

100Gbps CWDM4 2Km QSFP28 Optical Transceiver Module

S-QP1ACWL2K-CD

Features

- Hot Pluggable QSFP28 form factor
- Supports aggregate bit rate up to 103.1Gb/s
- LC Duplex optical interface
- 4x25G/s CWDM transmitter, PIN array detector
- Low power consumption <3.5W
- Applicable for 2km SMF connection
- All-metal housing for superior EMI performance
- IIC management interface
- Single +3.3V power supply
- Operating Temperature:0 to +70°C
- RoHS compliant (lead free)

Applications

- 100G ethernet
- Other optical links

Standards

- IEEE 802.3bm
- SFF-8636, SFF-8665, SFF-8679

Description

100Gbps CWDM4 QSFP28 transceiver is designed to meet the requirements of 100G data links over SMF up to 2km. It is compliant with QSFP28 MSA, 100G CLR4, CWDM4 MSA and IEEE 802.3bm. It is cost-effective, low power consumption with a single 3.3V power supply. The module has an aggregate bit rate up to 103.1Gbps by multiplexing of 4 independent CWDM optical lanes, each lane capable of transmitting 25.78125Gb/s over 2km SMF. It is fabricated with all-metal and compact size housing for superior EMI performance.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Power Supply Voltage	Vcc	-0.5		4	V
Storage Temperature Range	Ts	-40		85	°C
Relative Humidity - Storage	RH _s	0		95	%
Relative Humidity - Operating	RH _o	0		85	%

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Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Case Operating Temperature Range	T _c	0	-	70	°C
Power Supply Voltage	V _{cc}	3.14	3.3	3.47	V
Total Power Consumption	P	-	-	3.5	W
Data Rate	BR	-	25.78125	-	Gbps

Electrical Characteristics

Transmitter Electrical Characteristics					
Parameter	Symbol	Min	Typ	Max	Unit
Differential Input Voltage Swing	V _{IN}	180	-	900	mV
Tx Differential Input Impedence	Z _{IN}	-	100	-	Ω
Differential termination mismatch		-	-	10	%
Differential input return loss		Per 100G CLR4 MSA			dB
Common mode input return loss		Per 100G CLR4 MSA			dB
Receiver Electrical Characteristics					
Parameter	Symbol	Min	Typ	Max	Unit
Differential output Voltage Swing	V _{OUT}	300	-	1200	mV
Rx Differential Output Impedence	Z _{OUT}	-	100	-	Ω
Differential termination mismatch		-	-	10	%
Differential output return loss		Per 100G CLR4 MSA			dB
Common mode output return loss		Per 100G CLR4 MSA			dB

Optical Characteristics

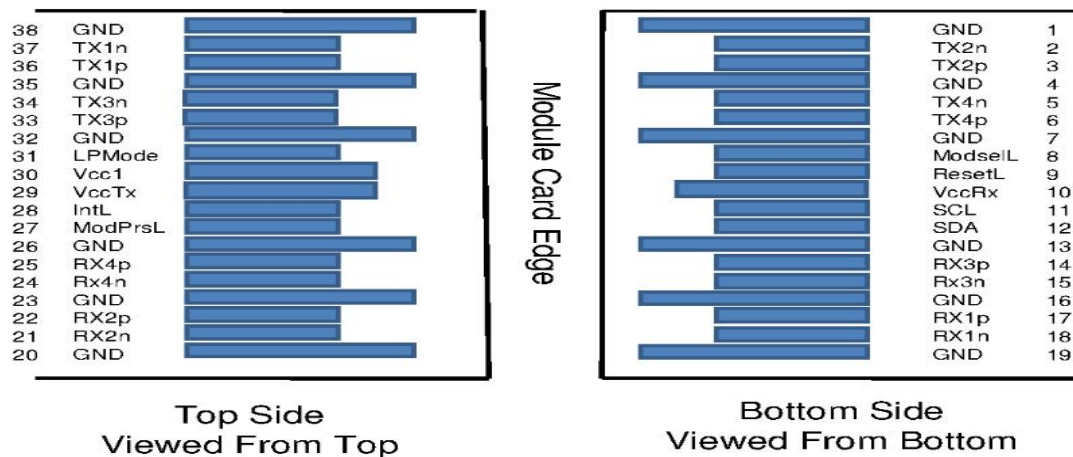
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter Characteristics						
Signaling rate per lane		25.78125			GBd	1
Lane center wavelengths(range)	λ	1264.5	1271	1277.5	nm	
		1284.5	1291	1297.5		
		1304.5	1311	1317.5		
		1324.5	1331	1337.5		
Total Average Launch Power	P _{out}			10.5	dBm	
Average Launch Power per Lane	TXP _x	-6.5		2.5	dBm	

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Extinction Ratio		ER	3.5			dB	
Sidemode Suppression ratio		SMSR	30			dB	
Relative Intensity Noise		RIN			-130	dB/Hz	
Transmitter Reflectance					-12	dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}			{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				1
Receiver Characteristics							
Signaling rate per lane			25.78125			GBd	3
Lane center wavelengths(range)		λ	1264.5	1271	1277.5	nm	
			1284.5	1291	1297.5		
			1304.5	1311	1317.5		
			1324.5	1331	1337.5		
Receive Saturation (OMA) per Lane		Rmax	2.5				
Unstressed Receiver Sensitivity (OMA) per Lane		Rxsens			-10	dBm	1, 2, 3
Receiver Reflectance					-26	dB	
LOS	Optical De-assert	Pd			-11.6	dBm	
	Optical Assert	Pa	-24		-13.6		
LOS hysteresis			0.5			dB	
Notes							
1. Hit ratio 5E-5. 2. Measured with a PRBS 2 ³¹ -1 test pattern, @25.78Gb/s, BER<5E-5, for each channel. 3. Minimum value is informative, equals min Tx OMA with infinite ER and max channel insertion loss. 4. Power value and power accuracy are with all channels on							

Pin Definitions



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Pin	Symbol	Name/Description	Notes
1	GND	Ground.	
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground.	
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground.	
8	ModSelL	Module Select.	
9	ResetL	Module Reset.	
10	VccRx	3.3V Power Supply Receiver.	1
11	SCL	2-Wire serial Interface Clock.	
12	SDA	2-Wire serial Interface Data.	
13	GND	Ground.	
14	Rx3p	Receiver Non-Inverted Data Output.	
15	Rx3n	Receiver Inverted Data Output.	
16	GND	Ground.	
17	Rx1p	Receiver Non-Inverted Data Output.	
18	Rx1n	Receiver Inverted Data Output.	
19	GND	Ground.	
20	GND	Ground.	
21	Rx2n	Receiver Inverted Data Output.	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground.	
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground.	
27	ModPrsl	Module Present	
28	IntL	Interrupt	
29	VccTx	3.3V power supply.	1
30	Vcc1	3.3V power supply.	1
31	LPMode	Low Power Mode	

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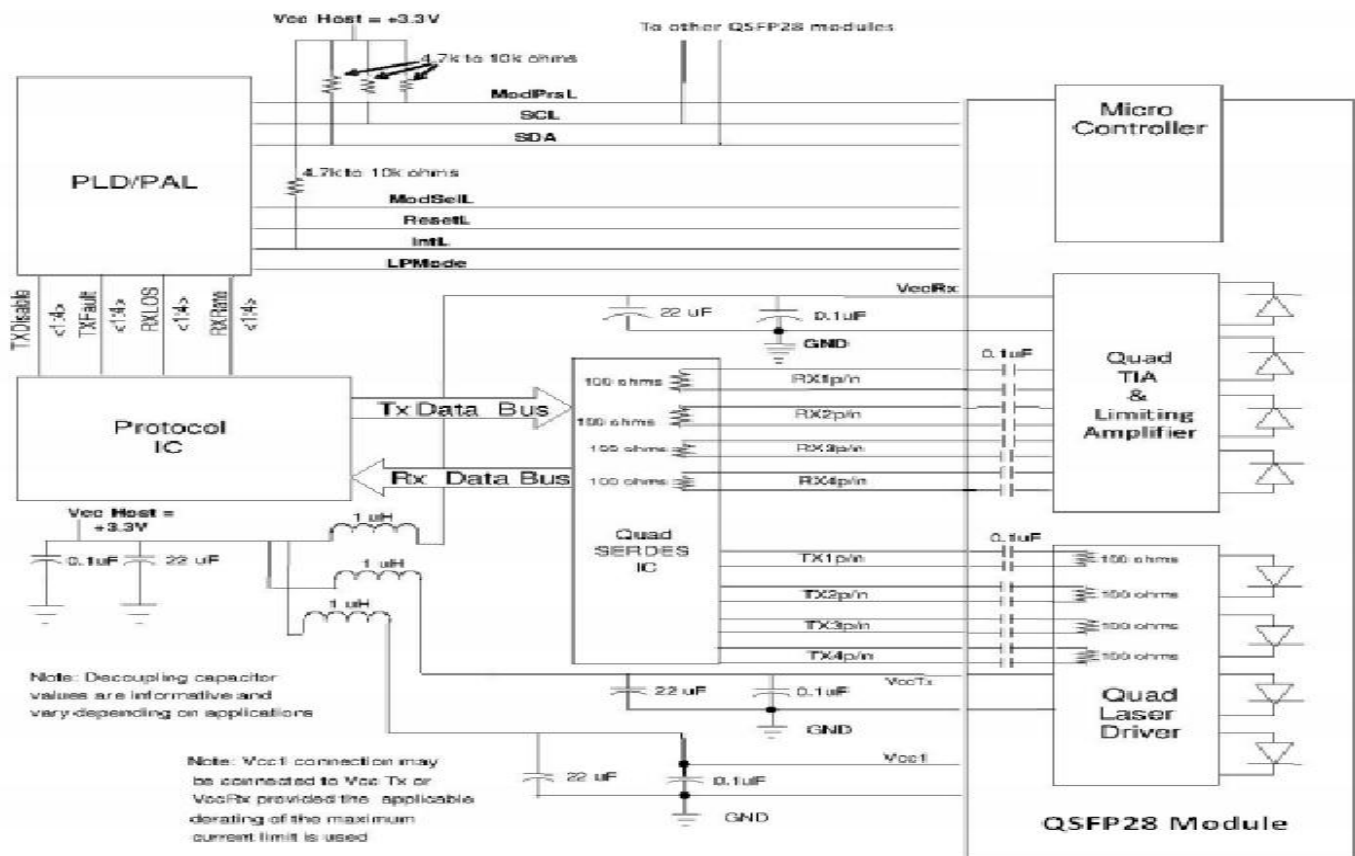
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32	GND	Ground.	
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground.	
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground.	

Notes:

1. VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown below. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP28 transceiver module in any combination.

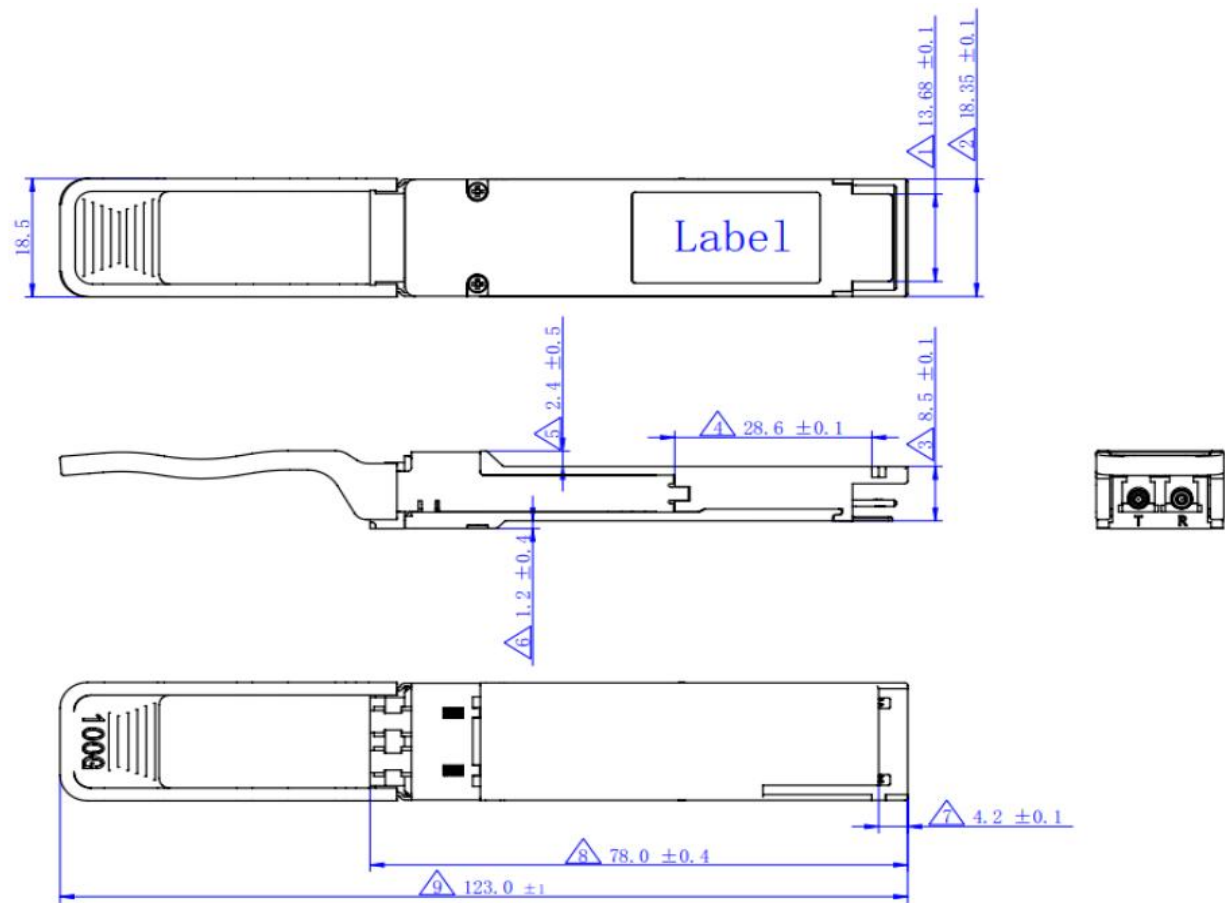
Recommended Interface Circuit



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Mechanical Dimensions



Ordering information

Part Number	Product Description
S-QP1ACWL2K-CD	QSFP28, 100Gbps,1271 -1331nm, SM, LC,2km, 0°C~+70°C, With DDM,