TECHNICAL SPECIFICATIONS

850 nm / 1310nm Multi-mode 1.25Gbps
SFP Bidirectional Transceiver Module

SFP-GV8513NX5
SFP-GF1385NX5

Revision Record

Document No.	Date of Issue	Description	Incorporated by	Checked by
SFP-GV8513NX5	05/10/2007	Rev 1	R.T.	E.C.

Description

- SFP-GV8513NX5 is a hot-pluggable integrated transceiver module with bidirectional data link through multi-mode optical fiber. The transceiver module is in compliant with the MSA Small Form Factor Pluggable (SFP) specifications. It can support data rates up to 1.25Gbps that is suitable for both Gigabit Ethernet and Fiber Channel applications.

Features

- 850nm VCSEL laser transmitter / 1310nm PD receiver
- 1310nm FP laser transmitter / 850nm PD receiver
- Super high isolation between two wavelengths
- Data rates up to 1.25Gbps
- Link length of 500m on 50/125μm MM fiber
- Hot-pluggable
- Low EMI
- Single +3.3V power supply
- EEPROM with serial ID functions
- Compliant to MSA SFP specifications
- Compliant to IEEE802.3ah 2004 1000BASE-BX
- Compliant with class one laser product EC0825-1

Applications

- Switch-to-switch interface
- Gigabit Ethernet data link
- Optical access network
- Fiber Channel
- High speed file server interface
- Bus extensions

Technical Specifications

1. Absolute maximum ratings

Parameter	Symbol	Ratings	Unit
Storage temperature	Tstg	-40~+85	℃
Storage relative humidity	RHstg	95	%
Supply voltage	Vcc	5.5	V
Lead soldering temperature	T_{SLD}	260	℃
Lead soldering duration	t_{SLD}	10	Sec

2. Recommended operating conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Ambient operating temperature	Top	0	—	70	℃
Data rate		—	1.25	—	Gbps
Total supply current	Is	—	—	250	mA

3. Transmitter characteristics (Tc=0~+70℃, Vcc=+3.15~+3.45V)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Optical center wavelength	λ	850Tx/1310Rx	780	—	870	nm
		1310Tx/850Rx	1280	—	1350	
Spectral width	Δλ	850Tx/1310Rx	—	—	1	nm
		1310Tx/850Rx	—	1.5	3	
Optical output power	Po	850Tx/1310Rx	-9	—	-3	dBm
		1310Tx/850Rx	-16	—	-12	
Extinction ratio	ER	P1/P0	8.2	—	—	dB
Output rise/fall time	tr,tf	20-80%; measured unfiltered	—	—	260	ps
Input voltage (Differential)	Vin	Ac coupled	400	—	1600	mV
Operation current	Icc		—	—	150	mA
Supply voltage	Vcc		3.15	3.3	3.45	V

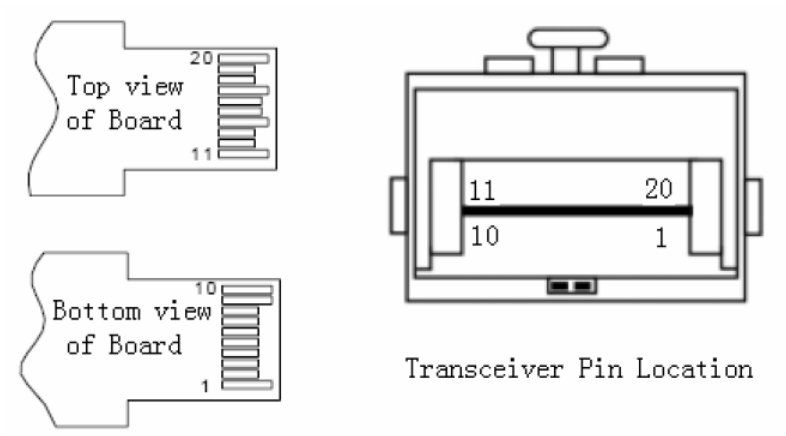
4. Receiver characteristics (Tc=0~+70℃, Vcc=+3.14~+3.47V)

Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
Optical input wavelength	λ	850Tx/1310Rx		780	—	870	nm
		1310Tx/850Rx		1260		1360	
Sensitivity	Sen	BER 10^{-12}, PRBS 2^7-1 @1.25Gbps	850Tx/ 1310Rx	—	—	-18	dBm
			1310Tx/ 850Rx	—	—	-18	
Optical input overload	Pol			-3	—	—	dBm
Signal detect-Asserted	Pa	Measured on transition – Low to High		-20	—	—	dBm
Signal detect-De-asserted	Pd	Measured on transition – High to Low		—	—	-35	dBm
Signal detect Hysteresis	Ph			0.5	—	5	dB
Output voltage (Differential)	Vout	AC coupled		400	—	2000	mV
Operation current	Ioc			—	—	100	mA
Supply voltage	Vcc			3.14	3.3	3.47	V

5. General specifications (Tc=0~+70℃, Vcc=+3.15~+3.6V)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Link length on 50/125μm MMF		BER<1.0E-12 @ 1.25Gbps	550	—	—	m
Link length on 62.5/125μm MMF		BER<1.0E-12 @ 1.25Gbps	300	—	—	m

6. SFP transceiver pin layout



7. Pin descriptions

Pin No.	Symbol	Descriptions	Note
1	VeeT	Transmitter ground	
2	TX Fault	Transmitter fault indication	1
3	TX Disable	Transmitter disable, Module disables on high or open	2
4	MOD-DEF2	Module definition 2 - Two wires serial ID interface	3
5	MOD-DEF1	Module definition 1 - Two wires serial ID interface	3
6	MOD-DEF0	Module definition 0 - Two wires serial ID interface	3
7	Rate Select	Not connected	Function not available
8	LOS	Loss of signal	4
9	VeeR	Receiver ground	
10	VeeR	Receiver ground	
11	VeeR	Receiver ground	
12	RD-	Inverted receiver data out	5
13	RD+	Receiver data out	5
14	VeeR	Receiver ground	
15	VccR	Receiver power, 3.3±5%	
16	VccT	Transmitter power, 3.3±5%	
17	VeeT	Transmitter ground	
18	TD+	Transmitter data in	6
19	TD-	Inverted transmitter data in	6
20	VeeT	Transmitter ground	

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. The pull up voltage is between 2.0V and Vcc+0.3V. When high, output indicates some kind of laser fault. Low indicates normal operation. In the 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 4.7K-10KΩ resistor. Its states are:
   - Low (0-0.8V): Transmitter on

- (>0.8V, <2.0V): Undefined
- High (2.0-3.465V): 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 wires serial interface for serial ID, and MOD-DEF 2 is the data line of two wires serial interface for serial ID.

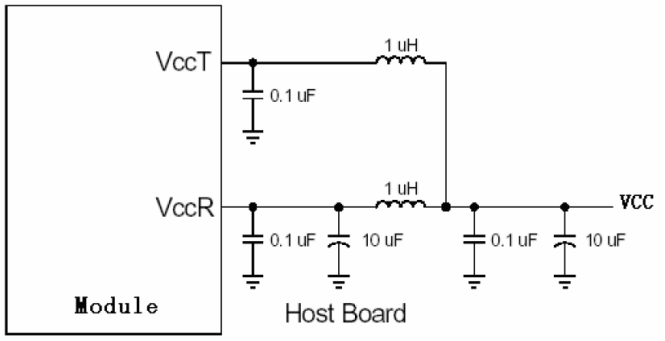
4. LOS is an open collector/drain output, which should be pulled up with a 4.7K-10KΩ resistor on the host board. The pull up voltage is between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates los of signal. In the low state, the output will be pulled to < 0.8V.

5. RD+/-: These are the differential receiver outputs. They are AC-coupled 100Ω differential lines which should be terminated with 100Ω {differential} at the user SERDES.

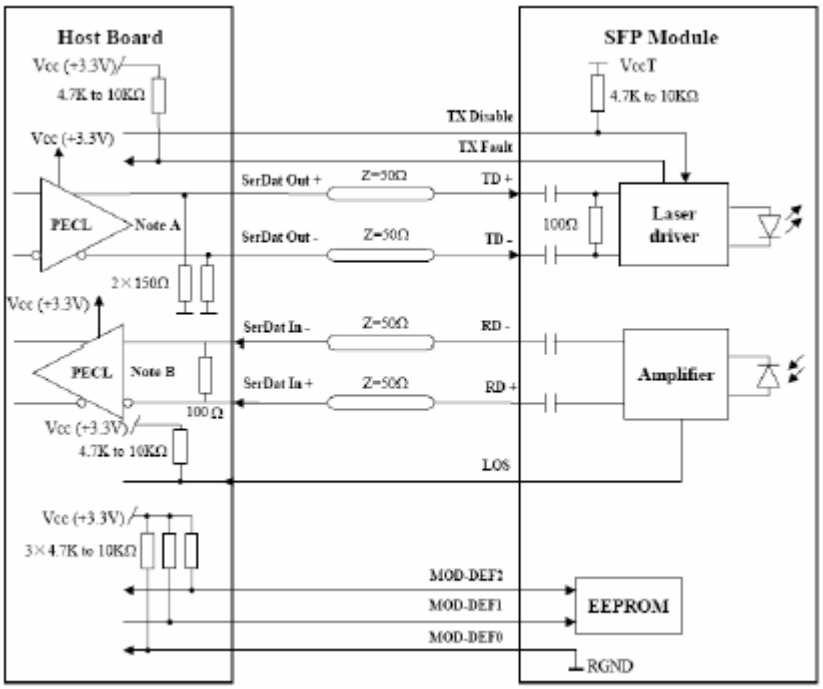
6. TD-/+: These are the differential transmitter inputs. They are AC-coupled differential lines with 100Ω differential termination inside the module.

8. Recommended power supply filter

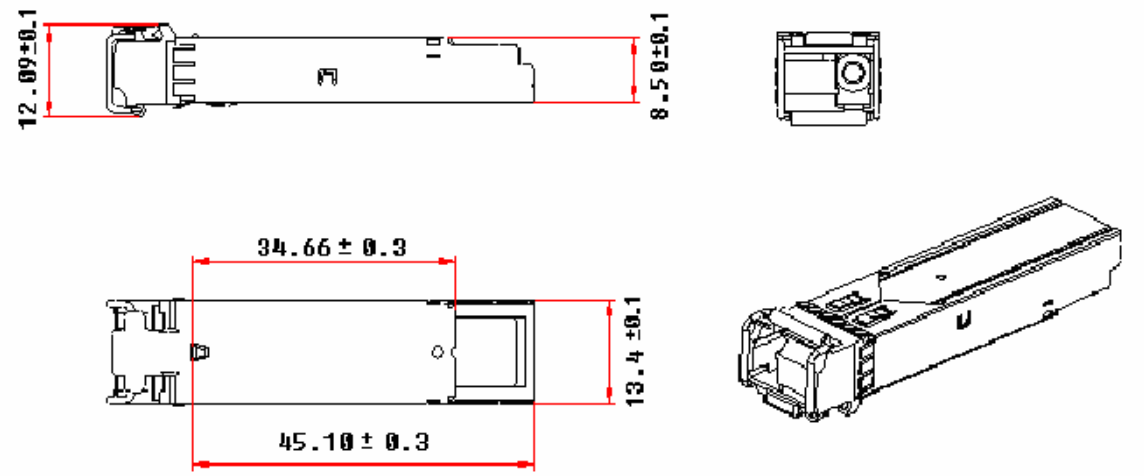
The transceiver includes internal circuit components to filter power supply noise. Under some conditions of EMI and power supply noise, external power supply filtering may be necessary. If receiver sensitivity is found to be degraded by power supply noise, the filter network illustrated in the following figure may be used to improve performance. The values of the filter components are general recommendations and may be changed to suit a particular system environment. Shielded inductors are recommended.



8. Recommend circuit schematic



9. Mechanical specifications (Unit: mm)



11. Ordering information: