LinkPro™

LPCRLB31-K02C

QSFP56 200Gb/s FR4 2km DDM

PRODUCT FEATURES

- Up to 26.5625Gbps data rate per channel by PAM4 modulation
- 4 duplex channels transmitters and receivers
- Integrated CWDM LD and PD array
- Single +3.3V power supply
- DDM function implemented
- Hot-pluggable QSFP56 form factor
- Transmission length up to 2km
- Low power dissipation:<6.5W
- International class 1 lasar safety certified
- Operating temperature range: 0℃ ~ +70 ℃
- Compliant with ROHS10

APPLICATIONS

- 200GBASE-FR4 Ethernet
- Switch & Router Connections
- Data Centers
- Other 200G Interconnect Requirements

Compliance

- IEEE802.3cd
- CMIS Rev4.0
- OIF-CEI-04.0 56G-VSR-PSM4
- IEEE802.3bs Annex120E
- SFF-8024 Rev.4.6
- SFF-8679 Rev1.8
- SFF-8665 Rev1.9

Ordering information

Part NO.	Bit Rate (Gbps)	Laser (nm)	Distance (km)	Media	DDMI	Detector	Temp (℃)
LPCRLB31-K02C	212.5	1310	2	SMF	YES	PIN	0~70

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I. Pin Diagram

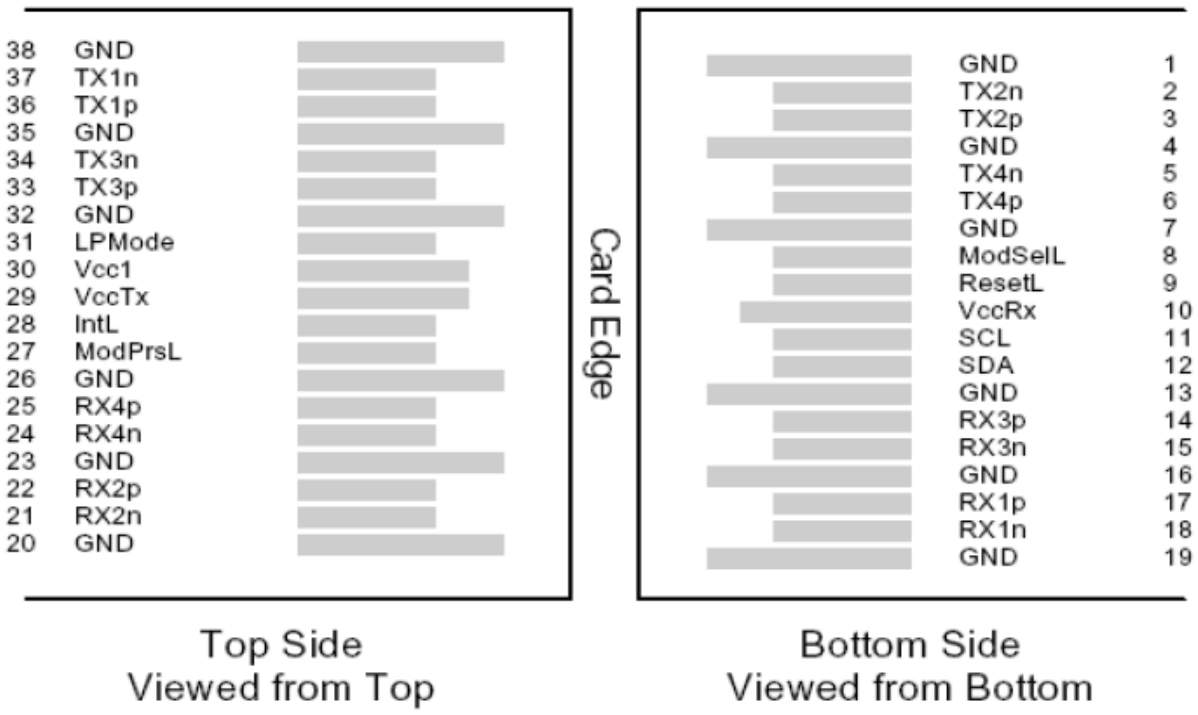


Figure 1. Electrical Pin-out Details

II. Pin Descriptions

Pin	Logic	Symbol	Name/Description	Ref.
1		GND	Module Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	
4		GND	Module Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	
7		GND	Module Ground	1
8	LVTTL-I	ModSe1L	Module Select	2
9	LVTTL-I	ResetL	Module Reset	2
10		Vcc Rx	+3.3V Power supply receiver	
11	LVCMOS-I	SCL	2-wire serial interface clock	2
12	LVCMOS-I/O	SDA	2-wire serial interface data	2
13		GND	Module Ground	1
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Module Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	

19		GND	Module Ground	1
20		GND	Module Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Module Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Module Ground	1
27	LVTTL-O	ModPrSL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		Vcc Tx	+3.3V Power supply transmitter	
30		Vcc1	+3.3V Power Supply	
31	LVTTL-I	LPMode	Low Power Mode	2
32		GND	Module Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Input	
35		GND	Module Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Input	
38		GND	Module Ground	1

Note：

1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector should be pulled up with 4.7K to 10K ohms on host board to a voltage between
   1. 3.15V and 3.46V

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Storage Temperature Range	T_S	-40		85	ºC	
Relative Humidity	H_A	5		85	%	
Power Supply Voltage	V_{CC}	-0.5		4.0	V	

II. Recommended Operating Conditions

Data Rate Spcifications	Symbol	Min.	Typ.	Max.	Unit	Ref.
Supply Voltage	Vcc	3.135	3.3	3.465	V	
Baud Rate(per channel)	BR		26.5625		GBd	
Operating Case Temperature Range	Tc	0		70	℃	

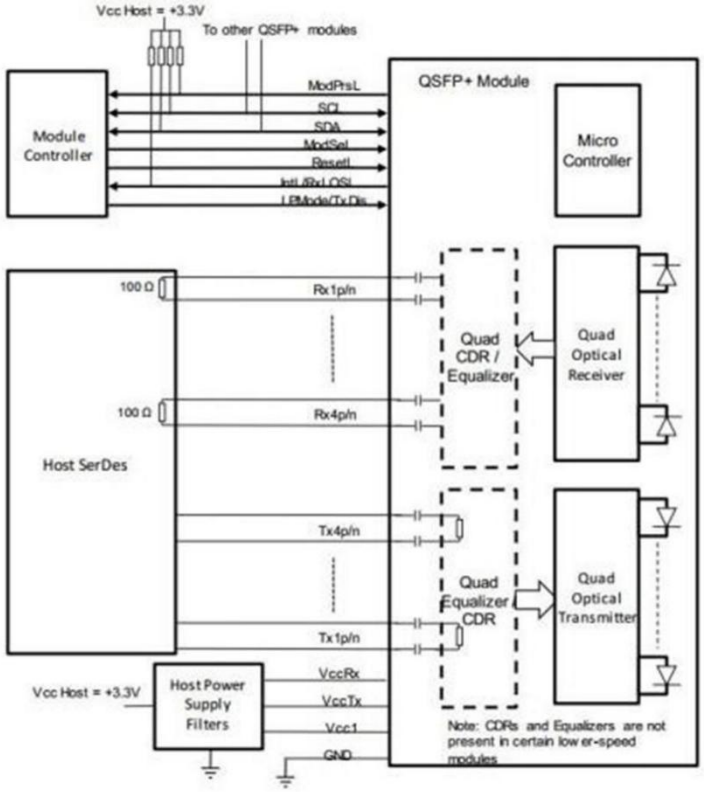
III. Optical Characteristics

Parameter Unit	Symbol	Min.	Min.	Typ.	Max.	Ref.
Transmitter(per lane)						
Signaling Speed per Lane		GBd		26.5625		
Modulation format				PAM4		
Center wavelength	WL	nm	1264.5	1271	1277.5	
		nm	1284.5	1291	1297.5	
		nm	1304.5	1311	1317.5	
		nm	1324.5	1331	1337.5	
Side-mode suppression Ratio	SMSR	dB	30			
Average Launch Power per Lane	TXPx	dBm	-4.2		4.7	
Tx OMA per lane	TxOMA	dBm	-1.2		4.5	
Optical Extinction Ratio	ER	dB	3.5			
Transmitter and dispersion eye closure for PAM4 per Lane	TDECQ	dB			3.3	
Optical Return Loss Tolerance	ORL	dB			16.5	
Relative Intensity Noise	RIN	Db/Hz			-132	
Receiver(per lane)						
Signaling Speed per Lane		GBd		26.5625		
Center wavelength	WL	nm	1264.5	1271	1277.5	
		nm	1284.5	1291	1297.5	
		nm	1304.5	1311	1317.5	
		nm	1324.5	1331	1337.5	
Damage Threshold	DT	dBm	5.7			
Average receive Power per Lane	RXPx	dBm	-8.2		4.7	
Receiver reflectance	Rfl	dB			-26	
Receiver sensitivity (OMA outer), (each lane，max)		dBm			-6	
Stressed receiver sensitivity (OMAouter) ,each lane		dBm			-3.6	

IV. Electrical Interface Characteristics

Parameter	Symbol	Unit	Min.	Typ.	Max.	Ref.
Supply Voltage	VCC	V	3.135	3.3	3.465	
Power Consumption	Pc	W			6.5	
Transceiver Power-on Initialize Time		ms			2000	
Transmitter						
Differential peak-to-peak input voltage tolerance		mV			900	
Differential termination mismatch		%			10	
Differential Input return loss(SDD11)		dB			See CEI-56G-VSR	
Common-mode to differential conversion and differential to common-mode conversion (SCD11,SDC11)		dB			See CEI-56G-VSR	
Receiver						
Differential peak-to-peak output voltage tolerance		mV			900	
DC Common Mode Voltage	Vcm	mV	-0.35		2.85	
AC Common Mode Noise,RMS		mV			17.5	
Differential termination mismatch		%			10	
Differential output return loss (SDD22)		dB			See CEI-56G-VSR	
Common-mode to differential conversion and differential to common-mode conversion (SCD22,SDC22)		dB			See CEI-56G-VSR	
IIC communication						
IIC Clock frequency	-	KHZ	/	400	1000	
clock stretching	-	us	/	/	500	
Data hold time	-	ns	300	/	/	

V. Recommended Interface Circuit



VI. Mechanical Specifications (Unit:mm)