1.25Gb/s SFP 1310nm 20km Optical Transceiver

Features

- Up to 1.25Gbps data rate
- Duplex LC receptacle optical interface compliant
- Single +3.3V power supply
- Hot-pluggable
- Receiver Loss of Signal Output
- Serial ID module on MOD(0-2)
- International Class 1 laser safety certified
- Transmitter disable input
- Optional operating temperature range:0~+70℃
- Optional 10km transmission distance on 9/125 μ m SMF
- 1310nm FP laser for 20km
- Power consumption less than 0.85W
- ROHS Compliant

Applications

- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

Compliance

- SFP MSA
- SFF-8472
- IEEE802.3z
- RoHS

Description

The SFP-1G-LX-20 series single-mode transceivers are small form factor pluggable module for bi-directional serial optical data communications such as Gigabit Ethernet 1000BASE-LX and Fiber Channel 1x SM-LC-L FC-PI. It is with the SFP 20-pin connector to allow hot plug capability. This module is designed for single mode fiber and operates at a nominal wavelength of 1310nm.

The transmitter section uses a multiple quantum well 1310nm laser and is a class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. The SFP-1GE-LX series are designed to be compliant with SFF-8472 SFP Multi-source Agreement (MSA).

Absolute Maximum Ratings

Table1-Absolute Maximum Ratings

Parameter	Symbols	Min.	Typical	Max.	Unit	Notes
Storage Temperature	T_S	-40		+85	°C	
3.3V Supply Voltage	VCC	-0.5		+4	V	

Recommended Operating Conditions

Table2-Recommended Operating Conditions

Parameter	Symbols	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	Tc	0		+70	°C	
3.3V Supply Voltage	VCC	3.135	3.3	3.465	V	
Total Data Rate			1.25/1.063		Gbps	

Electrical Characteristic

Tested under recommended operating conditions, unless otherwise noted

Table3-Electrical Characteristic

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Single Ended Data Input Swing				1100	mV	
Single Ended Data Output Swing		300		600	mV	
TX_fault/LOS output (TTL)	VOH	2.0		Vcc	V	
	VOL	0		0.8	V	
TX_disable input (TTL)	VOH	2.0		Vcc	V	
	VOL	0		0.8	V	
Optical transmitter Characteristics						
Launch Optical Power	Po	-9		-3	dBm	

Center Wavelength	λ c	1260	1310	1360	nm	
Extinction Ratio	ER	9			dB	1
Total Jitter*(note2)	TJ			0.43	UI	1
Eye Diagram	Complies with IEEE802.3z eye masks when filtered					1
Optical receiver Characteristics						
Center Wavelength	λ C	1260		1360	nm	
Receiver Sensitivity	Pmin			-24	dBm	2
Receiver Overload	Pmax	-3			dBm	
LOS De-assert	LosD			-22	dBm	
LOS Assert	LosA	-35			dBm	

Notes:

[1] Filtered, measured with a PRBS 27-1 test pattern @1.25Gbps

[2] Minimum avera0ge optical power measured at BER less than 1E-12, with a 27-1 PRBS and ER=9dB.

Pin Description

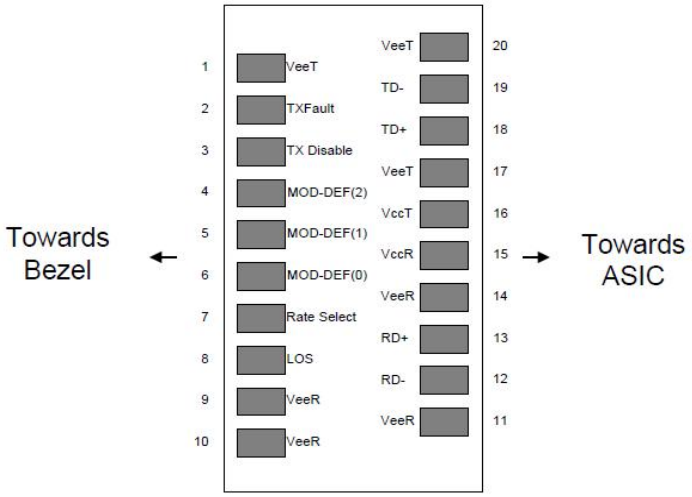


Figure1 Pin view

Pin Function Definitions

Table4-Pin Function Definitions

Pin	Name	Description	Notes
1	V_{EET}	Transmitter Ground (Common with Receiver Ground)	5
2	T_{FAULT}	Transmitter Fault.Open Drain. Logic "0" indicates normal operation.	1
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection required.	
8	LOS	Loss of Signal indication. Open Drain. Logic "0" indicates normal operation.	4
9	V_{EER}	Receiver Ground (Common with Transmitter Ground)	5
10	V_{EER}	Receiver Ground (Common with Transmitter Ground)	5
11	V_{EER}	Receiver Ground (Common with Transmitter Ground)	5
12	RD-	Receiver Inverted DATA out(CML). AC Coupled	6
13	RD+	Receiver Non-inverted DATA out(CML). AC Coupled	7
14	V_{EER}	Receiver Ground (Common with Transmitter Ground)	5
15	V_{CCR}	Receiver Power Supply	7
16	V_{CCT}	Transmitter Power Supply	7
17	V_{EET}	Transmitter Ground (Common with Receiver Ground)	5
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	8
19	TD-	Transmitter Inverted DATA in. AC Coupled.	8
20	V_{EET}	Transmitter Ground (Common with Receiver Ground)	5

Notes:

[1] TX Fault is an open collector/drain output, which should be pulled up with a 4.7K - 10KΩ resistor on the host board. P ull up voltage between 2.0V and VccT, R+0.3V. When high, output indicates a laser fault of some kinds. Low indicates norm al operation. In low state, the output will be pulled to＜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 4.7 – 10 KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (> 0.8, <2.0V): Undefined High (2.0 – 3.465V): Transm itter Disabled Open: Transmitter Disabled.

[3] Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7 – 10 KΩ resistor on the host board. The pullup voltage shall be VccT or VccR . Mod-Def 0 is grounded by the module to indicate that the module is pr esent 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 in terface for serial ID

[4] LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor. Pull up voltage between 2.0V and VccT/R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to＜0.8V.

[5] VeeR and VeeT may be internally connected within the SFP module.

[6] RD-/+: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminat ed with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required the h ost board. The voltage swing on these lines will be between 400 and 2000 mV differential (200 –1000 mV single ended) wh en properly terminated

[7] VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V ±5% at the SFP connector pin. Maximum supply current is 300mA. Recommended host board power supply filtering is shown below. Inductors with DC re sistance of less than 1 ohm should be used in order to maintain the required voltage at the SFP input pin with 3.3V suppl y voltage.When the recommended supply-filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP transceiver module.

[8] TD-/+: TD-/+: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ωdifferential te rmination inside the module.The AC coupling is done inside the module and is thus not required on the host board. The in puts will accept differential swings of 400–2000mV (200–1000mV single- ended).

Monitoring Specification

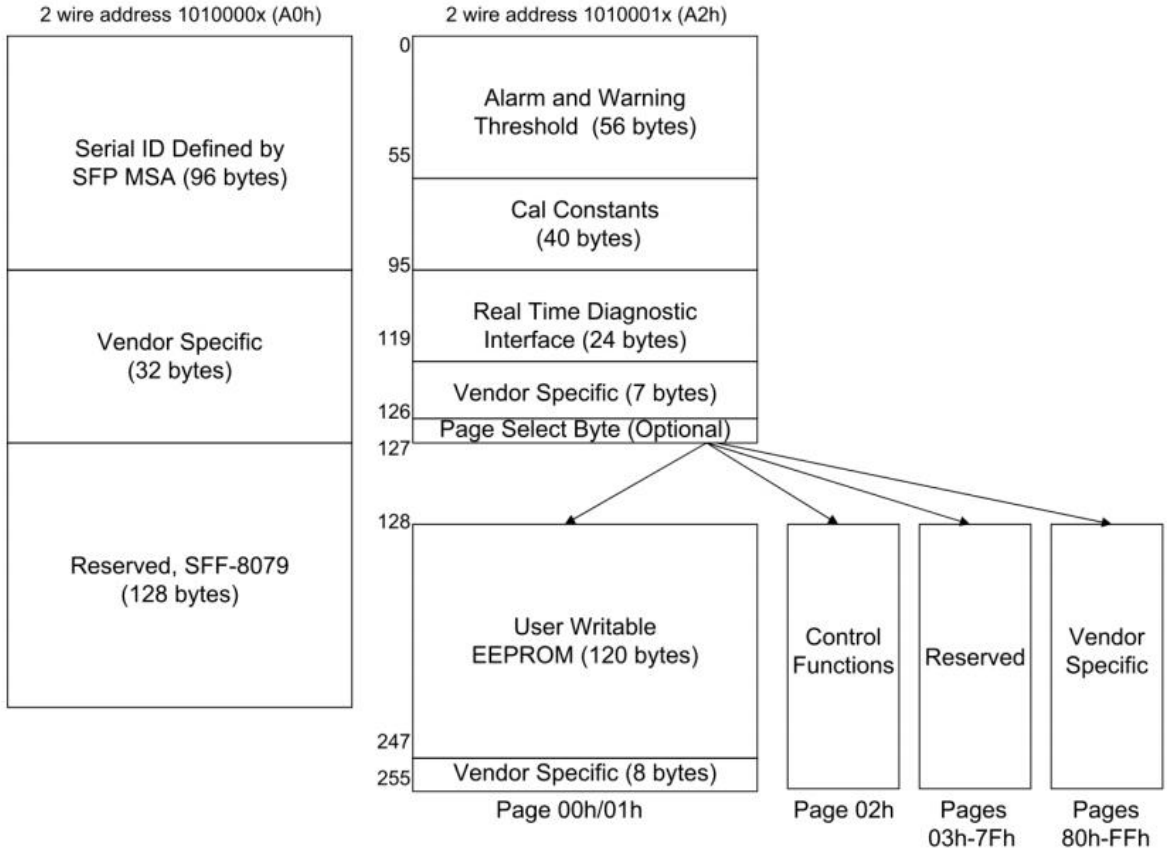


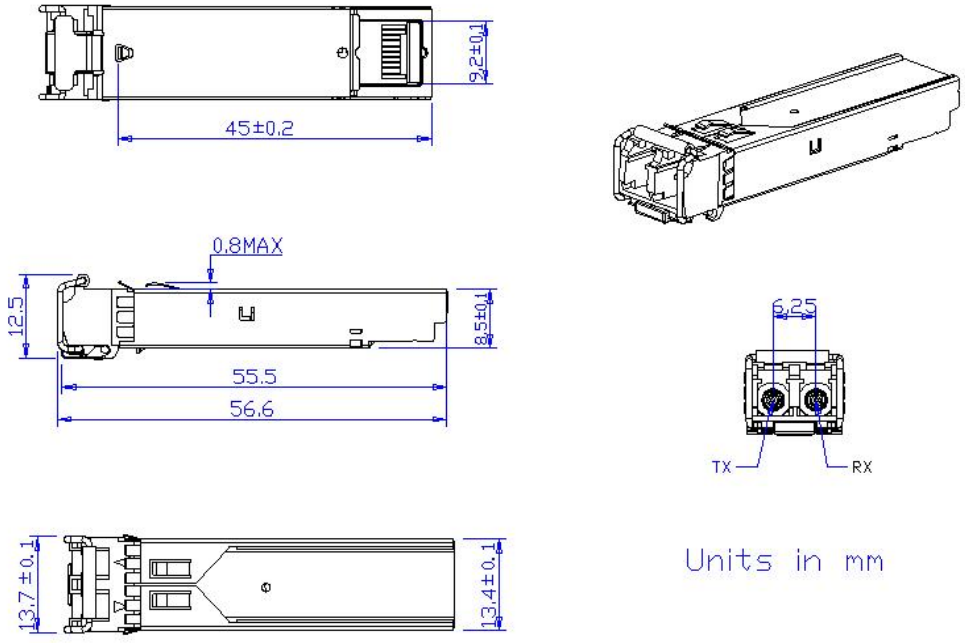
Figure2 Memory map

Regulatory Compliance

Table5-Regulatory Compliance

Feature	Test Method	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883C Method 3015.7	Class 1 (→ 1500 Volts)
Electrostatic Discharge (ESD) Immunity	Variation of IEC 61000-4-2	LV4(Air discharge :15KV;Contact discharge:8 KV) Performance criterion:B
Electromagnetic Interference (EMI)	CISPR22 ITE Class B EN55022 Class B FCC Class B	Compliant with standards
Immunity	IEC61000-4-3 Class 2 EN55024	Typically show no measurable effect from a 3V/m field swept from 80 to 1000MHz applied to the transceiver without a chassis enclosure.

Mechanical Dimensions



Precautions

a. This device 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.

b. Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

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Disclaimer

1. We are committed to continuous product improvement and feature upgrades, and the contents contained in this manual are subject to change without notice.

2. Nothing herein should be construed as constituting an additional warranty.

3. NADDOD assumes no responsibility for the use or reliability of equipment or software not provided by NADDOD.