Data Sheet

10G Base SFP+ Copper Transceiver Modules

WST-SFP+CuS-C

Features:

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

Applications:

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

Standards:

- Compatible with SFP MSA
- Compatible with IEEE Std 802.3

Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature Range	Ts	℃	-40	+85
Power Supply Voltage	V_{CC}	V	-0.5	+3.6

Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Case Operating Temperature -CT	T_{C-CT}	℃	0		70
Power Supply Voltage	Vcc	V	3.135	3.3	3.465
Power Supply Current	Icc	mA		570	750

PRODUCT DESCRIPTION

SFP+-10GBASE-T Copper Small Form Pluggable (SFP) 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.

Specifications (tested under recommended operating conditions, unless otherwise noted)

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

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	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.

High-Speed Electrical Interface, Transmission Line-SFP						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**unit**	**Notes/Conditions**
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
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	T_r,T_f		175		psec	20%-80%

Tx Input Impedance	Zin		50		Ohm	Single ended
Rx Output Impedance	Zout		50		Ohm	Single ended

General Specifications

General						
Parameter	**Symbol**	**Min**	**Typ**	**Max**	**unit**	**Notes/Conditions**
Data Rate	BR	1		10	Gb/sec	IEEE 802.3 compatible. See Notes 1 below

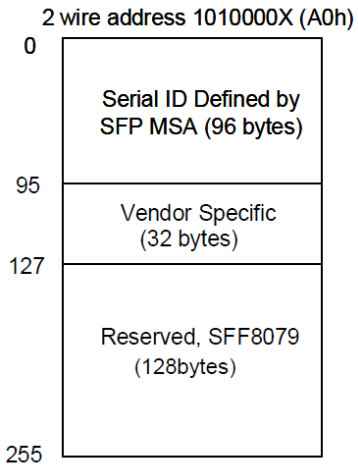
Notes:

1. Clock tolerance is +/- 50 ppm

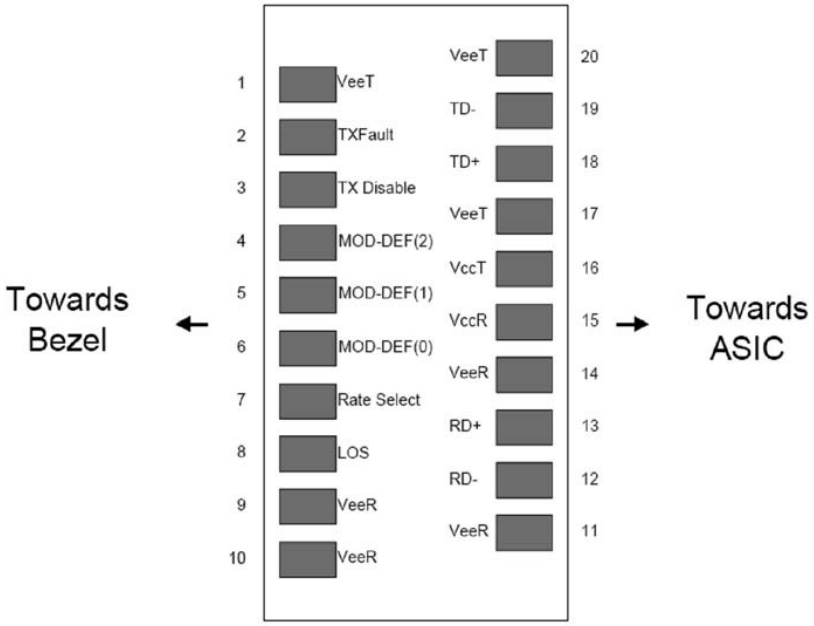
EEPROM Serial ID Memory Contents

Accessing Serial ID Memory uses the 2 wire address 1010000X (A0h). Memory Contents of Serial ID are shown in Table 2.

Table 2 Serial ID Memory Contents



Pin Description



Pin	Name	Function/Description	Notes
1	VEET	Transmitter Ground (Common with Receiver Ground)	1
2	TX Fault	Transmitter Fault. Not supported.	
3	TX Disable	Transmitter Disable. Laser output disabled on high or open.	2
4	MOD_DEF2	Module Definition 2. Data line for Serial ID.	3
5	MOD_DEF1	Module Definition 1. Clock line for Serial ID.	3
6	MOD_DEF0	Module Definition 0. Grounded within the module.	3
7	Rate Select	No connection required	
8	LOS	High indicates no linked. low indicates linked.	
9	VEER	Receiver Ground (Common with Transmitter Ground)	1
10	VEER	Receiver Ground (Common with Transmitter Ground)	1
11	VEER	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	VEER	Receiver Ground (Common with Transmitter Ground)	1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	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	VEET	Transmitter Ground (Common with Receiver Ground)	1

Notes:

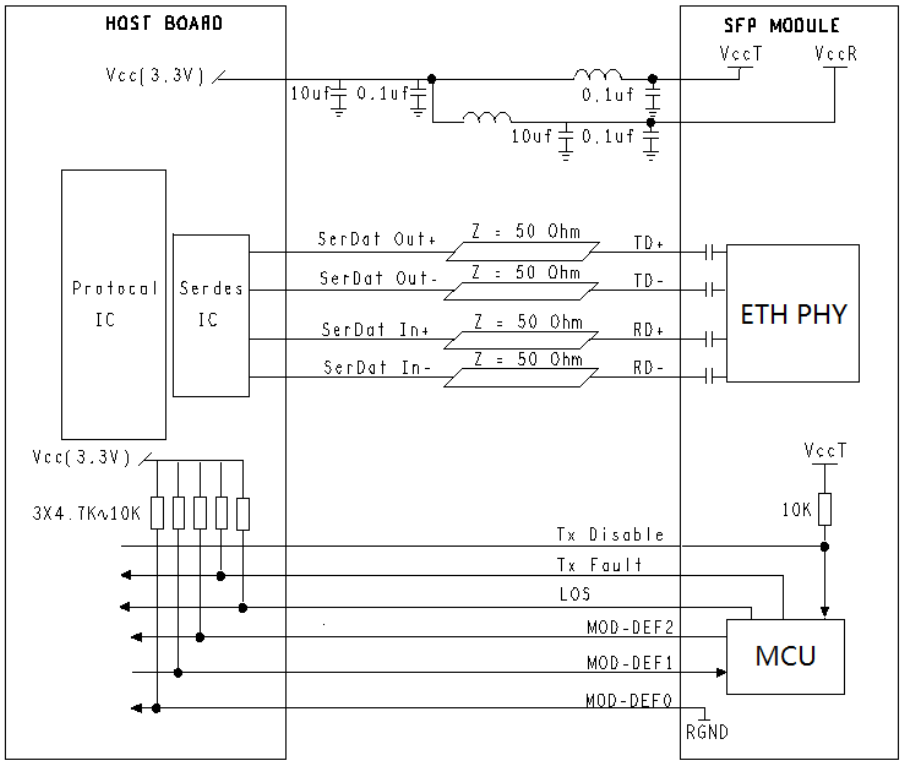
1. Circuit ground is connected to chassis ground
2. PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V
3. Should be pulled up with 4.7k - 10k Ohms on host board to a voltage between 2.0 V and 3.6 V. MOD_DEF(0) pulls line low to indicate module is plugged in.

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.

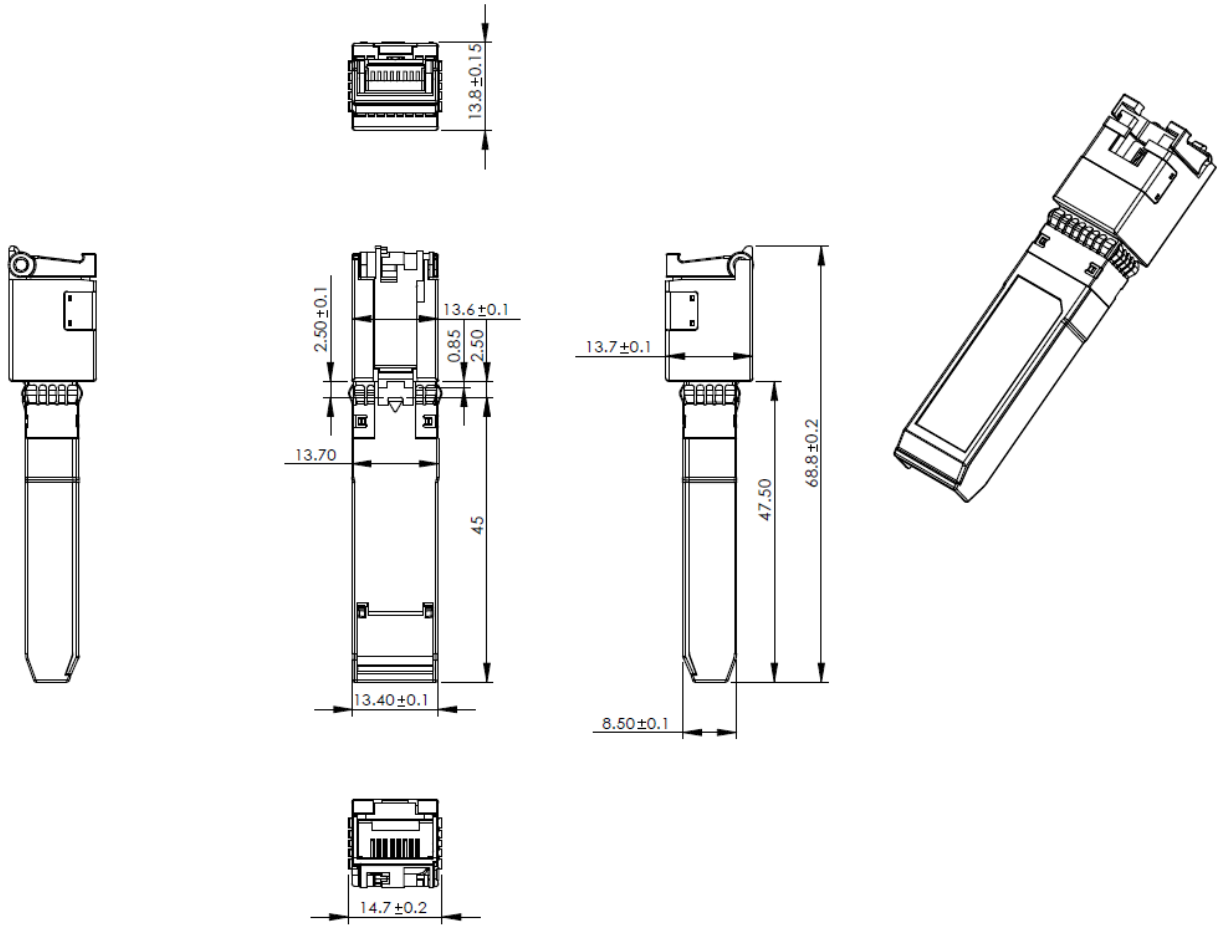
Serial Bus Timing, Requirements						
Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
I ^{2}C Clock Rate		0		200,000	Hz	

Typical Application Circuit



Package Outline

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



High Potential Test

High Potential						
Parameter	Symbol	Min	Typ	Max	unit	Notes/Conditions
AC		1200			V	10mA, 60s
DC		1800			V	10mA, 60s

Ordering Information

Specification							
Part No.	Package	Interface	Media	Data Rate	Temp	Reach	RoHS
WST-SFP+CuS-C	SFP+	Electric	Copper (see table below)	10G Rate	0~70℃	See table below	RoHS lead-free

Line Port	Cable	Reach	Host Port
10Gbase-T	CAT6A	80m	10GBase-R

Modification History

Revision	Date	Description	Originator	Review	Approved
V1.0	14-May-2019	New Issue	Min Liu	Min Liu	Wayne Liao
V1.1	07-Jul-2022	Update PCBA	Shao Yu	Tom Tang	Wayne Liao

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