

Optical Network Transceiver Innovator

GP-5524-12CD 1.25Gbps SFP Optical Transceiver, 120km Reach

Features

- Dual data-rate of 1.25Gbps/1.063Gbps operation
- 1550nm DFB laser and APD photodetector for 120km transmission
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitoring:
 Internal Calibration or External Calibration
- Compatible with SONET OC-24-LR-1
- Compatible with RoHS
- +3.3V single power supply
- Operating case temperature:
 Standard : 0 to +70°C

Applications

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

Description

The SFP transceivers are high performance, cost effective modules supporting dual data-rate of 1.25Gbps/1.0625Gbps and 120km transmission distance with SMF.

The transceiver consists of three sections: a DFB laser transmitter, a APD photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements.

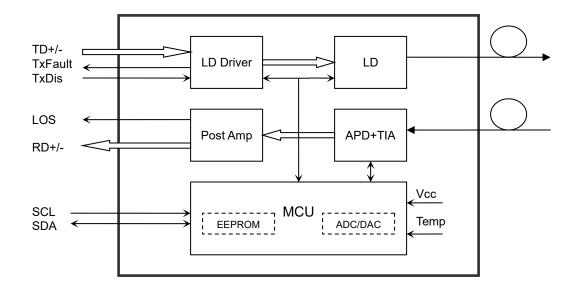
The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further





Optical Network Transceiver Innovator

information, please refer to SFP MSA.



Absolute Maximum Ratings

Table 1 - Absolute Maximum Ratings

Parameter	Symbol	Min	Мах	Unit
Supply Voltage	Vcc	-0.5	4.5	V
Storage Temperature	Ts	-40	+85	°C
Operating Humidity	-	5	85	%

Recommended Operating Conditions

Table 2 - Recommended Operating Conditions

Parameter		Symbol	Min	Typical	Max	Unit	
Operating Case Temperature Standard		Тс	0		+70	°C	
Power Supply Voltage		Vcc	3.13	3.3	3.47	V	
Power Supply Current		lcc			300	mA	
Gigabit Ethernet					1.25		Chro
Data Rate	Fiber Channel				1.063		Gbps



Optical and Electrical Characteristics

GP-5524-12CD: (DFB and APD, 1550nm, 120km Reach)

Table 3 - Optical and Electrical Characteristics

Para	meter	Symbol	Min	Typical	Мах	Unit	Notes
			Transmi	tter		<u> </u>	
Centre V	Vavelength	λς	1520	1550	1580	nm	
Spectral V	Vidth (-20dB)	Δλ			1	nm	
Average C	Output Power	Pout	0		5	dBm	1
Extinc	tion Ratio	ER	9			dB	
Optical Rise/Fal	II Time (20%~80%)	tr/tf			0.26	ns	
Data Input S	wing Differential	V _{IN}	400		1800	mV	2
Input Differe	ntial Impedance	ZIN	90	100	110	Ω	
	Disable		2.0		Vcc	V	
TX Disable	Enable		0		0.8	V	
TX Fault	Fault		2.0		Vcc	V	
	Normal		0		0.8	V	
	1	1	Receiv	er			
Centre Wavelength		λc	1260		1580	nm	
Receiver Sensitivity					-31	dBm	3
Receiver Overload			-9			dBm	3
LOS De-Assert		LOSD			-31	dBm	
LOS Assert		LOSA	-45			dBm	
LOS Hysteresis			0.5		4.5	dB	
Data Output Swing Differential		Vout	370		1800	mV	4
	00	High	2.0		Vcc	V	
L	OS	Low			0.8	V	

Notes:

1. The optical power is launched into SMF.

2. PECL input, internally AC-coupled and terminated.

3. Measured with a PRBS 2⁷-1 test pattern @1250Mbps, BER \leq 1×10⁻¹².

4. Internally AC-coupled.



Optical Network Transceiver Innovator

Timing and Electrical

Table 4 - Timing and Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Tx Disable Negate Time	t_on			1	ms
Tx Disable Assert Time	t_off			10	μs
Time To Initialize, including Reset of Tx Fault	t_init			300	ms
Tx Fault Assert Time	t_fault			100	μs
Tx Disable To Reset	t_reset	10			μs
LOS Assert Time	t_loss_on			100	μs
LOS De-assert Time	t_loss_off			100	μs
Serial ID Clock Rate	f_serial_clock			400	KHz
MOD_DEF (0:2)-High	V _H	2		Vcc	V
MOD_DEF (0:2)-Low	VL			0.8	V

Diagnostics

Table 5 – Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70	°C	±3°C	Internal / External
Voltage	3.0 to 3.6	V	±3%	Internal / External
Bias Current	0 to 100	mA	±10%	Internal / External
TX Power	0 to +5	dBm	±3dB	Internal / External
RX Power	-30 to -9	dBm	±3dB	Internal / External

Digital Diagnostic Memory Map

The transceivers provide serial ID memory contents and diagnostic information about the present

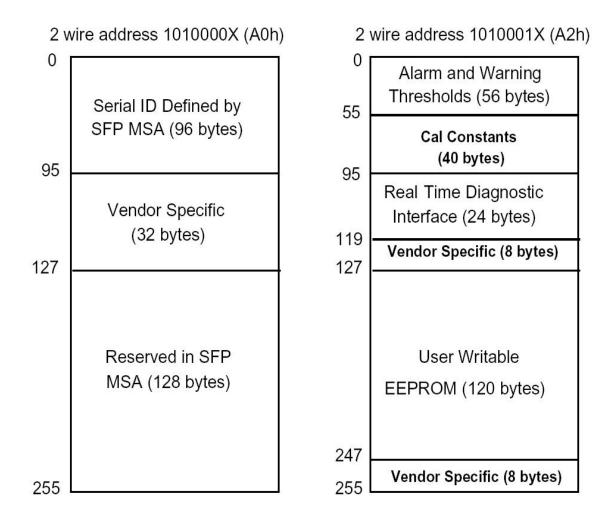


Optical Network Transceiver Innovator

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.

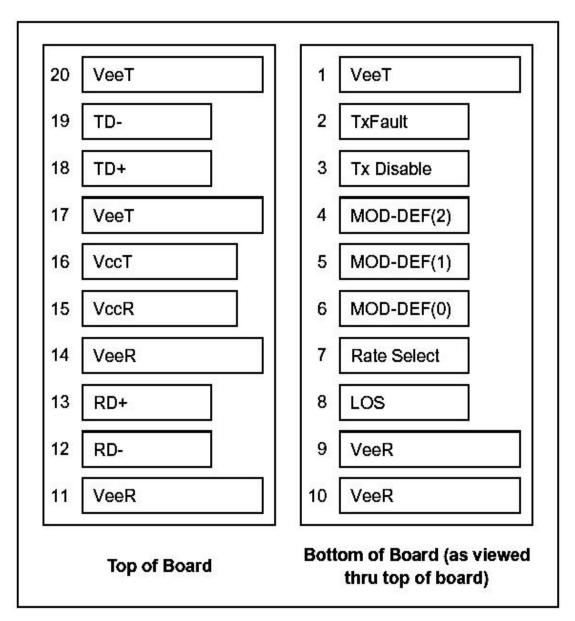




Optical Network Transceiver Innovator

Pin Definitions

Pin Diagram





Optical Network Transceiver Innovator

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)	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	V _{EER}	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	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	VEET	Transmitter Ground	1	

Notes:

Plug Seq.: Pin engagement sequence during hot plugging.

 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.

 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

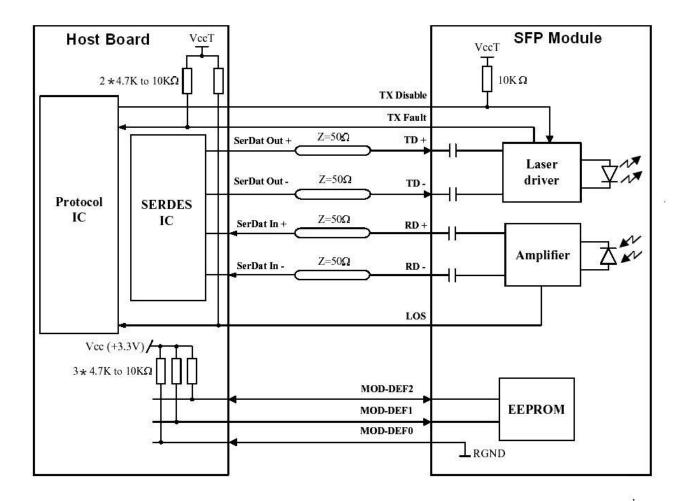
Mod-Def 1 is the clock line of two wire serial interface for serial ID

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.



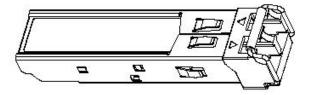
Recommended Interface Circuit

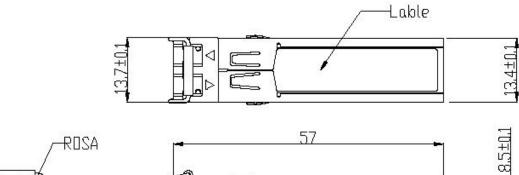


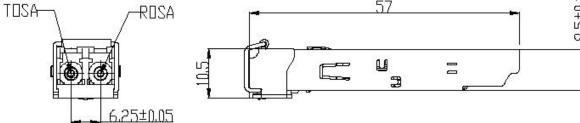
4



Mechanical Dimensions







Ordering information

Part Number	Product Description		
GP-5524-12CD	1550nm, 1.25Gbps, 120km, 0° C ~ +70°C, With Digital Diagnostic Monitoring		

E-mail: sales@gigalight.com.cn

Web : <u>http://www.gigalight.com.cn</u>