

TITLE 10G SFP+ DWDM 80km Transceiver	DOC No.	DTRX-0200802
	REVISION : 01	AUTHORIZED BY : Mike Sun
	DATE : 2020.08.06	CLASSIFICATION : Optical Transceiver

1. SCOPE

JPC's SFP+ transceivers, according to Enhanced 8.5 and 10.3 Gigabit Small Form Factor Pluggable "SFP+" Multi-Sourcing Agreement (MSA) SFF-8431 and SFF-8472, revision 10.4, are designed for 10G Ethernet serial optical data communication up to 80km on single mode fiber. They are compliant with IEEE Std 802.3-2005 10Gb Ethernet 10GBase-ZR/ZW.

2. PRODUCT FEATURES

- Electrical interface specifications per SFF-8431
- Management interface specifications per SFF-8431 and SFF-8472
- SFP+ MSA package with duplex LC connector
- Up to 10.3Gb/s data links
- Single +3.3V power supply
- DWDM-rated EML Transmitter
- 100GHz ITU Grid, C-Band
- Operating temperature Options: - (Industrial) -40 to +85°C
- Up to 80km on 9/125µm SMF
- RoHS Compliant

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3. PRODUCT DESCRIPTION

3.1 PRODUCT NAME AND SERIES NUMBER(S)

10G SFP+ DWDM 1550nm 80km Transceiver

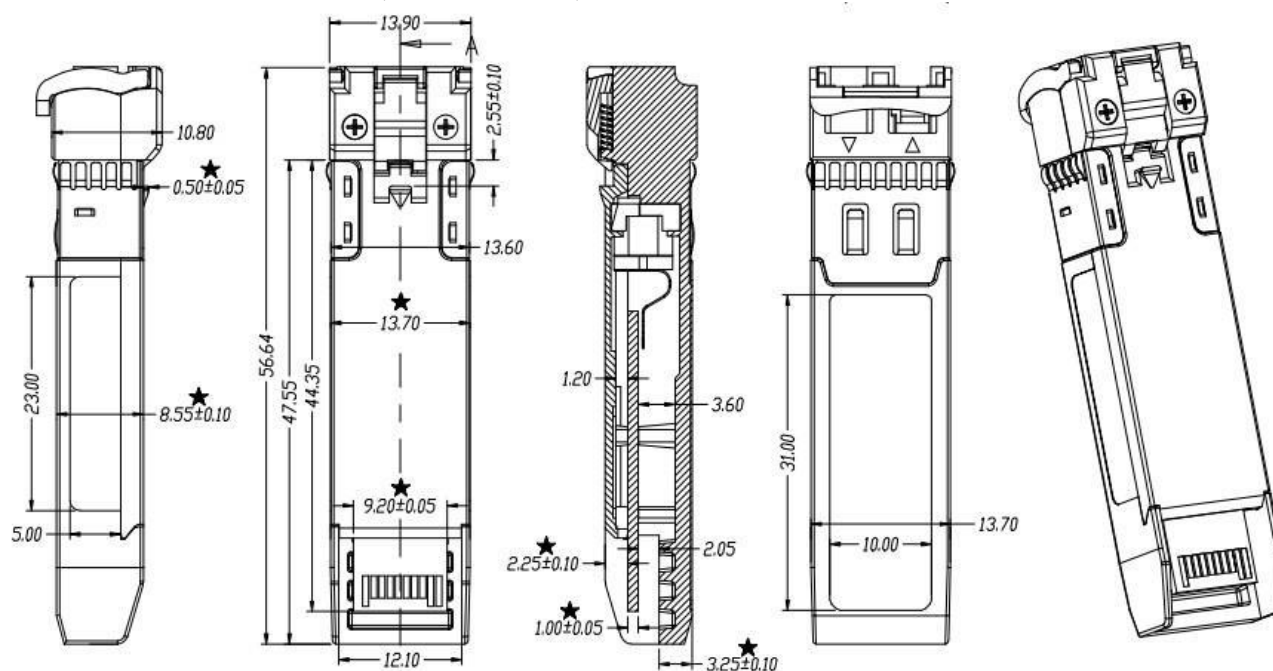
Part Number	Data Rate	Wavelength (nm)	Distance	Media	Power (dBm)	Sen. (dBm)	Connector	Tem.
P58000BDIZ80xx	10G	xxxxnm	80km	SMF	0 ~ +4	-23	LC	I

Notes: Refer to the following table for wavelength. For example, P58000BDIZ8017 is channel C17 (1563.86nm)

Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C17 (1563.86nm)	C18 (1563.05nm)	C19 (1562.23nm)	C20 (1561.41nm)	C21 (1560.61nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C22 (1559.79nm)	C23 (1558.98nm)	C24 (1558.17nm)	C25 (1557.36nm)	C26 (1556.55nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C27 (1555.75nm)	C28 (1554.94nm)	C29 (1554.13nm)	C30 (1553.33nm)	C31 (1552.52nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C32 (1551.72nm)	C33 (1550.92nm)	C34 (1550.12nm)	C35 (1549.32nm)	C36 (1548.51nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C37 (1547.72nm)	C38 (1546.92nm)	C39 (1546.12nm)	C40 (1545.32nm)	C41 (1544.53nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C42 (1543.73nm)	C43 (1542.94nm)	C44 (1542.14nm)	C45 (1541.35nm)	C46 (1540.56nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C47 (1539.77nm)	C48 (1538.98nm)	C49 (1538.19nm)	C50 (1537.40nm)	C51 (1536.61nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C52 (1535.82nm)	C53 (1535.04nm)	C54 (1534.25nm)	C55 (1533.47nm)	C56 (1532.68nm)
Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)	Wavelength (nm)
C57 (1531.90nm)	C58 (1531.12nm)	C59 (1530.33nm)	C60 (1529.55nm)	C61 (1528.77nm)

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3.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING



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

4. APPLICABLE DOCUMENTS AND SPECIFICATIONS

- 10G Ethernet 10BASE-ZR/ZW
- 80km 10G DWDM Network

5. Absolute Maximum Ratings & Recommended Operating Conditions

Absolute Maximum Ratings				
Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	+85	°C
Supply Voltage	VCC3	0	4.0	V
Relative Humidity(Non-condensing)	RH	0	95	%

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Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TC	-40	25	85	℃
Power Supply Voltage	VCC3	3.135	3.3	3.465	V
Data Rate	-	8.8	10.3125	-	Gbps

Transceiver Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Power Dissipation (C-Temp)	PD	-	-	2	W	-
Transmitter						
Input Differential Impedance	ZIN	-	100	-	Ω	-
Differential Data Input Swing	VIN,P-P	180	-	700	mVP-P	-
TX_FAULT Transmitter Fault	VOH	2.0		VCCHOST	V	-
	VOL	0		0.8	V	-
TX_DISABLE Transmitter Disable	VIH	2.0	-	VCCHOST	V	-
	VIL	0	-	0.8	V	-
Receiver						
Output Differential Impedance	ZO	-	100	-	Ω	-
Differential Data Output Swing	VOUT,P-P	300	-	850	mVP-P	-
Data Output Rise Time, Fall Time	tr, tf	28	-	-	ps	-
RX_LOS Loss Of Signal(LOS)	VOH	2.0	-	VCCHOST	V	-
	VOL	VEE	-	0.8	V	-

Transmitter Operating Characteristic-Optical, Electrical

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Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Center Wavelength	λ_c	1529	-	1563	dBm	-
Launch Optical Power	Po	0	-	+4	dBm	-
Side Mode Suppression Ratio	SMSR	30	-	-	dBm	-
Relative Intensity Noise	RIN	-	-	-128	dBHz	-
Extinction Ratio	EX	9	-	-	dB	-
Transmitter Dispersion Penalty	TDP	-	-	3.0	dB	-
Optical Return Loss Tolerance	ORLT	-	-	21	dB	-
Pout @TX-Disable Asserted	Poff	-	-	-30	dB m	1

Notes:

1. Average optical power shall be measured using the methods specified in TIA/EIA-455-95.

Receiver Operating Characteristic-Optical, Electrical

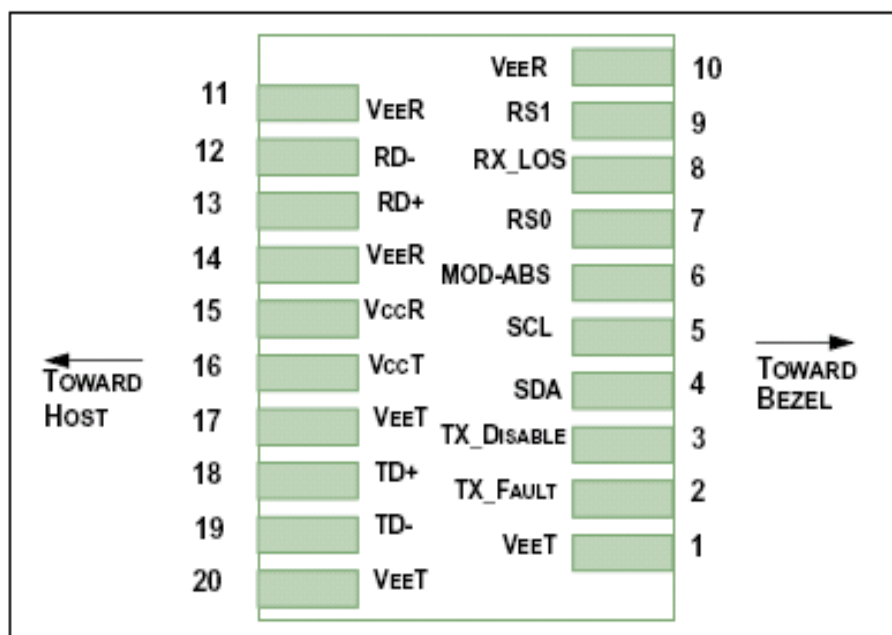
Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Center Wavelength	λ_c	1529	-	1563	nm	-
Receiver Sensitivity (Pavg)	S	-	-	-23	dBm	1
Receiver Overload (Pavg)	POL	-7	-	-	dBm	1
Optical Return Loss	ORL	26	-	-	dBm	-
LOS De-Assert	LOSD	-	-	-24	dBm	-
LOS Assert	LOSA	-35	-	-	dBm	-
LOS Hysteresis	-	0.5	-	6	dB	-

Notes:

1. Receiver sensitivity is informative. shall be measured with conformance test signal for BER = 1×10^{-12} .

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6. Applications Note :



Pin Definitions (Figure1)

Pin Assignment

Pin	Logic	Symbol	Name/Description	Note
1		VeeT	Module Transmitter Ground	Note1
2	LVTTTL-O	TX_Fault	Module Transmitter Fault	Note2
3	LVTTTL-I	TX_Disable	Transmitter Disable; Turns off transmitter laser output	Note3
4	LVTTTL-I/O	SDA	2-wire Serial Interface Data Line (Same as MOD-DEF2 as defined in the INF-8074i)	Note4
5	LVTTTL-I/O	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	LVTTTL-I	RS0	Rate Select 0, optionally controls SFP+ module receiver. When High input data rate 10.3GBd and when LOW input data rate 1.25GBd.	Note6
8	LVTTTL-O	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

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9	LVTTTL-I	RS1	Rate Select 1, optionally controls SFP+ transmitter. When High input data rate 10.3GBd and when LOW input data rate 1.25 GBd.	Note6
10		VeeR	Module Receiver Ground	Note1
11		VeeR	Module Receiver Ground	Note1
12	CML-O	RD-	Receiver Inverted Data Output	
13	CML-O	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	CML-I	TD+	Transmitter Non-Inverted Data Input	
19	CML-I	TD-	Transmitter Inverted Data Input	
20		VeeT	Module Transmitter Ground	Note1

Notes:

1. The module signal ground pins, VeeR and VeeT, shall be isolated from the module case.
2. This pin is an open collector/drain output pin and shall be pulled up with 4.7k-10kohms to Host_Vcc on the host board. Pull ups can be connected to multiple power supplies, however the host board design shall ensure that no module pin has voltage exceeding module VccT/R + 0.5 V.
3. This pin is an open collector/drain input pin and shall be pulled up with 4.7k-10kohms to VccT in the module.
4. See sff-8431 4.2 2-wire Electrical Specifications .
5. This pin shall be pulled up with 4.7k-10kohms to Host_Vcc on the host board.
6. If implementing SFF-8079 pin 7 and 9 are used for AS0 and AS1 respectively

Diagnostic Monitor Specifications

The digital diagnostic monitoring interface also defines another 256-byte memory map in EEPROM, which makes use of the 8 bit address 1010001X (A2h). Please see Figure 2. For detail EEPROM information, please refer to the related document of SFF-8472 Rev 11.0.

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Board Power Supply Filter Network

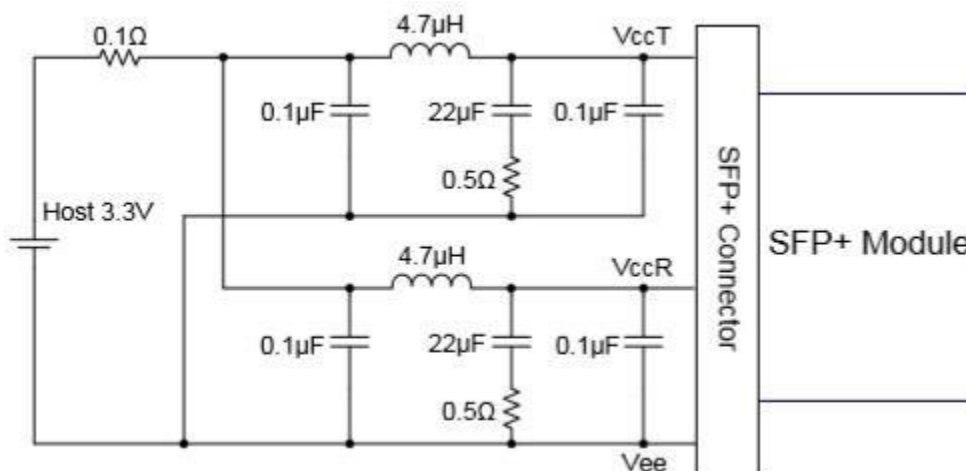


Figure2

Recommended Interface Circuit

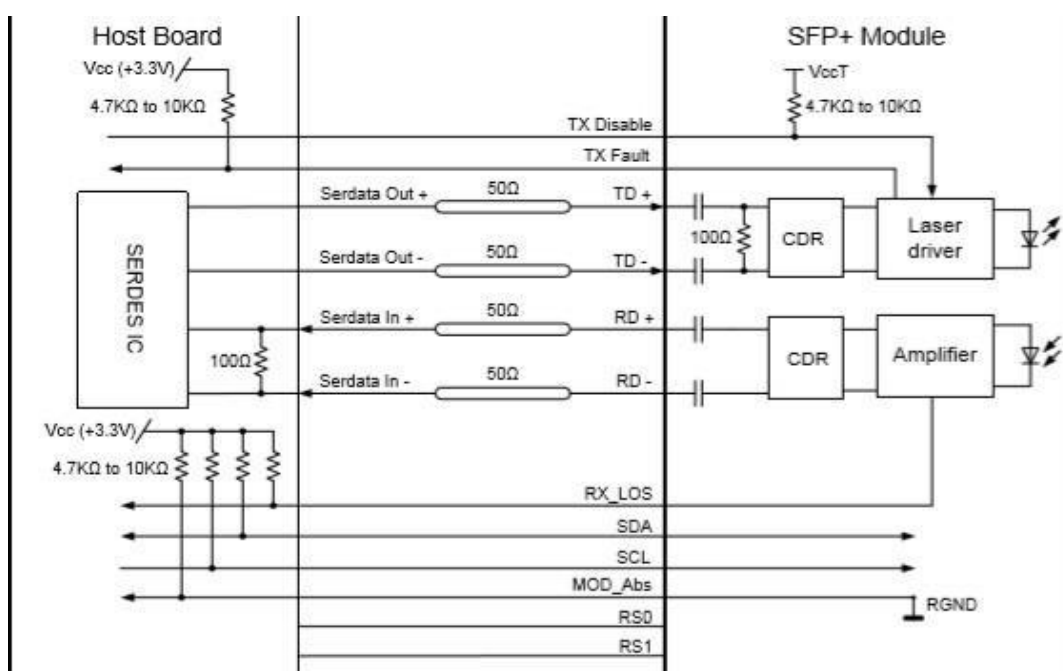
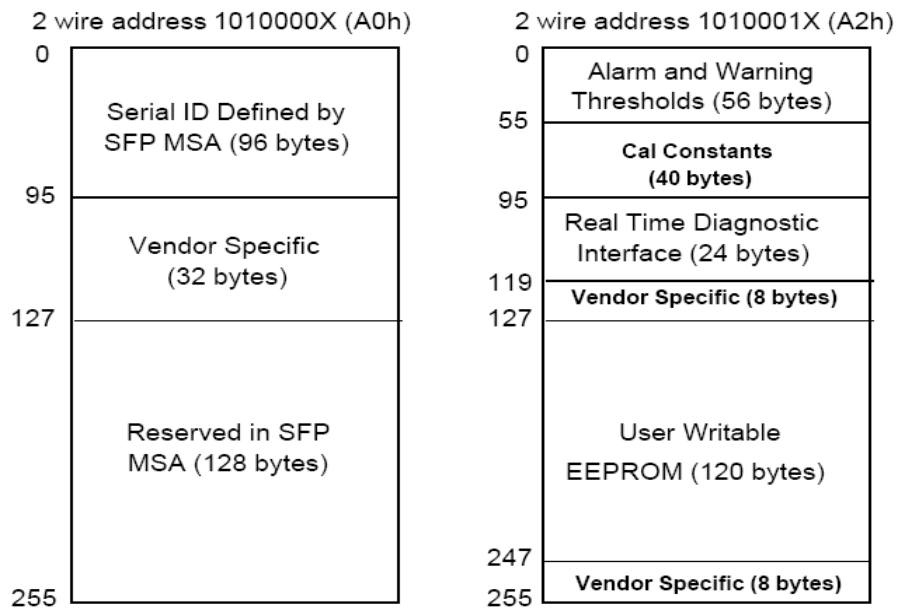


Figure3

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Digital Diagnostic Memory Map



8. Modification History

Rev.	Comments	Date	Originator	Approval
01	Preliminary Draft	2020.08.06	Mike Sun	Ray Yang