

1.25Gbps 550m Duplex LC SFP Transceiver

P/N: WST-S8CCIV-551D

Application

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission system

Standard:

- Compliant with SFP MSA
- Compliant with SFF-8472
- Compatible with IEEE802.3ah 2004

Description

The SFP transceivers are high performance, cost effective modules supporting data-rate of 1.25Gbps and 550m transmission distance with MMF.

The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA and SFF-8472.

Features:

- Up to 1.25Gbps data links
- 850nm VCSEL Laser and PIN photo-detector
- Up to 550m on 50/125µm MMF
- Duplex LC receptacle optical interface compliant
- Hot pluggable
- All-metal housing for superior EMI performance
- RoHS6 compliant (lead free)
- Operating case temperature:
Commercial: -5°C to +70°C
Extended: -20°C to +80°C
Industrial: -40°C to +85°C

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	V _{CC}	0		3.6	V
Storage Temperature	T _s	-40		+85	°C
Operating Case Temperature	T _c	-40		+85	°C
Relative Humidity	RH	0		85	%
RX Input Average Power	P _{max}	-		0	dBm

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	V _{CC}	3.13	3.3	3.46	V
Power Supply Current	I _{CC}			300	mA
Operating Case Temperature	Commercial	-5		+70	°C
	Extended	-20		+80	
	Industrial	-40		+85	
Data Rate			1.25		Gbps

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section						
Input Differential Impedance	R _{in}	90	100	110	Ω	
Single Ended Data Input Swing	V _{in PP}	250		1000	mV	1
Transmit Disable Voltage	V _D	V _{CC} - 1.3		V _{CC}	V	
Transmit Enable Voltage	V _{EN}	V _{EE}		V _{EE} + 0.8	V	
Receiver Section						
Single Ended Data Output Swing	V _{out PP}	300		600	mV	
LOS Fault	V _{los fault}	V _{CC} - 0.5		V _{CC_host}	V	2
LOS Normal	V _{los norm}	V _{EE}		V _{EE} +0.5	V	2

Notes:

1. Connected directly to TX data input pins. AC coupling from pins into laser driver IC.
2. LOS is an open collector output. Should be pulled up with 4.7kΩ - 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1.

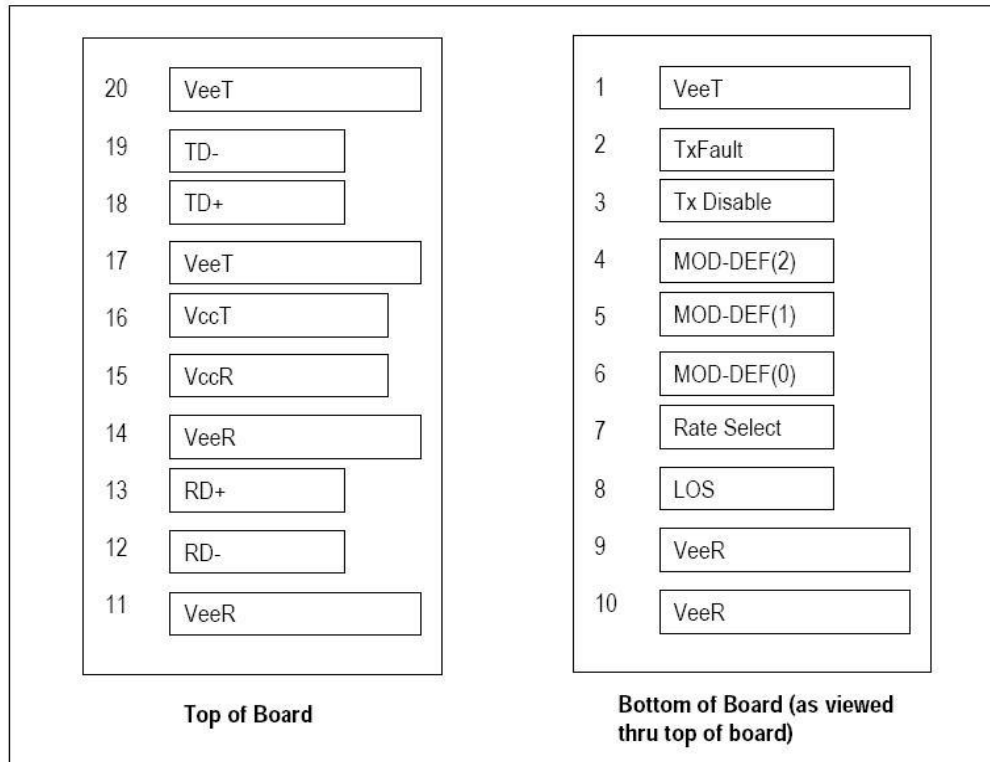
Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section						
Centre Wavelength	λ_c	830	850	860	nm	
Spectral Width (RMS)	σ			0.85	nm	
Average Optical Power (avg.)	P_{out}	-9		-3	dBm	1
Laser Off Power	P_{off}	-	-	-45	dBm	
Extinction Ratio	ER	9	-	-	dB	2
Relative Intensity Noise	RIN	-	-	-128	dB/Hz	
Optical Rise/Fall Time	t_r / t_f		-	260	ps	3
Optical Return Loss Tolerance		-	-	12	dB	
Output Optical Eye	Compliant with IEEE802.3z eye masks when filtered					2
Receiver Section						
Receiver Center Wavelength	λ_c	830		860	nm	
Receiver Sensitivity in Average Power	S_{en}	-18		-3	dBm	4
Los Assert	LOS_A	-35	-	-	dBm	
Los Dessert	LOS_D	-	-	-19	dBm	
Los Hysteresis	LOS_H	0.5	-	5	dB	
Overload	P_{in-max}	-	-	-3	dBm	4
Receiver Reflectance		-	-	-12	dB	
Receiver Power (damage)		-	-	0	dBm	

Notes:

1. The optical power is launched into 50/125 μ m MMF.
2. Measured with a PRBS 2⁷-1 test pattern @1.25Gbps.
3. . Unfiltered, 20-80%. Measured with a PRBS 2⁷-1 test pattern @1.25Gbps.
4. . Measured with a PRBS 2⁷-1 test pattern @1.25Gbps, ER=10dB, BER <10⁻¹².

Pin Definitions



Pin	Signal Name	Description	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	1
3	TX Disable	Transmitter Disable	3	2
4	MOD_DEF (2)	<i>I²C</i> Serial Data Signal SDA	3	3
5	MOD_DEF (1)	<i>I²C</i> Serial Clock Signal SCL	3	3
6	MOD_DEF (0)	Grounded in Module	3	3
7	Rate Select	Not Connected	3	
8	LOS	Receiver Loss of Signal Indicator (Active high, open-drain)	3	4
9	VeeR	Receiver Ground	1	
10	VeeR	Receiver Ground	1	
11	VeeR	Receiver Ground	1	
12	RD-	Inv. Received Data Out	3	5

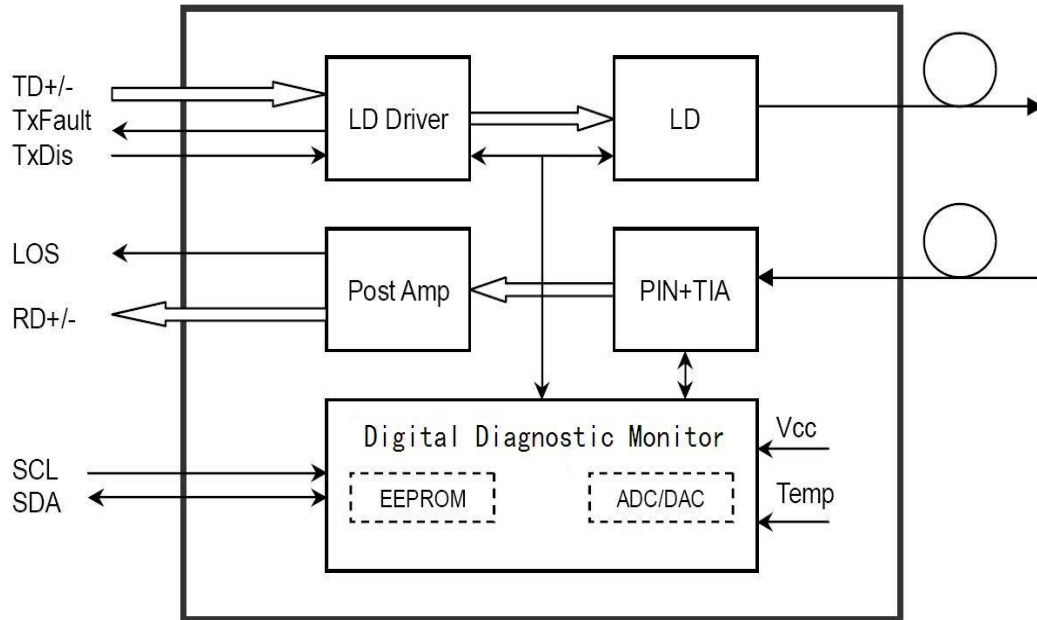
13	RD+	Received Data Out	3	5
14	VeeR	Receiver Ground	1	
15	VccR	Receiver Power Supply	2	
16	VccT	Transmitter Power Supply	2	
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data In	3	6
19	TD-	Inv. Transmit Data In	3	6
20	VeeT	Transmitter Ground	1	2

Notes:

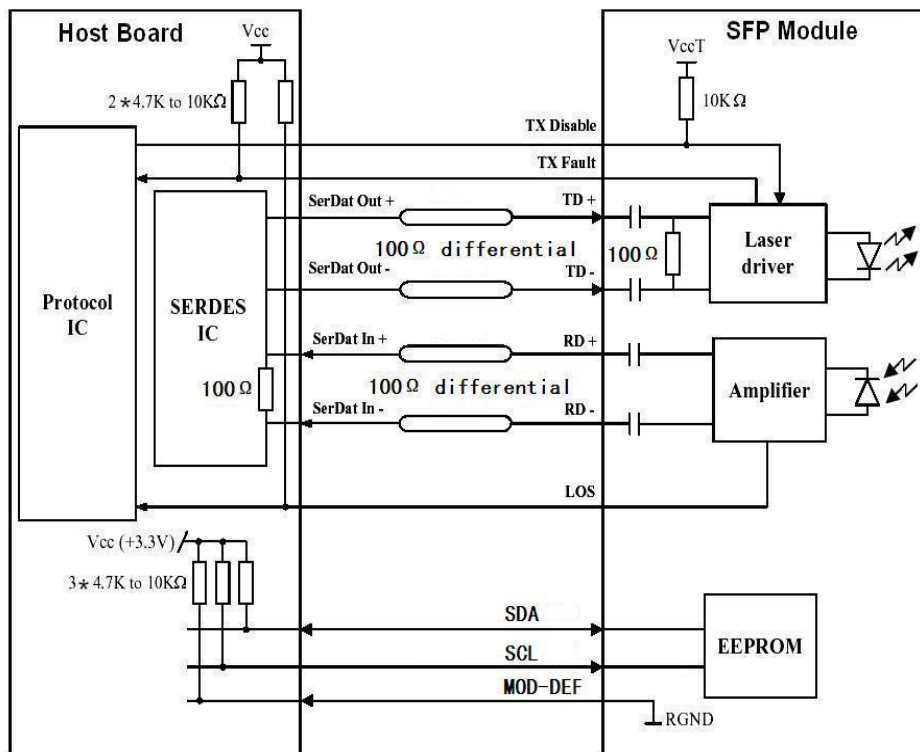
Plug Seq.: Pin engagement sequence during hot plugging.

- TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
- TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:
Low (0 to 0.8V): Transmitter on;
Between (>0.8V, < 2.0V): Undefined;
High (2.0 to 3.465V): Transmitter Disabled;
Open: Transmitter Disabled.
- Mod-Def0, 1, 2: These are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
MOD_DEF (0) is grounded by the module to indicate that the module is present.
MOD_DEF (1) is the clock line of two wire serial interface for serial ID SCL.
MOD_DEF (2) is the data line of two wire serial interface for serial ID SDA.
- LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor. Pull up voltage between 2.0V and Vcc+0.3V. Logic 1 indicates loss of signal; Logic 0 indicates normal operation. In the low state, the output will be pulled to less than 0.8V.
- RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.
- TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

Recommended Module Block Diagram



Recommended Interface Circuit

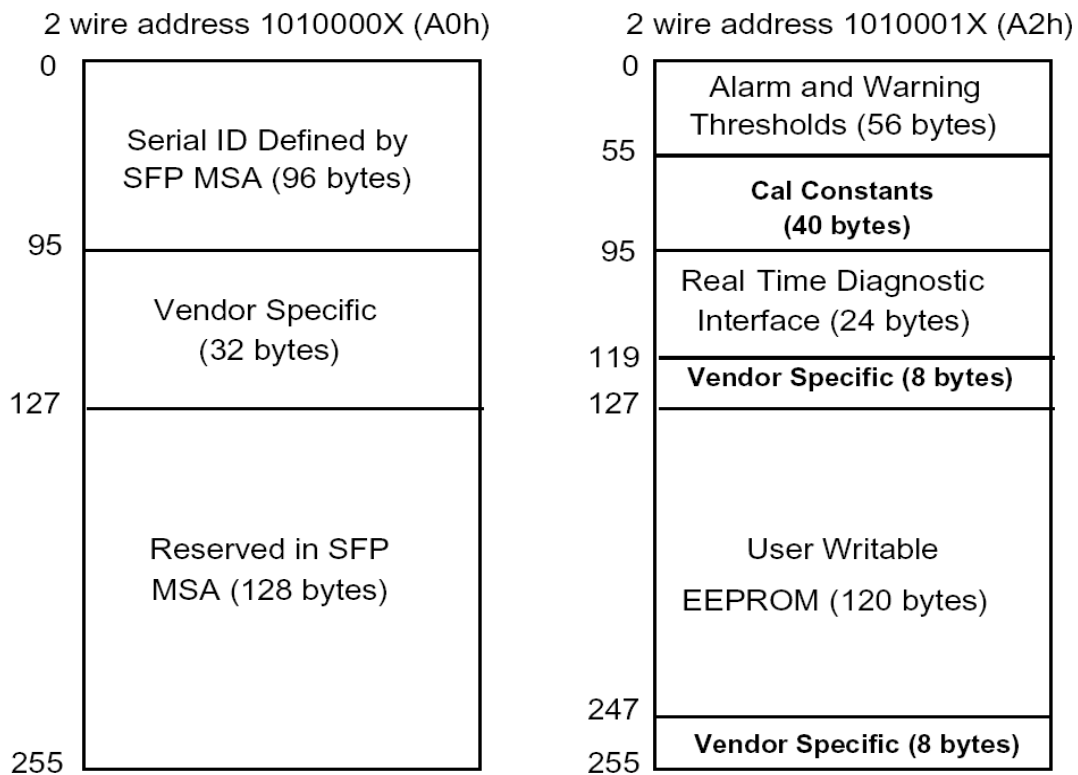


Digital Diagnostic Memory Map (Compliant with SFF-8472)

The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The diagnostic information with internal calibration or external calibration all are implemented, including received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring.

The digital diagnostic memory map specific data field defines as following (For further information, please refer to SFF-8472).

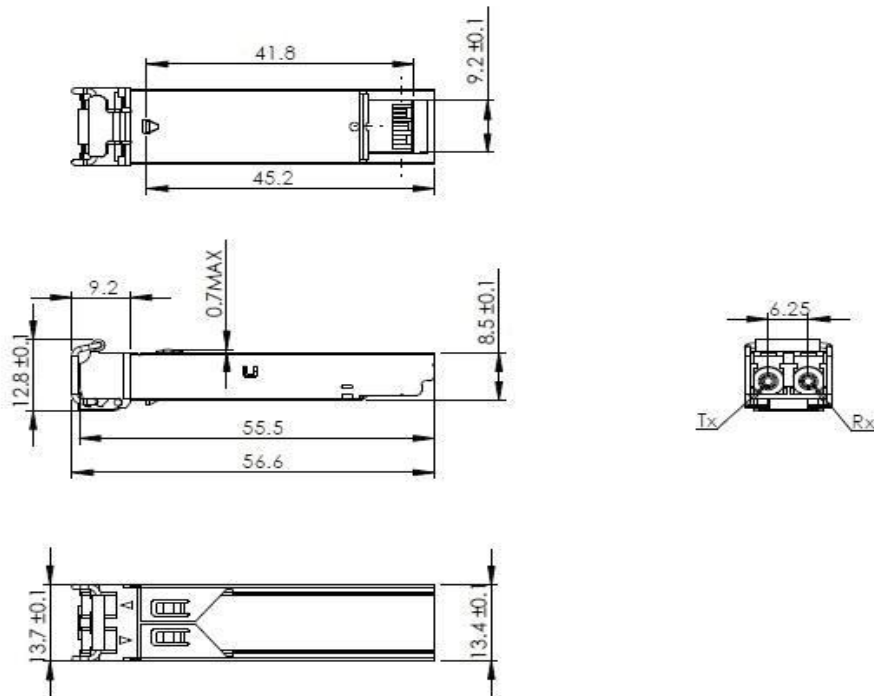


Digital Diagnostic Monitoring Interface (DDM)

The following digital diagnostic characteristics are defined over the Recommended Operating Environment unless otherwise specified. It is compliant to SFF8472 Rev10.2 with internal calibration mode. For external calibration mode please contact our sales staff.

Parameter	Symbol	Min.	Max.	Unit
Temperature Monitor Absolute Error	DMI_Temp	-3	3	°C
Laser Power Monitor Absolute Error	DMI_TX	-3	3	dB
RX Power Monitor Absolute Error	DMI_RX	-3	3	dB
Supply Voltage Monitor Absolute Error	DMI_VCC	-3%	3%	V
Bias Current Monitor Absolute Error	DMI_Ibias	-10%	10%	mA

Mechanical Drawing



Unit: mm

Ordering Information

Part No	Specification									
	Package	Data rate per Lane	Laser	Optical Power	Detector	Max. Receive Sensitivity (OMA)	Temp	Reach	Other	Application code
WST-S8CCCV-551D	SFP	1.25 Gbps	850nm VCSEL	-9~ -3 each Channel	PIN	-18 dBm each Channel	-5~70°C	550m	DDM RoHS	Gigabit Ethernet
WST-S8CCCV-551D	SFP	1.25 Gbps	850nm VCSEL	-9~ -3 each Channel	PIN	-18 dBm each Channel	-5~70°C	550m	DDM RoHS	Gigabit Ethernet
WST-S8CCEV-551D	SFP	1.25 Gbps	850nm VCSEL	-9~ -3 each Channel	PIN	-18 dBm each Channel	-20~80 °C	550m	DDM RoHS	Gigabit Ethernet
WST-S8CCEV-551D	SFP	1.25 Gbps	850nm VCSEL	-9~ -3 each Channel	PIN	-18 dBm each Channel	-20~80 °C	550m	DDM RoHS	Gigabit Ethernet
WST-S8CCIV-551D	SFP+	1.25 Gbps	850nm VCSEL	-9~ -3 each Channel	PIN	-18 dBm each Channel	-40~85 °C	550m	DDM RoHS	Gigabit Ethernet
WST-S8CCIV-551D	SFP+	1.25 Gbps	850nm VCSEL	-9~ -3 each Channel	PIN	-18 dBm each Channel	-40~85 °C	550m	DDM RoHS	Gigabit Ethernet

Modification History

Revision	Date	Description	Originator	Review	Approved
V1.0	14-May-2010	New Issue	Elma Yueh	Wayne Liao	Wayne Liao



Taipei Headquarters
 16F-5, No. 75, Sec. 1,
 Xintai 5th Rd., Xizhi Dist.,
 New Taipei City 22101,
 Taiwan
 Tel: +886-2-2698-7208
 Fax: +886-2-2698-7210

U.S. Branch
 2080 Rancho Higuera Ct.
 Fremont, CA 94539,
 USA
 Tel: 510-651-7800
 Fax: 510-651-7822

ShenZhen Branch
 610#, 6F, No.204 Building,
 2nd Industrial zone
 Nanyou, Nanshan district,
 Shenzhen, Guangdong
 China 518054
 Tel: +86-755-86265980
 Fax: +86-755-26642741