

10GBASE-T SFP+ RJ-45 80m Copper Transceiver

Features

- Support 10Gbase-T / on line port
- Support 10Gbase-R on host port
- Hot-pluggable SFP footprint
- Compact RJ-45 connector assembly
- Ambient Operating temperature: 0°C to +70°C
- RoHS compliant and lead-free
- 10 Gigabit Ethernet over Cat 6a cable
- Single +3.3V power supply
- Up to 80M reach over Cat6a/Cat7 cable
- Lower power consumption

Applications

- 10GBASE-T 10G Ethernet

Compliance

- 10GBASE-T 10G Ethernet
- Compatible with IEEE Std 802.3
- ROHS

Description

The SFP-10G-T-80 transceivers are based on the SFP Multi Source Agreement (MSA) . They are compatible with the 10Gbase-T standards as specified in IEEE Std 802.3 . SFP+-10GBASE-T uses the SFP's RX_LOS(must be pulled up on host) pin for link indication. If pull up or open SFP's TX_DISABLE pin, PHY IC be reset.

Cable Length

Table1-Cable Length			
Line Port	Cable	Reach	Host Port
10GBASE-T	CAT6A/CAT7	80m	10GBase-R

General Specifications

Table2-General Specifications						
Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
Data Rate	BR			10	Gb/sec	IEEE 802.3 compatible. See Notes 1,2 below

Note:

[1] Clock tolerance is +/- 50 ppm

Environmental Specifications

Automatic crossover detection is enabled. External crossover cable is not required

Table3-Environmental Specifications						
Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
Operating Temperature	Top	0		70	°C	Case temperature
Storage Temperature	Tsto	-40		85	°C	Ambient temperature

Serial Communication Protocol

All SFPs support the 2-wire serial communication protocol outlined in the SFP MSA. These SFPs use an MCU, can be accessed with address of A0h.

Table4-Serial Communication Protocol						
Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
I ² C Clock Rate		0		200000	Hz	

+3.3V Volt Electrical Power Interface

The SFP+-10GBASE-T has an input voltage range of 3.3 V +/- 5%. The 4V maximum voltage is not allowed for continuous operation.

Table5--3.3V Volt Electrical Power Interface

Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
Supply Current	Is		570	750	mA	2.5W max power over full range of voltage and temperature. See caution note below
Input Voltage	Vcc	3.13	3.3	3.47	V	Referenced to GND
Maximum Voltage	Vmax			4	V	
Surge Current	Isurge		TBD		mA	Hotplug above steady state current See caution note below

Caution:Power consumption and surge current are higher than the specified values in the SFP MSA

Low-Speed Signals

MOD_DEF(1) (SCL) and MOD_DEF(2) (SDA), are open drain CMOS signals (see section VII, "Serial Communication Protocol"). Both MOD_DEF(1) and MOD_DEF(2) must be pulled up to host_Vcc.

Table6-Low-Speed Signals

Low-Speed Signals, Electronic Characteristics						
Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
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

All high-speed signals are AC-coupled internally.

Table7-High-Speed Electrical Interface						
High-Speed Electrical Interface, Transmission Line-SFP						
Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
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

Table8-High-Speed Electrical Interface						
High-Speed Electrical Interface, Host-SFP						
Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
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

Pin Assignment

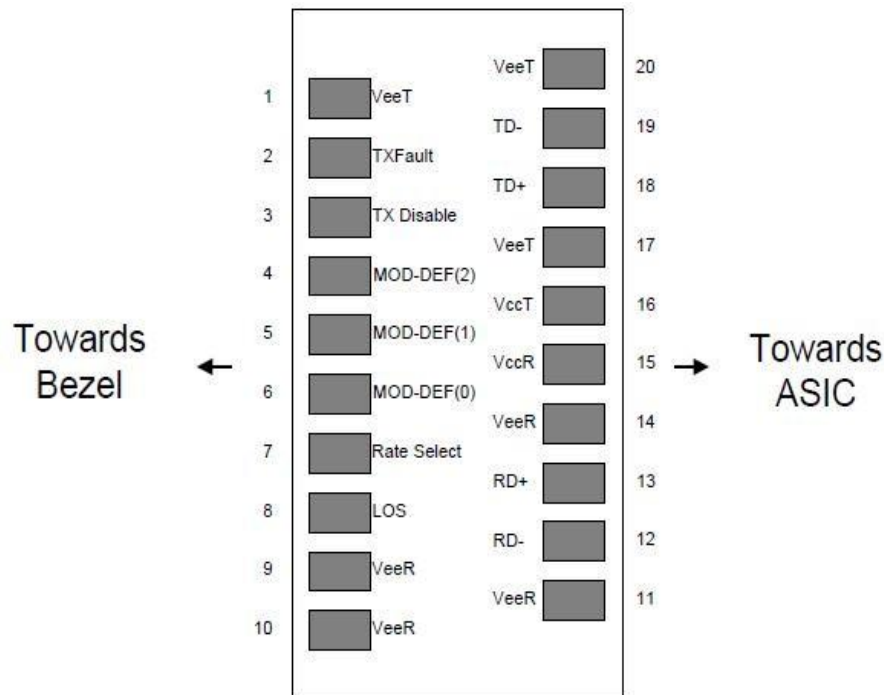


Figure 1 Diagram of Host Board Connector Block Pin Numbers and Names

Pin Function Definitions

PIN	Symbol	Description	Notes
1	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T _{FAULT}	Transmitter Fault. Not supported.	
3	T _{DIS}	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection required.	
8	LOS	High indicates no linked. low indicates linked..	
9	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
10	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
15	V _{CCR}	Receiver Power Supply	
16	V _{CCT}	Transmitter Power Supply	

17	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1

Notes:

[1] Circuit ground is connected to chassis ground

[2] PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V.

[3] 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.

EEPROM Information

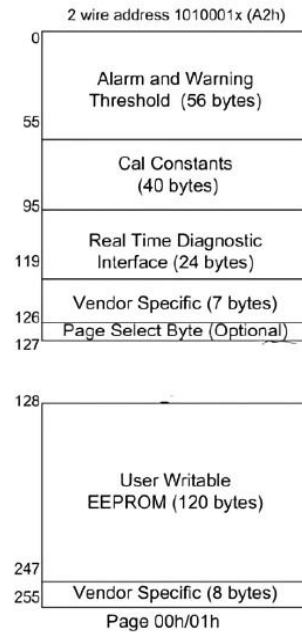


Table10-EEPROM Serial ID Memory Contents (A0h)

Address	Field Size (Bytes)	Name of Field	HEX	Description
0	1	Identifier	03	SFP
1	1	Ext Identifier	04	MOD4
2	1	Connector	22	RJ45
3-10	8	Transceiver	00 00 00 00 00 00 00 00	Transmitter Code
11	1	Encoding	06	64B66B
12	1	BR,nominal	67	10000M bps
13	1	Reserved	00	
14	1	Length(9um)-km	00	
15	1	Length(9um)	00	
16	1	Length(50um)	08	80
17	1	Length(62.5um)	03	30
18	1	Length(copper)	00	
19	1	Reserved	1E	30
20-35	16	Vendor name	57 49 4E 54 4F 50 20 20 20 20 20 20 20 20 20 20	
36	1	Reserved	00	
37-39	3	Vendor OUI	00 00 00	
40-55	16	Vendor PN	xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	ASC II
56-59	4	Vendor rev	31 2E 30 20	V1.0

60-61	2	Wavelength	00 00	850nm
62	1	Reserved	00	
63	1	CC BASE	XX	Check sum of byte 0~62
64-65	2	Options	00 1A	LOS, TX_DISABLE, TX_FAULT
66	1	BR max	00	
67	1	BR min	00	
68-83	16	Vendor SN	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Unspecified
84-91	8	Vendor date code	XX XX XX 20	Year, Month, Day
92-94	3	Reserved	00	
95	1	CC_EXT	XX	Check sum of byte 64~94
96-255	160	Vendor specific		

Recommended Application Circuit

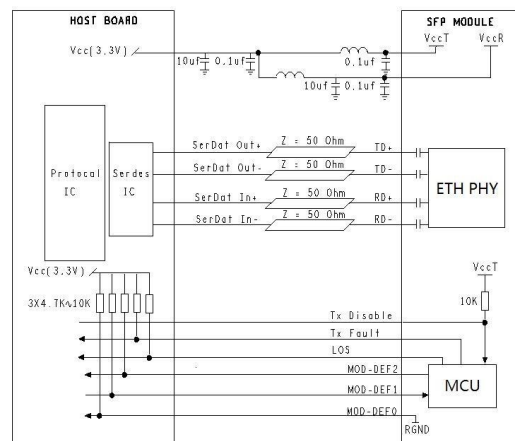
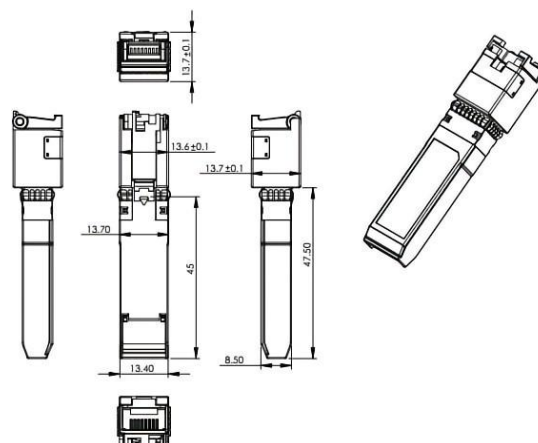


Diagram Mechanical Drawing



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