EOLT-C03-02-X & EOLT-C02-02-X Series

10/100BASE-T Copper SFP Transceiver
RoHS6 Compliant

Features

◆ Support 10/100BASE-T Operation in Host Systems

◆ For 100m Reach over Cat 5 UTP Cable

◆ Hot-Pluggable SFP Footprint

◆ Fully metallic enclosure for low EMI

◆ Low power dissipation

◆ Compact RJ-45 connector assembly

◆ Detailed product information in EEPROM

◆ Operating Case Temperature

   Standard：0℃~70℃

   Industrial：-40℃~85℃

◆ Compliant with SFP MSA

◆ Compliant with IEEE Std 802.3

Applications

◆ LAN 10/100Base-T

◆ Switch to Switch Interface

◆ Router/Server Interface

◆ Switched backplane applications

Order Information

Part No.	Data Rate	Link Type	Connector	LOS Function	Distance	Tempe.
EOLT-C02-02	10M	Cat5	RJ45	Without	100m	Standard
EOLT-C02-02-I	10M	Cat5	RJ45	Without	100m	Industrial
EOLT-C03-02	100M	Cat5	RJ45	Without	100m	Standard
EOLT-C03-02-I	100M	Cat5	RJ45	Without	100m	Industrial
EOLT-C03-02-A	10/100M	Cat5	RJ45	Without	100m	Standard
EOLT-C03-02-AI	10/100M	Cat5	RJ45	Without	100m	Industrial
EOLT-C02-02-E	10M	Cat5	RJ45	With	100m	Standard
EOLT-C02-02-EI	10M	Cat5	RJ45	With	100m	Industrial
EOLT-C03-02-E	10/100M	Cat5	RJ45	With	100m	Standard
EOLT-C03-02-EI	10/100M	Cat5	RJ45	With	100m	Industrial

EOLT-C03-02-D	100M	Cat5	RJ45	With	100m	Standard
EOLT-C03-02-DI	100M	Cat5	RJ45	With	100m	Industrial

*The product image only for reference purpose

Regulatory Compliance*Note3

Product Certificate	Certificate Number	Applicable Standard
TUV	R50135086	EN 60950-1:2006+A11+A1+A12+A2
		EN 60825-1:2014
		EN 60825-2:2004+A1+A2
UL	E317337	UL 60950-1
		CSA C22.2 No. 60950-1-07
EMC CE	AE 50285865 0001	EN 55022:2010
		EN 55024:2010
FCC	WTF14F0514417E	47 CFR PART 15 OCT., 2013
FDA	/	CDRH 1040.10
ROHS	/	2011/65/EU

Note3: The above certificate number updated to June 2014, because some certificate will be updated every year, such as FDA and ROHS. For the latest certification information, please check with Eoptolink.

Product Description

EOLT-C02-02-X/EOLT-C03-02-X series is a 10/100BASE-T Copper Small Form Pluggable (SFP), which is based on the SFP Multi Source Agreement (MSA). It's high performance, cost effective module compliant with the 100BASE-T standards as specified in IEEE 802.3-2002 and IEEE 802.3u, which supporting 100Mbps up to 100 meters reach over unshielded twisted-pair category-5 cable. EOLT-C03-02 can perform any necessary scrambling / descrambling between the 100Base-TX and 100Base-FX formats and support intelligent auto-negotiation 100BASE-T operation in host systems.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max
Maximum Supply Voltage	V_{cc}	-0.5		4.0
Storage Temperature	T_S	-40		85

Normal operating condition

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Operating Case Temperature	T_c	0		70	°C	Standard
		-40		85		Industrial
Supply Voltage	V_{cc}	3.15	3.3	3.45	V	

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
+3.3 Volt Electrical Power Interface						
Supply Current	Icc		170	300	mA	
Input Voltage	Vcc	3.13	3.3	3.47	V	
Surge Current	Isurge			30	mA	
Low-Speed Signals, Electronic Characteristics						
SFP Output LOW	V_{OL}	0		0.5	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
SFP Output HIGH	V_{OH}	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	V_{IL}	0		0.8	V	4.7k to 10k pull-up to Vcc, measured at SFP side of connector
SFP Input HIGH	V_{IH}	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[note1]						
Line Baud Rates	f_L		125		MHz	MLT-3 encoding per IEEE802.3u
TX Output impedance	Zout, TX		100		Ohm	Differential, AC coupled Internally
RX Input Impedance	Zin, RX		100		Ohm	Differential, AC coupled Internally
High-Speed Electrical Interface, Host-SFP[note1]						
Single ended data input swing	Vin	250		1200	mV	Single ended
Single ended data output swing	Vout	300		1000	mV	Single ended
Rise/Fall Time	Tr, Tf		3		nsec	20%-80%
TX Input Impedance	Zin		50		Ohm	Single ended

RX Output Impedance	Zout		50		Ohm	Single ended

Note1Note1: For detail information, refer to the recommend circuit.

General specifications

Parameter	Symbol	Min	Typ	Max	Units	Notes/Conditions
Data rate	EOLT-C02-02-X		10		Mbps	
	EOLT-C03-02-X		125			
Distance				100	m	Category 5 UTP. BER <10^{-12}

Pin Descriptions

Pin No.	Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	1
3	TX Disable	Transmitter Disable	3	2
4	MOD-DEF2	Module Definition 2	3	3
5	MOD-DEF1	Module Definition 1	3	3
6	MOD-DEF0	Module Definition 0	3	3
7	Rate Select	Not Connected	3	
8	LOS	Los of Signal	3	4
9	VeeR	Receiver Ground	1	
10	VeeR	Receiver Ground	1	
11	VeeR	Receiver Ground	1	
12	RD-	Inv. Received Data Out	3	5
13	RD+	Received Data Out	3	5
14	VeeR	Receiver Ground	1	
15	VccR	Receiver Power	2	6
16	VccT	Transmitter Power	2	6
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data In	3	7
19	TD-	Inv. Transmit Data In	3	7
20	VeeT	Transmitter Ground	1	

Notes:

1. TX Fault is not used and tied to ground within the module.

2. TX Disable is not used and is not connected within the module.

3. 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 tied to ground within the module.

   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 not used for EOLT-CXX-02, EOLT-CXX-02-A. For EOLT-CXX-02-E/D, the LOS will be LVTTL low for link ok and will be LVTTL high for link off.   Externally pull up to VccR or VccT with 4.7k – 10k ohm on host board.

5. These are the differential receiver output. Internally AC-coupled in the transceiver. 100Ω differential lines and 100 Ω terminate resistor should be used on the host board.

6. VccT and VccR are internally connected together in the transceiver.

7. These are the differential receiver input. Internally AC-coupled in the transceiver. 100Ω differential lines and 100 Ω terminate resistor is used in the transceiver.

The following is the Diagram of host board connector pin numbers and names
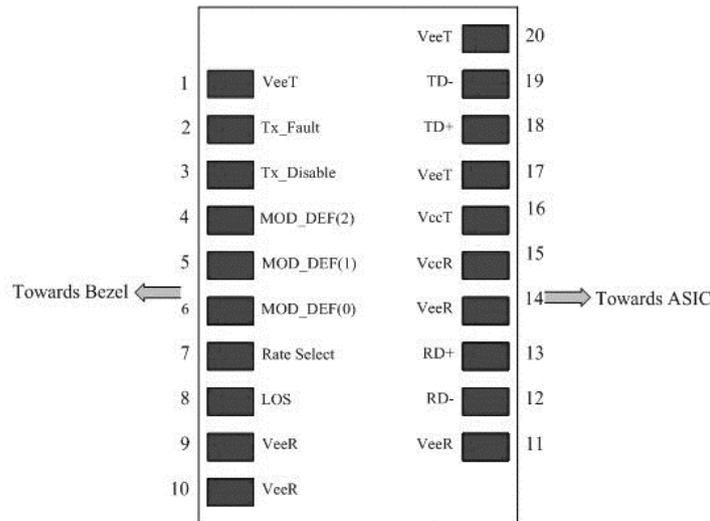
Serial Communication Protocol

Eoptolink Copper SFP support the 2-wire serial communication protocol defined in the SFP MSA. These SFP use a 128 byte EEPROM with an address of A0H.

EEPROM Serial ID Memory Contents

Accessing Serial ID Memory uses the 2 wire address 1010000X (A0H). Memory Contents of Serial ID are shown in Table 1.

Table 1 Serial ID Memory Contents

Addr.	Size (Bytes)	Name of Field	Hex	Description
BASE ID FIELDS				
0	1	Identifier	03	SFP
1	1	Ext. Identifier	04	SFP function is defined by serial ID only
2	1	Connector	22	RJ-45
3-10	8	Transceiver	00 00 00 20 00 00 00 00	100BASE-FX
11	1	Encoding	02	4B5B
12	1	BR, Nominal	01	100M
13	1	Reserved	00	

14	1	Length (9µm)km	00	Transceiver transmit distance
15	1	Length(9µm)100m	00	
16	1	Length (50µm) 10m	00	
17	1	Length(62.5µm)10m	00	
18	1	Length (Copper)	64	100m
19	1	Reserved	00	
20-35	16	Vendor name	XX XX XX XX XX XX XX XX(note2) 20 20 20 20 20 20 20 20	Vendor name (ASCII)
36	1	Reserved	00	
37-39	3	Vendor OUI	XX XX XX(note2)	
40-55	16	Vendor PN		Transceiver part number
56-59	4	Vendor rev	XX XX XX XX(note2)	
60-61	2	Wavelength	00	
62	1	Reserved	00	
63	1	CC_BASE	Check Sum (Variable)	Check code for Base ID Fields
EXTENDED ID FIELDS				
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 20 20 20 20 20 20 20 20(note2)	Serial Number of transceiver (ASCII). For example "B000822".
84-91	8	Date code	XX XX XX XX XX XX XX XX(note4)	Manufacture date code. For example "080405".
92-94	3	Reserved	XX(note4)	
95	1	CC_EXT	Check Sum (Variable)	Check sum for Extended ID Field.
VENDOR SPECIFIC ID FIELDS				
96-127	32	Vendor Specific	Read only	Depends on customer information
128-255	128	Reserved	Read only	

Note2: The "XX" byte should be filled in according to practical case. For more information, please refer to the related document of SFP Multi-Source Agreement (MSA).
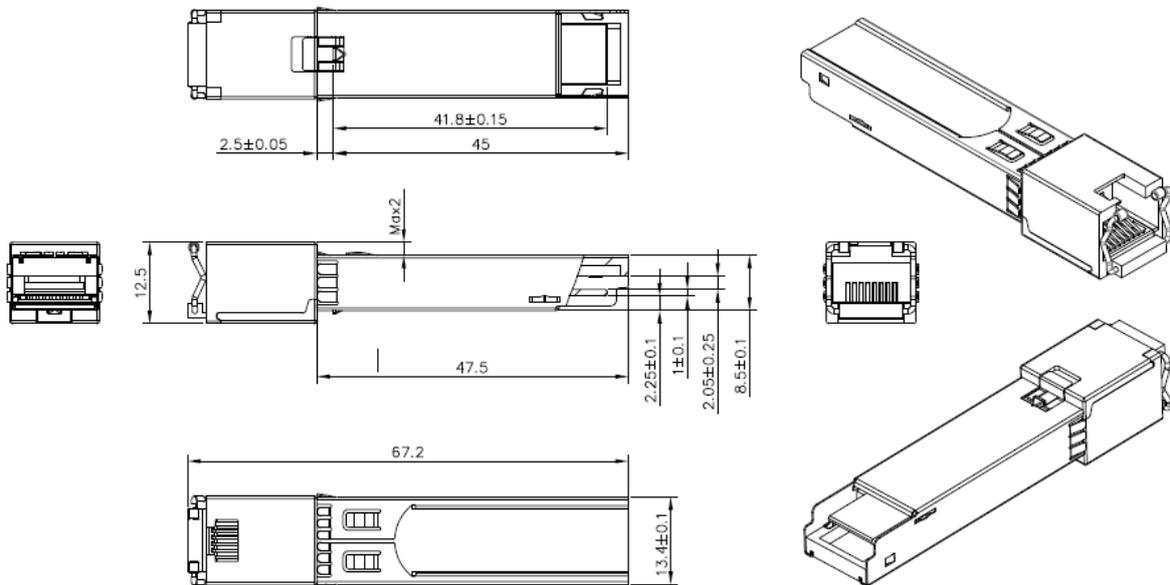
Recommended Circuit Schematic
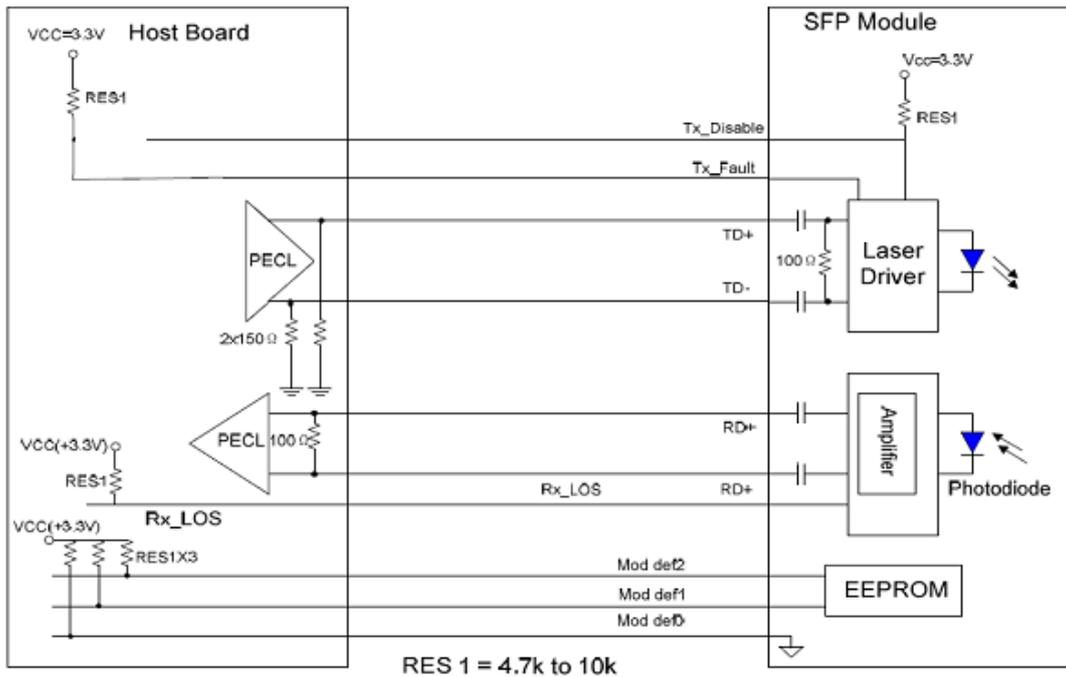
Note5: if TX_disable, LOSS and Tx_Fault are used, they should be connected as the recommend circuit.

Mechanical Specifications

Eoptolink's Copper SFP transceivers are compliant with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).

Unremarked tolerances ±0.2mm

*This 2D drawing only for reference, please check with Eoptolink before ordering.

Obtaining Document

You can visit our website:

http://www.eoptolink.com

Or contact Eoptolink Technology Inc., Ltd. Listed at the end of the documentation to get the latest documents.

Revision History

Revision	Initiated	Reviewed	Approved	DCN	Release Date
V1.a	Tim.Liang	Kelly.Cao		Released.	Apr 15, 2009
V1.b	Phlio	Kelly.Cao		Update Product List, PN&LOGO.	Oct 15, 2011
V1.c	Phlio	Kelly.Cao		Update application information and add recommend circuit. Update the output amplitude.	Nov 29, 2011
V1.d	Angela	Kelly, Torres		Update product picture and mechanical drawing	June 13, 2013
V1.e	Torres/ Angela			Update Features and regulatory compliance.	June 20, 2014
V1.f	Angela/ Torres			Correct a mistake.	Jan 04,2015
V1.g	Torres			Add new PN	Dec 29, 2016
V1.h	Torres			Correct a mistake.	Feb10, 2017
V1.i	Angela	Vina/Dean/ Chao.Wang	Kelly	Update the 2D drawing and contact information.	Sept 21,2017

Notice:

Eoptolink reserves the right to make changes to or discontinue any optical link product or service identified in this publication, without notice, in order to improve design and/or performance. Applications that are described herein for any of the optical link products are for illustrative purposes only. Eoptolink makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Contact:

Add: No.127 West Wulian Street, Gongxing Town, Shuangliu district, Chengdu City, Sichuan, China.

Tel: (+86) 028-67087999

Fax: (+86) 28-67087979-8010

Postal: 610213

E-mail:sales@eoptolink.com

http://www.eoptolink.com