

## DATA SHEET

### ZCABLES:ZFTFC4F1310A1xx

100Gb/s QSFP28 CWDM4 Optical Transceiver

### ZFTFC4F1310A1xx Overview

ZCables's ZFTFC4F1310A1xx optical transceiver converts 4 input channels of 25Gb/s electrical data to 4 CWDM optical signals, and multiplexes them into a single channel for 100Gb/s optical transmission. Reversely, on the receiver side, the module optically de-multiplexes a 100Gb/s input into 4 CWDM channels signals, and converts them to 4 channels output electrical data.

### Product Features

- Uncooled 4x25Gb/s CWDM transmitter
- QSFP28 MSA compliant
- Supports 103.1Gb/s bit rate
- Compliant with 100G CWDM4 MSA Specification
- Duplex LC connector
- Built-in digital diagnostic functions
- Up to 2km on Single Mode Fiber
- RoHS Compliant
- Operating temperature range: 0° C to70° C

### Applications

- Data Center Interconnect
- 100G Ethernet
- Infiniband QDR and DDR interconnects

## Ordering Information

Part Number	Description	Color on Clasp
ZFTFC4F1310A1xx	1 00G QSFP28 CWDM4 LC Connectors, up to 2 km on SMF, with DOM function.	Green
<b>For More Information:</b> ZCables.com Web: <a href="http://www.zcables.com">www.zcables.com</a> Email: support@zcables.com		

## General Specifications

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Signaling Rate each Channel			25.78125		Gb/s	1
Bit Error Rate	BER			$10^{-12}$		
Operating Temperature	T <sub>C</sub>	0		70	°C	2
Storage Temperature	T <sub>STO</sub>	-40		85	°C	3
Input Voltage	V <sub>CC</sub>	3.14	3.3	3.46	V	

**Notes:**

1. Case temperature
2. Ambient temperature

## Link Distances

Data Rate	Fiber Type	Distance Range (km)
100 Gb/s	9/ 125um SMF	2

## Optical – Characteristics – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Signaling rate, each lane (range)			25.78125		Gb/s	
Total Average Launch Power	$P_T$			8.5	dBm	
Average Launch Power( Each Lane)	$P_{TX}$	-6.5		2.5	dBm	1
Optical Center Wavelength	$\lambda_0$	1264.5	1271	1277.5	nm	
	$\lambda_1$	1284.5	1291	1297.5	nm	
	$\lambda_2$	1304.5	1311	1317.5	nm	
	$\lambda_3$	1324.5	1331	1337.5	nm	
Optical Modulation Amplitude( Each Lane)	OMA	-4		2.5	dB	
Extinction Ratio	ER	3.5			dB	
Side Mode Suppression Ratio	SMSR	30			dB	
Transmitter Dispersion Penalty	TDP			3	dB	
Optical Return Loss Tolerance	TOL			20	dB	
Transmitter reflectance				-12	dB	
Launch Power of OFF Transmitter(per lane)	$P_{OUT\_OFF}$			-30	dBm	

**Notes:**

1. Average

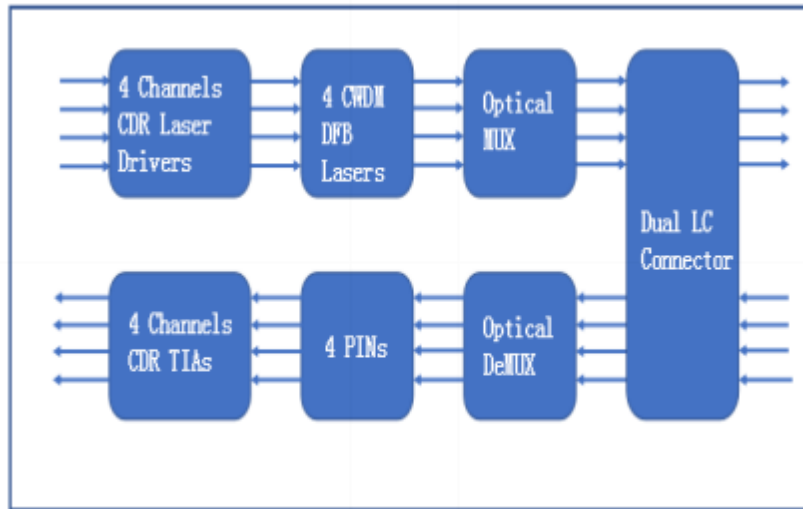
## Optical – Characteristics – Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Signaling rate, each lane (range)			25.78125		Gb/s	
Optical Center Wavelength	$\lambda_0$	1264.5	1271	1277.5	nm	
	$\lambda_1$	1284.5	1291	1297.5	nm	
	$\lambda_2$	1304.5	1311	1317.5	nm	
	$\lambda_3$	1324.5	1331	1337.5	nm	
Optical Average Input Power(each lane)	$P_{RX}$	- 11.5		2.5	dBm	
Optical Modulation Amplitude(each Lane)				2.5	dB	
Damage Threshold	P	3.5			dBm	
Receiver Sensitivity (OMA), Each Lane	$R_{X\_SEN1}$			- 10	dBm	
Receiver Reflectance	$TR_{RX}$			-26	dB	
LOS Assert	$LOS_A$		TBD		dBm	
LOS De-Assert	$LOS_D$		TBD		dBm	
LOS Hysteresis	$LOS_H$		TBD		dB	

## Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Power Consumption	P			3.5	W	
Supply Current	$I_{CC}$			1200	A	

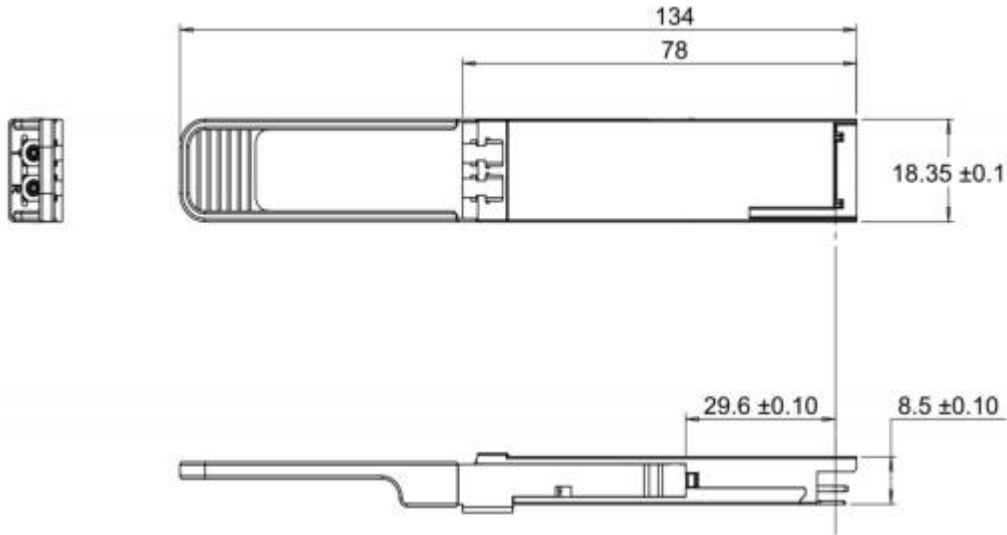
## Block-Diagram-of- Transceiver



### Functions Description

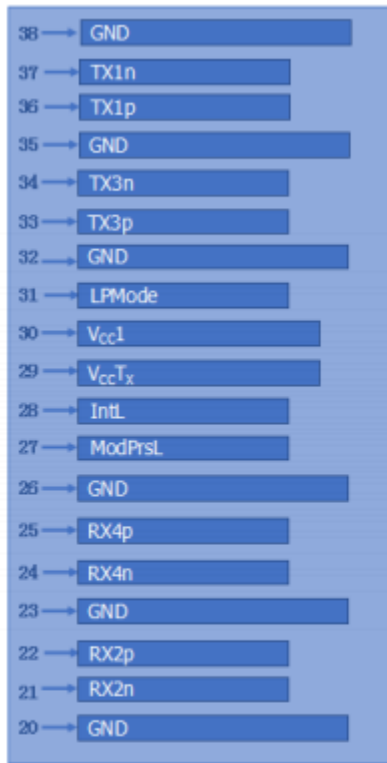
This product converts the 4-channel 25Gb/s electrical input data into CWDM optical signals (light), by a driven 4-wavelength distributed Feedback Laser array. The light is combined by the MUX parts as a 100Gb/s data, propagating out of the transmitter module from the SMF. The receiver module accepts the 100Gb/s CWDM optical signals input, and de-multiplexes it into 4 individual 25Gb/s channels with different wavelength. Each wavelength light is collected by a discrete photo diode, and then outputted as electric data after amplified by a TIA.

## Dimensions

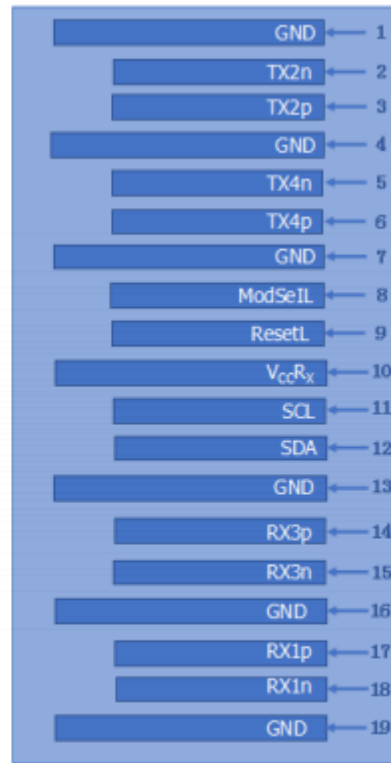


ALL DIMENSIONS ARE  $\pm 0.2$ mm UNLESS OTHERWISE SPECIFIED  
UNIT: mm

## Electrical Pad Layout



Top Board



Bottom Board

## Pin Assignment

PIN #	Symbol	Description	Remarks
1	GND	Ground	5
2	Tx2n	Transmitter Inverted Data Input, LAN2	
3	Tx2p	Transmitter Non-Inverted Data Input, LAN2	
4	GND	Ground	5
5	Tx4n	Transmitter Inverted Data Input, LAN4	
6	Tx4p	Transmitter Non-Inverted Data Input, LAN4	
7	GND	Ground	5
8	ModSelL	Module select pin, the module responds to two-wire serial communication when low level	1
9	ResetL	Module Reset	2
10	V <sub>cc</sub> R <sub>X</sub>	+3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	5
14	Rx3p	Receiver Non-Inverted Data Output, LAN3	
15	Rx3n	Receiver Inverted Data Output, LAN3	
16	GND	Ground	5
17	Rx1p	Receiver Non-Inverted Data Output, LAN1	
18	Rx1n	Receiver Inverted Data Output, LAN1	
19	GND	Ground	5
20	GND	Ground	5
21	Rx2n	Receiver Inverted Data Output, LAN2	
22	Rx2p	Receiver Non-Inverted Data Output, LAN2	
23	GND	Ground	5
24	Rx4n	Receiver Inverted Data Output, LAN4	
25	Rx4p	Receiver Non-Inverted Data Output, LAN4	
26	GND	Ground	5
27	ModPrsL	The module is inserted into the indicate pin and grounded in the module.	3
28	IntL	Interrupt	4
29	V <sub>cc</sub> T <sub>X</sub>	+3.3V Power Supply transmitter	
30	V <sub>cc1</sub>	+3.3V Power Supply	
31	LPMMode	Low Power Mode	5
32	GND	Ground	5



33	Tx3p	Transmitter Non-Inverted Data Input, LAN3	
34	Tx3n	Transmitter Inverted Data Input, LAN3	
35	GND	Ground	5
36	Tx1p	Transmitter Non-Inverted Data Input, LAN1	
37	Tx1n	Transmitter Inverted Data Input, LAN1	
38	GND	Ground	5

**Notes:**

1. ModSelL is the input pin. The module responds to 2-wire serial communication commands when it is held low by the host. ModSelL allows multiple QSFP modules to be used on a single 2-wire interface bus. If ModSelL is High, the module will not respond to any 2-wire interface communication from the host. ModSelL has internal pull-up resistors in the module
2. The module restart pin, when the low level on the ResetL pin lasts longer than the minimum pulse length, resets the module and restores all user modules to their default state. When performing reset device, the host should ignore all status bits. Until the module reset interrupt is completed, please note that during hot plugging, the module will issue this information to complete the reset interrupt without resetting
3. This pin is active high, indicating that the module is running under a low power module.
4. IntL is the output pin, which is the open collector output and must be pulled up to Vcc on the motherboard. When it is low, it indicates that the module may malfunction. The host uses a 2-wire serial interface to identify the interrupt source
5. Circuit ground is internally isolated from chassis ground.

**References**

1. 100G CWDM4 MSA Specification
2. QSFP28 MSA