

## SFP Cooper 10/100Base-T 100M

SL-SFP-2T



### Overview

Sourcelight SL-SFP-2T Copper Small Form Pluggable (SFP) transceiver module is specifically designed for converting 100Base-FX NRZI port interface to 10/100Base-TX interface with RJ45 connector.

The transceiver module is compliant with the SFP Multi Source Agreement (MSA) and IEEE802.3u. With the hot pluggability the module offers a flexible and easy way to be installed into SFP MSA compliant ports at any time without the interruption of the host equipment operating online.

The Copper SFP transceivers use an integrated RJ-45 connector with transformer and PHY IC.

### Features

- ◆ Hot-pluggable SFP footprint
- ◆ Extended case temperature range (0°C to +70°C )
- ◆ Fully metallic enclosure for low EMI
- ◆ Compact RJ-45 connector assembly
- ◆ It supports RX\_LOS(Loss of Signal) function
- ◆ Compatible with IEEE802.3u
- ◆ Access to physical layer IC via 2-wire serial bus
- ◆ A 10/100BASE-TX/ 100BASE-FX converter

### Applications

- ◆ This 100Base-TX Copper SFP Transceiver supports the SFP based switch 100Base-FX ports that accept standard 100Base-FX optics SFP.

### Ordering Information

Part Number	Product Description
SL-SFP-2T	10/100Base Cooper SFP with spring latch category 5 cable 100m 0°C ~ +70°C

## Pin Definitions

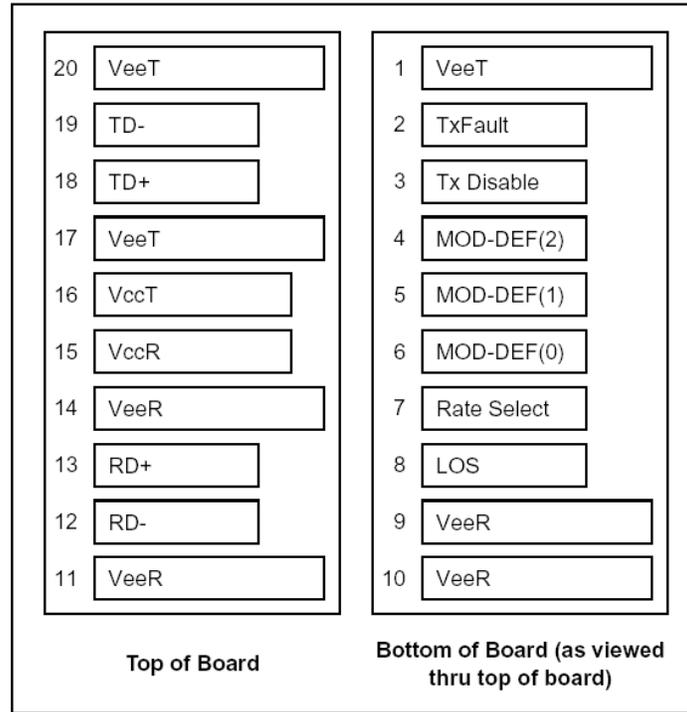


Figure1. Pin Diagram

## Pin Descriptions

Pin	Signal Name	Description	Plug Seq.	Notes
1	V <sub>EET</sub>	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note1
3	TX DISABLE	Transmitter Disable	3	Note2
4	MOD_DEF(2)	SDA Serial Data Signal	3	Note3
5	MOD_DEF(1)	SCL Serial Clock Signal	3	Note3
6	MOD_DEF(0)	TTL Low	3	Note3
7	Rate Select	Not Connected	3	
8	LOS	Loss of Signal	3	Note4
9	V <sub>EER</sub>	Receiver ground	1	
10	V <sub>EER</sub>	Receiver ground	1	
11	V <sub>EER</sub>	Receiver ground	1	
12	RX-	Inv. Received Data Out	3	Note 5
13	RX+	Received Data Out	3	Note 5
14	V <sub>EER</sub>	Receiver ground	1	
15	V <sub>CCR</sub>	Receiver Power Supply	2	

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16	V <sub>CCT</sub>	Transmitter Power Supply	2	
17	V <sub>EET</sub>	Transmitter Ground	1	
18	TX+	Transmit Data In	3	Note 6
19	TX-	Inv. Transmit Data In	3	Note 6
20	V <sub>EET</sub>	Transmitter Ground	1	

**Notes:**

Plug Seq.: Pin engagement sequence during hot plugging.

1) TX Fault is not supported and is always connected to ground.

2) TX disable, an input used to reset the transceiver module, This pin is pulled up within the module with a 4.7 KΩ resistor.

Low (0 – 0.8 V) : Transceiver on

Between (0.8 V and 2.0 V) : Undefined

High (2.0 – 3.465 V) : Transceiver in reset state

Open : Transceiver in reset state

3) Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K~10K 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) RX\_LOS (Loss of Signal): LVTTTL compatible with a maximum voltage of Host\_Vcc. RX\_LOS can enabled or disabled (Refer to Ordering information),RX\_LOS is not used and is always tied to ground via 100-ohm resistor.

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

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

### +3.3V Volt Electrical Power Interface

+3.3V volt Electrical Power Interface						
Parameter	Symbol	Min	Typical	Max	Units	Notes/Conditions
Supply Current	I <sub>s</sub>		320	375	mA	1.2W max power over full range of voltage and temperature. See caution note below
Input Voltage	V <sub>cc</sub>	3.13	3.3	3.47	V	Referenced to GND
Maximum Voltage	V <sub>max</sub>			3.6	V	

### Low-speed signals, electronic characteristics

Low-Speed Signals, Electronic Characteristics					
Parameter	Symbol	Min	Max	Units	Notes/Conditions
SFP Output LOW	VOL	0	0.5	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
SFP Output HIGH	VOH	host_Vcc - 0.5	host_Vcc + 0.3	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
SFP Input LOW	VIL	0	0.8	V	4.7k to 10k pull-up to Vcc, measured at SFP side of connector
SFP Input HIGH	VIH	2	Vcc + 0.3	V	4.7k to 10k pull-up to Vcc, measured at SFP side of connector

## High-speed electrical interface, transmission line-SFP

High-Speed Electrical Interface Transmission Line-SFP						
Parameter	Symbol	Min	Typical	Max	Units	Notes/Conditions
Line Frequency	fL		125		MHz	5-level encoding, per IEEE 802.3
Tx Output Impedance	Zout,TX		100		Ohm	Differential, for all Frequencies between 1MHz and 125MHz
Rx Input Impedance	Zin,RX		100		Ohm	Differential, for all Frequencies between 1MHz and 125MHz

## High-speed electrical interface, host-SFP

High-Speed Electrical Interface, Host-SFP						
Parameter	Symbol	Min	Typical	Max	Units	Notes/Conditions
Single ended data input swing	Vinsing	250		1200	mV	Single ended
Single ended data output swing	Voutsing	350		800	mV	Single ended
Rise/Fall Time	Tr,Tf		175		psec	20%-80%
Tx Input Impedance	Zin		50		Ohm	Single ended
Rx Output Impedance	Zout		50		Ohm	Single ended

## General specifications

General						
Parameter	Symbol	Min	Typical	Max	Units	Notes/Conditions
Data Rate	BR	10		1000	Mb/sec	IEEE 802.3 compatible. See Notes 2 through 4 below
Cable Length	L			100	m	Category 5 UTP. BER <10-12

### Notes:

1. Clock tolerance is +/- 50 ppm
2. By default, the GE-GB-PxRC-x is a full duplex device in preferred master mode
3. Automatic crossover detection is enabled. External crossover cable is not required

## Environmental specifications

Parameter	Symbol	Min	Typical	Max	Unit
Operating Case Temperature	Commercial		0		°C
	Extend		-20		°C
Storage Temperature			-40		°C

### Mechanical Specifications

The host-side of the SL-SFP-3T conforms to the mechanical specifications outlined in the SFP MSA1. The front portion of the SFP is larger to accommodate the RJ-45 connector.

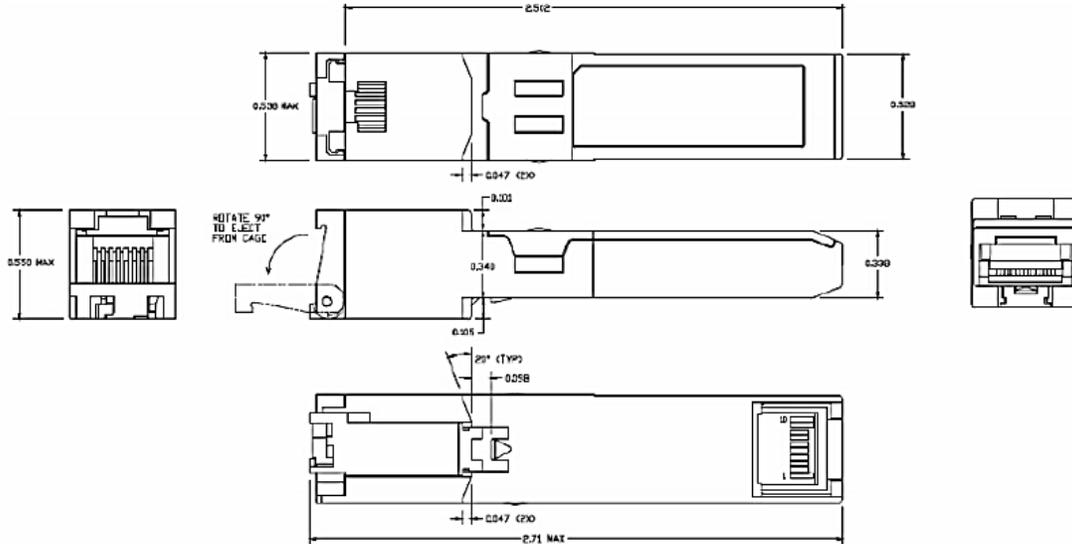


Figure2. Mechanical Specifications

### Regulatory Compliance

SFP-Copper transceiver is designed to be Class I Laser safety and is certified per the following standards:

Feature	Agency	Standard	Certificate / Comments
Environmental protection	SGS	RoHS Directive 2011/65/EU	GZ090319751A/CHEM

### References

1. Small Form Factor Pluggable (SFP) Transceiver Multi-Source Agreement (MSA), September 2000.
2. IEEE802.3 – 2002.
3. “AT24C01A/02/04/08/16 2-Wire Serial CMOS E2PROM”, Atmel Corporation.

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