LQP100-CWDM4

QSFP28 100Gb/s CWDM4 2km DDM

PRODUCT FEATURES

- Supports 103.1Gb/s aggregate bit rate
- 4x25Gb/s electrical interface
- 4X25Gb/s CWDM transmitter and PIN/TIA receiver
- Maximum link length of 2km on Single Mode Fiber (SMF)
- Hot-pluggable QSFP28 from factor
- Single 3.3V power supply
- Integrated 4-channel CWDM mux/Demux

  for duplex LC operation
- Duplex LC receptacles
- Maximum power dissipation<3.5W
- RoHS-6 compliant and lead-free
- I^2C management interface
- Case operating temperature

  Commercial: 0°C to +70°C

APPLICATIONS

- 100 Gigabit Ethernet

Compliance

- QSFP28 MSA.
- IEEE802.3bm
- SFF-8665
- RoHS

PRODUCT DESCRIPTION

LQP100-CWDM4 QSFP28 transceiver modules are designed for use in 100 Gigabit Ethernet links over multimode fiber. They are compliant with the QSFP28 MSA,CWDM4 MSA and IEEE 802.3bm.Digital diagnostic functions are available via an I2C interface, as specified by the QSFP28 MSA. The optical transceiver is compliant per the RoHS Directive 2011/65/EU.

Ordering information

Package	Product part NO.	Data Rate(Gbps)	Media	Wavelength(nm)	TransmissionDistance(km)	Temperature Range (℃)	
QSFP28	LQP100-CWDM4	4X25	Single-mode fiber	1271nm 1291nm 1311nm 1331nm	2	0~70	Commercial

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Storage Temperature	T_S	-40		85	ºC	
Storage Ambient Relative Humidity	H_A	0		85	%	
Maximum Supply Voltage	V_{CC}	-0.5		3.6	V	
Lead Soldering Temperature/Time	TSOLD			260/10	ºC/sec	1
Lead Soldering Temperature/Time	TSOLD			360/10	ºC/sec	2

Note:

1.Suitable for wave soldering.

2. Only for soldering by iron.

II. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Transmitter(per lane)						
Signaling Speed per Lane			25.78125 ± 100 ppm		Gb/s	1
Center Wavelength	λC	--	1264.5 – 1277.5 1284.5 – 1297.5 1304.5 – 1317.5 1324.5 – 1337.5	--	nm	
Extinction ratio	ER	3.5	--	--	dB	

Side Mode Suppression Ratio	SMSR	30	--	--	dB	
Total average launch power	Ptot	--	--	8.5	dBm	
Average launch power, each lane	Po	-6.5	--	2.5	dBm	
OMA, each lane	OMA	-4	--	2.5	dBm	CW,ER>3.5dB
Difference in launch power between any two lanes (OMA)				5	dB	
TDP, each lane	TDP			3.0	dB	2
Average launch power of OFF transmitter, each lane	Poff			-30	dBm	
Transmitter eye mask definition {X1,X2,X3,Y1,Y2,Y3}		{0.31, 0.40, 0.45, 0.34, 0.38, 0.4}				3
Receiver(per lane)						
Signaling Speed per Lane		25.78125 ± 100 ppm			Gb/s	4
Input Optical Wavelength	λ_{IN}		1264.5 – 1277.5 1284.5 – 1297.5 1304.5 – 1317.5 1324.5 – 1337.5		nm	
Damage threshold		3.5			dBm	
Receiver Power (OMA), each Lane		2.5			dBm	
Rx Sensitivity(OMA) per lane	R_{SENS}			-10	dBm	5
Stressed receiver sensitivity (OMA), each lane	SRS			-7.3	dBm	6
Conditions of stressed receiver sensitivity test:						
Vertical eye closure penalty, each lane	VECP	1.9		dB		
Stressed eye J2 jitter, each lane	J2	0.33		UI		
Stressed eye J4 jitter, each lane	J4	0.48		UI		
SRS eye mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.39, 0.50, 0.50, 0.39, 0.39, 0.4}				
Loss of Signal Assert	P_A	-24		-13.6	dBm	
Loss of Signal De-assert	P_D			-11.6	dBm	
LOS Hysteresis	P_D - P_A	0.5		6	dB	

Note :

1.Transmitter consists of 4 lasers operating at 25.78Gb/s each.

2.TDP value does not include MPI penalty.

3. Hit ratio of 5x10-5, per IEEE.

4. Receiver consists of 4 photodetectors operating at 25.78Gb/s each.

5.Sensitivity is specified at 5x10-5 BER.

6.Measured with CWDM4 MSA2 conformance test signal at TP3 for 5x10-5 BER.

III. Digital Diagnostic Functions

LQP100-CWDM4 QSFP28 transceivers support the I2C-based diagnostics interface specified by the QSFP28 MSA.

IV. Electrical Interface Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Supply Voltage	V_{CC}	3.135		3.465	V	
Supply Current	I_{CC}			1.12	A	
Module total power	P			3.5	W	1
Transmitter						
Signaling rate per lane		25.78125±100ppm			Gb/s	
Differential data input swing per lane	Vin,pp	900			mV	
Differential input return loss(min)	RLd(f)	9.5 – 0.37f, 0.01≤f<8 4.75-7.4log10(f/14), 8≤f<19			dB	
Differential to common mode input return loss(min)	RLdc(f)	22-20(f/25.78), 0.01≤f<12.89 15-6(f/25.78), 12.89≤f<19			dB	
Differential termination mismatch				10	%	
Eye width			0.46		UI	
Applied pk-pk sinusoidal Jitter		Per IEEE802.3bm Table 88-13				
Eye height			95		mV	
Receiver						
Signaling rate per lane		25.78125±100ppm			Gb/s	
Differential data output swing	Vout,pp	100		400	mVpp	2
		300		600		
		400	600	800		
		600		1200		
Eye width		0.57			UI	

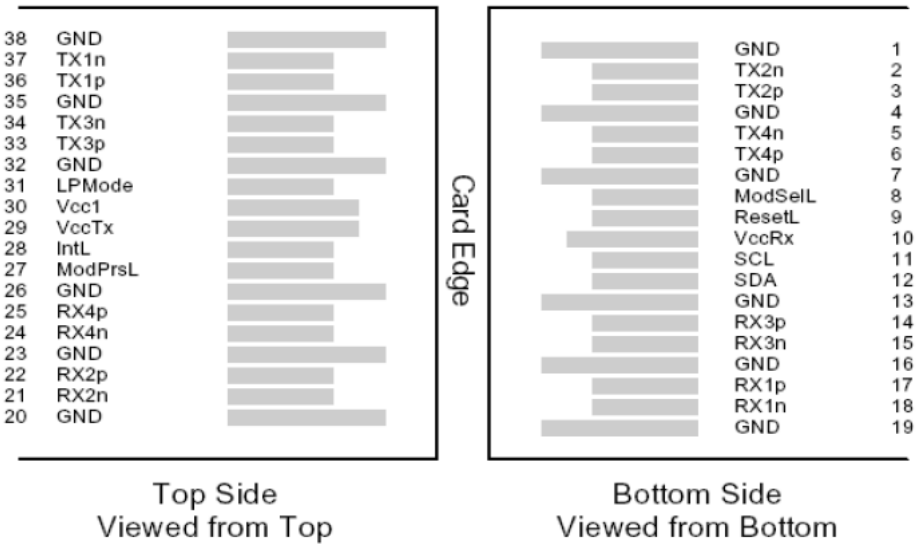
Vertical eye closure	VEC			5.5	dB	
Differential output return loss (min)	RLd(f)	9.5 – 0.37f, 0.01≤f<8 4.75 – 7.4log10(f/14), 8 ≤f<19			dB	
Common to differential mode conversion return loss (min)	RLdc(f)	22-20(f/25.78), 0.01≤f<12.89 15-6(f/25.78), 12.89≤f<19			dB	
Differential termination mismatch				10	%	

Note :

1.Maximum total power value is specified across the fulltemperature and voltage range.

2.Output voltage is settable in 4 discrete range via I2C.Default range is Range 2 (400 – 800mV).

V. Pin Diagram



QSFP28-compliant 38-pin connector (per SFF-8679)

VI. Pin Descriptions

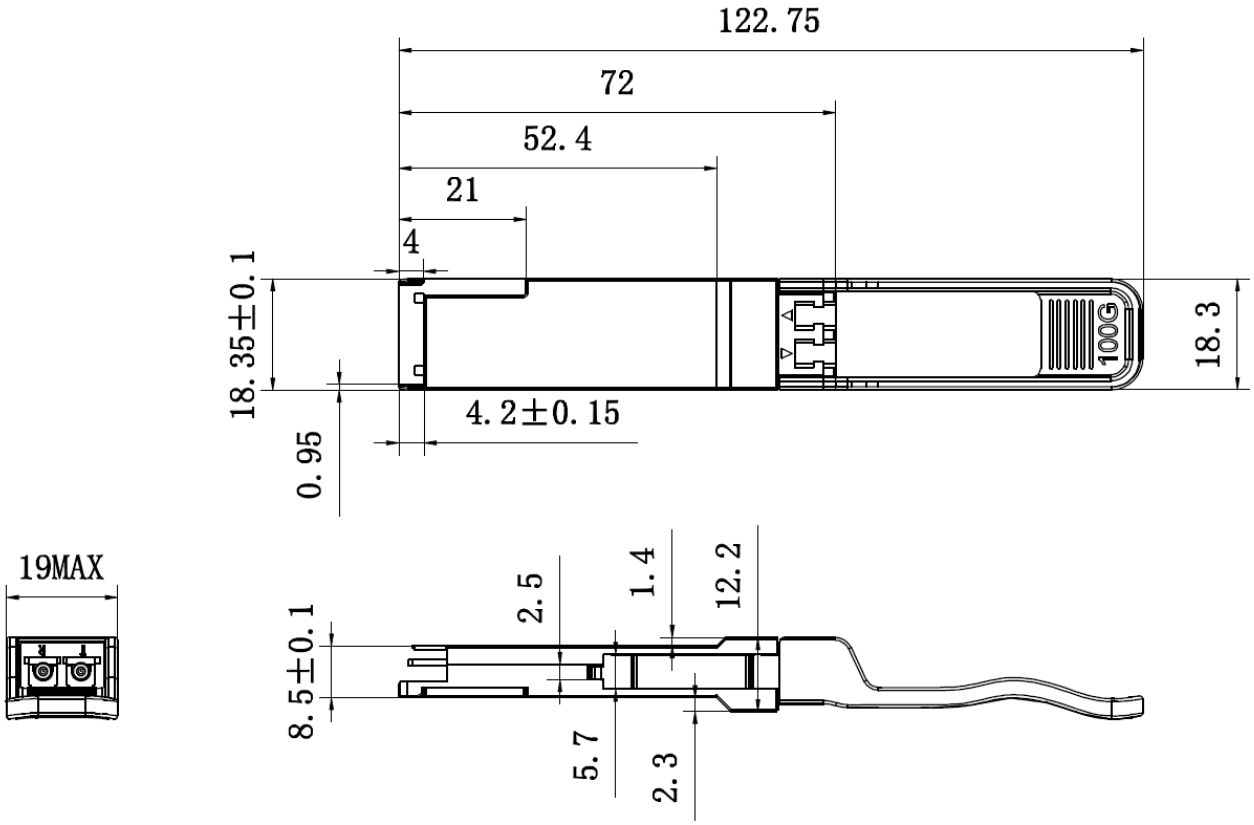
Pin	Symbol	Name/Description	Ref.
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	1

8	ModSe1L	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3V Power supply receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	1
20	GND	Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrSL	Module Present	
28	IntL	Interrupt	
29	VccTx	+3.3V Power supply transmitter	
30	Vcc1	+3.3V Power Supply	
31	LPMode	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	1

Note：

1. Circuit ground is internally isolated from chassis ground.

VII. Mechanical Specifications(Unit: mm)



Revision History

Version No.	Date	Description
1.0	June 24, 2020	Preliminary datasheet