

FPCOPT-RJA-BT

1.25G Copper SFP Transceiver Module

Features

- Up to 1.25Gb/s bi-directional data links
- Hot-pluggable SFP footprint
- Fully metallic enclosure for low EMI
- Low power dissipation (1.05 W typical)
- Compact RJ-45 connector assembly
- Access to physical layer IC via 2-wire serial bus
- Support intelligent auto-negotiation 10/100/1000Mbps operation in host systems with SGMII interface

Applications

- LAN 1000Base-T
- 1.25 Gigabit Ethernet over Cat 5 cable
- Switch to Switch interface
- Router/Server interface

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		4.0	V	
Storage Temperature	TS	-40		85	°C	

Normal operating condition

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Operating Temperature	Top	-5		70	°C	
Supply Voltage	Vcc	3.14	3.3	3.46	V	

Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Units	Notes/Conditions
+3.3 Volt Electrical Power Interface						
Supply Current	I _s		300	350	mA	
Input Voltage	V _{cc}	3.13	3.3	3.47	V	
Surge Current	I _{surge}			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						
Line Frequency	f _L		125		MHz	5-level encoding, per IEEE 802.3
Tx Output impedance	Z _{out,TX}		100		Ohm	Differential, for all frequencies between 1MHz and 125MHz
Rx Input Impedance	Z _{in,RX}		100		Ohm	Differential, for all frequencies between 1MHz and 125MHz
High-Speed Electrical Interface, Host-SFP						
Single ended data input swing	V _{insing}	250		1200	mV	Single ended
Single ended data output swing	V _{outsing}	350		800	mV	Single ended
Rise/Fall Time	T _r ,T _f		175		psec	20%-80%
Tx-Input Impedance	Z _{in}		50		Ohm	Single ended
Rx-Output Impedance	Z _{out}		50		Ohm	Single ended

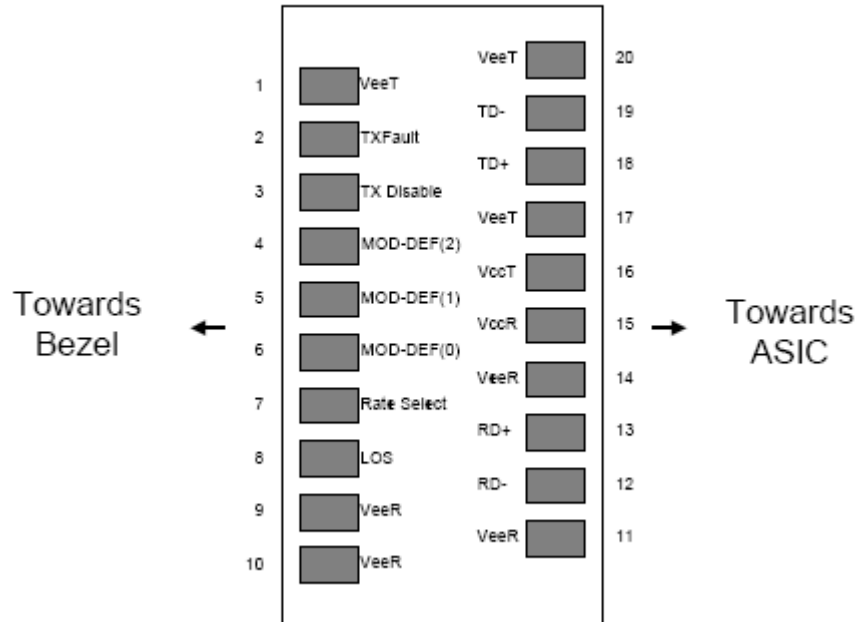
Pin Descriptions

Pin No.	Name	Function	PlugSeq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	Not used
3	TX Disable	Transmitter Disable	3	1
4	MOD-DEF2	Module Definition 2	3	2
5	MOD-DEF1	Module Definition 1	3	2
6	MOD-DEF0	Module Definition 0	3	2
7	Rate Select	Not Connected	3	
8	LOS	Loss of Signal	3	Not Used
9	VeeR	Receiver Ground	1	
10	VeeR	Receiver Ground	1	
11	VeeR	Receiver Ground	1	
12	RD-	Inv. Received Data Out	3	
13	RD+	Received Data Out	3	
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	
19	TD-	Inv. Transmit Data In	3	
20	VeeT	Transmitter Ground	1	

Notes:

1. PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V, used to reset the module.
2. Should be pulled up with 4.7k – 10k Ohms on host board to a voltage between 2.0 V and 3.6 V. MOD_DEF(0) pulls line low to indicate module is plugged in.

The following is the Diagram of host board connector block pin numbers and names



Serial Communication Protocol

Copper SFPs support the 2-wire serial communication protocol outlined in the SFP MSA. These SFP use a 128 byte EEPROM with an address of A0h. The 1000BASE-T physical layer IC can also be accessed via the 2-wire serial bus at address ACh.

EPROM Serial ID Memory Contents

Accessing Serial ID Memory uses the 2 wire address 1010000X (A0). Memory Contents of Serials ID are Shown in Table 1.

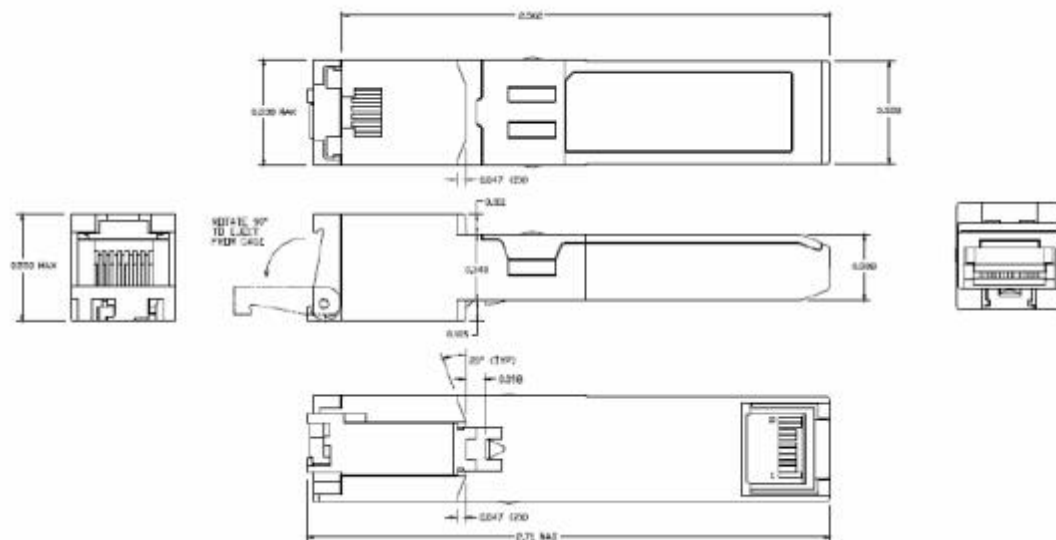
Table1. EEPROM ID Memory Contents

Data Address	Size (Bytes)	Name of Field	Contents (Hex)	Description
BASE ID FIELDS				
0	1	Identifier	03	SFP
1	1	Ext. Identifier	04	SFP function is defined by Serial ID
2	1	Connector	22	RJ45
3-10	8	Transceiver	00 00 00 08 00 00 00 00	1000BASE-T
11	1	Encoding	01	8B/10B
12	1	BR, Nominal	0D	Data Rate 1300M
13	1	Reserved	00	

14	1	Length(9um) km	00	"100M Cat5e"
15	1	Length (9um) 100m	00	
16	1	Length(50um) 10m	00	
17	1	Length (62.5um) 10m	00	
18	1	Length (Copper)	64	
19	1	Reserved	00	
20-35	16	Vendor Name	54 65 6C 63 6F 20 53 79 73 74 65 6D 73 20 20 20	"Telco Systems" (ASCII)
36	1	Reserved	00	
37-39	3	Vendor OUI	00 00 00	IEEE ID Registered
40-55	16	Vendor PN	42 54 49 4D 47 42 49 43 4D 54 58 20 20 20 20 20	"BTIMGBICMTX" (ASCII)
56-59	4	Vendor Rev.	56 31 2E 30	"V1.0" (ASCII)
60-61	2	Wavelength	00 00	
62	1	Reserved	00	
63	1	CC_BASE	xx	Check Sum for Base ID Fields
EXTENDED ID FIELDS				
64-65	2	Options	02 1A	Tx.Fault and Rx.Loss of signal / Power Level
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	Serial Number of Transceivers (ASCII)
84-91	8	Date Code	xx xx xx xx xx xx 20 20	Date Code (Year/Month/Day)
92	1	Diagnostic Monitoring Tye	00	
93	1	Enhanced Options	00	
94	1	SFF_8472 Compliance	03	For SFF-8472 Rev10.2
95	1	CC_EXT	xx	Check Sum for Extended ID Fields
VENDOR SPECIFIC ID FIELDS				
96-127	32	Vendor Specific	Read Only	Depends on customer information
128-255	128	Reserved	Read Only	Filled by Zero

Mechanical Specifications

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



Order Information

Part No.	Data Rate	Link type	Distance	Connector
FPCOPT-RJA	10/100/1000M	Cat5	100M	RJ45