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10G SFP+ Bidi 60km Transceiver

1. SCOPE

ZCables' 10G Bidi Transceiver is designed for 10GBASE-LR/LW and 8.5G/10G Fiber- Channel applications.

The transceiver consists of two sections: The transmitter section incorporates a DML laser. And the receiver section consists of a APD photodiode integrated with a TIA. 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-8432/ SFF-8472
- SFP+ MSA package with duplex LC connector
- 1270nm TX for C0U / 1330nm TX for C0V
- Up to 11.3Gb/s data links
- Single +3.3V power supply
- Class 1 laser safety certified
- Operating temperature Options: - (Industrial) -40 to +85°C // (Commercial) 0 to +70°C
- Up to 60km on 9/125µm SMF
- RoHS Compliant

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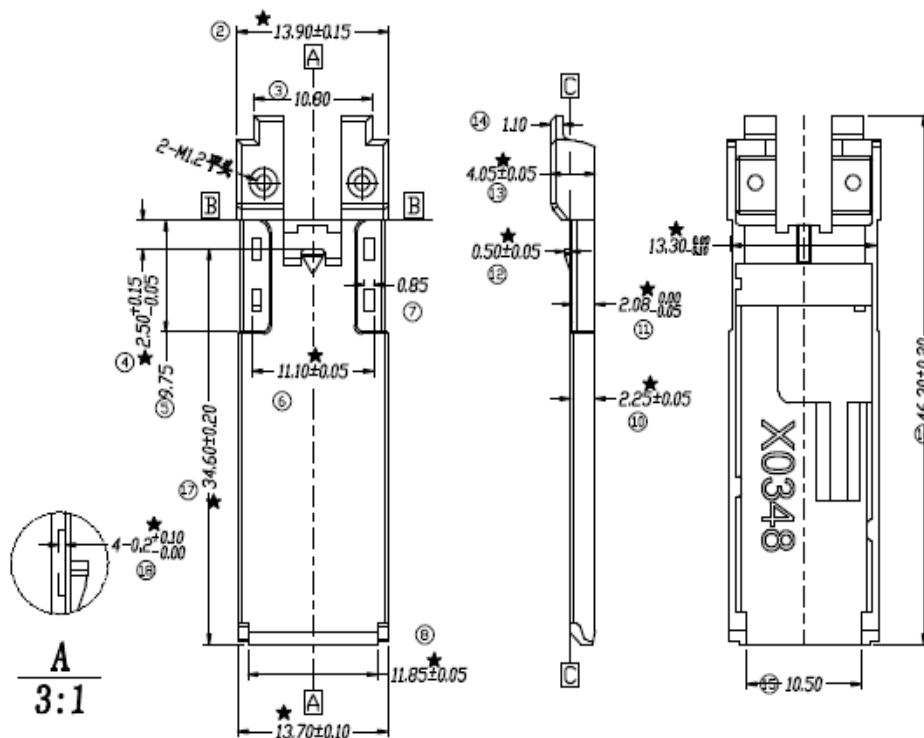
3. PRODUCT DESCRIPTION

3.1 PRODUCT NAME AND SERIES NUMBER(S)

SFP+ 10G Bidi T1330&T1270 Transceiver

Part Number	Data Rate	Wavelength (nm)	Distance	Media	Power (dBm)	Sen. (dBm)	Connector	Temp.
ZFTCBEC2733A2ST	10G	1270	60 km	SMF	1~5	-20	LC	C
ZFTCBEC3327A2ST	10G	1330	60 km	SMF	1~5	-20	LC	C

3.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING



TITLE**10G SFP+ Bidi 60km Transceiver****4. APPLICABLE DOCUMENTS AND SPECIFICATIONS**

- 10G Ethernet 10GBASE-LR/LW
- Wireless
- 10Gb/s Fiber Channel

5. Absolute Maximum Ratings & Recommended Operating Conditions**Absolute Maximum Ratings**

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	+85	°C
Supply Voltage	VCC3	-0.5	4	V
Relative Humidity(Non-condensing)	RH	5	95	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature(I-temp)	TI	0	25	70	°C
Power Supply Voltage	VCC3	3.135	3.3	3.465	V
	ICC3			450	mA
Data Rate	-	1	10.3125	11.3	Gbps
Power Dissipation	PD	-	-	1.5	W
Transmission Distance	-	-	-	60	Km

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Transceiver Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Input Differential Impedance	ZIN	-	100	--	Ω	-
Differential Data Input Swing	VIN, P-P	180	-	1000	mVP-P	-
Differential Data Output Swing	VIN, P-P	300	-	850	mVP-P	-
TX_FAULT LOS Output Voltage	VOH	2.0	-	VCCHOST	V	-
	VOL	0	-	0.8	V	-
TX_DISABLE Transmitter Disable Transmitter Enable	VIH	2.0	-	VCCHOST	V	-
	VIL	0	-	0.8	V	-

Transmitter Operating Characteristic-Optical

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Center Wavelength	λC	1320	1330	1340	nm	C0V
		1260	1270	1280	nm	C0U
Launch Optical Power	Po	1	-	5	dBm	-
-20dB Spectral Width	-	-	-	1	nm	-
Side Mode Suppression Ratio	SMSR	30	-	-	dBm	-
RIN12OMA	RIN	-	-	-128	dB/Hz	-
Extinction Ratio	ER	3.5	-	-	dB	-
Pout @TX-Disable Asserted	Poff	-	-	-30	dBm	-
Optical Return Loss Tolerance	ORLT	-	-	12	dB	-

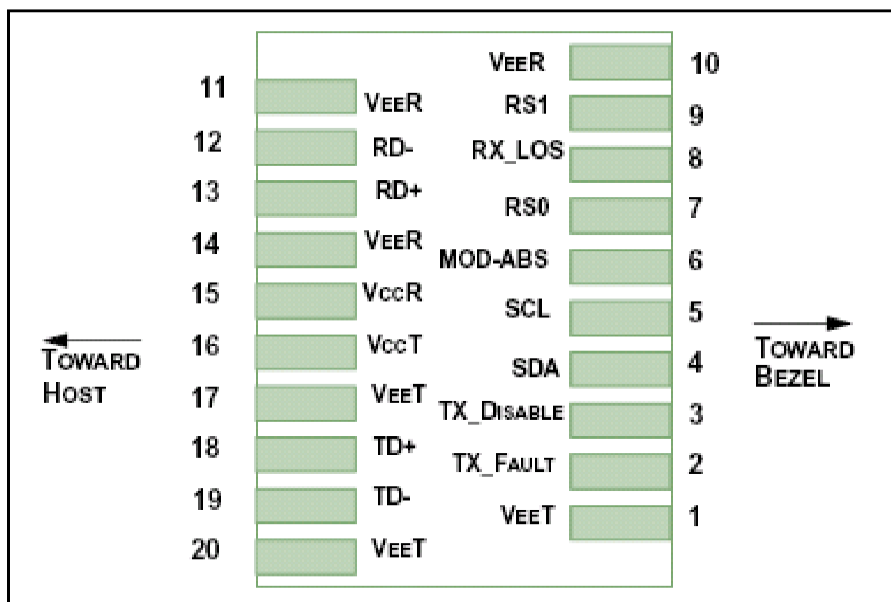
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Receiver Operating Characteristic-Optical, Electrical

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Center Wavelength	λ_c	1260	1270	1280	nm	C0U
	λ_c	1320	1330	1340	nm	C0V
Receiver Sensitivity (Pavg)	S	-	-	-20	dBm	-
Receiver Overload (Pavg)	POL	-7	-	-	dBm	-
Receiver Reflectance	-	-	-	-12	dB	-
LOS De-Assert	LOSD	-	-	-20	dBm	-
LOS Assert	LOSA	-30	-	-	dBm	-
LOS Hysteresis	-	0.5	-	-	dB	-

6. Pin-out Definition:



Pin Definitions

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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 GBd 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
9	LVTTTL-I	RS1	Rate Select 1, optionally controls SFP+ transmitter..	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

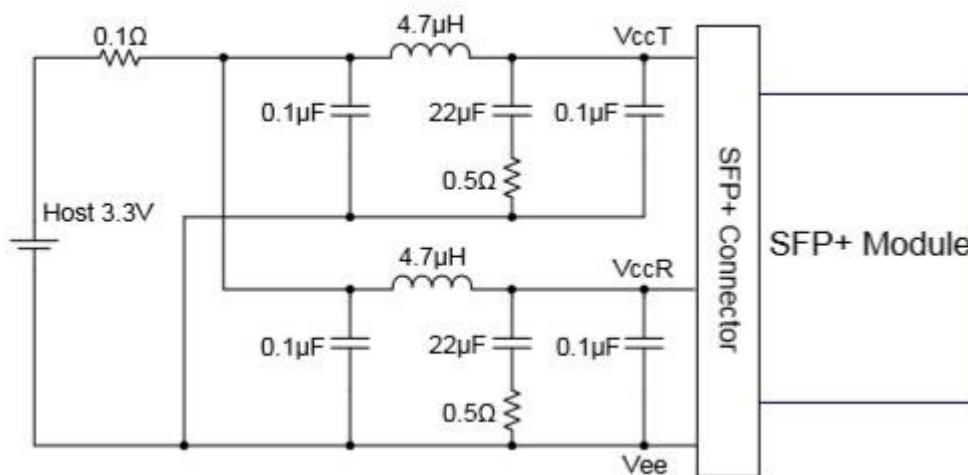
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board. Pull ups can be connected to multiple power supplies, however the host board design shall ensure that no module pin has voltage exceeding module $V_{ccT/R} + 0.5 V$.

3. This pin is an open collector/drain input pin and shall be pulled up with 4.7k-10kohms to V_{ccT} 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 $Host_V_{cc}$ on the host board.
6. If implementing SFF-8079 pin 7 and 9 are used for AS0 and AS1 respectively.

Block Power Supply Filter Network

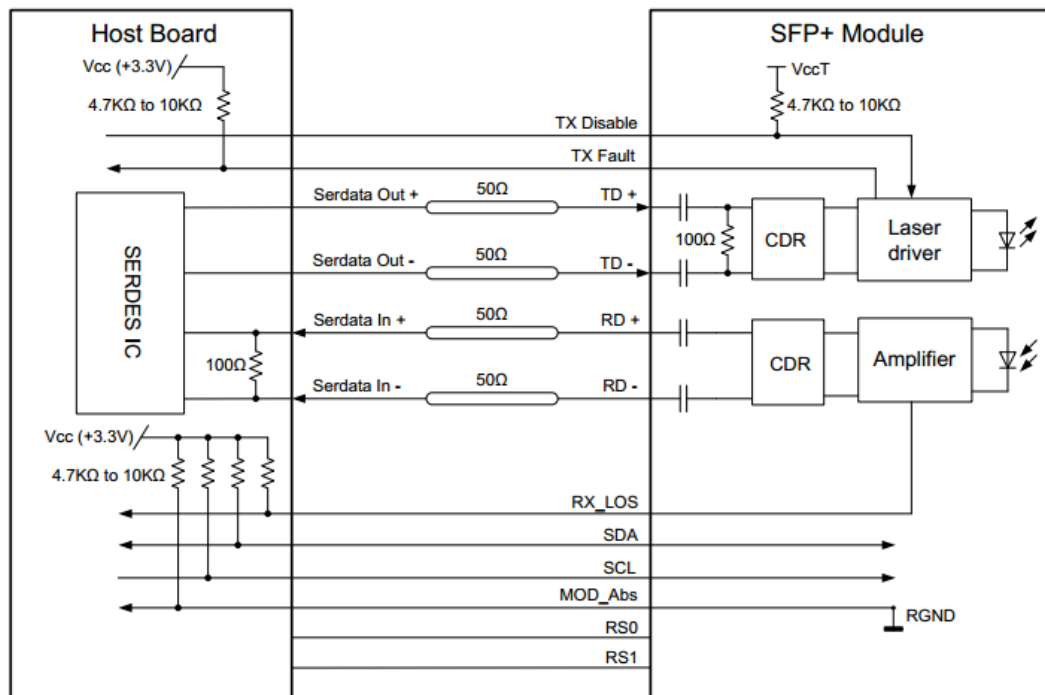


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Recommended Interface Circuit

Recommended Application Interface Block Diagram



DDM accuracy requirements

Parameters	Unit	Requirements
Temperature	°C	±3
Voltage	V	±3%
I bias	mA	±10%
Rx power	dB	±3
Tx power	dB	±3