

10GBASE-T SFP+ Copper Transceiver Module

P/N: WST-SFP+CuRMS-x



Features:

- Support 10GBASE-T / 5GBASE-T / 2.5GBASE-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
- Support 10GBASE-T up to 80 m over CAT6A F/FTP and 5GBASE-T / 2.5GBASE-T up to 100 m over CAT5E
- Operating temperature range:
0 °C to 70 °C Operation: WST-SFP+CuRMS-C
-40 °C to 85 °C Operation: WST-SFP+CuRMS-I
- RoHS compliant

Application:

- 10GBASE-R on Host and 10GBASE-T / 5GBASE-T / 2.5GBASE-T on Line Side
- 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+CuRMS-x is a multi-rate 10GBASE-T copper SFP+ transceiver module designed for Ethernet data communication and interconnect applications over copper cabling. It supports 10GBASE-R on the host side and 10GBASE-T, 5GBASE-T, or 2.5GBASE-T on the line side through an integrated rate-matching PHY. The module supports transmission distances of up to 80 m over CAT6A F/FTP cable at 10GBASE-T and up to 100 m over CAT5E cable at 5GBASE-T and 2.5GBASE-T, 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	Unit	Min	Typ	Max	Note
Case Operating Temperature -CT	TC-CT	°C	0		70	WST-SFP+CuRMS-C
Case Operating Temperature -IT	TC-IT	°C	-40		85	WST-SFP+CuRMS-I
Power Supply Voltage	V _{cc}	V	3.135	3.3	3.465	
Power Supply Current -CT	I _{cc} -CT	mA		540	600	WST-SFP+CuRMS-C
Power Supply Current -IT	I _{cc} -IT	mA			650	WST-SFP+CuRMS-I

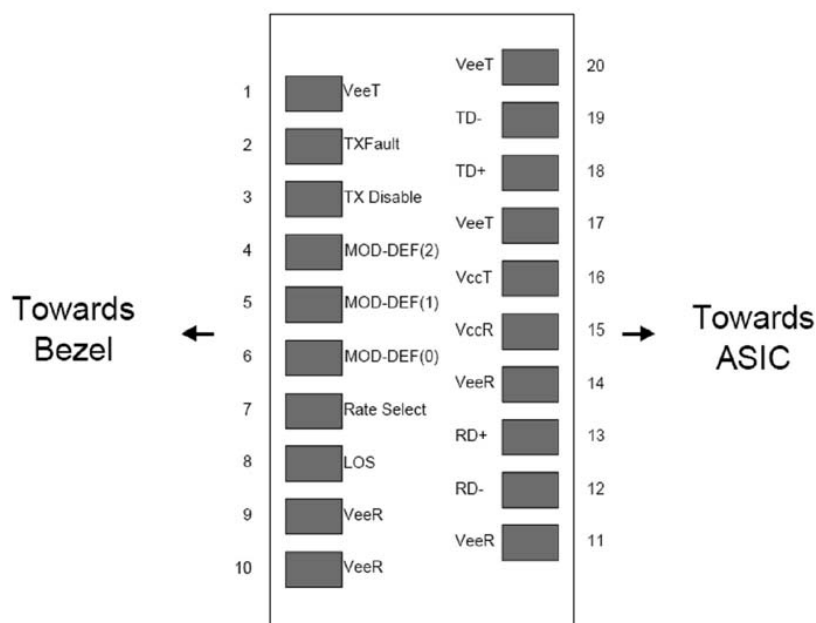
Electrical Characteristics

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_V _{cc} , measured at host side of connector
SFP Output HIGH	VOH	host_V _{cc} - 0.5	host_V _{cc} + 0.3	V	4.7k to 10k pull-up to host_V _{cc} , measured at host side of connector
SFP Input LOW	VIL	0	0.8	V	4.7k to 10k pull-up to V _{cc} , measured at SFP side of connector
SFP Input HIGH	VIH	2	V _{cc} + 0.3	V	4.7k to 10k pull-up to V _{cc} , measured at SFP side of connector

High-Speed Electrical Interface, Line Port						
Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
Modulation Rate for 10GBASE-T	SR		800		MBd	PAM16 / DSQ128, per IEEE 802.3
Modulation Rate for 5GBASE-T			400		MBd	PAM16, per IEEE 802.3
Modulation Rate for 2.5GBASE-T			200		MBd	PAM16, per IEEE 802.3
Tx Output Impedance	Z _{out,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_DEF(2)	Module Definition 2. Data line for Serial ID	2
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID	2
6	MOD_DEF(0)	Module Definition 0. Grounded within the module	2
7	Rate Select	Not connected	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	
9	VEER	Receiver Ground	
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:

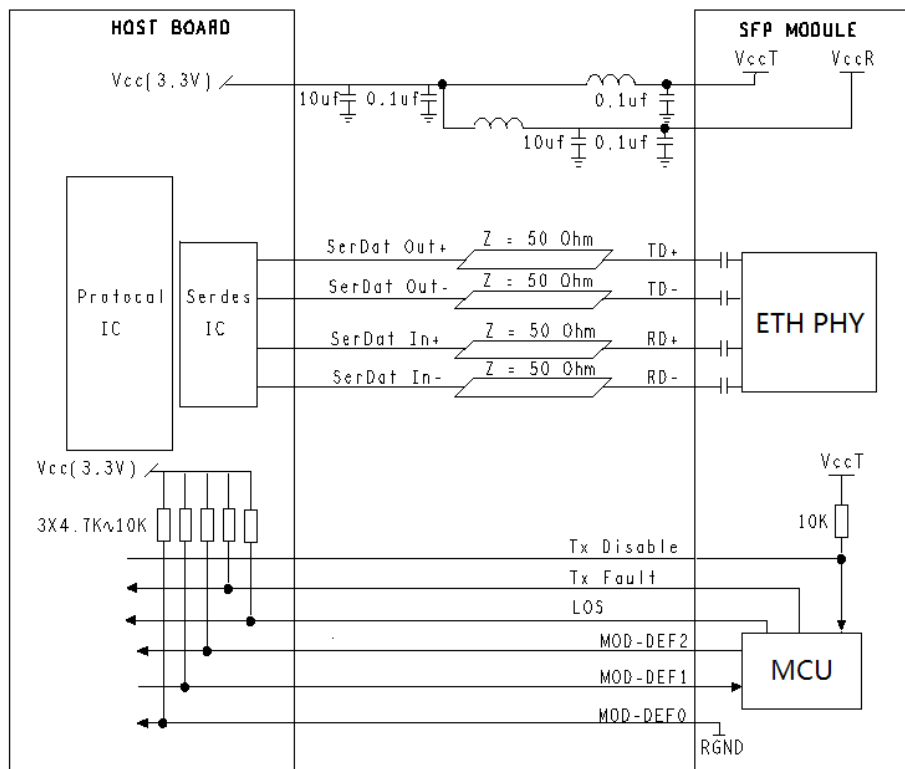
1. PHY disabled on TDIS > 2.0 V or open, enabled on TDIS < 0.8 V
2. Should be pulled up with 4.7k - 10k Ohms on host board to a voltage between 2.0 V and 3.6 V. MOD_DEF(0) pulls line low to indicate module is plugged in.

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.

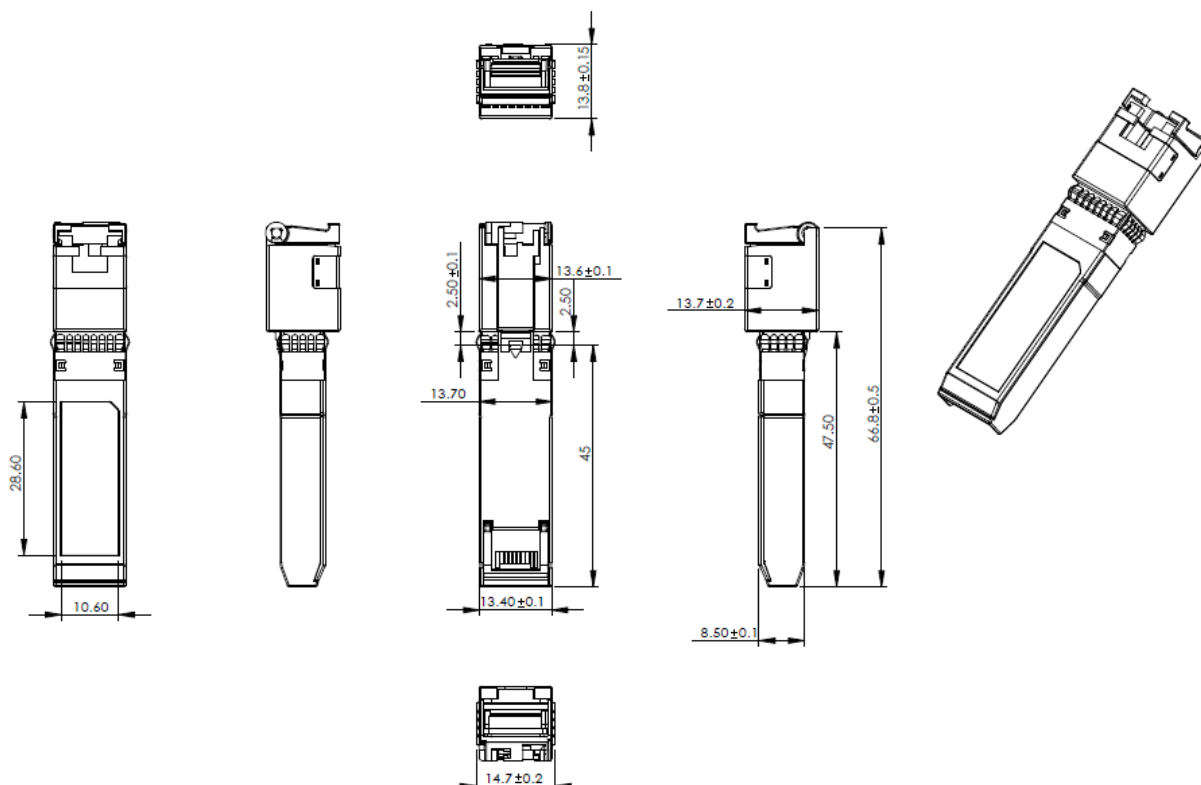
Serial Bus Timing, Requirements						
Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
I ² C Clock Rate		0		200	kHz	

Typical Application Circuit



Mechanical Drawing

Unit is millimeter. All dimensions are $\pm 0.1\text{mm}$ unless otherwise specified.



Ordering Information

Specification							
Part No.	Package	Interface	Media	Data Rate	Temp	Reach	Note
WST-SFP+CuRMS-C	SFP+	Electrical	Copper (see table below)	Multi-rate	0 to 70 °C	See table below	Rate Matching mode
WST-SFP+CuRMS-I	SFP+	Electrical	Copper (see table below)	Multi-rate	-40 to 85 °C	See table below	Rate Matching mode

Line Port	Cable	Reach	Host Port
10GBASE-T	CAT6A F/FTP	80 m	10GBASE-R
5GBASE-T	CAT5E	100 m	10GBASE-R
2.5GBASE-T	CAT5E	100 m	10GBASE-R

Modification History

Revision	Date	Description	Originator	Review	Approved
V1.0	11-Mar-2024	New Issue	Ken Cheng	Joanne Ni	Tom Tang
V1.1	26-Jan-2026	Add photo, update drawing and address	Max Lin	Amy Lee	Wayne Liao
V1.2	20-Aug-2026	Update typos, electrical specifications, and add the current value for the industrial version	Jason Hou	Wayne Liao	Tom Tang

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