SPT-P1S131G-L20D

1.25Gb/s Self looping Single Mode Datacom SFP Transceiver

Features

- Up to 1.25Gb/s Self looping data links
- Hot-pluggable SFP footprint
- Built-in digital diagnostic functions
- 1310nm FP laser transmitter
- Single LC receptacle
- RoHS compliant and Lead Free
- Up to 20 km on 9/125um SMF
- Metal enclosure for lower EMI
- Single 3.3V power supply
- Low power dissipation <600mW typical
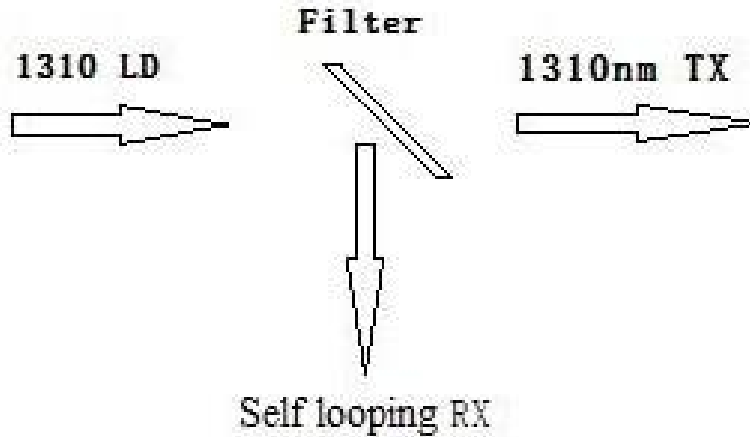- Operating case temperature:

  Standard: 0 to +70°C

Applications

- 1.25Gb/s 1000Base-LX Ethernet
- 1.06 Gb/s Fibre Channel

Description

SPT-P1S131G-L20D 1.25Gb/s Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). They simultaneously comply with Gigabit Ethernet as specified in IEEE Std 802.3 and 1x Fibre Channel as defined in FC-PI-4 Rev. 8.00. Digital diagnostics functions are available via the 2-wire serial bus specified in the SFP MSA.

Schematic diagram of optical path

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        Filter
1310 LD          1310nm TX



        Self looping RX
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Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Supply Voltage	Vcc	-0.5	4	V
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	85	%

Recommended Operating Conditions

Parameter		Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Standard	Tc	0		+70	°C
Power Supply Voltage		Vcc	3.1	3.3	3.5	V
Power Supply Current		Icc			180	mA
Data Rate	Gigabit Ethernet			1.25		Gbps
	Fiber Channel			1.063		

Optical and Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Centre Wavelength	λc	1270	1310	1350	nm	
Average Output Power	Pout	-15		-7	dBm	1
Extinction Ratio	ER	9			dB	
Receiver						
Average Received Power	Rx		-15		dBm	

Notes:

1. Average Received Power comes from TX.

General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Data Rate	BR	1062		1250	Mb/s	
Bit Error Rate	BER			$10E^{-12}$		PRBS 7
Max. Supported Link Length on 9/125um SMF @ 1X Fibre Channel	L		10	20	KM	
Max. Supported Link Length on 9/125um SMF @ Gigabit Ethernet	L		10	20	KM	

Digital Diagnostic Specifications

Parameter	Symbol	Min	Max	Accuracy	Unit	Condition
Transceiver temperature	D Temp	-40	85	±5	℃	
Transceiver supply voltage	D Voltage	3.1	3.5	±3%	V	PRBS 7
Transmitter bias current	D Bias	0	70	±10%	mA	
Transmitter output power	D TxPo	-15	-7	±3dB	dBm	
Average optical input power	D RxPo	-26	1	±3dB	dBm	

Digital Diagnostic Memory Map

The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).
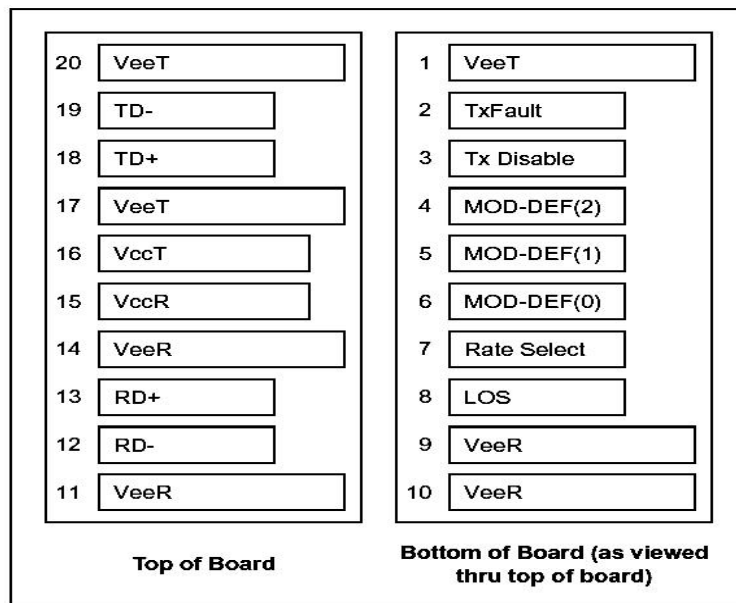
The diagnostic information with internal calibration or external calibration all are implemented, including received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring.

The digital diagnostic memory map specific data field defines as following.

2 wire address 1010000X (A0h)

0	
	Serial ID Defined by SFP MSA (96 bytes)
95	
	Vendor Specific (32 bytes)
127	
	Reserved in SFP MSA (128 bytes)
255	

2 wire address 1010001X (A2h)

0	
	Alarm and Warning Thresholds (56 bytes)
55	
	Cal Constants (40 bytes)
95	
	Real Time Diagnostic Interface (24 bytes)
119	
	Vendor Specific (8 bytes)
127	
	User Writable EEPROM (120 bytes)
247	
	Vendor Specific (8 bytes)
255	
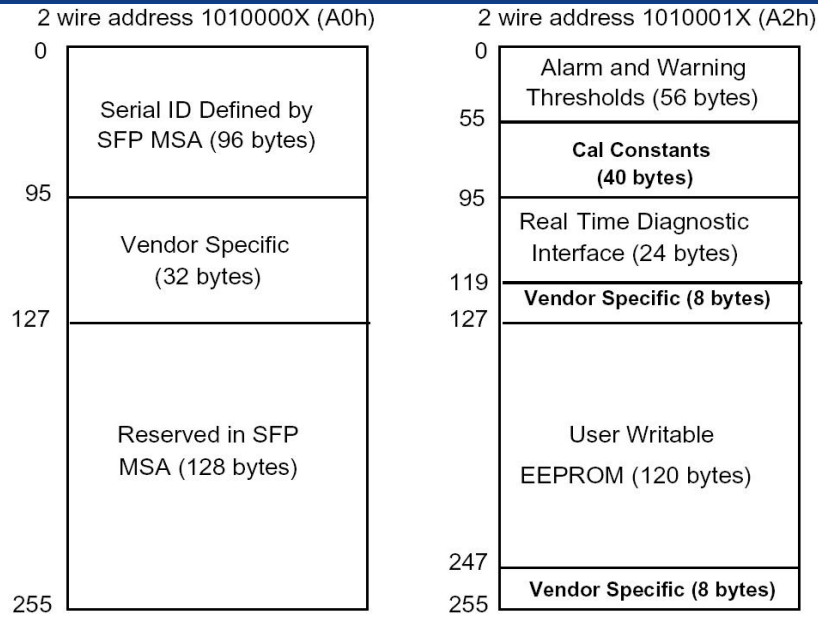
Pin Definitions

Pin Diagram

Top of Board		Bottom of Board (as viewed thru top of board)	
20	VeeT	1	VeeT
19	TD-	2	TxFault
18	TD+	3	Tx Disable
17	VeeT	4	MOD-DEF(2)
16	VccT	5	MOD-DEF(1)
15	VccR	6	MOD-DEF(0)
14	VeeR	7	Rate Select
13	RD+	8	LOS
12	RD-	9	VeeR
11	VeeR	10	VeeR

Pin Descriptions

Pin	Signal Name	Description	Plug Seq.	Notes
1	VEET	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)	TTL Low	3	Note 3

7	Rate Select	Not Connected	3	
8	LOS	Loss of Signal	3	Note 4
9	VEER	Receiver ground	1	
10	VEER	Receiver ground	1	
11	VEER	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 5
13	RD+	Received Data Out	3	Note 5
14	VEER	Receiver ground	1	
15	VCCR	Receiver Power Supply	2	
16	VCCT	Transmitter Power Supply	2	
17	VEET	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 6
19	TD-	Inv. Transmit Data In	3	Note 6
20	VEET	Transmitter Ground	1	

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

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.

Recommended Interface Circuit
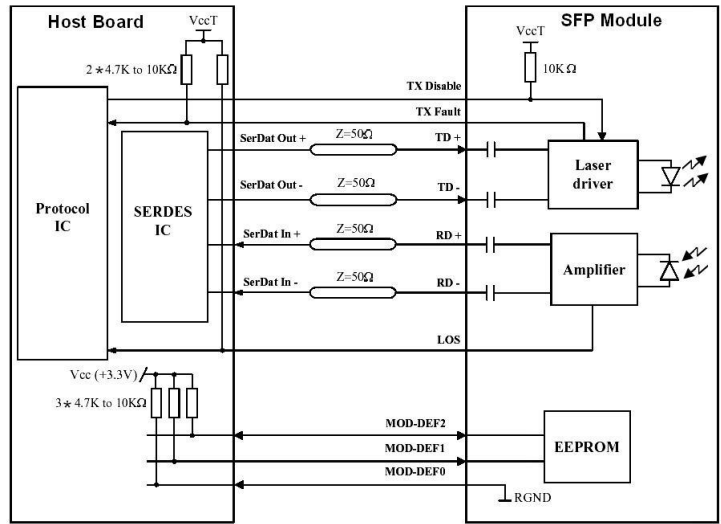
Mechanical Dimensions

Unit:mm
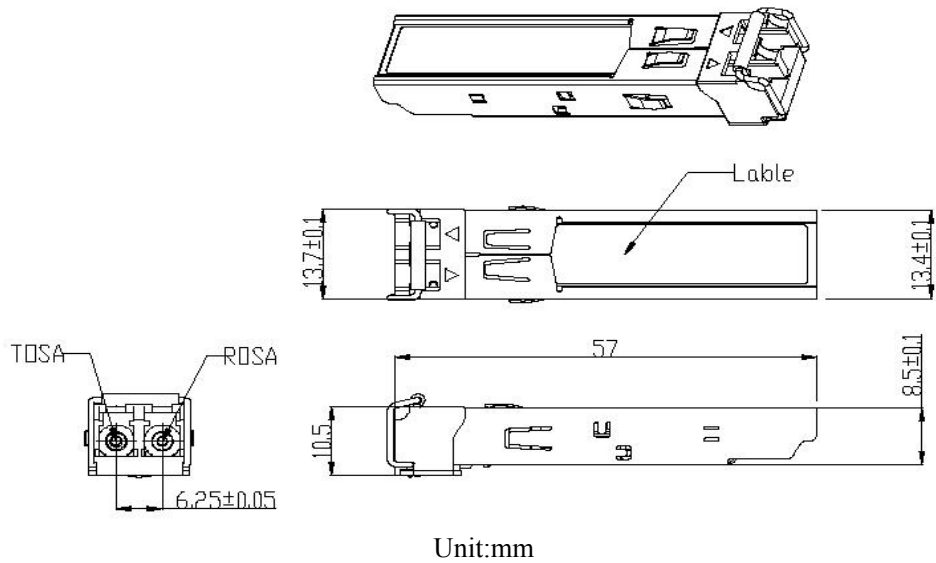
Ordering information

Part Number	Product Description
SPT-P1S131G-L20D	1.25Gb/s Self looping Single Mode Datacom SFP Transceiver,1310nm, 20km, 0ºC ~ +70ºC,DDM

Note: If you need more customized services, please contact us.

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