

TITLE 1G SFP SX 550m Transceiver	DOC No. RFD-202501090006-001	
	REVISION : 05	AUTHORIZED BY : Albert Lin
	DATE : 2025.01.14	CLASSIFICATION : CONFIDENTIAL

1. SCOPE

1G SX is a high performance, cost effective modules, which is supporting up to 1.25Gbps, and transmission distance up to 550m on MM fiber. The transceiver consists of two sections: The transmitter section incorporates a laser driver and 850nm VCSEL laser. The receiver section consists of a PIN photodiode integrated with a transimpedance preamplifier (TIA) and a Limiting Amplifier. The module is hot pluggable into the 20-pin connector. The high-speed electrical interface is based on low voltage logic, with nominal 100Ohms differential impedance and AC coupled in the module. The optical output can be disabled by LVTTTL logic high-level input of TX_DIS. Transmit Fault (Tx_Fault) is provided to indicate that the module transmitter has detected a fault condition related to laser operation or safety. Loss of signal (RX_LOS) output is provided to indicate the loss of an input optical signal of receiver. A serial EEPROM in the transceiver allows the user to access transceiver monitoring and configuration data via the 2-wire SFP Management Interface. This interface uses a single address, A0h, with a memory map divided into a lower and upper area. Basic digital diagnostic (DD) data is held in the lower area while specific data is held in a series of tables in high memory area.

TITLE 1G SFP SX 550m Transceiver	DOC No. RFD-202501090006-001	
	REVISION : 05	AUTHORIZED BY : Albert Lin
	DATE : 2025.01.14	CLASSIFICATION : CONFIDENTIAL

2. PRODUCT FEATURES

- Up to 1.25Gbps Data Links
- Up to 550m transmission on MMF
- 850nm VCSEL laser and PIN receiver
- Very low EMI and excellent ESD protection
- 2-wire interface with integrated Digital Diagnostic monitoring
- Hot-pluggable SFP footprint
- Single 3.3V power supply
- Power dissipation < 1.0W
- Operating temperature range: -40°C to +85°C

3. PRODUCT DESCRIPTION

3.1 PRODUCT NAME

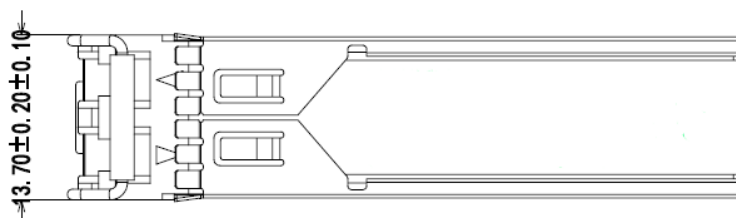
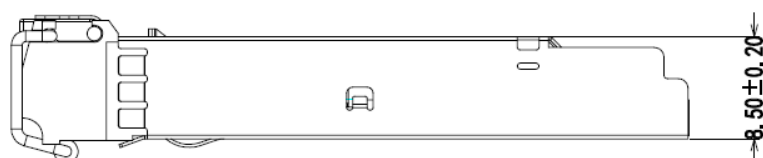
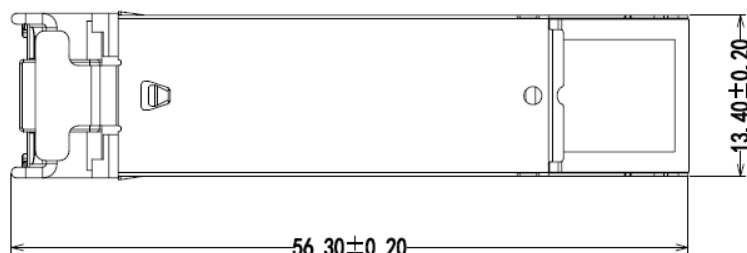
1G SFP SX Transceiver

Part number	Category	Wavelength (nm)	Distance	Media	Power (dBm)	Sen. (dBm)	Connector	Tem.
P58**0ARIAS1-1	SFP SX	850	550m	MMF	-3 ~ -9.5	-17	LC	I

Note-1 : ** Indicates the customer code.

TITLE 1G SFP SX 550m Transceiver	DOC No. RFD-202501090006-001	
	REVISION : 05	AUTHORIZED BY : Albert Lin
	DATE : 2025.01.14	CLASSIFICATION : CONFIDENTIAL

3.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING



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

4. APPLICABLE DOCUMENTS AND SPECIFICATIONS

- High-speed storage area networks
- Computer cluster cross-connect
- Custom high-speed data pipes
- Compliant with IEEE 802.3Z
- Compliant with MSA SFF-8472
- Compliant with SFP MSA

TITLE 1G SFP SX 550m Transceiver	DOC No. RFD-202501090006-001	
	REVISION : 05	AUTHORIZED BY : Albert Lin
	DATE : 2025.01.14	CLASSIFICATION : CONFIDENTIAL

5. Absolute Maximum Ratings & Recommended Operating Conditions

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T _s	-40	+85	°C
Supply Voltage	V _{CC3}	-0.5	4	V
Relative Humidity	RH	5	+95	%
Rx Input Average Power	P _{max}	-	-3	dBm

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit
Case Operating Temperature	T _c	-40		85	°C
Power Supply Voltage	V _{CC}	3.14	3.3	3.47	V
Power Supply Current	I _{CC}	-		300	mA
Data Rate	BR		1.25		Gbps
Power Dissipation	P _d			1.0	W

TITLE 1G SFP SX 550m Transceiver	DOC No. RFD-202501090006-001	
	REVISION : 05	AUTHORIZED BY : Albert Lin
	DATE : 2025.01.14	CLASSIFICATION : CONFIDENTIAL

Transmitter Operating Characteristic-Optical, Electrical

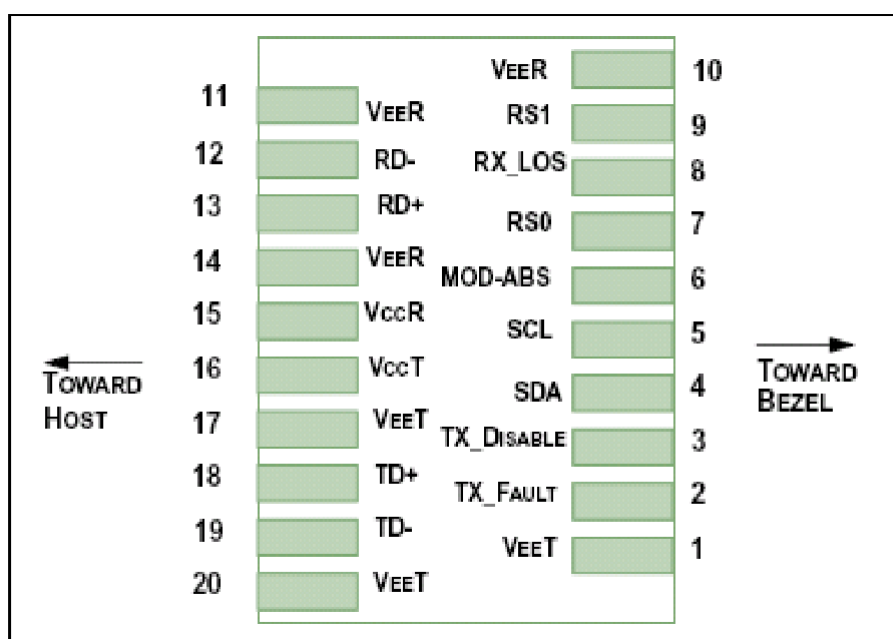
Parameter	Symbol	Min.	Typ.	Max.	Unit
Centre Wavelength	λ_c	830	850	860	nm
Spectral Width	$\Delta\lambda$			4	nm
Average Optical Power	Pavg	-9.5	-	-3	dBm
Laser Off Power	Poff	-	-	-40	dBm
Extinction Ratio	ER	9	-	-	dB
Operating Data Rate		-	1.25	-	Gbps
Output Eye Mask	Compliant with IEEE 802.3z eye mask when filtered				
Tx Input Diff. Voltage	VI	500	-	2400	mV
Tx Fault	VoL	-0.3	-	0.4	V
	VoH	2.4	-	Vcc+0.3	-

Receiver Operating Characteristics-Optical, Electrical

Parameter	Symbol	Min.	Typ.	Max.	Unit
Center Wavelength	λ_r	800		900	nm
Receiver Sensitivity In Average Power	Psen	-	-	-17	dBm
Los Assert	LosA	-35	-	-	dBm
Los Dessert	LosD	-	-	-21	dBm
Los Hysteresis	LosH	0.5	-	5	dB
Overload	Pin	0	-	-	dBm
Rx Output Diff Voltage	Vo	370	-	2000	mV
Operating Data Rate	-	-	1.25	-	Gbps
LOS Output Voltage-Low	V _{LoSL}	0	-	0.8	V

TITLE 1G SFP SX 550m Transceiver	DOC No. RFD-202501090006-001	
	REVISION : 05	AUTHORIZED BY : Albert Lin
	DATE : 2025.01.14	CLASSIFICATION : CONFIDENTIAL

6. Applications Note:



Pin Definitions

Pin	Symbol	Description	Notes
1	VeeT	Module Transmitter Ground	Note1
2	TX_Fault	Module Transmitter Fault	Note2
3	TX_Disable	Transmitter Disable; Turns off transmitter laser output	Note3
4	SDA	2-wire Serial Interface Data Line (Same as MOD-DEF2 as defined in the INF-8074i)	Note4
5	SCL	2-wire Serial Interface Clock (Same as MOD-DEF1 as defined in the INF-8074i)	Note4
6	MOD_ABS	Module Absent, connected to VeeT or VeeR in the module	Note5
7	RS0	Not used	
8	RX_LOS	Receiver Loss of Signal Indication (In FC designated as RX_LOS, in SONET designated as LOS, and in Ethernet designated at Signal Detect)	Note2

TITLE 1G SFP SX 550m Transceiver	DOC No. RFD-202501090006-001	
	REVISION : 05	AUTHORIZED BY : Albert Lin
	DATE : 2025.01.14	CLASSIFICATION : CONFIDENTIAL

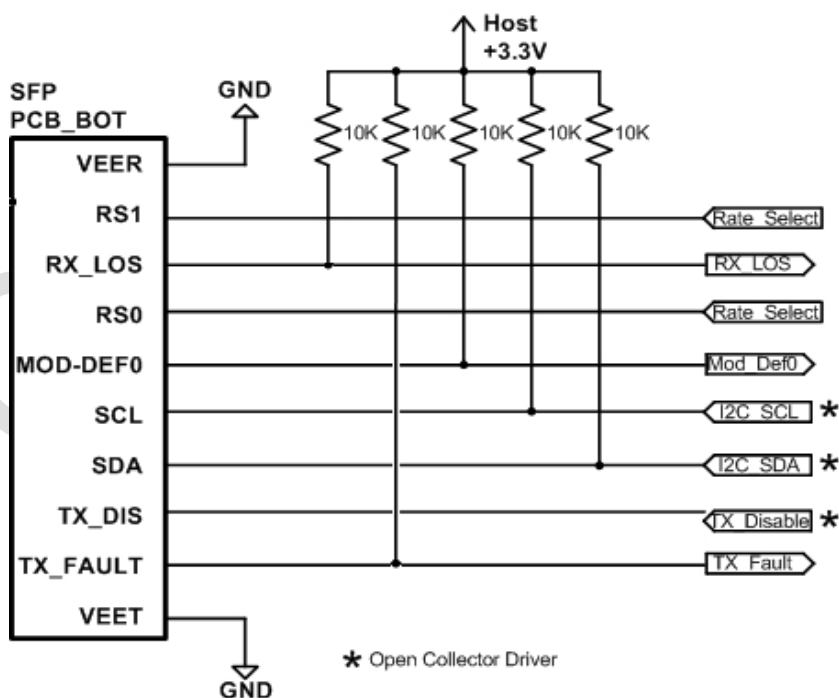
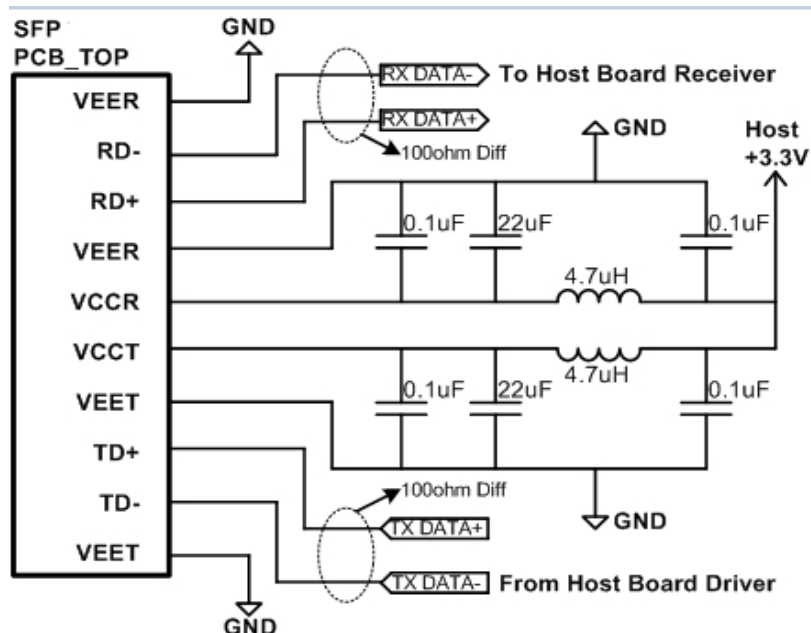
9	RS1	Not used	
10	VeeR	Module Receiver Ground	Note1
11	VeeR	Module Receiver Ground	Note1
12	RD-	Receiver Inverted Data Output	
13	RD+	Receiver Non-Inverted Data Output	
14	VeeR	Module Receiver Ground	Note1
15	VccR	Module Receiver 3.3 V Supply	
16	VccT	Module Transmitter 3.3 V Supply	
17	VeeT	Module Transmitter Ground	Note1
18	TD+	Transmitter Non-Inverted Data Input	
19	TD-	Transmitter Inverted Data Input	
20	VeeT	Module Transmitter Ground	Note1

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. TFAULT is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
3. Laser output disabled on TDIS>2.0V or open, enabled on TDIS<0.8V.
4. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.
5. Internally pulled down per SFF-8431 Rev 4.1.

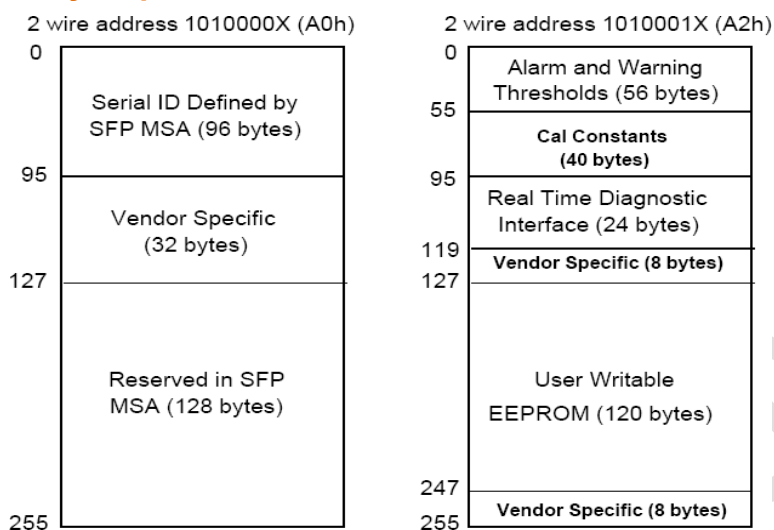
TITLE 1G SFP SX 550m Transceiver	DOC No. RFD-202501090006-001	
	REVISION : 05	AUTHORIZED BY : Albert Lin
	DATE : 2025.01.14	CLASSIFICATION : CONFIDENTIAL

Recommended Interface Circuit



TITLE 1G SFP SX 550m Transceiver	DOC No. RFD-202501090006-001	
	REVISION : 05	AUTHORIZED BY : Albert Lin
	DATE : 2025.01.14	CLASSIFICATION : CONFIDENTIAL

Digital Diagnostic Memory Map



7. Modification History

Rev.	Comments	Date	Originator	Approval
01	Preliminary Draft	2017.11.26	Mike Sun	Ray_Yang
02	Revise Part Number	2018.05.10	Mike Sun	Ray Yang
03	Add Certificate	2020.11.6	Mike Sun	Ray_Yang
04	Modify Receiver Sensitivity	2025.01.14	Albert Lin	Mike Sun
05	Revise Part Number	2026.04.13	Henry Chen	Mike Sun