

TITLE**25G LR SFP28 Transceiver****1. SCOPE**

ZCables' SFP28 transceivers, according to 25 Gigabit Small Form Factor Pluggable "SFP28" Multi-Sourcing Agreement (MSA) SFF-8431 Rev. 4.1 and SFF-8472 Rev. 12.1, are designed for use up to 25.78Gb/s data rate and up to 10km link length. They are compatible with SFF-8432. ZCables' SFP28 transceivers offer commercial operating temperature options and Industrial temperature.

2. PRODUCT FEATURES

- Up to 24.33Gb/s for CPRI
- Up to 25.78Gb/s for bi-directional data links
- Electrical interface specifications per SFF-8431
- Management interface specifications per SFF-8432 and SFF-8472
- Build-in dual CDR with shut off control
- SFP28 MSA package with duplex LC connector
- Uncooled 1310nm DFB Laser
- Up to 10 km on 9/125um SMF
- Single +3.3V power supply
- Class 1 laser safety certified
- 1.5W maximum power consumption with established link
- Operating temperature Options: 0°C to +70°C; -40~85°C RoHS Compliant

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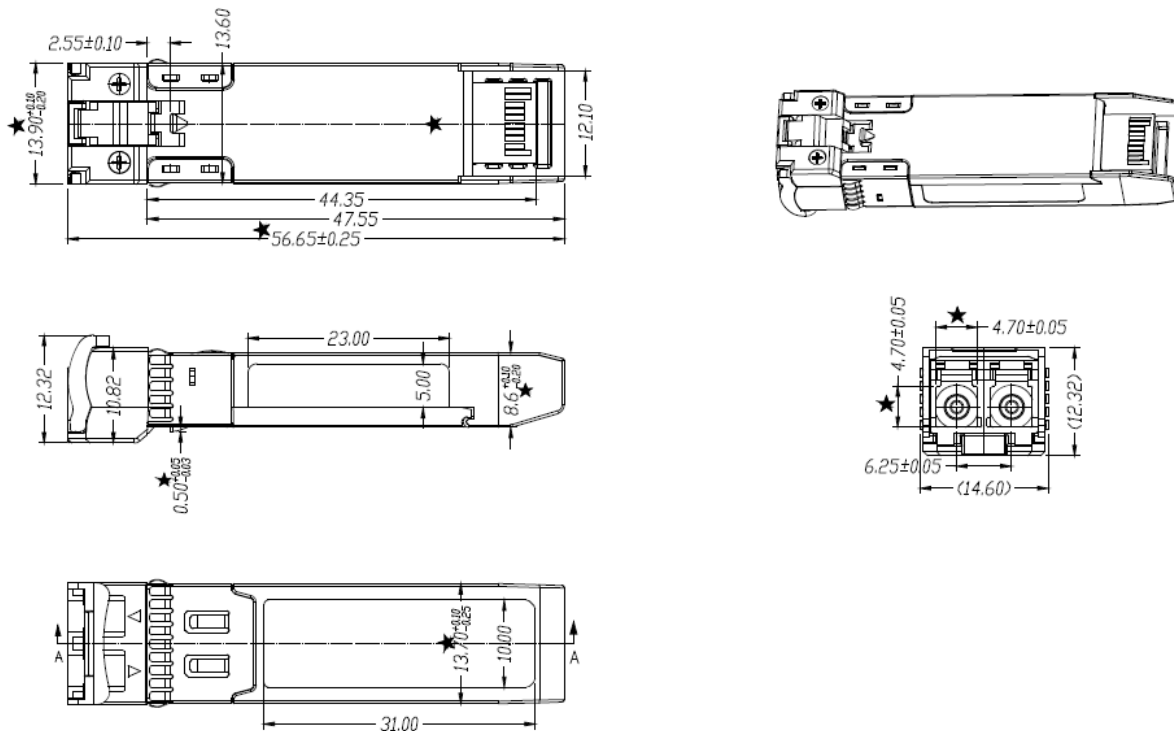
3. PRODUCT DESCRIPTION

3.1 PRODUCT NAME AND SERIES NUMBER(S)

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Part Number	Data Rate	Wavelength (nm)	Distance	Media	Power (dBm)	Sen. (dBm)	Connector	Tem.
ZFTDLRD1310A1ST	25G	1310	10km	SMF	-2 ~ 4	-13	LC	C

3.2 DIMENSIONS, MATERIALS, PLATINGS AND MARKING



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

4. APPLICABLE DOCUMENTS AND SPECIFICATIONS

- 25GE LR
- eCPRI & CPRI

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5. QUALIFICATION

- Electrostatic Discharge (ESD) to the Electrical Pins
- Electrostatic Discharge (ESD) to the LC Connector
- RoHS compliance

6. 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	0	85	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TC	0	25	70	°C
	TI	-40	25	85	°C
Power Supply Voltage	VCC3	3.135	3.3	3.465	V
Data Rate			24.33 25.78	28	Gbps
Transmission Distance				10	Km

Transmitter Operating Characteristic-Optical, Electrical

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Launch Optical Power	Po	-2	-	4	dBm	1
Extinction Ratio	ER	3	-	-	dB	25Gbps
Center Wavelength Range	λ_c	1290	1310	1330	nm	
Optical Modulation Amplitude	OMA	-2	-	-	dBm	

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Transmitter and Dispersion Penalty	TDP	-	-	2.2	dB	
Spectral Width	$\Delta\lambda$	-	-	1	nm	
RIN ₁₂ OMA	-	-	-	-128	dB/Hz	
Optical Return Loss Tolerance	ORTL	-	-	12	dB	
Pout @TX-Disable Asserted	Poff	-	-	-30	dBm	
Module Supply Current	Icc	-	-	450	Ma	
Power Dissipation	PD	-	-	1500	mW	
Input Differential Impedance	ZIN	-	100	-	Ω	
Differential Data Input Swing	VIN,P-P	180	-	700	mV,P-P	
Tx_Fault	Transmitter Fault		2.0		VCCHOST	V
	Normal Operation		0		0.8	V
Tx Disable	Transmitter Disable		2.0		VCCHOST	V
	Transmitter Enable		0		0.8	V
Eye Diagram	25GBASE-LR mask and filter					

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	1260	1310	1360	nm	-
Receiver OMA Sensitivity	RxSENS	-	-	-13	dBm	1
Receiver Overload (Pavg)	Pol	0	-	-	dBm	1
Optical Return Loss	ORL	26	-	-	dB	-
LOS De-Assert	LOS_D	-	-	-13	dBm	-
LOS Assert	LOS_A	-30	-	-	dBm	-
LOS Hysteresis	-	0.5	-	-	dB	-
Output Differential Impedance	ZO	-	100	-	Ω	-

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Differential Data Output Swing	Vout,P-P	300	-	850	mVP-P	-	
Data Output Rise Time, Fall Time	Tr,Tf	15	-	-	ps	-	
Rx_LOS	Loss Of Signal(LOS)	VOH	2.0	-	VCCHOST	V	-
	Normal Operation	VOL	0	-	0.8	V	-

Notes:

1. Receiver sensitivity is informative. shall be measured with conformance test signal for BER =5x 10⁻⁵.

Special function

Receiver special description is defined in table as below.

Parameters	Description	Note
RX LOS RX LOS enable/disable	RX LOS enable	*1
LOS LOS Criterion	/	

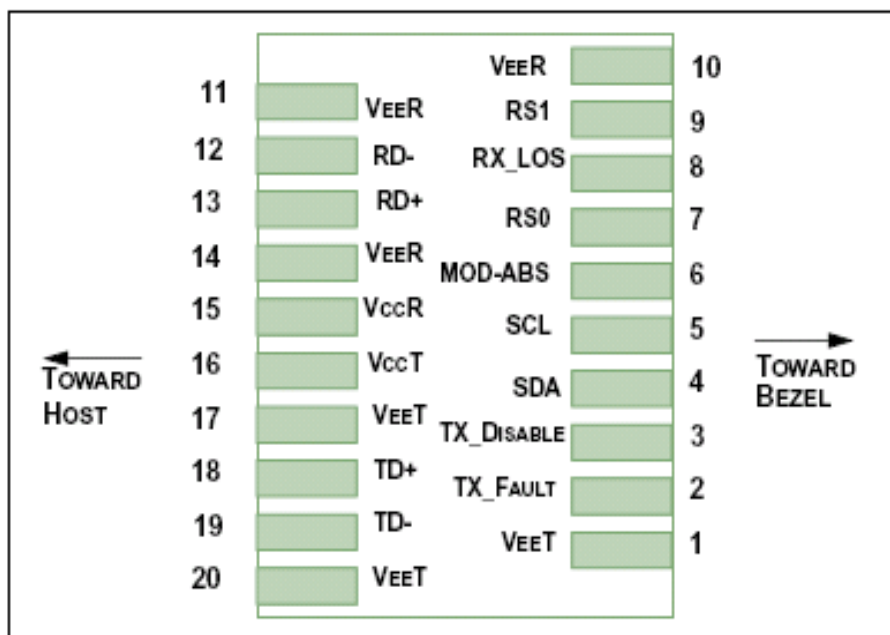
Note:

1. RX LOS enable means when LOS RX no signal output, inverse, Rx may be have normal signal amplitude output.

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6. Applications Note :



Pin Definitions

Pin Assignment

Pin	Symbol	Name/Description	Note
1	VeeT	Transmitter Ground	1
2	TX_Fault	Transmitter Fault (LVTTTL-O) - High indicates a fault condition	2
3	TX_Disable	Transmitter Disable (LVTTTL-I) – High or open disables the transmitter	3
4	SDA	Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)	4
5	SCL	Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)	4
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module	5
7	RS0	NA	6
8	RX_LOS	Receiver Loss of Signal (LVTTTL-O)	2
9	RS1	NA	6
10	VccRx	Receiver Ground	1
11	SCL	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O)	

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13	RD+	Received Data out (CML-O)	
14	VeeR	Receiver Ground	
15	VccR	Receiver Power - +3.3V	
16	VccT	Transmitter Power - +3.3 V	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Data In (CML-I)	
19	TD-	Inverse Transmitter Data In (CML-I)	
20	VeeT	Transmitter Ground	1

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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Recommended Interface Circuit

