

QP1H-SM31CR4C

QSFP28 100Gb/s CWDM4 2km Transceiver

PRODUCT 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
- Operating case temperature:0 to 70 °C
- 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
- RoHS compliant



APPLICATIONS

- 100G Ethernet
- Data center

PRODUCT DESCRIPTION

Shenzhen Photonics Valley QP1H-SM31CR4C 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.

Ordering information

Part Number	Data Rate (Gbps)	Media	Wavelength (nm)	Transmission Distance	Temperature Range (Tcase) (°C)	
QP1H-SM31CR4C	103.125	SMF	1271,1291,1311,1331	2km	0~70	Commercial

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	V _{cc}	-0.5		3.6	V
Storage Temperature	T _s	-40		85	°C
Humidity- Storage	RH _s	0		95	%
Humidity-Operating	RH _o	0		85	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	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

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter						
Laser Type		DFB				
Data Rate per lane	-	-	25.78125	-	Gb/s	
Lane Center Wavelength Range	λ	1264.5 - 1277.5			nm	
		1284.5 - 1297.5				
		1304.5 - 1317.5				
		1324.5 - 1337.5				
Link Length	L	2	-	2000	m	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Total Average launch Power	P _{TOTAL}	-	-	8.5	dBm	
Average Launch Power, each lane	P _{OUT}	-6.5	-	2.5	dBm	
Optical Modulation Amplitude (OMA), each lane	P _{OMA}	-4		2.5	dBm	

Launch Power in OMA minus TDP, each lane		-5	-	-	dBm	
Average Launch Power of OFF transmitter, each lane	P_{OFF}	-	-	-30	dBm	
Extinction Ratio	$\frac{E}{R}$	3.5	-	-	dB	
Transmit Reflectance	RFL	-	-	-12	dB	
Eye Diagram	Complies with 100G CLR4 eye masks when filtered					
Receiver						
Receiver Type		PIN				
Data Rate		-	25.78125	-	Gb/s	
Operating Central Wavelength	λ	1264.5 - 1277.5			nm	
		1284.5 - 1297.5				
		1304.5 - 1317.5				
		1324.5 - 1337.5				
Damage Threshold		3.5	-	-	dBm	
Receiver Sensitivity (OMA), each lane	Sen_{OMA}	-	-	-8.1	dBm	
Stressed Receiver Sensitivity (OMA), each lane	Sen_S	-	-	-5.6	dBm	1
Average Receive Power, each lane		-10	-	2.5	dBm	
Receiver Power, each lane (OMA)		-	-	2.5	dBm	
Receiver Reflectance	RFL	-	-	-26	dB	
LOS Assert	LOSA	-30	-	-	dBm	
LOS De-Assert	LOSD	-	-	-13	dBm	
LOS Hysteresis	LOSH	0.5	3	5	dB	
Notes						
1. BER=10 ⁻¹²						

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit
Transmitter					
Differential Input Voltage Swing	V_{IN}	180	-	900	mV
Tx Differential Input Impedence	Z_{IN}	-	100	-	Ω
Differential input return loss		Per 100G CLR4 MSA			dB
Common mode input return loss		Per 100G CLR4 MSA			dB
Receiver					
Differential output Voltage Swing	V_{OUT}	300	-	850	mV
Rx Differential Output Impedence	Z_{OUT}	-	100	-	Ω
Differential output return loss		Per 100G CLR4 MSA			dB
Common mode output return loss		Per 100G CLR4 MSA			dB

Pin Description

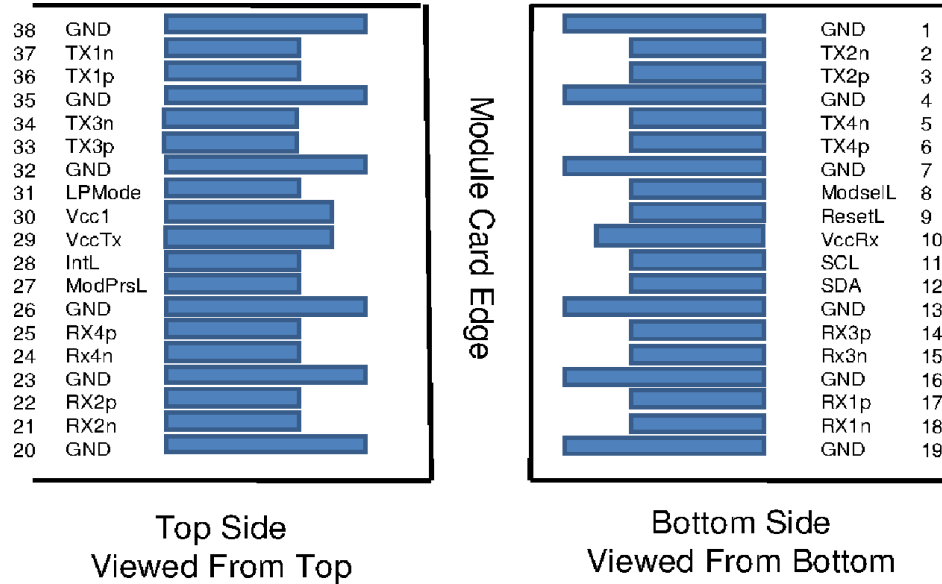
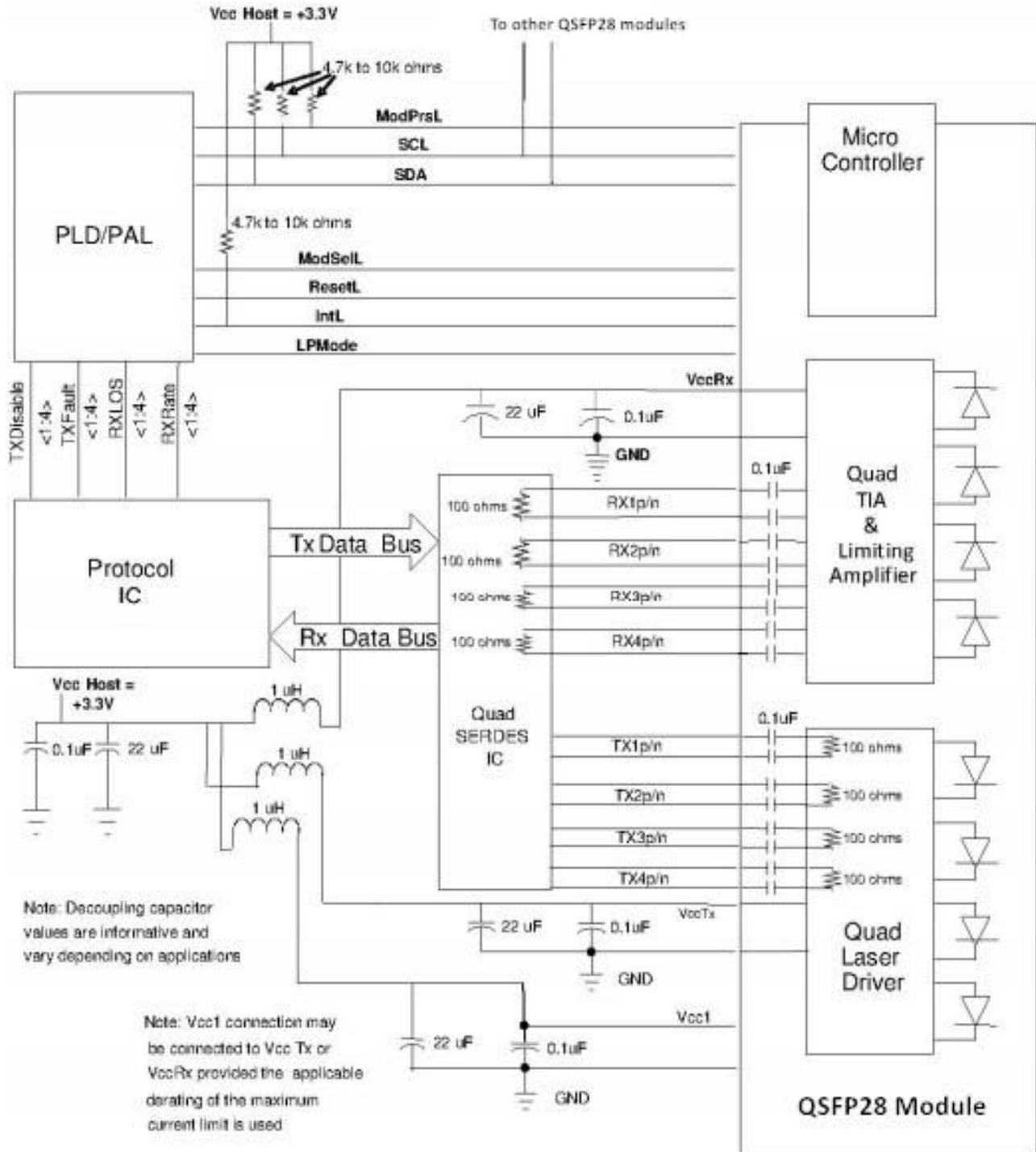


Diagram of Host Board Connector Block Pin Numbers and Name

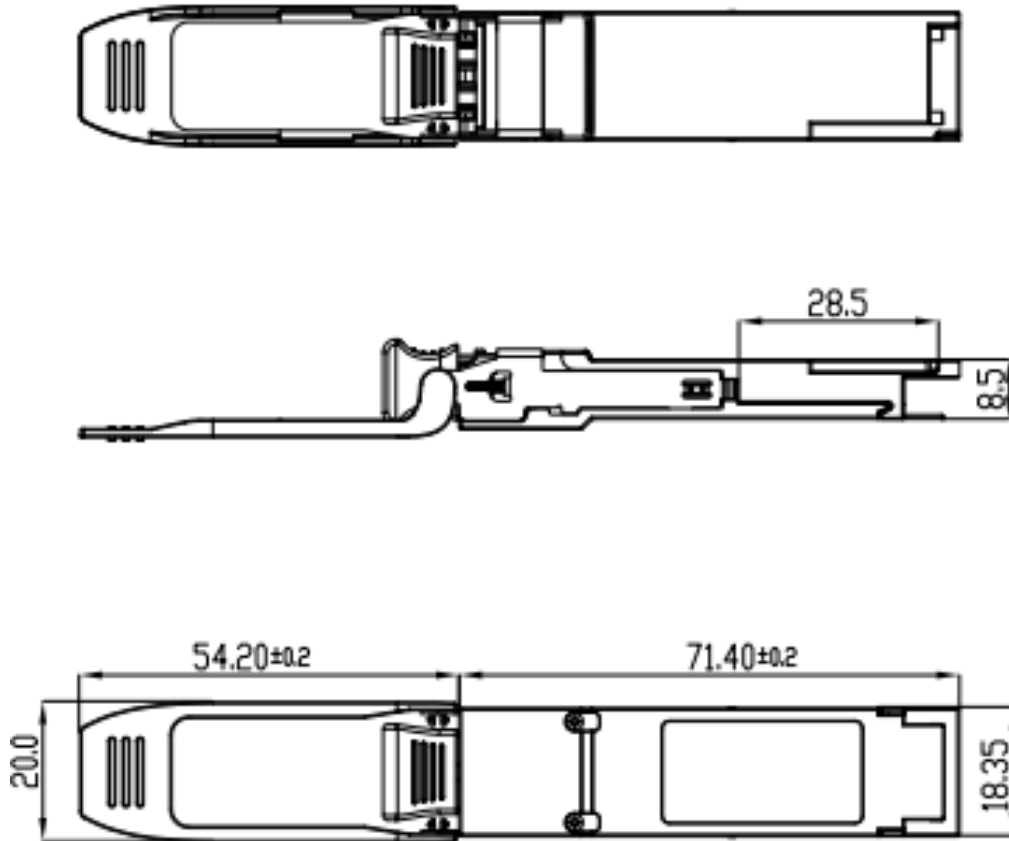
Pin	Symbol	Name/Description	Notes
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc 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	Vcc Tx	+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

Recommended Interface Circuit



Mechanical Dimensions



Regulatory Compliance

Agency	Standard	Certificate /Comments
CE-EMC	EN 55032: 2015	17706703 003
	EN 55024: 2010+A1	
REACH	REACH SVHC 197	68.420.19.0344.01
FCC	FCC Rules and Regulations Part 15 Subpart B Class B	MTi190422E141C
RoHS	2011/65/EU and amendment (EU) 2015/863	68.420.17.1030.01

