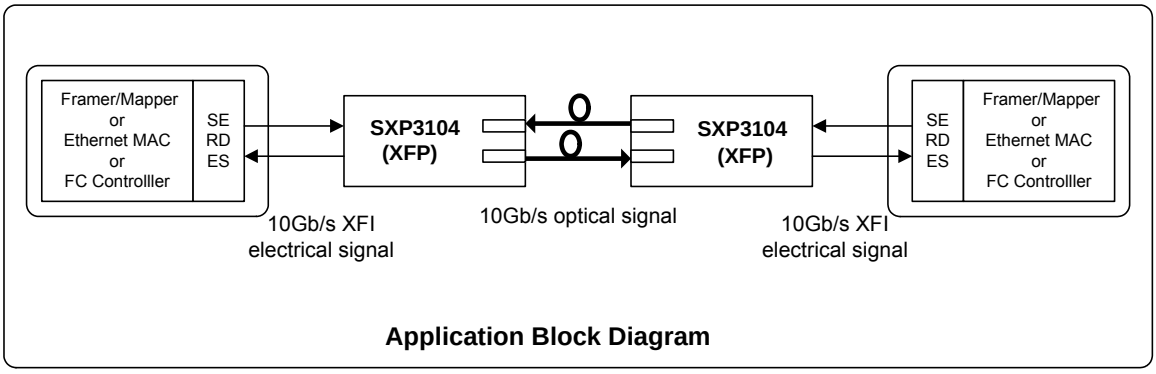
(IR-2/S-64.2b, 10GBASE-ER/EW, 1550nm EML, PIN-PD)

Features

- 10Gb/s Serial Optical Interface
  - High quality and reliability optical device and sub-assemblies
  - 1550nm EML laser for up to 40km over single mode fiber
  - High sensitivity PIN photodiode and TIA
- XFP MSA Revision 4.5 Compliant
  - Easy supply management for hot pluggability
  - Duplex LC Receptacle
  - XFP Mechanical Interface with color coded bail latch for easy removal (Bail color: Red)
  - XFI High Speed Electrical Interface
  - 2-wire interface for management and diagnostic monitor
  - Tx_Disable and Rx_LOS functions
- Multi-Protocol
  - SONET OC-192/SDH STM-64
  - IEEE802.3ae 10 Gigabit Ethernet
- Low Power Consumption
  - +3.3V and +5.0V Power Supplies
  - Low power consumption
- RoHS6 Compliant

Applications

- SONET(OC-192)/SDH(STM64) line card
- 10GE Ethernet switches and routers
- 10GE Core-routers
- 10GE Storage
- Inter Rack Connection
- Other high speed data connections



Application Block Diagram

1. General Description

The SXP3104SV-M is a very compact 10Gb/s optical transceiver module for serial optical communication applications at 10Gb/s. The SXP3104SV-M converts a 10Gb/s serial electrical data stream to 10Gb/s optical output signal and a 10Gb/s optical input signal to 10Gb/s serial electrical data streams. The high speed 10Gb/s electrical interface is fully compliant with XFI specification.

The SXP3104SV-M is designed for use in a variety of 10Gb/s SONET/SDH equipment including FEC (9.95Gb/s to 10.7Gb/s) as well as Ethernet LAN (10.3Gb/s) and WAN (9.95Gb/s) applications. The high performance cooled 1550nm EML transmitter and high sensitivity PIN receiver provide superior performance for SONET /SDH and Ethernet applications at up to 40km links.

The fully XFP compliant form factor provides hot pluggability, easy optical port upgrades and low EMI emission.

2. Functional Description

The SXP3104SV-M contains a duplex LC connector for the optical interface and a 30-pin connector for the electrical interface. Figure 2.1 shows the functional block diagram of SXP3104SV-M XFP Transceiver.

Transmitter Operation

The transceiver module receives 10Gb/s electrical data and transmits the data as an optical signal. The transmitter contains a Clock Data Recovery (CDR) circuit that reduces the jitter of received signal and reshapes the electrical signal before the electrical to optical (E-O) conversion. The optical output power is maintained constant by an automatic power control (APC) circuit. The transmitter output can be turned off by Tx disable signal, at TX_DIS pin. When TX_DIS is asserted High, Transmitter is turned off.

Receiver Operation

The received optical signal is converted to serial electrical data signal. The optical receiver contains a CDR circuits that reshapes and retimes an electrical signal before sending out to the XFI channel (i.e. XFP connector and high speed signal traces).

The RX_LOS signal indicates insufficient optical power for reliable signal reception at the receiver.

Management Interface

A 2-wire interface (SCL, SDA) is used for serial ID, digital diagnostics and other control /monitor functions. The address of XFP transceiver is 1010000x. MOD_DESEL signal can be used in order to support multiple XFP modules on the same 2-wire interface bus.

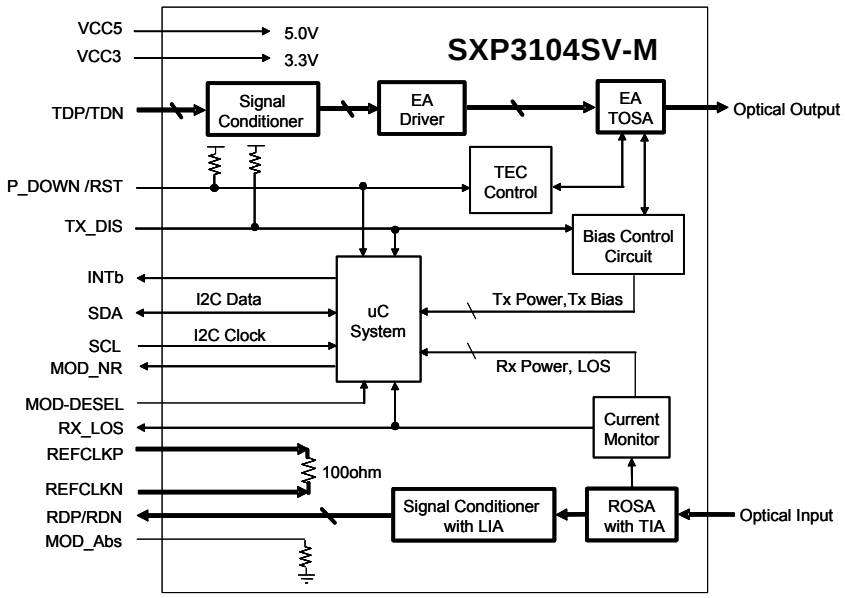
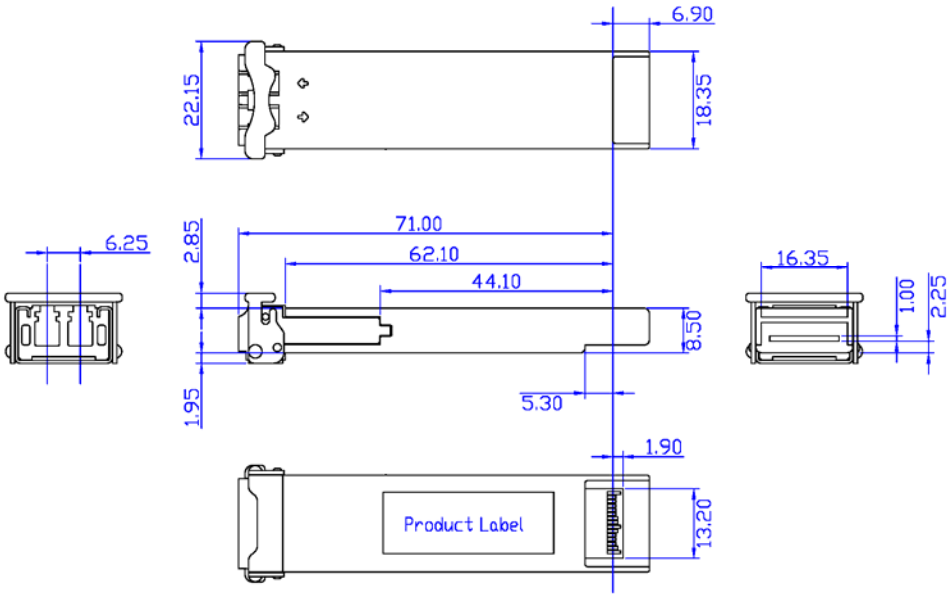


Figure 2.1. Functional Block Diagram

3. Package Dimensions

Figure 3.1 shows the package dimensions of SXP3104SV-M. SXP3104SV-M is designed to be complaint with XFP MSA specification. Package dimensions are specified in section 6.3 of the XFP MSA specification Rev. 4.5.



* Bail color is Red. Unit : mm

Figure 3.1. Package Dimensions

4. Pin Assignment and Pin Description

4.1. XFP Transceiver Electrical Pad Layout

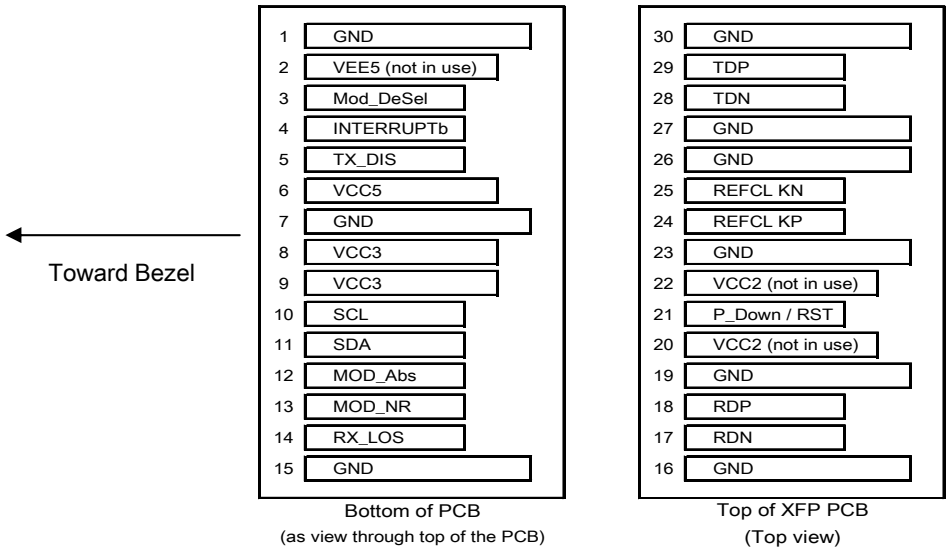


Figure 4.1. XFP Transceiver Electrical Pad Layout

4.2. Host PCB XFP Pinout

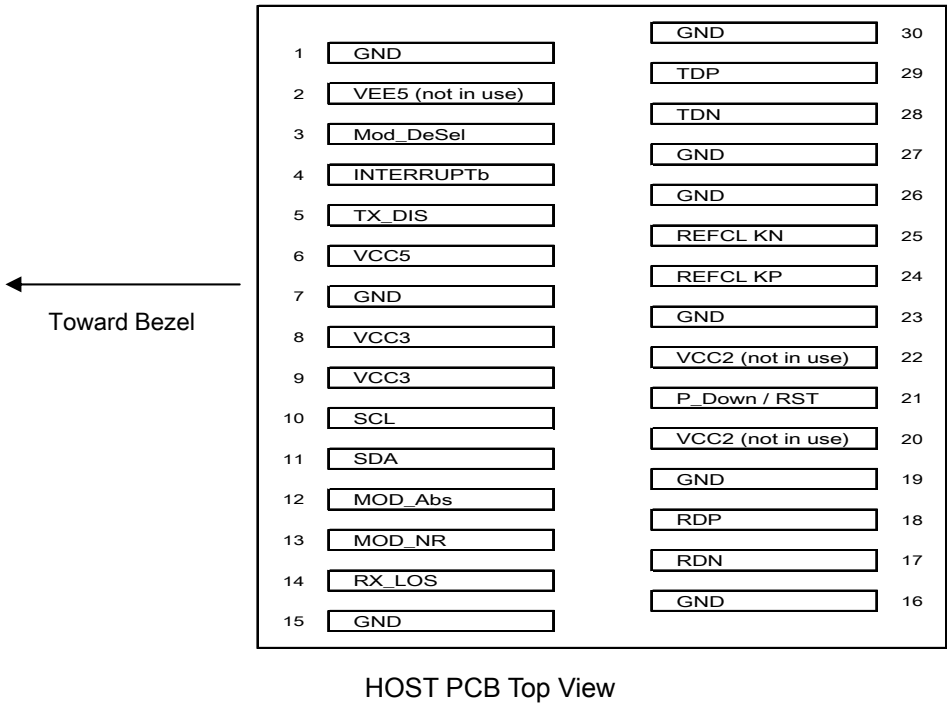


Figure 4.2. Host PCB XFP Pinout

4.3. Pin Descriptions

Table 4.3. Pin Description

Pin#	Name	Logic	Description	Note
1	GND		Module Ground	1
2	VEE5		-5.2V Power Supply; **not in use**	3
3	MOD_DeSel	LVTTL-I	Module De-select; When held Low allows module to respond to 2-wire serial interface	
4	INTERRUPTb	LVTTL-O	Indicates presence of an important condition, which can be read over the 2-wire serial interface. This pin is an open collector output and must be pulled up to host_Vcc on the host board.	2
5	TX_DIS	LVTTL-I	Transmitter Disable; When asserted High, transmitter output is turned off. This pin is pulled up to VCC3 in the module	
6	VCC5		+5V Power Supply	
7	GND		Module Ground	1
8	VCC3		+3.3V Power Supply	
9	VCC3		+3.3V Power Supply	
10	SCL	I/O	2-wire serial interface clock. Host shall use a pull-up resistor connected to host_Vcc of +3.3V.	2
11	SDA	I/O	2-wire serial interface data. Host shall use a pull-up resistor connected to host_Vcc of +3.3V.	2
12	MOD_Abs	LVTTL-O	Indicates Module is not present. Host shall pull up this pin, and grounded in the module. "High" when the XFP module is absent from a host board.	2
13	MOD_NR	LVTTL-O	Module not ready; When High, Indicates Module Operational Fault. This pin is an open collector and must be pulled to host_Vcc on the host board.	2
14	RX_LOS	LVTTL-O	Receiver Loss of Signal; When high, indicates insufficient optical input power to the module. This pin is an open collector and must be pulled to host_Vcc on the host board.	2
15	GND		Module Ground	

Pin#	Name	Logic	Description	Note
16	GND		Module Ground	
17	RDN	CML-O	Receiver Inverted Data Output; AC coupled inside the module.	
18	RDP	CML-O	Receiver Non-Inverted Data Output; AC coupled in side the module.	
19	GND		Module Ground	1
20	VCC2		+1.8V Power Supply; **not in use**	3
21	P_Down/RST	LVTTL-I	Power down; When High, module is limited power mode. Low for normal operation. Reset; The falling edge indicates complete reset of the module. This pin is pulled up to VCC3 in the module.	
22	VCC2		+1.8V Power Supply; **not in use**	3
23	GND		Module Ground	1
24	REFCLKP	PECL-I	Reference clock Non-Inverted Input; **not in use**	
25	REFCLKN	PECL-I	Reference clock Inverted Input; **not in use**	
26	GND		Module Ground	1
27	GND		Module Ground	1
28	TDN	CML-I	Transmitter Inverted Data Input; AC coupled in side the module.	
29	TDP	CML-I	Transmitter Non-Inverted Data Input; AC coupled in side the module.	
30	GND		Module Ground	1

Note

1: Module ground pins are isolated from the module case and chassis ground within the module.

2: Shall be pulled up with 4.7k to 10k ohm to a voltage between 3.15V and 3.45V on the host board.

3: Not connected internally.

5. Absolute Maximum Ratings and Recommended Operating Conditions

Table 5.1. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Note
Storage Temperature	Tst	-40	85	degC	
Relative Humidity (non-condensation)	RH	-	85	%	
Supply Voltage	VCC5	-0.3	6.0	V	
Supply Voltage	VCC3	-0.5	3.6	V	
Voltage on LVTTL Input	Vilvttl	-0.5	VCC3+0.5	V	
LVTTL Output Current	Iolvttl	-	15	mA	
Voltage on Open Collector Output	Voco	0	6	V	
Receiver Input Optical Power(Average)	Mip	-	4	dBm	1

Note:

1: PIN Receiver

Table 5.2. Recommended Operating Conditions and Supply Requirements

Parameter	Symbol	Min	Max	Unit	Note
Operating Case Temperature	Topc	-5	85	degC	
Relative Humidity (non-condensing)	Rhop	-	85	%	
Power Supply Voltage	VCC5	4.75	5.25	V	
Power Supply Voltage	VCC3	3.135	3.465	V	
Power Supply Current	ICC5	-	500	mA	1
Power Supply Current	ICC3	-	750	mA	
Total Power Consumption	Pd	-	3.5	W	

Note:

1: The inrush current is included

6. Electrical Interface

6.1. High Speed Electrical Interface

XFI Application Reference model

Figure 6.1.1 shows the high speed electrical interface (XFI) compliance points.

XFI electrical interface is specified for each compliance point in the chapter 3 of the XFP MSA specification. Rev (4.5)

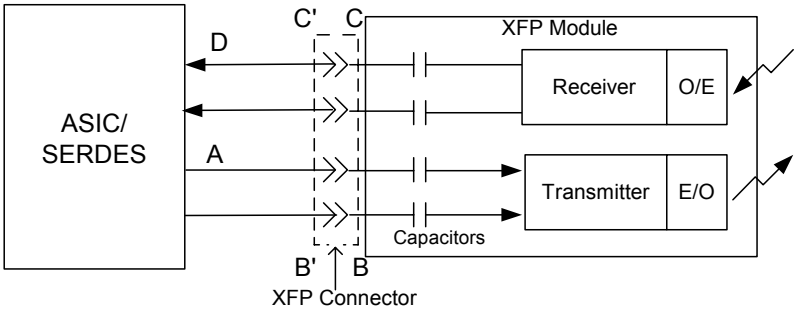


Figure 6.1.1. XFI Application Reference Model

XFI Module Transmitter Input Electrical Interface Specification at B'

Table 6.1.1. XFI Transmitter Input Electrical Specification at B'

Parameter -B'	symbol	Min	Typ	Max	Units	Note
Reference differential Input Impedance	Zd	-	100	-	Ohm	
Termination Mismatch	ΔZm	-		5	%	
Input AC Common mode Voltage		-		25	mV(RMS)	
Differential Input Return Loss	SDD11	20		-	dB	1
		8		-	dB	2
		See 3		-		3
Comon Mode Input Return Loss	SCC11	3		-	dB	4
Differential to Common Mode Conversion	SCD11	10		-	dB	4
Total Input Non-DDJ Jitter	TJtnd	-		0.41	UIp-p	
Total Input Jitter	TJ	-		0.61	UIp-p	
Input Jitter for ITU-T 20kHz-80MHz	Gjin1	-		150	mUIp-p	
Input Jitter for ITU-T 4MHz-80MHz	Gjin2	-		50	mUIp-p	
Eye Mask	X1	-		0.305	UI	5
	Y1	60		-	mV	
	Y2	-		410	mV	

Note

1: 0.05 to 0.1 GHz

2: 0.1 to 5.5GHz

3: 5.5 to 12GHz, SDD11(dB)=8-20.66Log10(f/5.5), with f in GHz

4: 0.1 to 15GHz

5: Eye Mask is defined in Figure 6.1.2

XFI Module Receiver Output Electrical Interface Specification at C'

Table 6.1.2. XFI Receiver Output Electrical Specification at C'

Parameter -C'	symbol	Min	Typ	Max	Units	Note
Reference differential Output Impedance	Zd	-	100	-	Ohm	
Termination Mismatch	ΔZm	-		5	%	
Output AC Common mode Voltage		-		15	mV(RMS)	
Output Rise and Fall time (20%-80%)	trh, tfh	24		-	ps	
Differential Output Return Loss	SDD22	20		-	dB	1
		8		-	dB	2
		See 3		-		3
Comon Mode Input Return Loss	SCC22	3		-	dB	4
Determinstic Jitter	TJtnd	-		0.18	Ulp-p	
Total Jitter	TJ	-		0.34	Ulp-p	
Eye Mask	X1	-		0.17	UI	5
	X2	-		0.42	UI	
	Y1	170		-	mV	
	Y2	-		425	mV	

Note

1: 0.05 to 0.1 GHz

2: 0.1 to 5.5GHz

3: 5.5 to 12GHz, SDD11(dB)=8-20.66Log10(f/5.5), with f in GHz

4: 0.1 to 15GHz

5: Eye Mask is defined in Figure 6.1.3

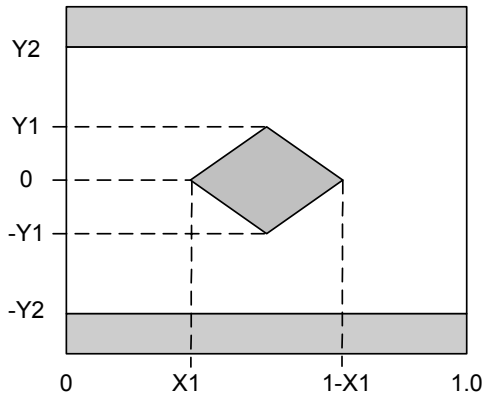


Figure 6.1.2.
Transmitter Input Eye Mask

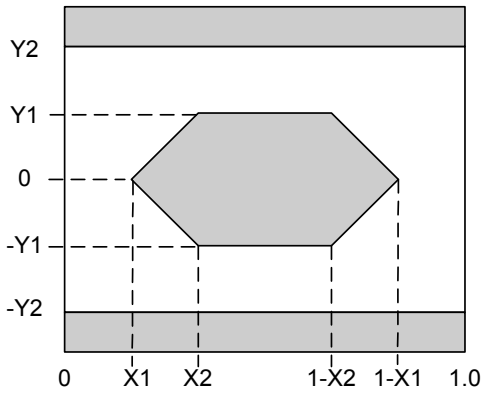


Figure 6.1.3.
Receiver Output Eye Mask

XFI Reference Clock Specification

Note that the reference clock is not needed for SXP3104SV-M. The differential reference clock signals if used are internally terminated across 100ohm as shown in Figure 2.1.

6.2. CDR Specification

Transmitter CDR

Table 6.2.1. Transmitter CDR Specification

Parameter	symbol	Min	Typ	Max	Units	Note
Jitter Transfer Bandwidth	BW	-		8	MHz	1
Jitter Transfer Peaking	Jp1	-		0.1	dB	2
	Jp2	-		1	dB	3

Note

1: In order to meet SONET/SDH jitter transfer requirement, de-jitter PLL will be needed on the host board SerDes.

2: Frequency ≤ 120kHz

3: Frequency ≥ 120kHz

Receiver CDR

Table 6.2.2. Receiver CDR Specification

Parameter	symbol	Min	Typ	Max	Units	Note
Jitter Transfer Bandwidth	BW	-		12	MHz	
Jitter Transfer Peaking	Jp1	-		0.1	dB	1
	Jp2	-		1	dB	2

Note

1: Frequency ≤ 120kHz

2: Frequency ≥ 120kHz

6.3. Low Speed Electrical Interface

Table 6.3.1. Low Speed Control and Alarm Signals Electrical Interface

Parameter	symbol	Min	Typ	Max	Units	Note
XFP Interrupt, Mod_NR, RX_LOS	Vol	0.0		0.4	V	1
	Voh	Vcc-0.5		Vcc+0.3		2
XFP TX_DIS, P_DOWN/RST	Vil	-0.3		0.8	V	3
	Vih	2.0		VCC3+0.3		4
XFP SCL and SDA Output	Vol	0.0		0.4	V	1
	Voh	Vcc-0.5		Vcc+0.3		2
XFP SCL and SDA Input	Vil	-0.3		VCC3*0.3	V	5
	Vih	VCC3*0.7		VCC3+0.5		6
Capacitance for XFP SCL and SDA I/O pin	Ci	-		14	pF	
Total bus capacitive load for SCL and SDA	Cb	-		100	pF	7
		-		400	pF	8

Note

1: Pull-up resistor must be connected to host_Vcc on the host board. Iol(max)=3mA

2: Pull-up resistor must be connected to host_Vcc on the host board.

3: Pull-up resistor connected to VCC3 within XFP module. Iil(max)= -10μA.

4: Pull-up resistor connected to VCC3 within XFP module. Iih(max)= 10μA.

5: Pull-up resistor must be connected to host_Vcc on the host board. Iol(max)= -10μA.

6: Pull-up resistor must be connected to host_Vcc on the host board. Iol(max)= 10μA.

7: at 400KHz, 3.0kohms, at 100kHz, 8.0kohms max.

8: at 400KHz, 0.8kohms, at 100kHz, 2.0kohms max.

7. Optical Interface

Table 7.1. Optical Interface

Transmitter Optical Interface						
Parameter	Symbol	Min	Typical	Max	Unit	Note
Operating Data Rate	-	9.95		10.71	Gb/s	1
Output Center Wavelength	ltc	1530		1565	nm	
Spectral Width	dl	-		1	nm	
SMSR	SMSR	30		-	dB	
Average Output Power	Po	-1		2	dBm	2
Disabled Power	Poff	-		-30	dBm	2
Extinction Ratio	ER	8.2		-	dB	4
Optical Modulation Amplitude (10G Ethernet)	OMA	-1.7		-	dBm	3
Transmitter and dispersion penalty (10G Ethernet)	TDP	-		3	dB	3
OMA-TDP (10G Ethernet)	OMAtdp	-2.1		-	dBm	3
Eye Mask 1 (SONET/SDH)		GR-253-CORE/ITU-T G.691				4
Eye Mask 2 (10G Ethernet)		IEEE802.3ae				3
Generation Jitter 1 (20kHz - 80MHz)		-		0.15	UIp-p	
Generation Jitter 2 (4MHz - 80MHz)		-		0.1	UIp-p	
RIN_{21} OMA	RIN	-		-128	dB/Hz	
Optical Return Loss Tolerance		-		21	dB	
Receiver Optical Interface						
Parameter	Symbol	Min	Typical	Max	Unit	Note
Operating Data Rate	-	9.95		10.71	Gb/s	1
Input Center Wavelength	lrc	1260		1565	nm	
Overload	Rovl	0.5		-	dBm	
Minimum Sensitivity	Pmin	-		-14	dBm	4
Stressed Sensitivity in OMA	OMAst	-		-11.3	dBm	
RX_LOS Assert Level	RLOSa	-30		-25	dBm	
RX_LOS Deassert Level	RLOSd	-		-22	dBm	
RX_LOS Hysteresis	RLOSh	1		5	dB	
Optical Return Loss	ORL	27		-	dB	
Jitter Tolerance	JTL	GR-253-CORE/ITU-T G.783				

Note:

1: Data rate tolerance
IR-2/S-64.2b, 10GBASE-EW : typ.+/-20ppm
10GBASE-ER : typ.+/-100ppm

2: Measured at 9.95328Gbps, Framed PRBS2^31-1, NRZ

3: Measured at 10.3125Gbps, Non-framed PRBS2^31-1, NRZ

4: Measured at 10.70992Gbps, Non-framed PRBS2^31-1, NRZ

8. Electrical and Optical I/O Signal Relationship

Table.8.1. TX_DIS vs. Optical Output Power

TX_DIS	Optical Output Power
Low (V_{IL}=-0.3 to 0.8V)	Enabled
High (V_{IH} =2.0 to VCC3+0.3V)	Disabled (<-30dBm)

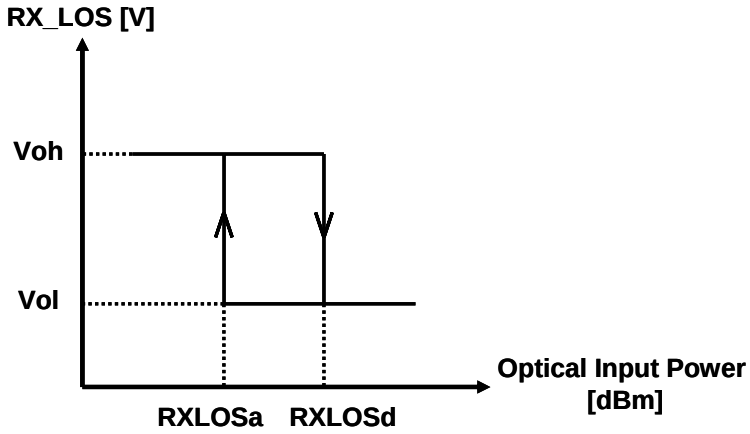


Figure.8.1. Optical Input Power vs. RX_LOS

9. User Interface

9.1. XFP Mechanical Interface

XFP Mechanical Interface is specified in the Chapter 6 in the XFP MSA specification.

XFP Mechanical Components

Figure 9.1 shows the XFP transceiver concept and mechanical components.

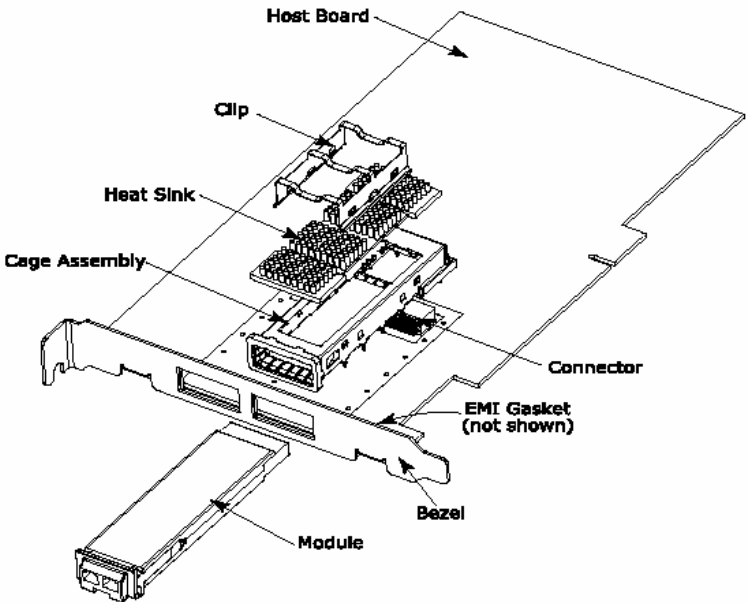


Figure 9.1. XFP Mechanical Interface Concept and Components

XFP Host board Mechanical Layout

XFP Host Board Layout is specified in the Figure 35 of the XFP MSA specification (Rev. 4.5).

Host Board XFP Connector Footprint and Layout

Host board XFP connector layout is specified in the Figure 36 of the XFP MSA Specification (Rev. 4.5).

XFP Datum Alignment and Bezel Design

XFP datum alignment (depth) is specified in the Figure 30 of the XFP MSA specification (Rev. 4.5).

The recommended bezel design is specified in the Figure 37 of the XFP MSA specification (Rev. 4.5).

XFP Connector and XFP Cage Assembly

The XFP 30-contact connector mechanical specification is shown in Figure 39 of the XFP MSA specification (Rev. 4.5)

The XFP Cage Assembly mechanical specification is shown in the Figure 41 of the XFP MSA specification (Rev. 4.5).

9.2. Management Interface

XFP 2-Wire Serial Interface Protocol

XFP 2-wire serial interface is specified in the Chapter 4 of the XFP MSA specification.

The XFP 2-wire serial interface is used for serial ID, digital diagnostics, and certain control functions. The 2-wire serial interface is mandatory for all XFP modules.

The 2-wire serial interface address of the XFP module is 1010000X(A0h). In order to access to multiple modules on the same 2-wire serial bus, the XFP has a MOD_DESEL (module deselect pin). This pin (which is pull high or deselected in the module) must be held low by the host to select of interest and allow communication over 2-wire serial interface. The module must not respond to or accept 2-wire serial bus instructions unless it is selected.

XFP Management Interface

XFP Managed interface is specified in the Chapter 5 of the XFP MSA specification.

The Figure 9.2 shows the structure of the memory map. The normal 256 Byte address space is divided into lower and upper blocks of 128 Bytes. The lower block of 128 Byte is always directly available and is used for the diagnostics and control functions that must be accessed repeatedly. Multiple blocks of memories are available in the upper 128 Bytes of the address space. These are individually addressed through a table select Byte which the user enters into a location in the lower address space. The upper address space tables are used for less frequently accessed functions and control space for future standards definition.

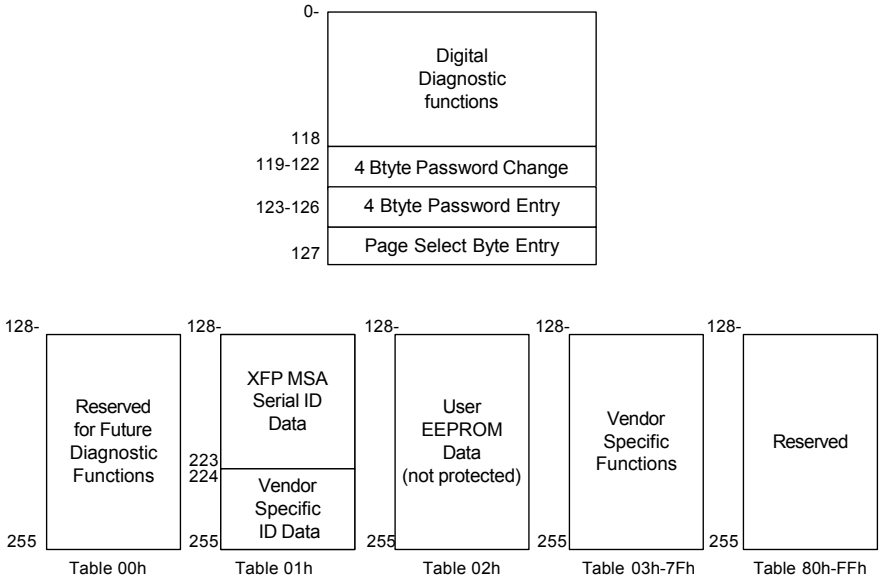


Figure 9.2. 2-wire Serial Interface Memory Map

9.3. A/D Accuracy and Values

Table 9.3.1. A/D Values

Byte	Bit	Name	Description
96	All	Temperature MSB	Signed 2's complement integer temperature (-40 to +125degC) based on internal temperature measurement
97	All	Temperature LSB	Fractional part of temperature(count/256)
98-99	All		Reserved
100	All	Tx Bias MSB	Measured Laser Bias Current in mA. Bias current is full 16 bit value *2μA. (Full range of 0 to 131mA)
101	All	Tx Bias LSB	
102	All	Tx Power MSB	Measured Tx output power in mW. Tx power is full 16 bit value *0.1μW. (Full range of -40 to +8.2dBm)
103	All	Tx Power LSB	
104	All	Rx Power MSB	Measured Rx input power in mW. Tx power is full 16 bit value *0.1μW. (Full range of -40 to +8.2dBm)
105	All	Rx Power LSB	
106	All	Vcc3 MSB	Internally measured transceiver supply voltage. Vcc is full 16 bit value*100μV. (Full range of 0 to +6.55 Volts)
107	All	Vcc3 LSB	
108	All	Vcc5 MSB	
109	All	Vcc5 LSB	

Table 9.3.2. A/D Accuracy

Data Address	Parameter	Accuracy	Relative accuracy	Units Display	Note
96-97	Temperature	+/-3degC	NA	Signed 2's complement integer degC	Junction temperature of monitoring IC.
98-99	Reserved				
100-101	Tx Bias	+/-10%	NA	×2μA	Specified by nominal value
102-103	Tx Power	+/-2dB@BOL (Note1) (Range: -1 to +2dBm	+/-1dB (Note2)	×0.1μW	Average Power
104-105	Rx Power	+/-2dB@BOL (Note1) (Range: -16 to +2dBm)	+/-1dB (Note2)	×0.1μW	At specified transmitter wavelength.
106-107	Vcc	+/-3%	NA	×100μV	+3.3V Only
108-109	Vcc	+/-3%	NA	×100μV	+5.0V Only

Note

1: Over specified temperature and voltage.

2: Over specified temperature and voltage range over the life of the product into a fixed measurement system.

9.4. Serial ID Memory Map (Data Field – Page 01h)

Address	Name of field	Hex	ASCII	Description
128	Identifier	6		XFP
129	Ext. Identifier	90		Power Level 3 Module(3.5W max.power dissipation.),
				Module with CDR function
				TX Ref Clock Input Not Required
				No CLEI code present in Table 02h
130	Connector	7		LC
131	Transceiver	22		10GBASE-ER, 10GBASE-EW
132		0		
133		0		
134		0		
135		0		
136		20		S-64.2b
137		0		
138		0		
139	Encoding	B0		64B/66B, SONET Scrambled, NRZ, ,
140	BR, Nominal	64		9953Mbps
141	BR, Max	6C		10750Mbps
142	Length(SMF) - km	28		40km
143	Length (E-50um)	0		
144	Length (50um)	0		
145	Length (62.5um)	0		
146	Length (Copper)	0		
147	Device Tech	74		1550nm EML, No wavelength control,
				Cooled transmitter,PIN detector
148	Vendor name	53	S	
149		75	u	
150		6D	m	
151		69	i	
152		74	t	
153		6F	o	
154		6D	m	
155		6F	o	
156		45	E	
157		6C	l	
158		65	e	
159		63	c	
160		74	t	
161		72	r	
162		69	i	
163		63	c	
164	CDR Support	F0		CDR support for 9.95 Gb/s,
				10.3 Gb/s ,10.5 Gb/s ,10.7 Gb/s ,,
165	Vendor OUI	0		
166		0		
167		5F		
168	Vendor PN	53	S	
169		58	X	
170		50	P	
171		33	3	
172		31	1	
173		30	0	
174		34	4	
175		53	S	
176		56	V	
177		2D	-	
178		4D	M	
179		20		
180		20		
181		20		
182		20		
183		20		
184	Vendor rev	41	A	
185		20		
186	Wavelength	78		1547.5nm
187		E6		
188	Wavelength Tolerance	D		17.5nm(Note1)
189		AC		
190	Max Case Temp	55		85degC
191	CC_BASE			Note2

Address	Name of field	Hex	ASCII	Description
192	Power Supply	AF		3.5W
193		96		1.5W(Note3)
194		A8		max current : 500mA @5V, 800mA @3.3V
195		0		Note4
196	Vendor SN			Note5
197				
198				
199				
200				
201				
202				
203				
204				
205				
206				
207				
208				
209				
210				
211				
212	Date code & Lot code			Year(Note6)
213				
214				Month(Note6)
215				
216				Day(Note6)
217				
218				Lot code(Note6)
219				
220	Diagnostic Monitoring type	8		No BER Support, Average Power
221	Enhanced Options	60		Optional Soft TX_DISABLE implemented,
				Optional Soft P_down implemented
222	Aux Monitoring	76		+3.3V Supply Voltage, +5V Supply Voltage
223	CC_EXT			Note7
224		FF		
225		FF		
226		FF		
227		FF		
228		FF		
229		FF		
230		FF		
231		FF		
232		FF		
233		FF		
234		FF		
235		FF		
236		FF		
237		FF		
238		FF		
239		FF		
240		FF		
241		FF		
242		FF		
243		FF		
244		FF		
245		FF		
246		FF		
247		FF		
248		FF		
249		FF		
250		FF		
251		FF		
252		FF		
253		FF		
254		FF		
255		FF		

Note

1: The guaranteed +/- range of transmitter output wavelength under all normal operating conditions.

2: Address 191 is check sum of bytes 128 to 190.

3: Maximum total power dissipation in power down mode.

4: +1.8V/-5.2V is not in use.

5: Address 196 to 211 Vendor Serial Number

6: Address 212 to 219 Date code

7: Address 223 is check sum of bytes 192 to 222.

9.5. Supply filter

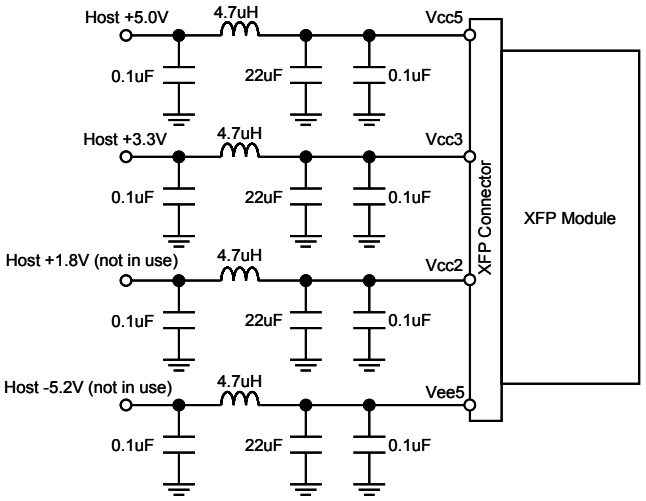


Figure 9.5. Supply Filter

9.6. Recommended Electrical Interface

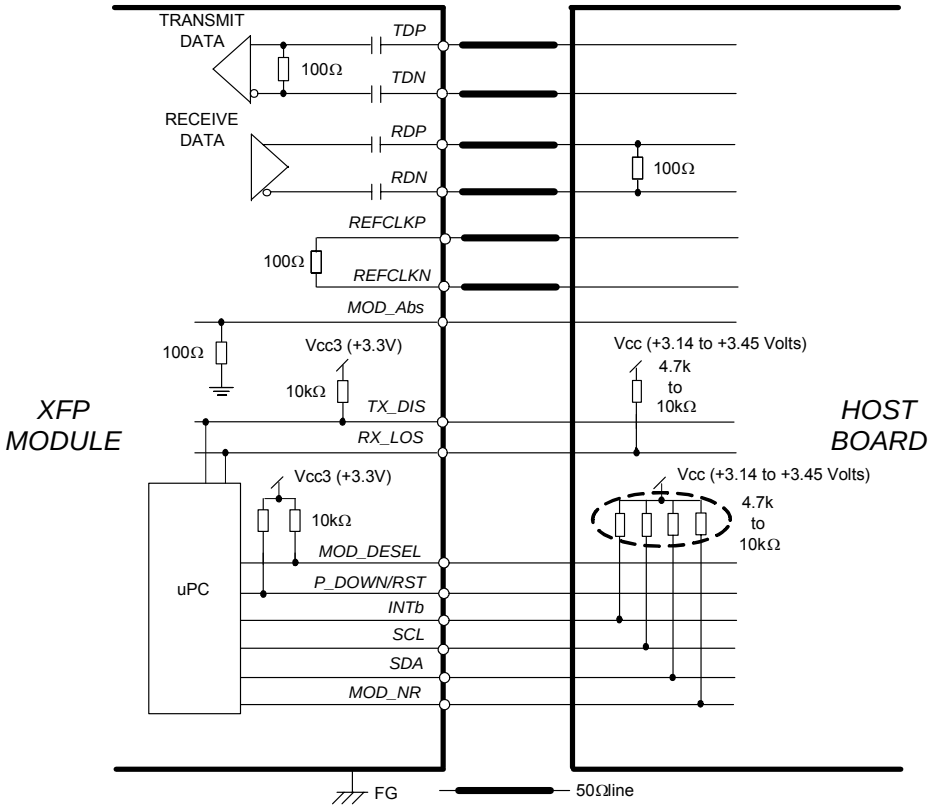


Figure 9.6. Recommended Electrical Interface

10. Qualification Testing

SXP3104SV-M 10Gb/s transceiver is qualified to Sumitomo Electric Industries internal design and manufacturing standards. Telecordia GR-468-CORE reliability test standards, using methods per MIL-STD-883 for mechanical integrity, endurance, moisture, flammability and ESD thresholds, are followed.

11. Laser Safety Information

SXP3104SV-M OC-192 transceiver uses a semiconductor laser system that is classified as Class 1 laser products per the Laser Safety requirements of FDA/CDRH, 21 CFR1040.10 and 1040.11. These products have also been tested and certified as Class 1 laser products per IEC60825-1:2007 and IEC60825-1:2001 International standards.

Caution

If this product is used under conditions not recommended in the specification or is used with unauthorized revision, the classification for laser product safety is invalid. Reclassify the product at your responsibility and take appropriate safety measures.

12. Electromagnetic Compatibility (Pending)

EMI (Emission)

SXP3104SV-M is designed to meet FCC Class B limits for emissions and noise immunity per CENELEC EN50 081 and 082 specifications.

RF Immunity

SXP3104SV-M has an immunity to operate when tested in accordance with IEC 61000-4-3 (80- 1000MHz, Test Level 3) and GR-1089.

Electrostatic Discharge (ESD) Immunity

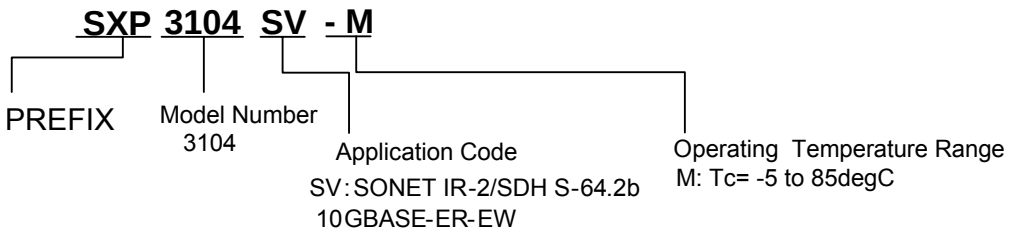
SXP3104SV-M has an immunity against direct and indirect ESD when tested accordance with IEC 61000-4-2.

13. RoHS COMPLIANCY

Compliance versus requirements contained within the following reference document is guaranteed: 'DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast)'.

14. Ordering Information

14.1. Part Numbering System



14.2. Evaluation Board Kit

For test purposes, Evaluation Board model number SK3101A and SP3101A may be ordered to use with the SXP3104 Series transceivers.

SK3101A : SXP3104 XFP evaluation board

SP3101A : XFP 2-wire serial interface evaluation kit

14.3. Ordering Number Code

Table 13. SXP3104 Application Code

P/N	Distance	Fiber	E/O	O/E	ITU-T G.691	Telecordia GR-253	IEEE 802.3ae
SXP3104SV-M	40km	STD-SMF	1.55umEML	PIN	S-64.2b	IR-2	10GBASE-ER/EW

14.4. Firmware version

This product contains the firmware inside. Sumitomo Electric may upgrade the firmware version without advance notice as far as such would be upper compatible.

When customer should prefer to have the current firmware version, Sumitomo Electric will accommodate such request and will assign customized part number for this purpose.

14.5. I2C Interface

If the serial clock(SCL) is more than 100kHz, the SCL is held in line lpw(clock stretching) during an I2C read or white operation.

15. Label Information

(Bottom Label)

(Case Label)

16. Contact Information

U.S.A.
Sumitomo Electric Device Innovations, U.S.A., Inc.
<West Coast (USA Headquarters)>
2355 Zanker Rd. San Jose, CA 95131-1138, USA
Tel: +1-408-232-9500
Fax: +1-408-428-9111
<East Coast>
4021 Stirrup Creek Drive, Suite 200, Durham, NC 27703, USA
Tel: +1-919-361-1600
Fax: +1-919-361-1619
Email: lw-info@sei-device.com, mw-info@sei-device.com
http://www.sei-device.com/

Europe
Sumitomo Electric Europe Ltd.
220 Centennial Park, Elstree, Herts, WD6 3SL UK
Tel: +44-208-953-8681
Fax: +44-208-207-5950
E-mail: photonics@sumielectric.com
http://www.sumielectric.com

Asia
Sumitomo Electrics Asia Ltd.
Photonics Department
Room 2624 - 2637, 26F., Sun Hung Kai Center, 30 Harbour Road, Wanchai, Hongkong.
Tel: +852-2576-0080
Fax: +852-2576-6412

Japan
Sumitomo Electric Industries, Ltd.
Device Sales Department
<Tokyo>
3-9-1, Shibaura, Minato-ku, Tokyo 108-8539, Japan
TEL +81-3-6722-3286
FAX +81-3-6722-3284
<Osaka>
4-5-33, Kitahama, Chuo-ku, Osaka 541-0041, Japan
Tel: +81-6-6220-4245
Fax: +81-6-6222-6231
E-mail: optoele-sales-pro-sml@list.sei.jp
http://www.sei.co.jp/products/index.html