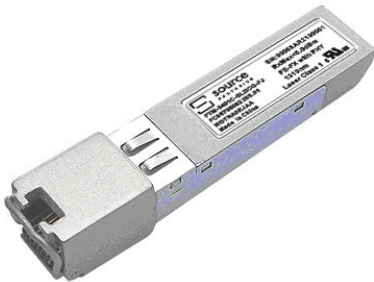


### Features



- 100Mbps bi-direction data links
- 100m transmission over unshielded twisted-pair (UTP) Category 5 Cable
- Perform any necessary scrambling / descrambling between the 100Base-TX and 100Base-FX formats.
- Support intelligent auto-negotiation 100BASE-T operation in host systems
- Hot-pluggable capability
- SFP form with compact RJ-45 connector
- With spring latch for high density application
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- Low power dissipation
- Operating case temperature: -5 to +70°C
- Detailed product information in EEPROM

### Regulatory Compliance

**Table 1 - Regulatory Compliance**

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883E Method 3015.7	Class 2(>2000 V)
Electrostatic Discharge (ESD) to the RJ-45 Receptacle	IEC 61000-4-2 GR-1089-CORE	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022 Class B (CISPR 22B) VCCI Class B	Compatible with standards
Immunity	IEC 61000-4-3	Compatible with standards
Component Recognition	UL and CSA	Compatible with standards
RoHS	2002/95/EC 4.1&4.2 2005/747/EC	Compliant with standards <sup>note</sup>

Note:

In light of item 5 in Annex of 2002/95/EC, "Pb in the glass of cathode ray tubes, electronic components and fluorescent tubes." and item 13 in Annex of 2005/747/EC, "Lead and cadmium in optical and filter glass." ,the two exemptions are being concerned for Source Photonics' transceivers, because Source Photonics' transceivers use glass, which may contain Pb, for components such as lenses, windows, isolators, and other electronic components.

## Absolute Maximum Ratings

**Table 2 - Absolute Maximum Ratings**

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	$T_s$	-40	-	+85	°C	
Supply Voltage	$V_{CC}$	-0.5	-	+3.6	V	
Operating Relative Humidity	RH	5	-	+95	%	

## Recommended Operating Conditions

**Table 3 – Recommended Operating Conditions**

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	$T_C$	-5	-	+70	°C	
Power Supply Voltage	$V_{CC}$	3.13	3.30	3.47	V	
Power Supply Current	$I_{CC}$	-	170	300	mA	1
Date Rate			100		Mbps	

Note 1: The max. power supply current after module work stable.

## Host Side Electrical Interface

**Table 4 –Electrical Characteristics**

Transmitter						
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Data Input Swing Differential	$V_{IN}$	500		2400	mV	1
Input Differential Impedance	$Z_{IN}$		100		$\Omega$	
Data Output Swing Differential	$V_{OUT}$	370		2000	mV	2
Output Differential Impedance	$Z_{OUT}$		100		$\Omega$	
Output Data Rise/Fall Time				3	ns	

Notes:

- Internally AC coupled and terminated.
- Internally AC coupled.

## Line Side Electrical Interface

Table 5 – Electrical Characteristics

Transmitter						
Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Line Baud Rate			125		MBaud	
Bit Error Rate	BER			$10^{-12}$		1
Line Rx Input Impedance	$Z_{IN}$		100		$\Omega$	
Line Tx Output Impedance	$Z_{OUT}$		100		$\Omega$	

Notes:

1. Measured over 100m Cat-5 UTP cable.

## Recommended Host Board Power Supply Circuit

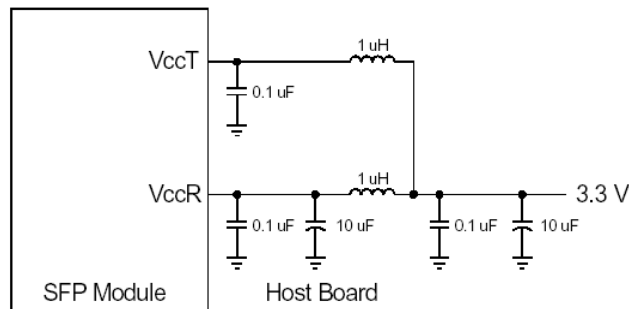


Figure 1, Recommended Host Board Power Supply Circuit

## Pin Definitions

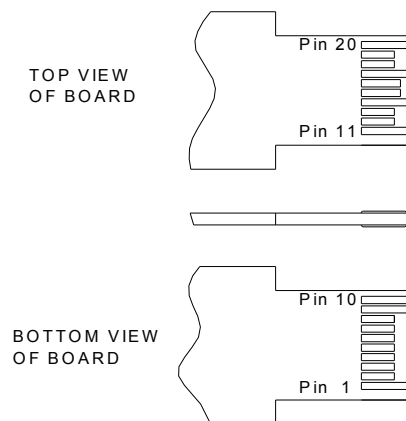


Figure 2, Pin View

**Table 6–Pin Function Definitions**

Pin No.	Name	Function	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-DEF2	Module Definition 2	3	Note 3
5	MOD-DEF1	Module Definition 1	3	Note 3
6	MOD-DEF0	Module Definition 0	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	2	
16	VccT	Transmitter Power	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	

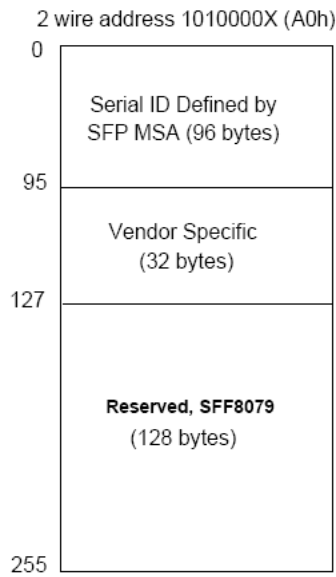
**Notes:**

- 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 (0~0.8V):	Transmitter on
(>0.8V, <2.0V):	Undefined
High (2.0~3.465V):	Transmitter Disabled
Open:	Transmitter Disabled
- MOD-DEF 0,1,2 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
- LOS 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 loss of signal or link down with partner I. In the low state, the output will be pulled to less than 0.8V.

5. These are the differential receiver output. They are internally AC-coupled 100Ω differential lines which should be terminated with 100Ω (differential) at host with SGMII interface.
6. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module.

**EEPROM Information**



**Figure 3, 2-wire Serial Memory Map**

**Table 7 –EEPROM Serial ID Memory Contents (A0h)**

Addr.	Field Size (Bytes)	Name of Field	Hex	Description
0	1	Identifier	03	SFP
1	1	Ext. Identifier	04	MOD4
2	1	Connector	00	LC
3—10	8	Transceiver	00 00 00 30 00 00 00 00	100BASE-FX/100BASE-LX
11	1	Encoding	02	4B5B
12	1	BR, nominal	01	100M
13	1	Reserved	00	
14	1	Length (9um)-km	00	
15	1	Length (9um)	00	
16	1	Length (50um)	00	
17	1	Length (62.5um)	00	
18	1	Length (copper)	64	100m
19	1	Reserved	00	

20—35	16	Vendor name	53 4F 55 52 43 45 50 48 4F 54 4F 4E 49 43 53 20	“SOURCEPHOTONICS”(ASC II)
36	1	Reserved	00	
37—39	3	Vendor OUI	00 00 00	
40—55	16	Vendor PN	53 50 46 45 54 58 43 4E 46 41 20 20 20 20 20 20	“SPFETXCNFA”(ASC II)
56—59	4	Vendor rev	31 30 20 20	ASC II (“31 30 20 20” means 1.0 revision)
60-61	2	Wavelength	00 00	
62	1	Reserved	00	
63	1	CC BASE	xx	Check sum of bytes 0 - 62
64—65	2	Options	00 00	
66	1	BR, max	00	
67	1	BR, min	00	
68—83	16	Vendor SN	xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	ASC II.
84—91	8	Vendor date code	xx xx xx xx xx xx 20 20	Year (2 bytes), Month (2 bytes), Day (2 bytes)
92	1	Reserved	00	
93	1	Reserved	00	
94	1	Reserved	00	
95	1	CC_EXT	xx	Check sum of bytes 64 - 94
96—255	160	Vendor specific		

## Mechanical Diagram

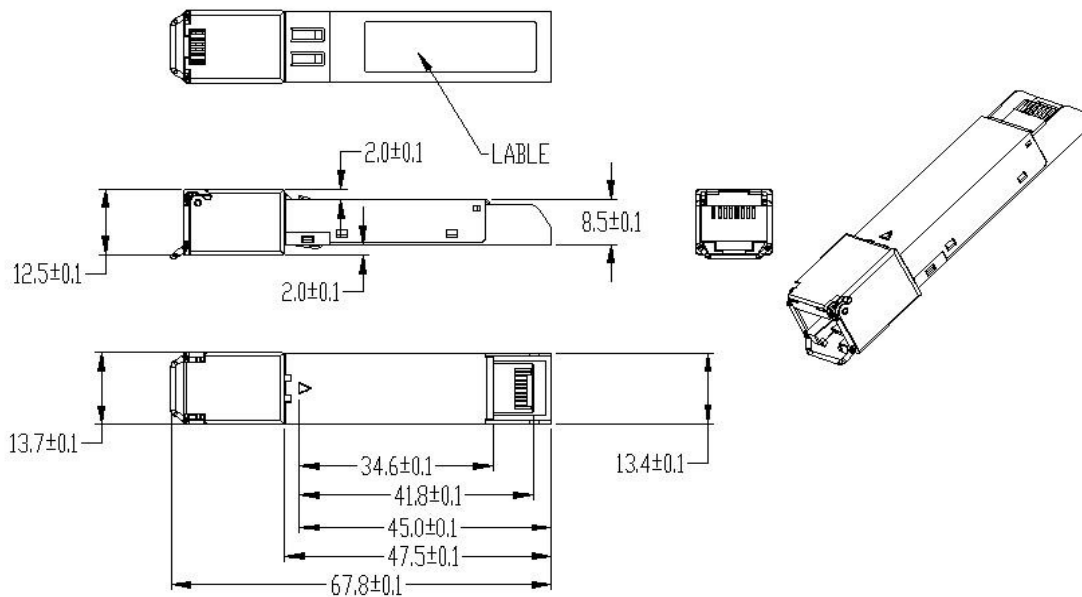


Figure 4, Mechanical Diagram

## Order Information

**Table 8 – Order Information**

Part No.	Media	Data Rate(Mbps)	Transmission Distance(km)	Temperature
SP-FE-TX-CNFA	unshielded twisted-pair (UTP) Category 5 Cable	100	0.1	-5~+70°C

## Warnings

**Handling Precautions:** 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.

**Laser Safety:** Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

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