WAVESPLITTER™ TECHNOLOGIES, INC.

Data Sheet

10GBASE-T SFP+ Copper Transceiver Module
P/N: WST-SFP+CuS-x

Features:

- Support 10GBASE-T on line port
- Support 10GBASE-R on host port
- Hot-pluggable SFP footprint
- Compact RJ-45 connector assembly
- Single +3.3 V power supply
- 10 Gigabit Ethernet over CAT6A F/FTP cable
- Case Operating Temperature:
  WST-SFP+CuS-C, 0 ˚C to +70 ˚C
  WST-SFP+CuS-I, -40 ˚C to +85 ˚C
- Up to 80 m reach over CAT6A F/FTP cable
- Lower power consumption
- RoHS compliant

Application:

- LAN 10GBASE-T
- Switch to Switch Interface
- Router / Server interface
- Switched backplane applications

Standard:

- SFP+ form factor compatible
- Compatible with IEEE Std 802.3

Description

The WST-SFP+CuS-x is a 10GBASE-T copper SFP+ transceiver module designed for 10 Gigabit Ethernet data communication and interconnect applications over copper cabling. It supports a 10GBASE-R electrical interface on the host side and a 10GBASE-T interface on the line side, with a transmission distance of up to 80 m over CAT6A F/FTP cable. The module integrates a 10GBASE-T PHY and provides an RJ-45 copper interface.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum Supply Voltage	V_{cc}			4.0	V	
Storage Temperature	T_S	-40		85	°C	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Note
Case Operating Temperature	T_{C-CT}	0		70	°C	WST-SFP+CuS-C
	T_{C-IT}	-40		85		WST-SFP+CuS-I
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Data Rate	BR		10		Gb/s	1
Power Supply Current	Icc		540	575	mA	WST-SFP+CuS-C
				650		WST-SFP+CuS-I

Note:

1. Clock tolerance is +/- 50 ppm

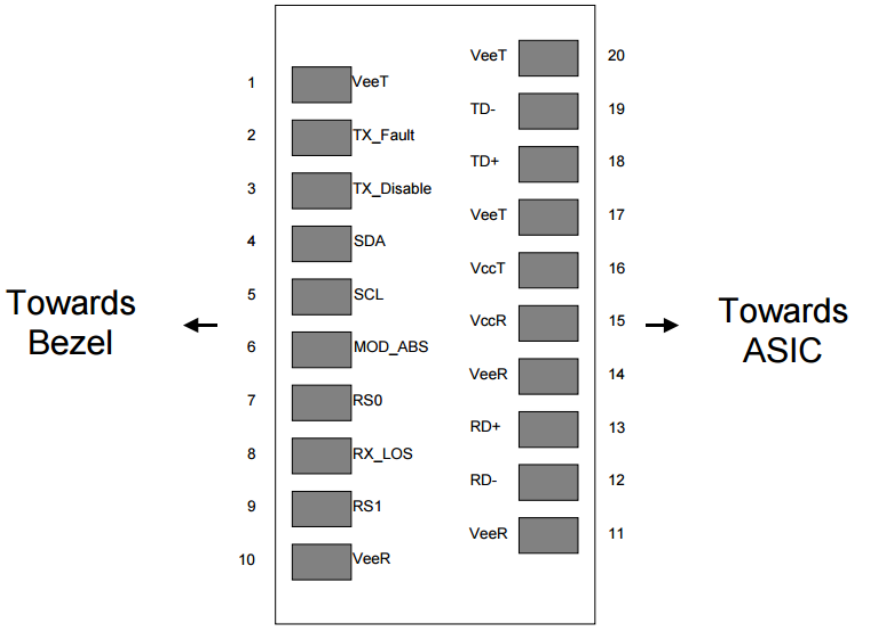
Electrical Characteristics

Parameter	Symbol	Min.	Max.	Unit	Notes
Low-Speed Signals, Electronic Characteristics					
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, Transmission Line-SFP						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**unit**	**Notes/Conditions**
Modulation Rate	SR		800		MBd	PAM16 / DSQ128, per IEEE 802.3
Tx Output Impedance	Zout,TX		100		Ω	Differential
Rx Input Impedance	Zin,RX		100		Ω	Differential
High-Speed Electrical Interface, Host-SFP						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**unit**	**Notes/Conditions**
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		Ω	Single ended
Rx Output Impedance	Zout		50		Ω	Single ended

Pin Assignment



Pin	Name	Function/Description	Notes
1	VEET	Transmitter Ground	
2	TX Fault	Transmitter Fault Indication. Not supported	
3	TX Disable	Transmitter Disable. PHY is disabled when TDIS is high or open.	1
4	MOD_DEF2	Module Definition 2. Data line for Serial ID.	2
5	MOD_DEF1	Module Definition 1. Clock line for Serial ID.	2
6	MOD_DEF0	Module Definition 0. Grounded within the module.	2
7	RS0	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	
9	RS1	No connection required	
10	VEER	Receiver Ground	
11	VEER	Receiver Ground	
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VEER	Receiver Ground	
15	VCCR	Receiver Power Supply	

16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground	
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled	
19	TD-	Transmitter Inverted DATA in. AC Coupled	
20	VEET	Transmitter Ground	

Notes:

1. PHY disabled on TDIS > 2.0 V or open, enabled on TDIS < 0.8 V

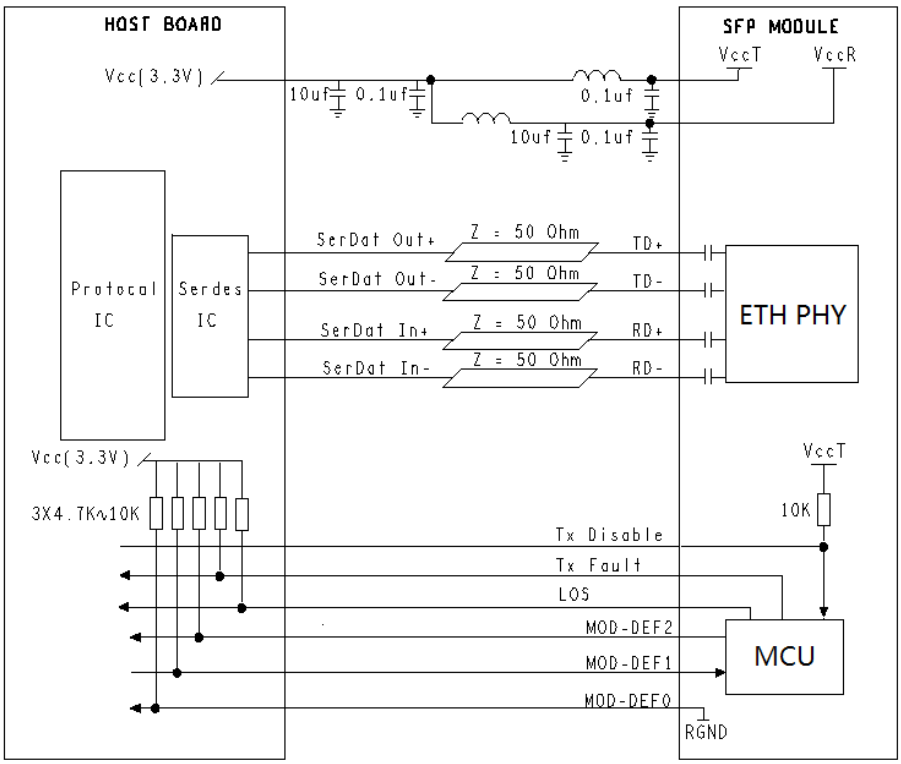
2. Should be pulled up with 4.7k - 10k Ohms on host board to a voltage between 2.0 V and 3.6 V. MOD_DEF(0) pulls line low to indicate module is plugged in.

Serial Communication Protocol

All Wavesplitter 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.

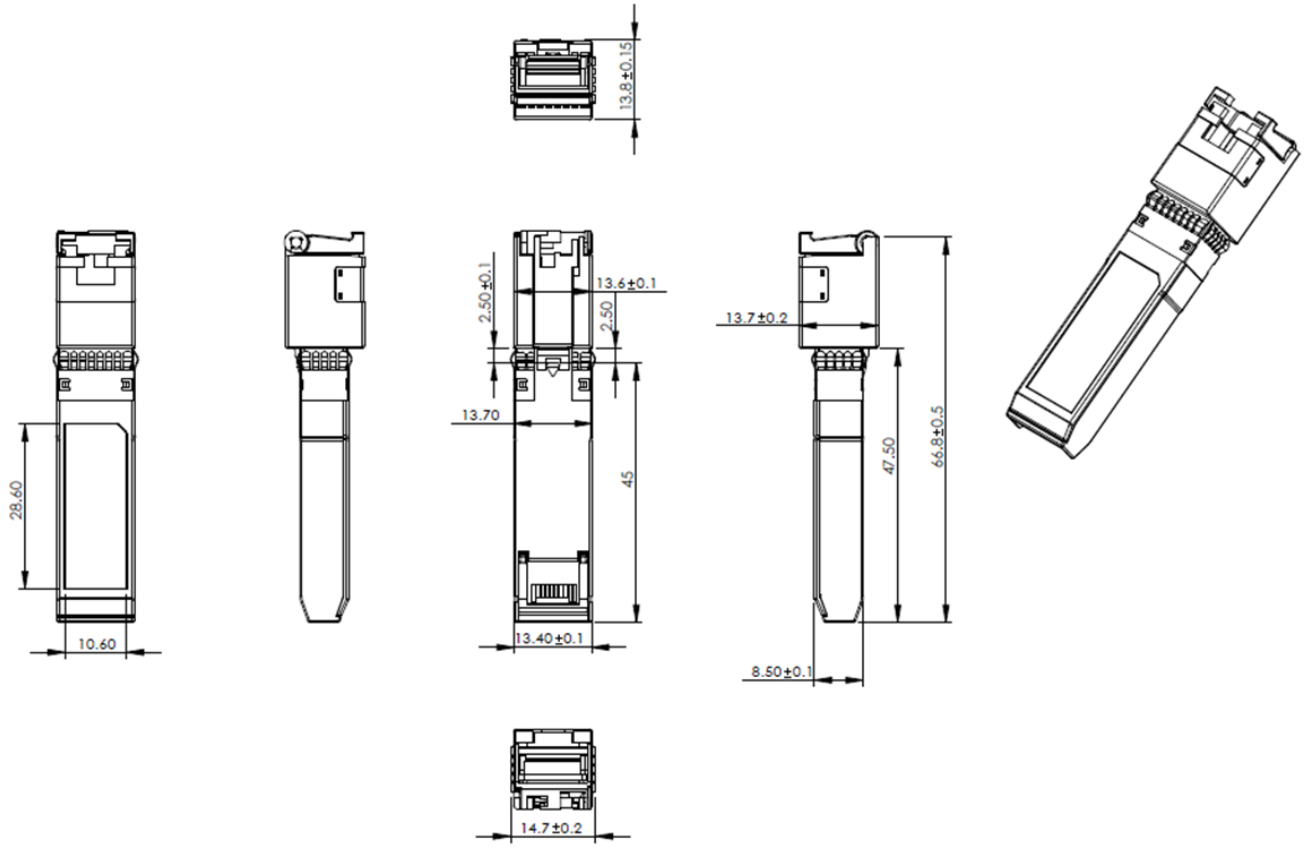
Serial Bus Timing, Requirements						
Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
I ^{2}C Clock Rate		0		200	kHz	

Typical Application Circuit



Mechanical Drawing

Unit is millimeter. All dimensions are ±0.1mm unless otherwise specified.



Ordering Information

Specification							
Part No.	Package	Interface	Media	Data Rate	Temp	Reach	RoHS
WST-SFP+CuS-C	SFP+	Electrical	Copper (see table below)	10G only	0 to 70 °C	See table below	RoHS lead-free
WST-SFP+CuS-I	SFP+	Electrical	Copper (see table below)	10G only	-40 to 85 °C	See table below	RoHS lead-free

Line Port	Cable	Reach	Host Port
10GBASE-T	CAT6A F/FTP	80 m	10GBASE-R

Modification History

Revision	Date	Description	Originator	Review	Approved
V1.0	20-Aug-2025	New Release	Jason Hou	Wayne Liao	Tom Tang

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