TITLE	DOC No. RFD-20260612100-002	
10G SFP+ 40km BIDI transceivers	REVISION : 01	AUTHORIZED BY : Jeff Lo
	DATE : 2026.06.16	CLASSIFICATION : Optical Transceiver

1. PRODUCT FEATURES

- Support 8.5Gb/s to 11.32Gb/s Multi-Rate
- Up to 40km transmission distance
- DFB laser and High sensitivity PIN photodiode and TIA
- LC single connector
- Hot pluggable 20pin connector
- Low power consumption <1.2 W
- Single +3.3V±5% power supply
- Compliant with SFF-8472 & SFF-8431 & SFF-8432
- Fully RoHS Compliant
- Compliant with IEEE802.3ae 10GBASE-BX
- Compliant with CPRI Option 7,8
- Laser Safety: Class 1 Laser Product
- Operating temperature range: Commercial: 0°C to +70°C / Industrial: -40°C to +85°C

2. APPLICATIONS

- 10GBASE-BX(BR) Ethernet @10.31G
- Fiber Channel 800-SM-LC-L 8GFC @8.5G,1200-SM-LL-L 10GFC @10.51875G
- SONET OC-192&SDH &STM-64 @9.953G
- CPRI Option#7 @9.83G, #8 @10.1376G
- OTN OTU2 @10.7G, OTU2e @11.09G, OTU2f @11.32G

3. PRODUCT DESCRIPTION

The 10G SFP+ BIDI Transceiver is intended for 40km reach service from 0.6Gb/s to 10.3125Gb/s BI-direction single mode high-speed communications equipment where low-cost, extraordinary performance and reliability are essential. It consumes low power, operates base on 3.3V DC power supply and is offered in the industrial temperature range. They are compliant with SFP28 MSA, SFF-8431 and SFF-8432.

The low jitter and low bit error rate optical assembly features a DML laser transmitter and PIN/TIA receiver. The differential AC coupled Tx and Rx data interfaces are CML compatible. The device is Class I laser safety compliant.

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3.1 PRODUCT NAME

10G SFP+ 40km BIDI Transceivers

JPC P/N	Wavelength (nm)	Distance	Media	Power(dBm)	Sen. (dBm)	Connector	Tem.
P58**0BRII40-1	1270	40km	SMF	-2 ~ 5	-15.5	LC	C/I
P58**0BRIJ40-1	1330	40km	SMF	-2 ~ 5	-15.5	LC	C/I

Note-1：** Indicates the customer code.

3.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING

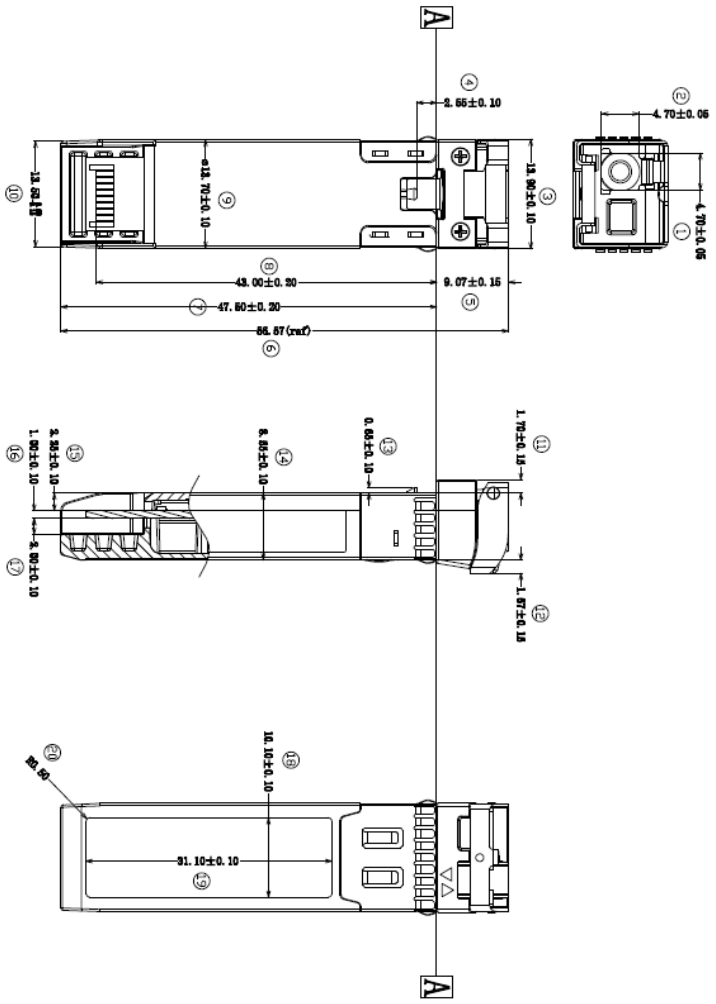

Figure 1. Module Mechanical Dimensions

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4. Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Storage Temperature Range	Ts	°C	-40	85
Relative Humidity	RH	%	5	95
Supply Voltage	Vcc	V	-0.5	+4.0

5. Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max
Operating Case Temperature Range	Tc	°C	-40		85
Power Supply Voltage	Vcc	V	3.14	3.3	3.46
Bit Rate	BR	Gb/s	0.6	10.3125	
Bit Error Ratio	BER				1E-12
Max Supported Link Length	L	Km			40
Supply Current	Icc	mA			360

6. Electric Ports Definition

Parameter	Symbol	Unit	Min	Typ	Max	Note
Transmitter						
Input Differential Impedance	R_{IN}	Ω		100		
Differential Data Input Swing	V_{IN}	mVp-p	180		850	
Transmit Disable Voltage	V_{DIS}	V	2		V_{CCHOST}	
Transmit Enable Voltage	VEN	V	GND		0.8	
Transmit Fault Assert Voltage	V_{FA}	V	2		V_{CCHOST}	
Transmit Fault De-Assert Voltage	VFDA	V	GND		0.8	
Receiver						
Differential Data Output Swing	V_{OD}	mVp-p	300		900	
LOS Assert Voltage	VEN	V	2		V_{CCHOST}	
LOS De-Assert Voltage	VLOSNR	V	GND		0.8	

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7. Optical Characteristics (TA and Vcc= 3.14 to 3.46V)

Parameter	Symbol	Unit	Min	Typ	Max	Note
Transmitter						
Center Wavelength (10G40x-23)	λ	nm	1260	1270	1280	
Center Wavelength (10G40x-32)	λ	nm	1320	1330	1340	
Average Output Power	Pav	dBm	-2		5	
Spectral Width (-20dB)	σ	nm			1	
Extinction Ratio	ER	dB	3.5			
Side Mode Suppression Ratio	SMSR	dB	30			
Average Launch Power of OFF Transmitter	POFF	dBm			-30	
Relative Intensity Noise	RIN	dB/Hz			-128	
Receiver						
Center Wavelength (10G40x-23)	λC	nm	1320	1330	1340	
Center Wavelength (10G40x-32)	λC	nm	1260	1270	1280	
Receiver Sensitivity	RSENSE	dBm			-15.5	1
Receiver Overload	Pmax	dBm	2			
Receiver Reflectance		dB			-12	
LOS Assert	LOSA	dBm	-30			
LOS De-Assert LOS	LOSD	dBm			-16.5	
LOS Hysteresis		dB	0.5			

Note1: Measured at 10.3125Gb/s, ER>8.2dBm, PRBS 2^{31}-1 and BER better than or equal to 1E-12;

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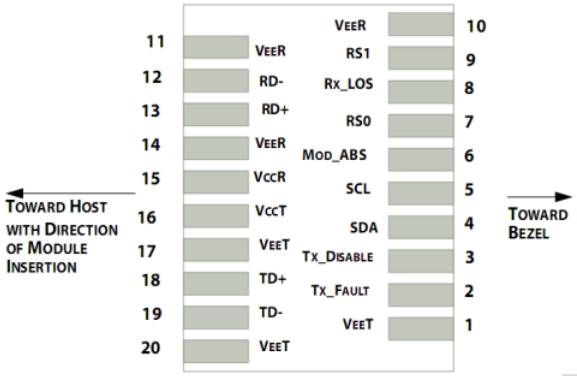
8. Applications Note:

Pin-out Definition



Pin Assignment

Pin Number	Symbol	Name	Description
1,17,20	VeeT	Transmitter Signal Ground	Connected to signal ground on the host board.
2	TX Fault	Transmitter Fault Out (OC)	Module transmitter fault output.
3	TX Disable	Transmitter Disable In (LVTTL)	Module transmitter disable control.
4	SDA	Module Definition Identifiers	Serial ID with SFF 8472 Diagnostics Module Definition pins should be pulled up to Host Vcc with 10 kΩ resistors.
5	SCL		
6	MOD-ABS		
7	RS0	Receiver Rate Select (LVTTL) Transmitter Rate Select (LVTTL)	Rate Select 0, optionally controls SFP+module receiver. These pins are pulled low to VeeT with a >30K resistor.
9	RS1		
8	LOS	Loss of Signal Out (OC)	Receiver loss of signal.
10,11,14	VeeR	Receiver Signal Ground	Connected to signal ground on the host board.
12	RD-	Receiver Negative DATA Out	Receiver inverted data output, internally AC coupled and terminated
13	RD+	Receiver Positive DATA Out	Receiver non-inverted data output, internally AC coupled and terminated.

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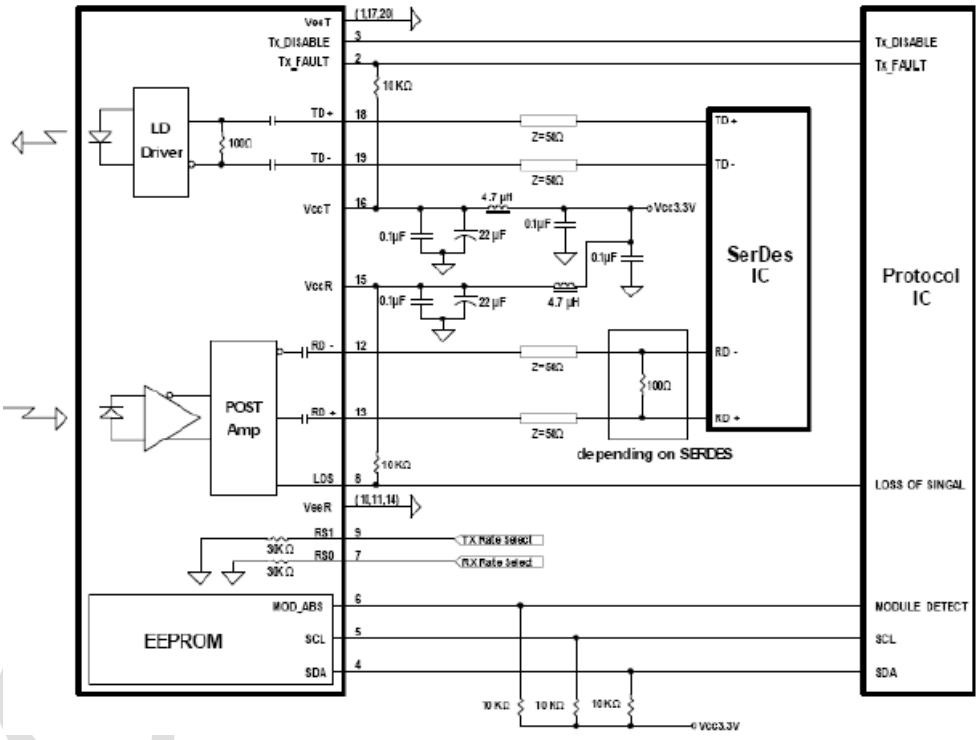
15	VccR	Receiver Power Supply	Receiver Power 3.3V Supply.
16	VccT	Transmitter Power Supply	Transmitter Power 3.3V Supply.
18	TD+	Transmitter Positive DATA In	Transmitter non-inverted data input, internally AC coupled and terminated.
19	TD-	Transmitter Negative DATA In	Transmitter inverted data Input, internally AC coupled and terminated.

Recommended Interface Circuit



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9. Digital Diagnostics Functions

As defined by the SFF-8472, The 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-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	+/-5	mA
Measured Tx output power	+/-3	dB
Measured Rx received average optical power	+/-3	dB

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11. Modification History

Rev.	Comments	Date	Originator	Approval
01	Initial	2026.06.16	Jeff Lo	Mike Sun

JPC connectivity