



Professional high-speed optical transceiver

OPN-LS1G1310-I

1310 nm Single-mode Transceiver, 1000Base-LX With Diagnostic Monitoring 1.0625Gbd for Fiber channel/ 1.25 Gigabit Ethernet

PRODUCT FEATURES

- VCSEL/FP/DFB Laser Diode Transmitter
 - Up to 10Km on 9/125μm SMF
 - 3.3V power supply
 - LC duplex optical interface
- Digital diagnostic monitor interface compatible with SFF-8472
- CML Differential Inputs and CML Outputs and LVTTTL signal detect
- Class 1 Laser International Safety Standard IEC 825 Compliant
- Operating case temperature range Industrial: -50°C to +85°C

APPLICATIONS

- Fiber Channel Switch Infrastructure
- Gigabit Ethernet Switches and Routers
 - Other optic links

PRODUCT DESCRIPTION

The OPN-LS1G1310-I series of transceiver modules are the perfect solution for high -speed communication networks.

These transceiver modules support data rates up to 1.5Gbps. The module is fully compliant with Small Form-Factor Transceiver. These transceiver modules provide the system designer with Telecom, Datacom, and other Fibre Channel applications.

ORDER INFORMATION

Type	Fiber Type	Wavelength(nm)	Fiber Length(Km)
OPN-LS1G1310-I	SM	1310(FP)	10

Absolute Maximum Ratings

Operating of the transceiver beyond the Absolute Conditions Listed in Table 1 will degrade or damage the product. It's not implied that the product would function above the recommended operating environment, it's possible to reduce the reliability and lifetime of device if Recommended Operating Environment is exceeded (Refer to table 2).



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Table 1--- Absolute Maximum Conditions

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	T _{ST}	-50	+85	°C	-
Relative Humidity	RH	5	95	%	-
Supply Voltage	V _{CC}	0	+3.6	V	-

Table 2--- Recommended Operating Environment and Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Note
Supply Voltage	V _{cc}	+3.1	+3.3	+3.5		V
Supply Current	I _{cc}	-	-	260		mA
Operating Case Temperature	T _{op}	0	-	+70	°C	1
		-50	-	+85		2
Data Rate	B	100	1250	1500	Mbps	-
Soldering temperature	-	-	-	350	°C	3
Soldering duration	-	-	-	10	Sec	3

Note 1. standard level
 2. industrial level
 3. Not recommended wave soldering.

Optical Parameters

Transceiver Optical Characteristics

(Ambient Operating Temperature Ta=+25±5°C, VCC = 3.3±0.2V)

Parameter	Symbol	Min	Typ	Max	Units	Notes
Transmitter						
Data rate	B	100	1250	1500	Mbps	-
Output Center Wavelength	λ _c	1260	1310	1360	nm	-
Output Spectral width (RMS)	λ	-	-	4	nm	-
Average Optical Output Power	P _o	-10	-	-3	dBm	1,2
Extinction Ratio	ER	8.2	-	-	dB	1,2
Optic Output Eye: Compliant IEEE802.3						1,2
Receiver						
Receiver Sensitivity	P _{min}	-	-	-22	dBm	1,2
Receiver Saturation	P _{max}	-3	-	-	dBm	1,2
Operation Center Wavelength	λ _c	1260	-	1620	nm	-
SD	Deassert	PD	-35	-	dBm	1,2
	Assert	PA	-	-22	dBm	1,2
SD Hysteresis	SDHYS	0.5	-	-	dB	-

Note1 : The optical power is launched into 9/125μm SMF.

Note2 : With a PRBS 2²³-1 test pattern@ 1250Mbps.

Electrical Parameters

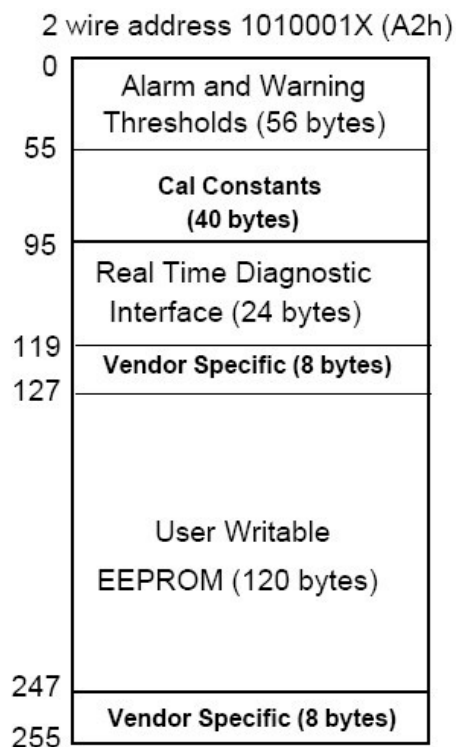
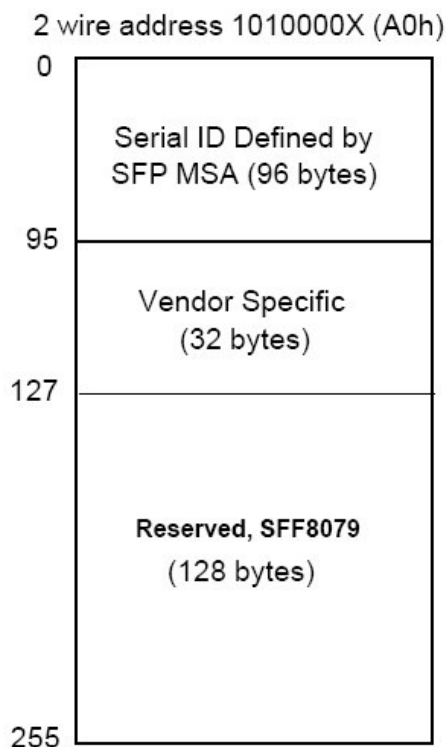
Table 12--- Transceiver Electrical Characteristics (Ambient Operating Temperature Ta=+25±5°C, VCC = 3.3±0.2V)						
Parameter	Symbol	Min	Typ	Max	Units	Notes
Supply Voltage	V _{CC}	+3.1	+3.3	+3.5	V	-
Supply Current	I _{CC}	-	-	260	mA	-
Transmitter						
Differential Input Voltage	V _{in}	400	-	2000	mV _{P-P}	-
Input Differential Impedance	Z _{in}	90	100	110	Ω	-
TX_DISABLE	Disable	V _D	2.0	-	V _{CC}	-
	Enable	V _{EN}	0	-	0.8	-
Receiver						
Differential Output Voltage	V _{OUT}	400	-	2000	mV _{P-P}	-
SD	Normal	V _F	2.0	-	V _{CC}	-
	Fault	V _N	0	-	0.8	-

EEPROM Information Functions

Serial ID provides access to identification information that describes the transceiver 's capabilities, standard interfaces, manufacturer, and other information.

RJ transceivers provide digital diagnostic monitoring interface, which allows real- time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, and received optical power and transceiver supply voltage.

Defines a 256 byte memory map in E2PROM that is accessible over a 2- wire serial interface at the 8 bit address 1010000X (A0h). The digital diagnostic monitoring interface makes use of the 8 bit address 1010001X (A2h). The interface is identical to, and compatible with both the GBIC Specification and the SFP Multi Source Agreement. The complete interface is described in "Digital Diagnostics Monitoring Interface for SFF Optical Transceivers".





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Digital diagnostic monitoring Characteristics

Table 13--- Digital diagnostic monitoring Characteristics				
Parameter	Symbol	Range	Accuracy	Note
Transceiver Internal Temperature	T	Recommended Operation Condition	±3℃	-
Transceiver Internal Supply Voltage	V _{CC}	Recommended Operation Condition	±3%	-
Laser Bias Current	I _b	I _b :1-100mA, Recommended Operation Condition	±10%	-
TX Output Power	P _o	P _o :min~max dBm, Recommended Operation Condition	±3dBm	-
RX Input Power	P _i	P _i :min~max dBm, Recommended Operation Condition	±3dBm	-

EPROM Serial ID Memory Contents:

Table 14--- Serial ID Memory Map:A0h			
Data Address	Size (Byte)	Name of Field	Description
Base ID Fields			
0	1	Identifier	SFF
1	1	Ext. Identifier	SFP function is defined by serial ID only
2	1	Connector	LC Connector
3-10	8	Transceiver	Transceiver Codes
11	1	Encoding	NRZ
12	1	BR, Nominal	1250Mbps
13	1	Reserved	
14	1	Length(9μm)km	Transceiver transmit distance
15	1	Length(9μm)100m	
16	1	Length(50μm)10m	
17	1	Length(62.5μm)10m	
18	1	Length(Copper)	Not compliant
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name: Optowan
36	1	Reserved	
37-39	3	Vendor OUI	
40-55	16	Vendor PN	Part Number: "OPN-LS1G1310-I"
56-59	4	Vendor rev	
60-61	2	Wavelength	Transceiver wavelength
62	1	Reserved	
63	1	CC_BASE	Check code for Base ID Fields
Extended ID Fields			
64-65	2	Options	TX_FAULT, TX_DISABLE and Loss of Signal implemented.
66	1	BR, max	
67	1	BR, min	
68-83	16	Vendor SN	Serial number
84-91	8	Date code	Manufactory date code
92	1	Diagnostic Monitoring Type	Digital diagnostic monitoring implemented, "internally calibrated" is implemented, RX measurement type is "Average Power".
93	1	Enhanced Options	Optional Alarm/Warning flags implemented for all monitored quantities, Optional Soft RX LOS monitoring implemented.
94	1	SFF-8472 Compliance	Includes functionality described in Rev 9.3 SFF-8472.
95	1	CC_EXT	Check sum for the extended ID Fields
Vendor Specific ID Fields			
96-127	32	Vendor Specific	Vendor Specific EEPROM
128-255	128	Reserved	Reserved for SFF-8079

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Pin Definitions

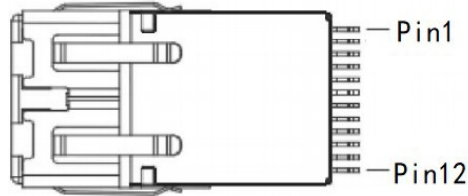


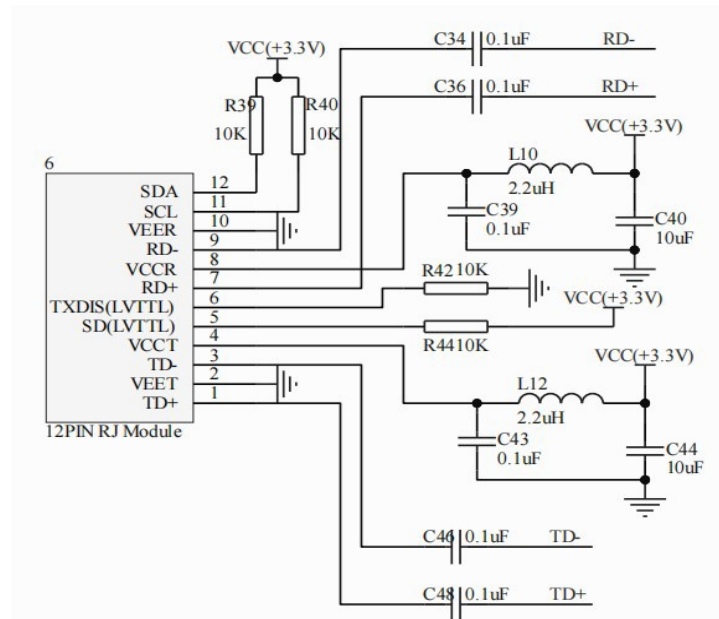
Table 15--- Connector pin assignment

Pin #	Pin Name	Description	Note
1	TD+	Transmit Data In	-
2	VEET	Transmitter Ground	-
3	TD-	Inv. Transmit Data In	-
4	VCCT	Transmitter Power	-
5	SD	Signal Detect, LVTTL ouput	1
6	TXDIS	Transmitter Disable, LVTTL	2
7	RD+	Received Data Out	-
8	VCCR	Receiver Power	-
9	RD-	Inv. Received Data Out	-
10	VEER	Receiver Ground	-
11	SCL	SCL Serial Clock Signal	3
12	SDA	SDA Serial Data Signal	3

Note1 : LVTTL-Normal optical input levels to the receiver result in logic “1” output, pull-up 10kΩresistor.

Note2 : The is an input that is used to shut down the transmitter optical output. Transmitter on in logic “0”. Note3 : LVTTL, pull-up 10kΩresistor.

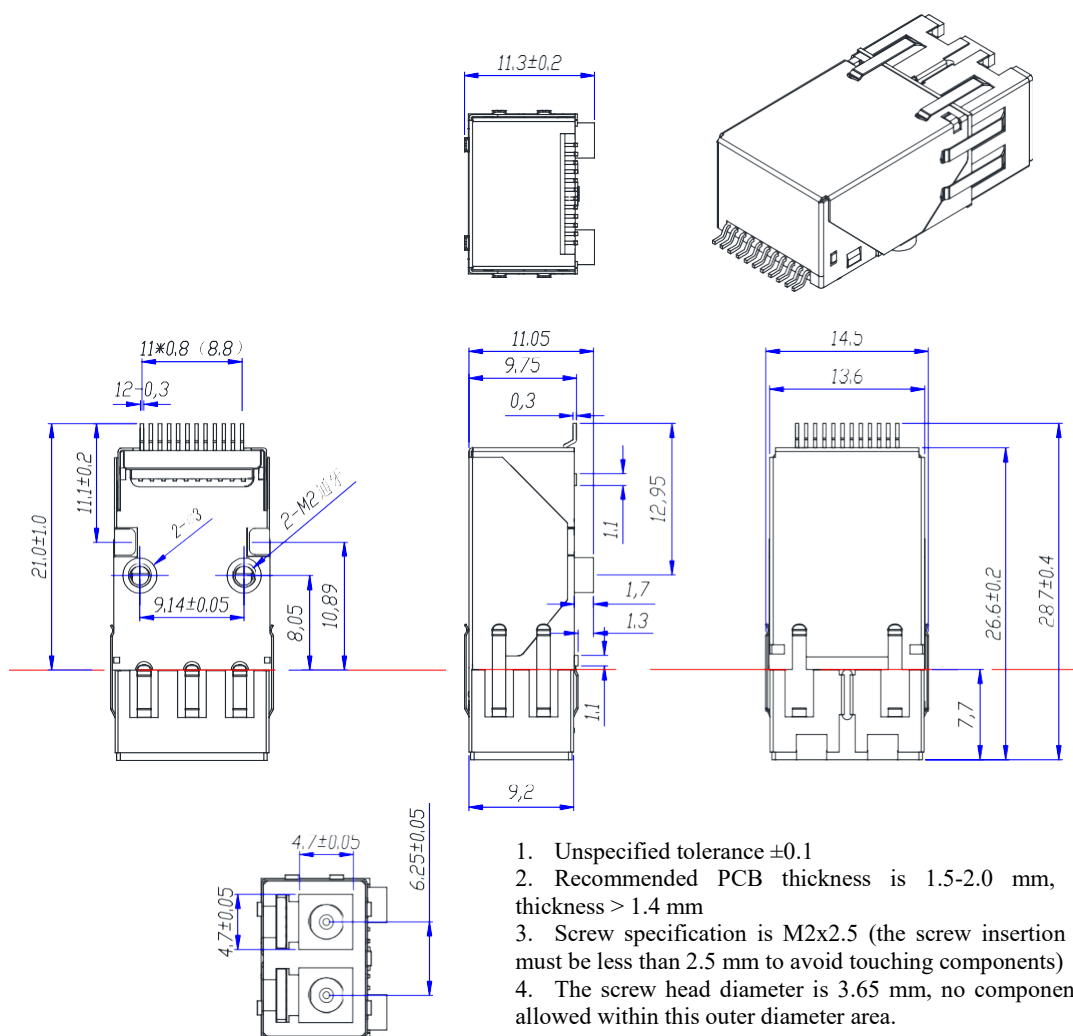
Recommended Circuit Schematic



Recommended Circuit Schematic

Module Outline Drawing

(Units in mm)



Note: Specifications subject to change without notice.

REVISION HISTORY

Version	Subject	Release Date
1.0	Initial datasheet	01/02/2025
2.0	Chassis	01/08/2025
2.0	Change package diagram	01/08/2025