10GBASE-T SFP+ Copper RJ-45 30m Transceiver

iSFP-10G-T-LL

Application

• 10GBASE-T 10G Ethernet

Features

• Hot-pluggable SFP footprint

• Support 10GBASE-T

• Compact RJ-45 connector assembly

• Commercial Temperature Range: 0 to 70°C

• Single +3.3V power supply

• 10 Gigabit Ethernet over Cat6a/Cat7 cable

• RoHS compliant and lead-free

Description

10GBASE-T standards as specified in IEEE Std 802.3. 10GBASE-T SFP+ copper transceivers use the SFP's RX_LOS pin for link indication. If pull up SFP's TX_DISABLE pin, PHY GBASE-T SFP+ copper transceivers are based on the SFP Multi-Source Agreement (MSA). They are compatible with the 10GBASE-T / IC will be reset.

Product Specifications

I.General Specifications

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
Bit Rate	BR	1		10	Gb/sec	IEEE 802.3 compatible. See Notes 1 below

Note:

1. Clock tolerance is +/- 50 ppm

II. Environmental Specifications

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
Operating Temperature	Top	0		70	°C	Case temperature
Storage Temperature	Tsto	-40		85	°C	Ambient temperature

Note:

1.Automatic crossover detection is enabled. External crossover cable is not require

III. Transmission Distances

Standard	Cable	Reach	Host Port
10GBASE-T	Cat6a/Cat7	30m	XFI

IV. Electrical Characteristics

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

Low-Speed Signals, Electronic Characteristics					
Parameter	**Symbol**	**Min**	**Max**	**Unit**	**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	mV	4.7k to 10k pull-up to Vcc, measured at SFP side of connector

V. +3.3V Volt Electrical Power Interface

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

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
Supply Current	Is		700	900	mA	3.0W 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	1
Surge Current	Isurge		TBD		mA	Hot plug above steady statecurrent. See caution notebelow.

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

VI. High-Speed Electrical Interface

All high-speed signals are AC-coupled internally.

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
High-Speed Electrical Interface, Transmission Line-SFP						
Line Frequency	fL		125		MHz	5-level encoding, perIEEE 802.3
Tx Output Impedance	Zout,TX		100		Ohm	Differential, for allfrequencies between1MHz and 125MHz
Rx Input Impedance	Zin,RX		100		Ohm	Differential, for allfrequencies between1MHz and 125MHz
High-Speed Electrical Interface, Host-SFP						
Single ended data inputswing	Vinsing	250		1200	mV	Single ended
Single ended data outputswing	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

VII. Serial Communication Protocol

All longline.COM 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.

Parameter	Symbol	Min	Typ.	Max	Unit	Notes/Conditions
Serial Bus Timing, Requirements						
I ^{2}C Clock Rate		0		200,000	Hz	

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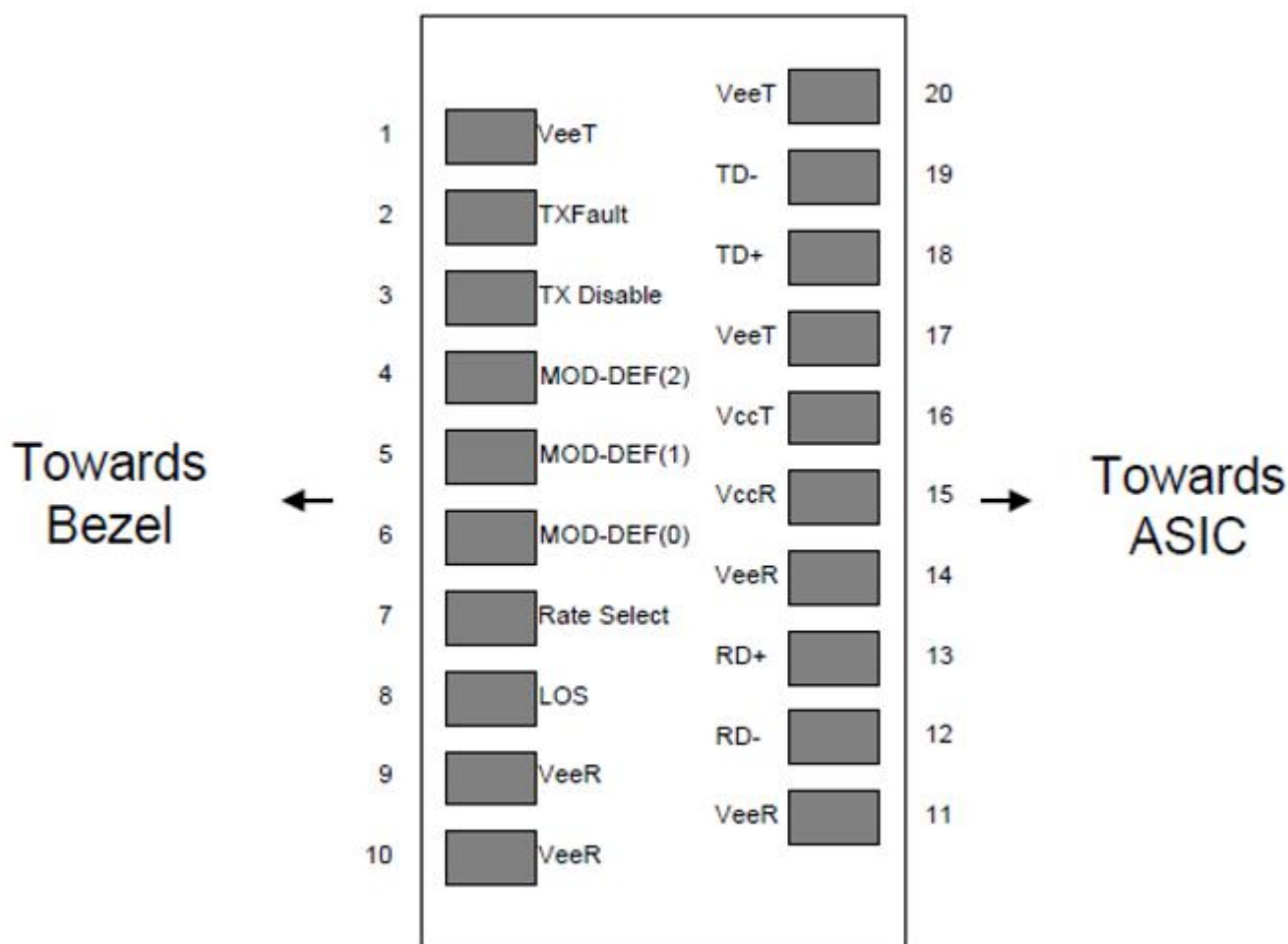
Figure 1. Diagram of Host Board Connector Block Pin Numbers and Names.

Pin	Symbol	Name/Description	Ref.
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.	4
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.

4. LVTTL compatible with a maximum voltage of 2.5V.

IX. Mechanical Specifications