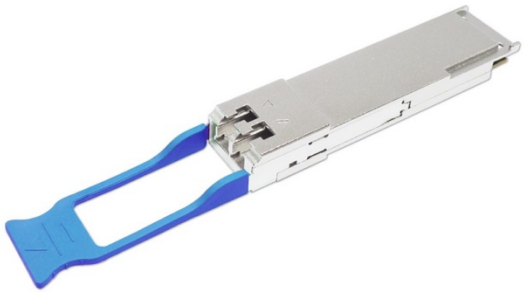
RoHS compliant
CL-QSFP+_ZR4
40Gb/s 80km QSFP+ Transceiver
Hot Pluggable, Duplex LC Connector, Single mode



Features

- Support line rates from 41.2 Gb/s;
- Lane bit rate 10.3125 Gb/s
- Up to 100km transmission on single mode fiber.
- LAN WDM EML laser and PIN receiver with SOA;
- Support Multi-Pin function with IntL/RxLOSL and LPMode/TxDIS;
- High speed I/O electrical interface (CAUI-4);
- I2C interface with integrated Digital Diagnostic monitoring;
- QSFP+ MSA package with duplex LC connector;
- Single +3.3V power supply;
- Maximum power consumption 6 W;
- Operating case temperature: 0 to +70 °C;
- Complies with EU Directive 2015/863/EU;

Applications

- 40GBASE-ZR4
- 40G Datacom& Telecom connections

Ordering Information

PART NUMBER	INPUT/OUTPUT	SIGNAL DETECT	VOLTAGE	TEMPERATURE
CL-QSFP+_ZR4	AC/AC	TTL	3.3V	0°C to 70 °C

RoHS compliant
CL-QSFP+_ZR4
40Gb/s 80km QSFP+ Transceiver
Hot Pluggable, Duplex LC Connector, Single mode

Carelink CL-QSFP+_ZR is designed for 80km optical communication applications. This module contains 4-lane optical transmitter, 4-lane optical receiver and module management block including 2 wire serial inter-face. The optical signals are multiplexed to a single-mode fiber through an commercial standard LC connector.

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	+85	°C
Maximum Supply Voltage	VCC	-0.5	3.6	V
Operating Relative Humidity	RH		85	%

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T_C	0		+70	°C	
Power Supply Voltage	V_{CC}	3.13	3.3	3.47	V	
Power Supply Current	I_{CC}			1.82	A	
Maximum Power Dissipation	P_D			6	W	
Aggregate Bit Rate	BR_{AVE}		41.2		Gb/s	
Lane Bit Rate	BR_{LANE}		10.3125		Gb/s	
Transmission Distance	TD			80	km	
Coupled fiber	Single mode fiber					9/125um SMF

III. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Signaling Speed per Lane			10.3125		Gbps	
Lane Wavelengt	L0	1294.53	1295.56	1296.59	nm	
	L1	1299.02	1300.05	1301.09	nm	
	L2	1303.54	1304.58	1305.63	nm	
	L3	1308.09	1309.14	1310.19	nm	
Total Launch Power,	P_T			12.5	dBm	1
Average Launch Power per Lane,	Pavg	2		6.5	dBm	1
OMA, each Lane	P_{OMA}	3.6		8.2	dBm	1
Difference in launch power between any two lanes(Average and OMA) between any Two Lanes (OMA)	Ptx,diff			3	dB	
Average Output Power (Laser Turn off)	P_{off}			-30	dBm	
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio, 40GE	ER	8			dB	
RIN20OMA	RIN			-130	dB/Hz	
Optical Return Loss Tolerance	TOL			20	dB	
Transmitter Reflectance	R_T			-12	dB	
Optical Eye Mask	{0.25,0.4, 0.45, 0.25, 0.28, 0.4}				%	2
Receiver						
Signaling rate, each lane			10.3125		Gbps	
Center Wavelength Lane 0	λ0	1294.53	1295.56	1296.59	nm	
Center Wavelength Lane 1	λ1	1299.02	1300.05	1301.09	nm	
Center Wavelength Lane 2	λ2	1303.54	1304.58	1305.63	nm	
Center Wavelength Lane 3	λ3	1308.09	1309.14	1310.19	nm	
Damage threshold , each lane	Pdamage	-6			dBm	
Average Receive Power, each lane		-26		-6	dBm	3
Receiver sensitivity Average, each lane	SEN			-26	dBm	3
Los Assert	LosA	-40			dBm	
Los De-assert	LosDA			-28	dBm	

Note:

1. The optical power is launched into SMF.
2. Measured with a PRBS 2^{31}-1 test pattern @10.3125 Gb/s.
3. Measured with a PRBS 2^{31}-1 test pattern @10.3125 Gb/s.

IV. Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter (Module Input)						
Data Rate, each lane			10.3125		Gbps	
Differential data input swing	Vpp	120		1200	mV	1
Transition time	Trise/Tfall	28			ps	2
Receiver (Module Output)						
Data Rate, each lane			10.3125		Gbps	
Common Mode Noise, RMS	Vrms			7.5	mV	
Differential output voltage swing	Vout, pp	400		1200	mV	
Differential Termination Resistance Mismatch				5	%	1
Transition time	Trise/Tfall	28			ps	

Notes:

1. At 1 MHz.

2. 20%~80%.

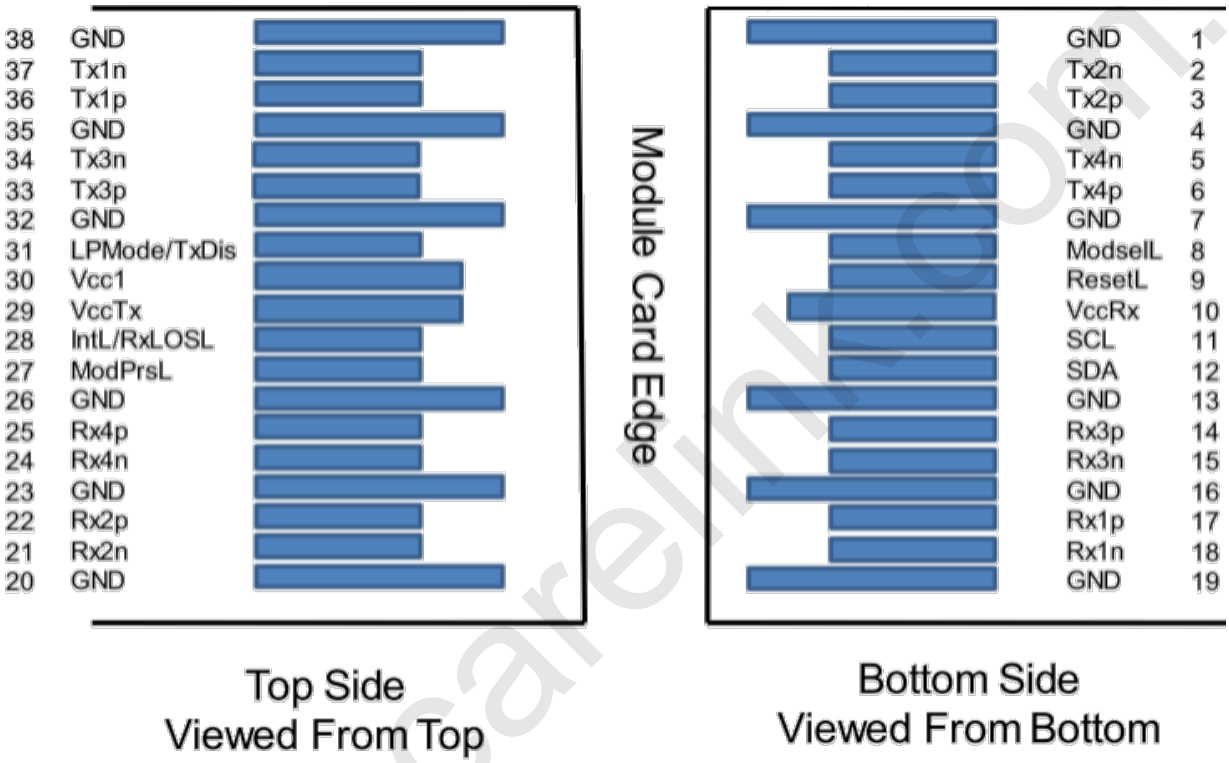
V. Digital Diagnostics

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70	°C	±3°C	Internal / External
Voltage	3.0 to 3.6	V	±3%	Internal / External
Bias Current	30 to 100	mA	±10%	Internal / External
TX Power	2 to 6.5	dBm	±3dB	Internal / External
RX Power	-26 to -6	dBm	±3dB	Internal / External

Note:

The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA). The diagnostic information with internal calibration or external calibration all are implemented, including received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring.

VI. Pin Diagram



VII. Pin Descriptions

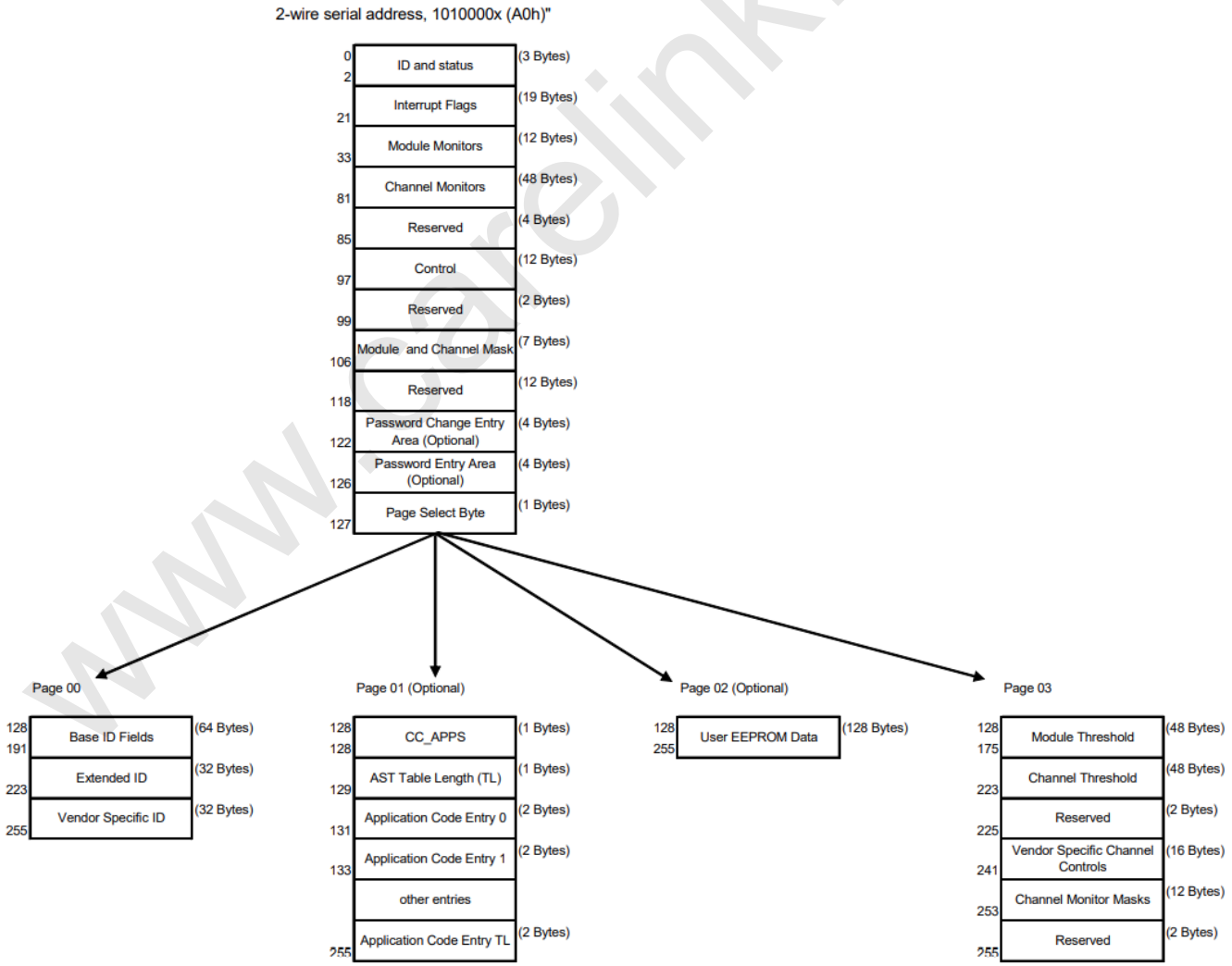
PIN	Logic	Symbol	Description	Plug Seq.	Notes
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	

6	CML-I	Tx4p	Transmitter Non-Inverted Data output	3	
7		GND	Ground	1	1
8	LVTLL-I	ModSelL	Module Select	3	
9	LVTLL-I	ResetL	Module Reset	3	
10		VccRx	+3.3V Power Supply Receiver	2	2
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	3	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data	3	
13		GND	Ground	1	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	1
20		GND	Ground	1	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	1
24	CML-O	Rx4n	Receiver Inverted Data Output	3	1
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	1
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL/Rx_LOS	Interrupt/Rx_LOS	3	
29		VccTx	+3.3 V Power Supply transmitter	2	2
30		Vcc1	+3.3 V Power Supply	2	2
31	LVTTL-I	LPMode/TxDIS	Low Power Mode/Tx_Disable	3	

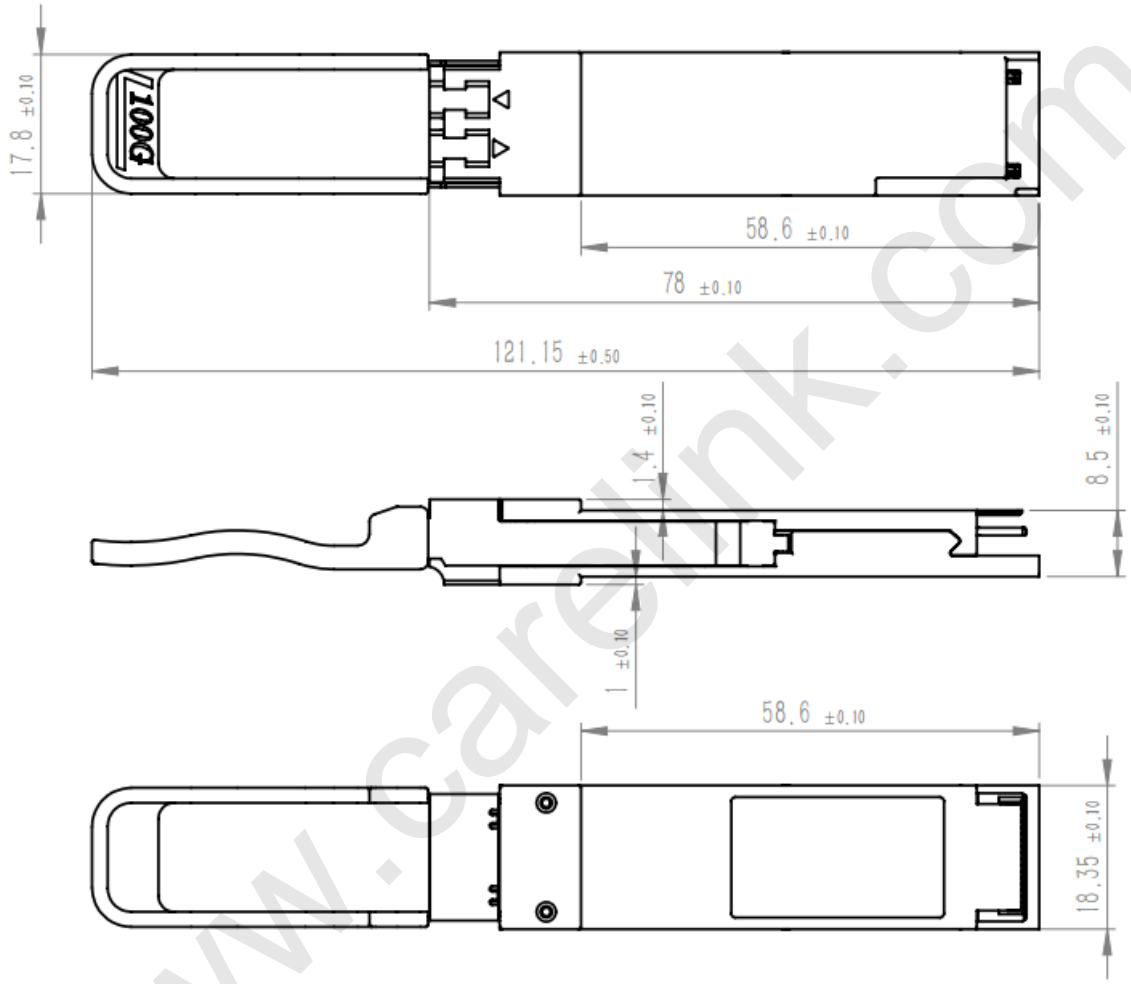
32		GND	Ground	1	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Output	3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Output	3	
38		GND	Ground	1	1

VIII. EEPROM Information

EEPROM memory map specific data field description is as below



IX. Mechanical Specifications(Unit: mm)



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