

TITLE 10G SFP+ 10km Dual LC transceivers	DOC No. RFD-20260723100-001	
	REVISION : 01	AUTHORIZED BY : Jeff Lo
	DATE : 2026.07.23	CLASSIFICATION : Optical Transceiver

1. PRODUCT FEATURES

- Up to 11.1Gbps Data Links
- Up to 10km transmission on SMF
- DFB Laser and PIN receiver
- Metal enclosure, for lower EMI
- 2-wire interface with integrated Digital Diagnostic monitoring
- Hot-pluggable SFP+ footprint
- Specifications compliant with SFF 8472
- Compliant with SFP+ MSA with LC connector
- Single 3.3V power supply
- Power dissipation < 1.2W
- Operating temperature range: Commercial: 0°C to +70°C / Industrial: -40°C to +85°C

2. APPLICATIONS

- 10GBASE-LR/LW & 10G Ethernet
- Switched Backplane Applications
- Router/Server Interface
- Other Optical Links

3. PRODUCT DESCRIPTION

The 10G Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). The transceiver consists of four sections: the LD driver, the limiting amplifier, the DFB laser, and the PIN photo-detector. The module data link up to 10KM in 9/125um single mode fiber. The optical output can be disabled by a TTL logic high-level input of Tx Disable. Tx Fault is provided to indicate that degradation of the laser. Loss of signal (LOS) output is provided to indicate the loss of an input optical signal of receiver or the link status with partner.

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3.1 PRODUCT NAME

10G SFP+ 10km Dual LC Transceivers

JPC P/N	Wavelength (nm)	Distance	Media	Power (dBm)	Sen. (dBm)	Connector	Tem.
P58**SBRCB10-1	1310	10km	SMF	-8.5 ~ 0.5	-14.4	LC	C
P58**SBRIB10-1	1310	10km	SMF	-8.5 ~ 0.5	-14.4	LC	I

Note-1 : ** Indicates the customer code.

3.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING

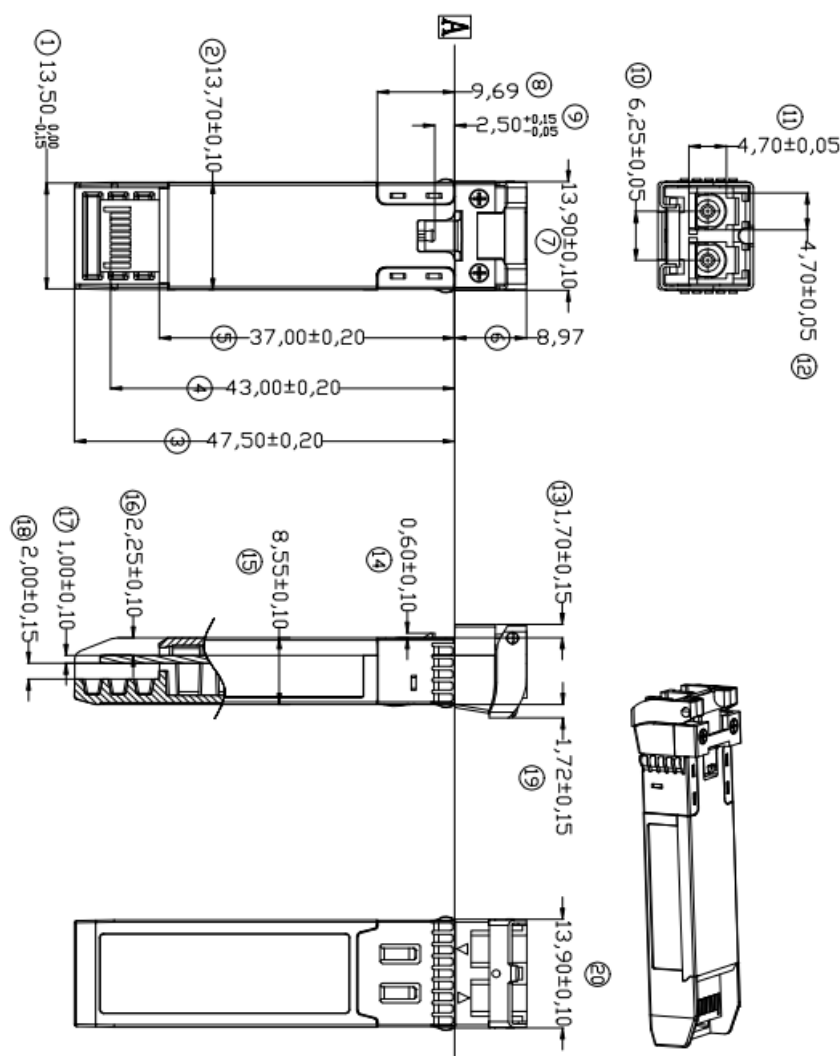


Figure 1. Module Mechanical Dimensions

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4. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	T _s	-40	-	85	°C	
Relative Humidity	R _H	5	-	95	%	
Power Supply Voltage	V _{CC}	-0.3	-	4	V	
Signal Input Voltage	V _{SI}	V _{CC} -0.3	-	V _{CC} +0.3	V	

5. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	T _c	0		70	°C	C-TEMP
		-40		85	°C	I-TEMP
Power Supply Voltage	V _{CC}	3.14	3.3	3.47	V	
Power Supply Current	I _{CC}	-		360	mA	
Data Rate	BR		10.3125		Gbps	TX Rate/RX Rate
Transmission Distance	TD		10		km	
Coupled fiber	Single mode fiber					9/125um SMF

6. Electrical Interface Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Differential line input Impedance	R _{IN}	85	100	115	Ohm	
Differential Data Input Voltage	V _{DT}	100	-	1000	mVp-p	
Transmitter Fault Output-High	V _{FaultH}	2	-	V _{CC} +0.3	V	
Transmitter Fault Output-Low	V _{FaultL}	0	-	0.8	V	
Transmitter Disable Voltage- High	V _{DisH}	2	-	V _{CC} +0.3	V	
Transmitter Disable Voltage- low	V _{DisL}	0	-	0.8	V	
Receiver						
Differential line Output Impedance	R _{OUT}	80	100	120	Ohm	

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Differential Data Output Voltage	V_{DR}	300	-	850	mVp-p	
Data Output Rise/Fall time	t_r/t_f		-	38	ps	
LOS Output Voltage-High	V_{LOSH}	2	-	$V_{CC}+0.3$	V	
LOS Output Voltage-Low	V_{LOSL}	0	-	0.8	V	

7. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Average Launched Power	P _O	-8.5		0.5	dBm	
Average Launched Power (Laser Off)	P _{off}	-	-	-30	dBm	
Center Wavelength Range	λ _C	1260	1310	1355	nm	
Spectrum Bandwidth(-20dB)	Δλ	-	-	1	nm	
Side-Mode Suppression Ratio	SMSR	30	-	-	dB	
Transmitter and Dispersion Penalty	TDP			3.2	dB	
Extinction Ratio	ER	3.5		-	dB	Note (1)
Output Eye Mask	Compliant with IEEE 802.3ae					Note (2)
Receiver						
Input Optical Wavelength	λ _{IN}	1270	-	1610	nm	
Receiver Sensitivity	P _{sen}	-	-	-14.4	dBm	Note (3)
Input Saturation Power (Overload)	P _{SAT}	0.5	-	-	dBm	Note (3)
Los Of Signal Assert	P _A	-30	-	-	dBm	
Los Of Signal De-assert	P _D	-	-	-17	dBm	
LOS -Hysteresis	P _{Hys}	0.5	2	6	dB	

Note (1): Measured with a PRBS 2³¹-1 test pattern, @10.3125Gb/s, BER<10⁻¹²

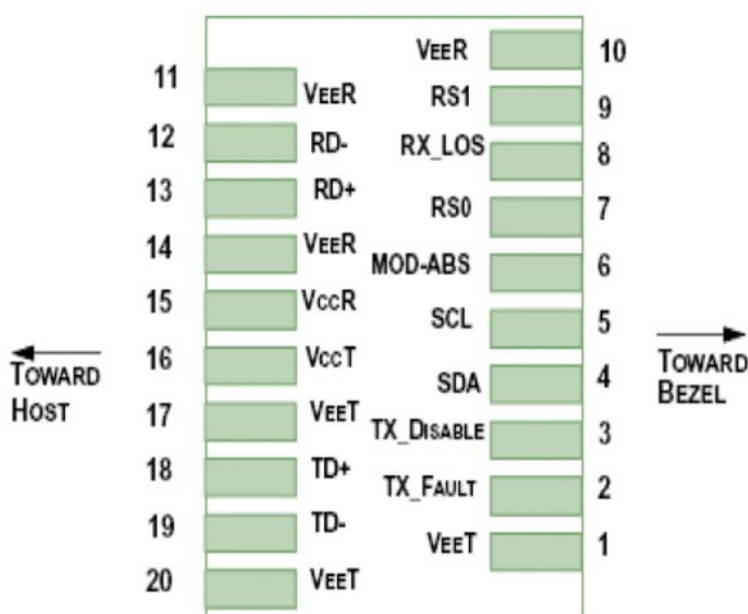
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Note (2): Transmitter eye mask definition, Compliant with IEEE 802.3ae

Note (3): Measured with Light source 1310nm; BER =<10⁻¹² @PRBS=2³¹-1 NRZ.

8. Applications Note:

Pin-out Definition



Pin Assignment

Pin	Symbol	Name/Description	NOTE
1	VEET	Transmitter Ground (Common with Receiver Ground)	1
2	TFAULT	Transmitter Fault.	2
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	Rate Select 0	5
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6
9	RS1	No connection required	1

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Pin	Symbol	Name/Description	NOTE
10	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V _{EER}	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	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
15	V _{CCR}	Receiver Power Supply	
16	V _{CCT}	Transmitter Power Supply	
17	V _{EET}	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	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1

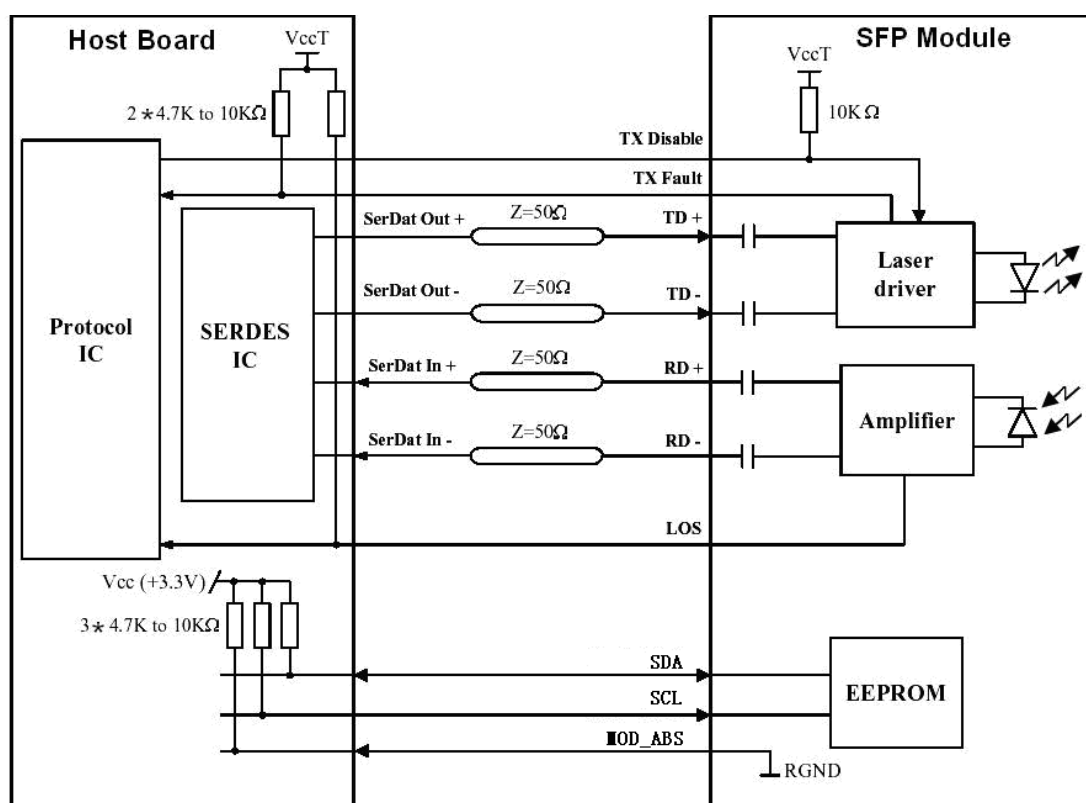
Notes:

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 V_{cc} + 0.3V. A high output indicates a transmitter fault caused by either the eTX 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.

LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Recommended Interface Circuit

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9. Digital Diagnostics Functions

As defined by the SFF-8472, Our SFP28 transceivers provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

- Transceiver temperature
- Laser bias current
- Transmitted optical power
- Received optical power
- Transceiver supply voltage

It also provides a sophisticated system of alarm and warning flags, which may be used to alert end-

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users when operating parameters are outside of a factory-set normal range. The operating and diagnostics information is monitored and reported by a Digital Diagnostics Transceiver Controller (DDTC) inside the transceiver, which is accessed through the 2-wire serial interface. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially. The 2-wire serial interface provides sequential or random access to the 8-bit parameters, addressed from 0x00h to the maximum address of the memory. For more detailed information, including memory map definitions, please refer the SFF-8472 documentation.

10. Digital Diagnostic Monitor Accuracy

The following characteristics are defined over recommended operating conditions

Parameter	Accuracy	Unit
Internally measured transceiver temperature	+/-3	deg.C
Internally measured transceiver supply voltage	+/-3	%
Measured Tx bias current	+/-10	%
Measured Tx output power	+/-3	dB
Measured Rx received average optical power	+/-3	dB

11. Modification History

Rev.	Comments	Date	Originator	Approval
01	Initial	2024.04.23	Albert Lin	Mike Sun
02	Add JPC P/N	2026.07.23	Jeff Lo	Mike Sun