100Gbps PSM4 2Km QSFP28 Optical Transceiver Module

S-QP1A31M2K-CD

Features

- Hot Pluggable
- Support line rates from 103.125 Gbps to 111.81 Gbps
- Digital Diagnostics Monitoring Interface
- Up to 2km reach over SMF
- No external reference clock
- Compliant with QSFP28 MSA with MPO Receptacle
- Power dissipation < 3.5 W
- Operating Temperature:0 to +70°C
- RoHS compliant (lead free)

Applications

- 100G Ethernet
- Data center
- Infiniband QDR
- Fiber channel

Standards

- Compliant to IEEE 802.3bm
- Compliant with SFP MSA
- Compliant to SFF-8636

Description

100G PSM4 QSFP28 single mode optical transceiver designed for optical communication applications. This product provides increased port density, offering four independent transmit and receive channels，Each channel operates at 25Gbps, resulting in an aggregate data rate of 100Gbps on 2km of single mode fiber，An optical fiber ribbon cable with an MTP/MPO connector can be plugged into the QSFP28 module receptacle，The guide pins inside the receptacle ensure proper alignment。

according to the QSFP28 Multi-Source Agreement (MSA)，The module can be managed through the I2C two-wire serial interface. The transmitter module accepts electrical input signals compatible with Common Mode Logic (CML) levels，All input data signals are differential and internally terminated. The receiver module converts parallel optical input signals via a photo detector array into parallel electrical output signals. The receiver module outputs electrical signals are also voltage compatible with Common Mode Logic (CML) levels. All data signals are differential and support a data rates up to 25Gb/s per channel.

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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	%

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Case Operating Temperature Range	Tc	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 Impendence	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 Impendence	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

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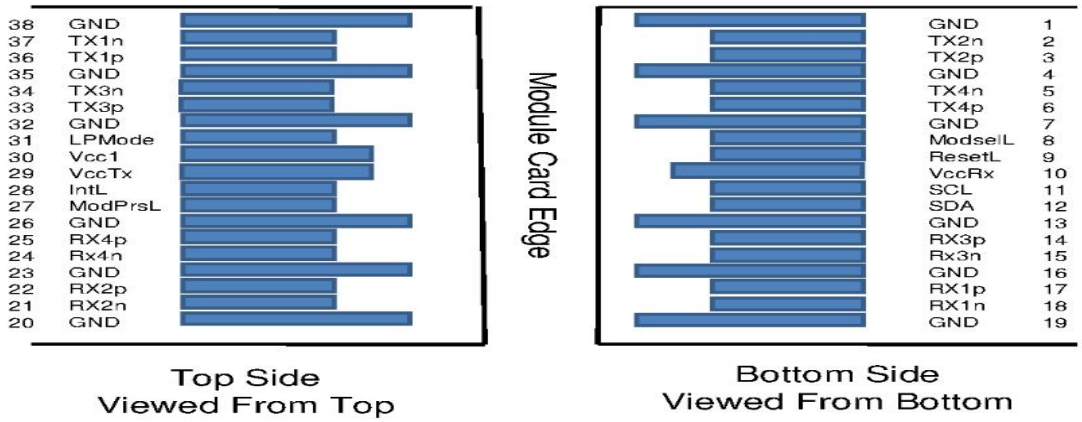
ptical Characteristics

Parameter		Symbol	Min	Typ	Max	Unit	Notes
Transmitter Characteristics							
Signaling rate per lane				25.78125		GBd	1
Lane center wavelengths(range)		λ	1260	1310	1355	nm	
Total Average Launch Power		Pout			9.5	dBm	
Average Launch Power per Lane		TXPx	-6.5		2.5	dBm	
Extinction Ratio		ER	3.5			dB	
Sidemode Suppression ratio		SMSR	30			dB	
Average launch Power off per lane		Poff			-30	dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}				{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}			
Receiver Characteristics							
Signaling rate per lane				25.78125		GBd	
Lane center wavelengths(range)		λ	1260		1355	nm	
Average receiver power，each lane		Rmax			3.5	dBm	
Unstressed Receiver Sensitivity (OMA) per Lane		Rxsens			-10.2	dBm	1
Input Saturation Power (Overload)		Psat	4.5			dBm	
Receiver Reflectance		Rr			-26	dB	
LOS	Optical De-assert	Pd			-12	dBm	
	Optical Assert	Pa	-18				
Notes							
1. Measured with a PRBS 231 -1 test pattern, @25.78Gb/s, BER<5*10-5							

Pin Definitions



Top Side
Viewed From Top

Bottom Side
Viewed From Bottom

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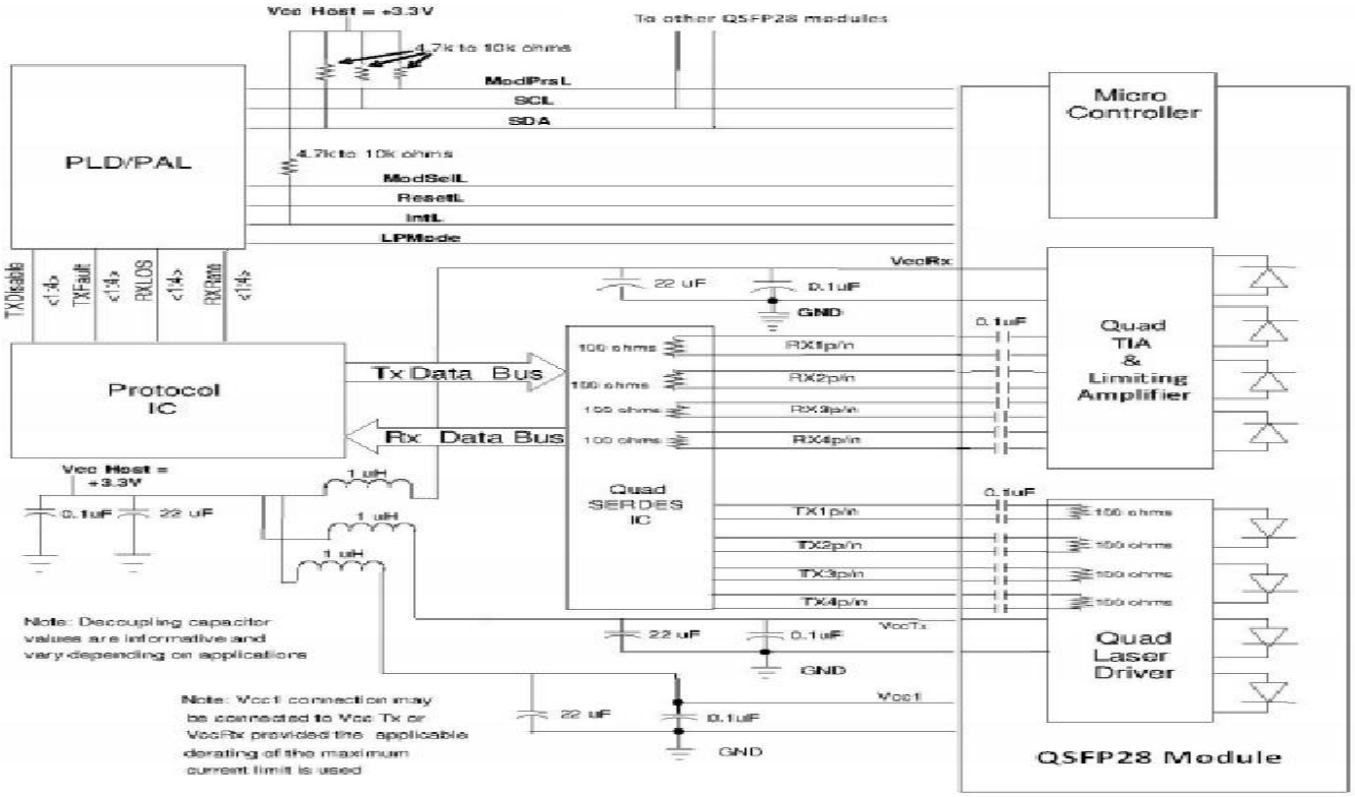
Pin	Symbol	Name/Description	Notes
1	GND	Ground.	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground.	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground.	1
8	ModSelL	Module Select.	
9	ResetL	Module Reset.	
10	VccRx	3.3V Power Supply Receiver.	2
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.	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	1
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground.	1
27	ModPrsl	Module Present	
28	IntL	Interrupt	
29	VccTx	3.3V power supply.	2
30	Vcc1	3.3V power supply.	2
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

Notes:

1. GND is the symbol for signal and supply (power) common for QSFP28 modules. All are common within the QSFP28 module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal common ground plane.
2. 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.

Recommended Interface Circuit



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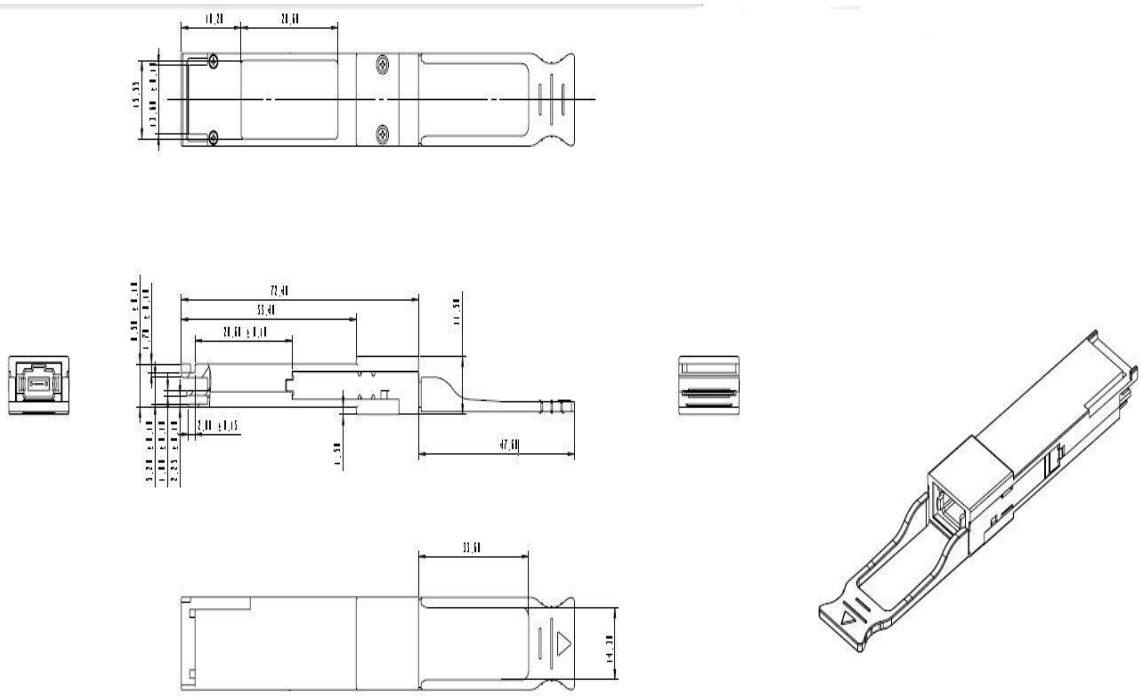
Mechanical Dimensions



Ordering information

Part Number	Product Description
S-QP1AC31M2K-CD	QSFP28, 100Gbps, PSM4,1310nm,SM,MPO,2km, 0ºC~+70ºC, With DDM,