

LQ28-100G-LP10

QSFP28 100Gb/s LR4 10km DDM

PRODUCT FEATURES

- Supports 100GBASE-LR4(103.1Gb/s);
- Lane bit rate 25.78 Gb/s;
- Up to 10km transmission on SMF;
- LAN WDM laser and PIN receiver;
- High speed I/O electrical interface (CAUI-4);
- I2C interface with integrated Digital Diagnostic monitoring;
- QSFP28 MSA package with duplex LC connector;
- Single +3.3V power supply;
- Maximum power consumption 4W;
- Operating case temperature: 0 to +70 °C;
- Compliant to IEEE 802.3bm;
- Compliant to SFF-8665 and SFF-8679;
- Complies with EU Directive 2015/863/EU;

APPLICATIONS

- 100GBASE-LR4

Ordering information

Part No.	Data Rate	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI
LQ28-100G-LP10	103.1Gbps	LWDM	SMF	10km	LC	0~70C	Y

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	T_S	-40	-	+85	°C	
Supply Voltage	V_{CC}	0	-	+4.0	V	
Operating Relative Humidity	RH	5	-	+85	%	

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T_C	0	-	+70	°C	
Power Supply Voltage	V_{CC}	3.13	3.3	3.47	V	
Power Supply Current	I_{CC}	-	-	1.2	A	
Maximum Power Dissipation	P_D	-	-	4.0	W	
Aggregate Bit Rate	BR_{AVE}	-	103.125	-	Gb/s	
Lane Bit Rate	BR_{LANE}	-	25.78	-	Gb/s	
Transmission Distance	TD		-	10	km	Over SMF

III. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Center Wavelength Lane 0	λ_0	1294.53	1295.56	1296.59	nm	
Center Wavelength Lane 1	λ_1	1299.02	1300.05	1301.09	nm	
Center Wavelength Lane 2	λ_2	1303.54	1304.58	1305.63	nm	
Center Wavelength Lane 3	λ_3	1308.09	1309.14	1310.19	nm	
Total Launch Power, 100GE	P_{ALL}	-	-	10.5	dBm	1
Average Launch Power per Lane, 100GE	P_{TX_LANE}	-4.3	-	4.5	dBm	1
OMA per Lane, 100GE	OMA	-1.3	-	4.5	dBm	1
OMA-TDP per Lane, 100GE	OMA_TDP	-2.3	-	-	dBm	
Difference in launch power between lanes	$P_{TX_Delta_LANE}$	-	-	5	dB	
Average Output Power (Laser Turn off)	$P_{OUT-OFF}$	-	-	-30	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio, 100GE	ER	4	-	-	dB	
Optical Eye Mask, 100GE	Compliant with IEEE 802.3ba					2
Receiver						
Center Wavelength Lane 0	λ_0	1294.53	1295.56	1296.59	nm	
Center Wavelength Lane 1	λ_1	1299.02	1300.05	1301.09	nm	
Center Wavelength Lane 2	λ_2	1303.54	1304.58	1305.63	nm	
Center Wavelength Lane 3	λ_3	1308.09	1309.14	1310.19	nm	
Average Rx Power per Lane, 100GE	P_{RX_LANE}	-10.6		4.5	dBm	3

OMA Sensitivity per Lane, 100GE	P_{OMA_LANE}	-	-	-8.6	dBm	3
Damage threshold	P_{Damage}	5.5	-	-	dBm	

Note:

1. The optical power is launched into SMF.
2. Measured with a PRBS 2³¹-1 test pattern @25.78125, Hit ratio≤5E-5.
3. Measured with a PRBS 2³¹-1 test pattern @25.78125 Gb/s, BER≤1E-12.

IV. Electrical Characteristics

High-Speed Signal: Compliant to CAUI-4 (IEEE 802.3bm)

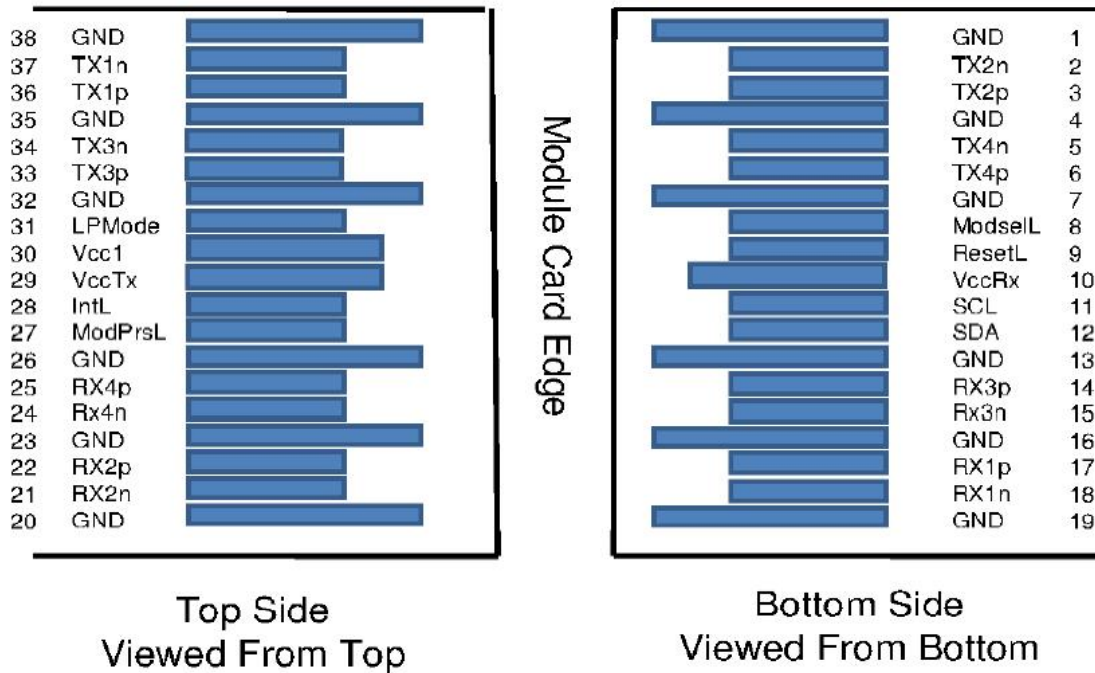
Low-Speed Signal: Compliant to SFF-8679.

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter (Module Input)						
Differential Data Input Amplitude	$V_{IN,P-P}$	85	-	900	mVpp	
Differential Termination Mismatch		-	-	10	%	
LPMODE, Reset and ModSelL / Tx dis	V_{IL}	-0.3	-	0.8	V	
LPMODE, Reset and ModSelL / Tx dis	V_{IH}	2.0	-	$V_{CC}+0.3$	V	
Receiver (Module Output)						
Differential Data Output Amplitude	$V_{OUT,P-P}$	200	-	900	mVpp	
Differential Termination Mismatch(1MHZ)		-	-	10	%	
Output Rise/Fall Time, 20%~80%	T_R	12	-	-	ps	
ModPrsL and IntL / Rx los	V_{OL}	0	-	0.4	V	
ModPrsL and IntL / Rx los	V_{OH}	$V_{CC}-0.5$	-	$V_{CC}+0.3$	V	

V. Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3%	°C	Internal
Voltage	0 to V_{CC}	±3%	V	Internal
Tx Bias Current Per Lane	0 to 100	±10%	mA	Internal
Tx Output Power Per Lane	-4.3 to 4.5	±3	dB	Internal
Rx Power (Each Lane)	-10.6 to 4.5	±3	dB	Internal

VI. Pin Diagram



VII. Pin Descriptions

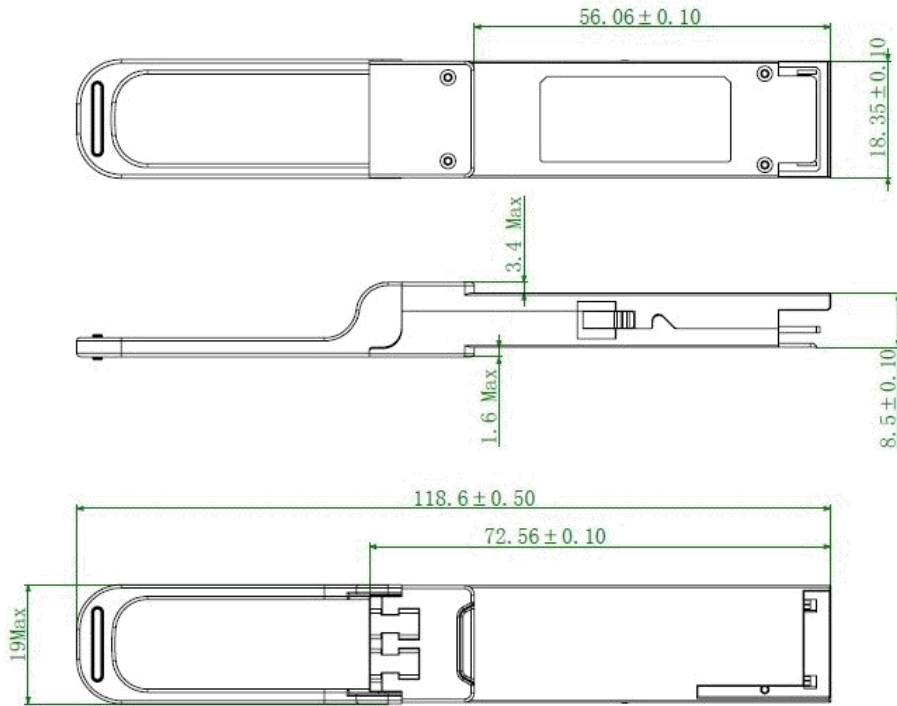
PIN	Logic	Symbol	Description	Plug Seq.	Notes
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	3	
7		GND	Ground	1	1
8	LVTLL-I	ModSelL	Module Select	3	
9	LVTLL-I	ResetL	Module Reset	3	
10		VccRx	+ 3.3V Power Supply Receiver	2	2
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	3	
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data	3	
13		GND	Ground	1	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	1

17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	1
20		GND	Ground	1	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	1
24	CML-O	Rx4n	Receiver Inverted Data Output	3	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	1
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL	Interrupt	3	
29		VccTx	+3.3 V Power Supply transmitter	2	2
30		Vcc1	+3.3 V Power Supply	2	2
31	LVTTL-I	LPMode	Low Power Mode	3	
32		GND	Ground	1	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Output	3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Output	3	
38		GND	Ground	1	1

Notes:

1. GND is the symbol for signal and supply (power) common for the QSFP28 module. 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. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Requirements defined for the host side of the Host Edge Card Connector are listed in MSA. The connector pins are each rated for a maximum current of 1000 mA.

VIII.Mechanical Specifications(Unit: mm)



Revision History

Version No.	Date	Description
1.0	June 24, 2023	Preliminary datasheet

Contact:

Add: Building 7, Mobile Terminal Industrial Park, East Lake Comprehensive Bonded Zone, 777 Optics Valley 3 Road, East Lake New Technology Development Zone, Wuhan, China

Tel: (+86) 86-27-88870005

Postal: 430205

E-mail:sales@lightrend.com

<http://www.lightrend.com>