SFP-C-T-TAA

Gigabit Copper Ethernet SFP Module with Extended Operating Temperature and TAA Compliant

FEATURES

- Small Form Factor Pluggable (SFP) MSA Compliant
- Compatible with IEEE 802.3:2002
- Compatible with 1000BASE-X and 1000BASE-T Auto-Negotiation
- Auto-Detect MDI/MDI-X
- 10/100/1000BASE-T Operation in Host System with SGMII Interface
- Link Length up to 100m at 1.25Gbps with Four Pair Category 5 UTP Cabling
- Internal PHY IC is Configurable by Host System via I2C Interface
- Single 3.3V Power Supply Operation
- Low Power Dissipation
- TAA Compliant

INTRODUCTION

The SFP-C-T-TAA is specifically designed for the high performance integrated full duplex data link at 1.25Gbps over four pair Category 5 UTP. The transceiver module is compliant with the SFP MultiSource Agreement (MSA) and IEEE 802.3:2002. 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 SFP-C-T-TAA uses an integrated RJ-45 connector with a transformer and PHY IC. The link length is up to 100m over four pair Category 5 UTP cabling.

SPECIFICATIONS

Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit	Note
Storage Temperature	Tst	-40	85	℃	
Supply Voltage	Vcc	-0.5	4.0	V	
Relative Humidity	RH	5	95	%	

Recommended Operating Conditions

Parameter	Symbol	Minimum	Type	Maximum	Unit	Note
Case Operating Temperature	TOP	-40		85	℃	Refer to Ordering Information

Supply Voltage	Vcc	3.135	3.3	3.47	V	
Supply Current	Icc		320	375	mA	
Power Consumption	P			1.2	W	

General Specifications

Parameter	Symbol	Minimum	Type	Maximum	Unit	Note
Data Rate	DR	10		1000	Mb/sec	1
Cable Length	L			100	M	2

Notes:

1. 10/100/1000BASE-T operation requires an SGMII interface with no clocks in the host system. With a SERDES interface that does not support SGMII, the module will operate at 1000BASE-T only.
2. Cat.5 UTP, BER<10^{-12}

High-Speed Electrical Interface, Host to SFP

Parameter	Symbol	Minimum	Type	Maximum	Unit	Note
TD+, TD- Input Voltage Swing	Vin+ Vin-	250		1200	mV	1
RD+, RD- Output Voltage Swing	Vout+ Vout-	350		800	mV	1
Rise / Fall Time (20~80%)	Tr / Tf		175		ps	
Tx Input Impedance	Zin		50		Ohm	1
Rx Output Impedance	Zout		50		Ohm	1

Notes:

1. Single ended

High-Speed Electrical Interface, Cable to SFP

Parameter	Symbol	Minimum	Type	Maximum	Unit	Note
Line Frequency	FL		125		MHz	1
Tx Output Impedance	Zout.Tx		100		Ohm	2
Rx Input Impedance	Zin.Rx		100		Ohm	2

Notes:

1. 4D-PAM-5 encoding per IEEE 802.3:2002
2. Differential for frequencies ranging from 1MHz to 1.25GHz

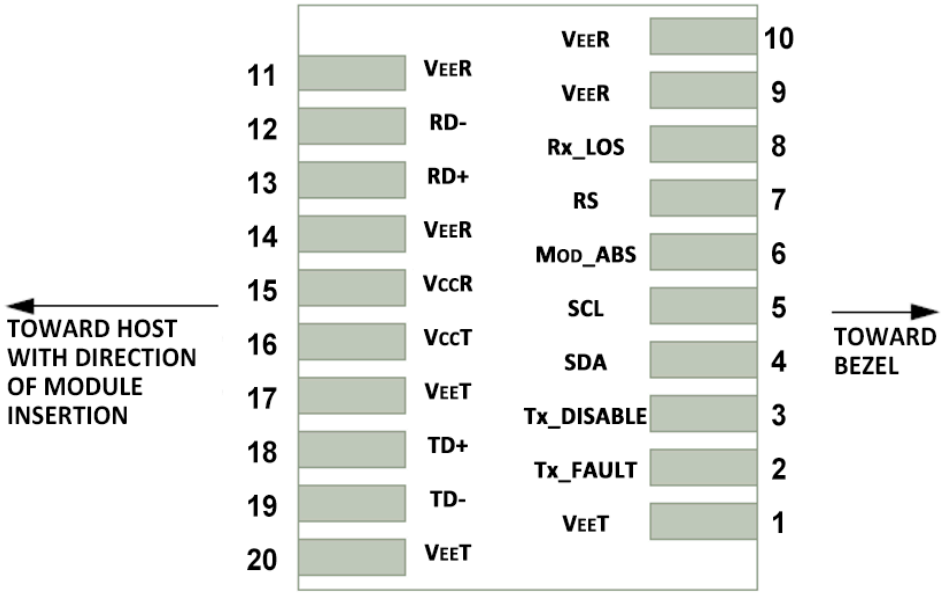
High-Speed Electrical Interface, Cable to SFP

Parameter	Symbol	Minimum	Maximum	Unit	Note
SFP Output LOW	VOL	0	0.5	V	4.7k to 10k pull up to H ost_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 H ost_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

Note: 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.

PIN DESCRIPTION



Host PCB SFP Pad Assignment Top View

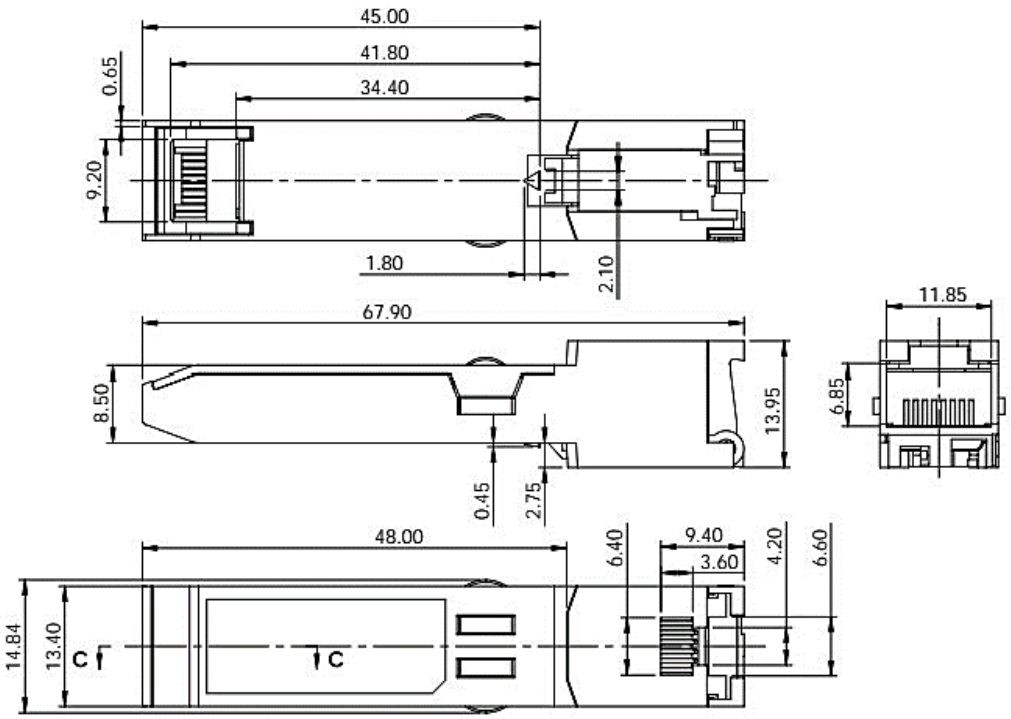
Pin Number	Name	Function / Description
1	VeeT	Transmitter Ground
2	Tx_FAULT	Transmitter Fault Indication (1)
3	Tx_DISABLE	Transmitter Disable - Turns off transmitter laser output (2)
4	SDA	2-wire Serial Interface Data Line (SDA: Serial Data Signal) (3)
5	SCL	2-wire Serial Interface Clock (SCL: Serial Clock Signal) (3)
6	MOD_ABS	Module Absent, connected to VeeT or VeeR in the module (3)
7	RS	Rate Select, optional (5)
8	Rx_LOS	Receiver Loss of Signal Indication (4)
9	VeeR	Receiver Ground
10	VeeR	Receiver Ground
11	VeeR	Receiver Ground
12	RD-	Receiver Inverted Data output, Differential LVPECL, AC coupled
13	RD+	Receiver Non-Inverted Data output, Differential LVPECL, AC coupled
14	VeeR	Receiver Ground
15	VccR	Receiver 3.3V Power Supply
16	VccT	Transmitter 3.3V Power Supply

17	VeeT	Transmitter Ground
18	TD+	Transmitter Non-Inverted Data Input, Differential LVPECL, AC coupled
19	TD-	Transmitter Inverted Data Input, Differential LVPECL, AC coupled
20	VeeT	Transmitter Ground

Notes:

1. TX Fault is not used and is always tied to ground through a 100 ohm resistor.
2. TX Disable as described in the MSA is not applicable to the 1000BASE T module, but is used for convenience as an input to reset the internal PHY IC. This pin is pulled up within the module with a 4.7K Ω 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. These are the module definition pins. They should be pulled up with a 4.7K~10K Ω resistor on the host board to supply less than VccT+0.3V or VccR+0.3V. MOD_ABS is grounded by the module to indicate that the module is present.
4. Rx LOS (Loss of signal) is an open collector/drain output which should be pulled up externally with a 4.7K~10K Ω resistor on the host board to supply <VccT+0.3V or VccR+0.3V. When high, this output indicates the received optical power is below the worst case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to <0.8V.
5. No connection on this module.

DIMENSIONS



(All Dimensions are ±0.20mm Unless Otherwise Specified, Unit: mm)

ORDERING INFORMATION

SFP Models	
Part Number	**Description**
SFP-C-T-TAA	10/100/1000BASE-T Copper Ethernet SFP Transceiver, -40~85°C, with TAA Compliant