

TITLE 25G SFP28 BiDi 10km 1270nm/1330nm Transceiver	DOC No. RFD-20230609006-011	
	REVISION : 01	AUTHORIZED BY : Andy Yang
	DATE : 2023.06.26	CLASSIFICATION : Optics Transceiver

1. SCOPE

The receiver section consists of a PIN photodiode integrated with a transimpedance preamplifier (TIA).
The module is hot pluggable into the 20-pin connector. All modules satisfy class I laser safety requirements.
Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage.

2. PRODUCT FEATURES

- Electrical and Management interface specifications are compliant with SFF-8431/ SFF-8472
- Compliant with SFP28 MSA Specification
- Digital Diagnostic Monitoring available.
- Uncooled 1270nm DFB Laser
- Uncooled 1330nm DFB Laser
- Up to 25.78Gb/s bi-directional data links
- Up to 10km on 9/125μm SMF
- Simplex LC connector compliant
- Single +3.3V DC power supply
- Hot-pluggable SFP footprint
- Low power dissipation
- Class 1 laser safety certified
- Operating temperature Options: - (Commercial) 0 to +70°C
- RoHS Compliant

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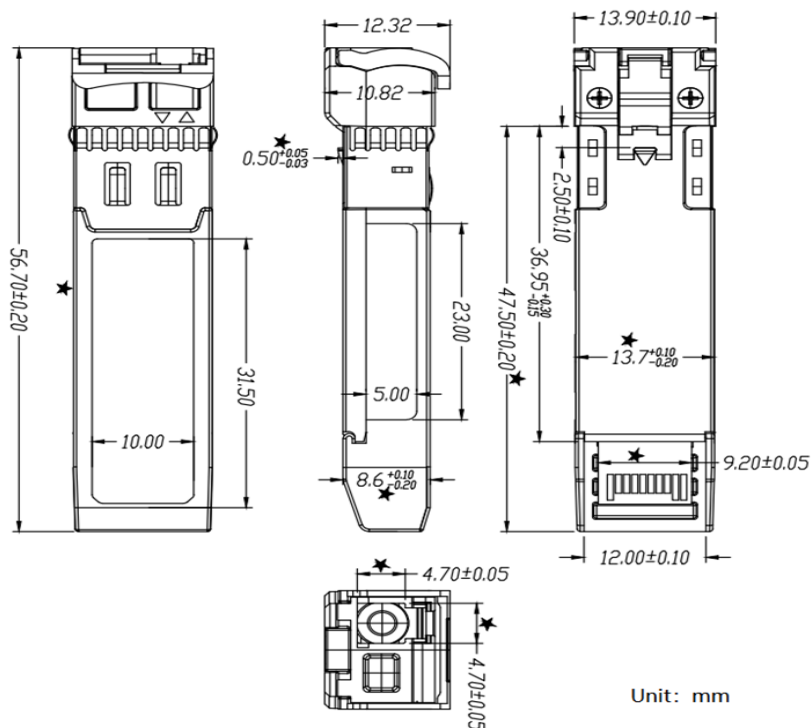
3. PRODUCT DESCRIPTION

3.1 PRODUCT NAME AND SERIES NUMBER(S)

SFP28 25G BiDi T1270/R1330 & T1330/R1270 Transceiver

Data Rate	Wavelength (nm)	Distance	Media	Power (dBm)	Sen. (dBm)	Connector	Temp.
25G	1270	10 km	SMF	-4~2	-12	LC	C
25G	1330	10 km	SMF	-4~2	-12	LC	C
25G	1270	10 km	SMF	-4~2	-12	LC	I
25G	1330	10 km	SMF	-4~2	-12	LC	I

3.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING



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4. APPLICABLE DOCUMENTS AND SPECIFICATIONS

- High speed storage area networks
- 25G high speed interconnection
- Switch to Switch Interface
- Other Optical Links

5. Absolute Maximum Ratings & Recommended Operating Conditions

Absolute Maximum Ratings				
Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	+85	℃
Supply Voltage	VCC3	3.1	3.6	V
Relative Humidity(Non-condensing)	RH	5	95	%

Recommended Operating Conditions					
Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature(C-temp)	TC	0		70	℃
Power Supply Voltage	VCC3	3.135	3.3	3.465	V
	ICC3			450	mA
Transmission Distance				10	Km
Power Dissipation	Po			1.5	W
Data Rate			25.78		Gbps

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PRODUCT SPECIFICATION

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Transmitter Operating Characteristic-Optical, Electrical

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Center Wavelength	λ_C	1250	1270	1290	dBm	Tx1270nm
Center Wavelength	λ_C	1310	1330	1350	dBm	Tx1330nm
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
-20dB Spectral Width	-	-	-	1	nm	DFB laser
Laser Off Power	P _{off}	-	-	-30	dBm	-
Average Optical Power	P _{avg}	-4		+2	dBm	
Tx Output Diff Swing	V _I	180	-	700	mV _{pp}	-
Extinction Ratio	ER	3.5	-	-	dB	-
Tx_Disable(Transmitter Disable)			2	VCC	V	
Tx_Enable (Transmitter Disable)			VEE	VEE+0.8	V	

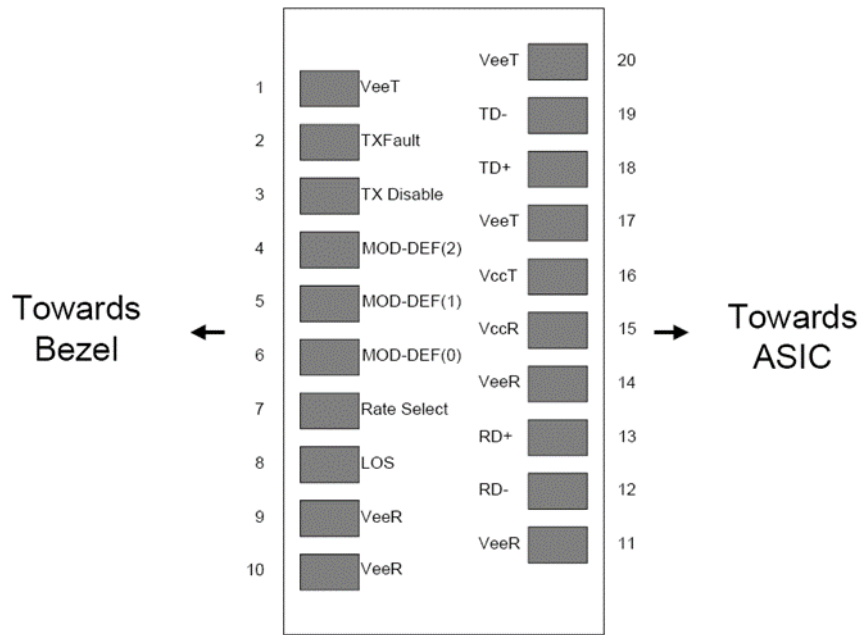
Receiver Operating Characteristic-Optical, Electrical

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Center Wavelength	λ_c	1250	1270	1290	nm	Rx1270nm
Center Wavelength	λ_c	1310	1330	1350	nm	Rx1330nm
Receiver Sensitivity (P _{avg})	S	-	-	-12	dBm	1
LOS De-Assert	LOSD	-	-	-13	dBm	-
LOS Assert	LOSA	-35	-	-	dBm	-
LOS Hysteresis	-	0.5	-	6	dB	-
Overload	P _{ov}	+1	-	-	dBm	
Rx Output Diff Swing	V _o	300	-	850	mV _{pp}	

Note1: Minimum average optical power measured at ER=4 dB, 2³¹-1 PRBS data pattern, BER<5E-5

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6. Pin-out Definition:



Pin Assignment

Pin	Symbol	Name/Description	Note
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	Data Line (Same as MOD-DEF2 as defined in the INF-8074i)	Note4
5	SCL	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	Rate Select 0, optionally controls SFP+ module receiver. When High input data rate GBd and when LOW input data rate 1.25GBd.	Note6

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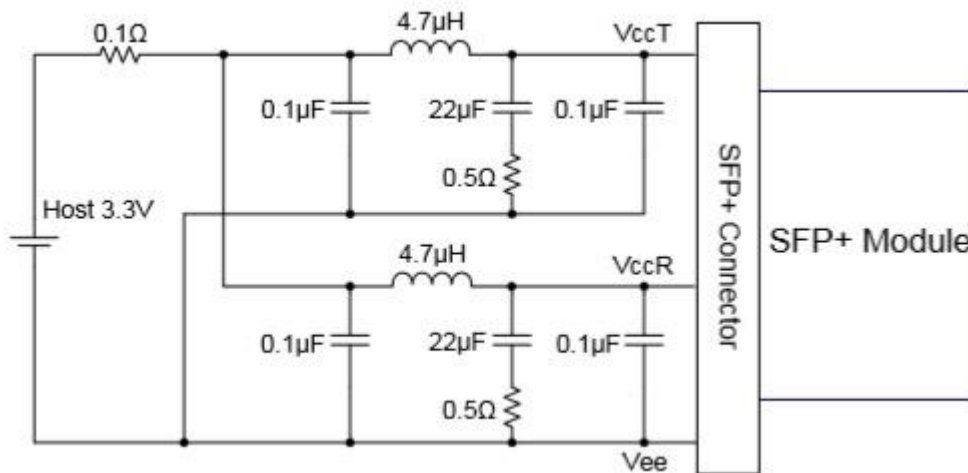
8	RX_LOS	Receiver Loss of Signal Indication (In FC designated as RX_LOS, in SONET designated as LOS, and in Ethernet designated at Signal Detect)	Note2
9	RS1	Rate Select 1, optionally controls SFP+ transmitter. When High input data rate 10.3GBd and when LOW input data rate 1.25 GBd.	Note6
10	VeeR	Module Receiver Ground	Note1
11	VeeR	Module Receiver Ground	Note1
12	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:

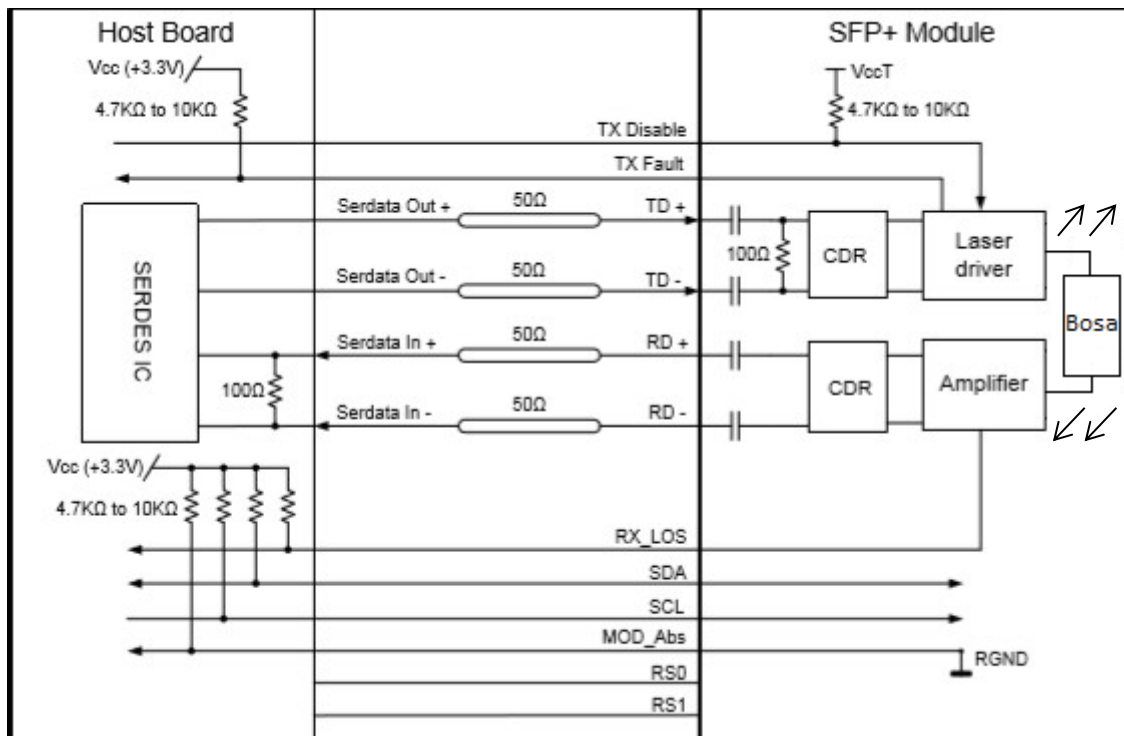
1. The module signal ground pins, VeeR and VeeT, shall be isolated from the module case.
2. This pin is an open collector/drain output pin and shall be pulled up with 4.7k-10kohms to Host_Vcc on the host board. Pull ups can be connected to multiple power supplies, however the host board design shall 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.

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Block Power Supply Filter Network

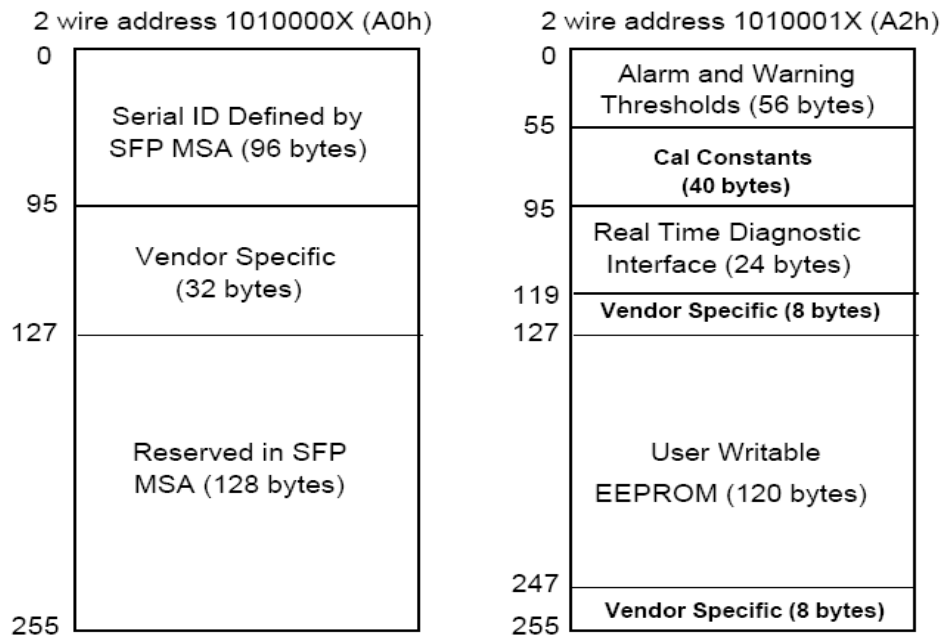


Recommended Interface Circuit



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7. Digital Diagnostic Memory Map



8. Modification History

Rev.	Comments	Date	Originator	Approval
01	Initial	2023/06/26	Andy Yang	Mike Sun