100Gb/s CFP2 LR4 Transceiver

100G-C2-LR4

Product Features

- ✓ 4 WDM lanes MUX/DEMUX design
- ✓ 4 WDM channels are 1296, 1300, 1305 and 1309 nm
- ✓ Hot-pluggable CFP2 footprint
- ✓ RoHS compliant and Lead Free
- ✓ Up to 10Km link length
- ✓ Power dissipation <9W (0~70℃)
- ✓ No external reference clock
- ✓ Compliant to IEEE 802.3ba:100GBASE-LR4
- ✓ Compliant to CFP MSA CFP2 Hardware Specification
- ✓ Compliant to CFP MSA CFP2 Management Interface Specification

Applications

- ✓ Data Center
- ✓ Local Area Network
- ✓ Ethernet switches and router applications

Product Selection

Part Number	Operating Case temperature	DDMI
100G-C2-LR4	Commercial(0~70℃)	Yes

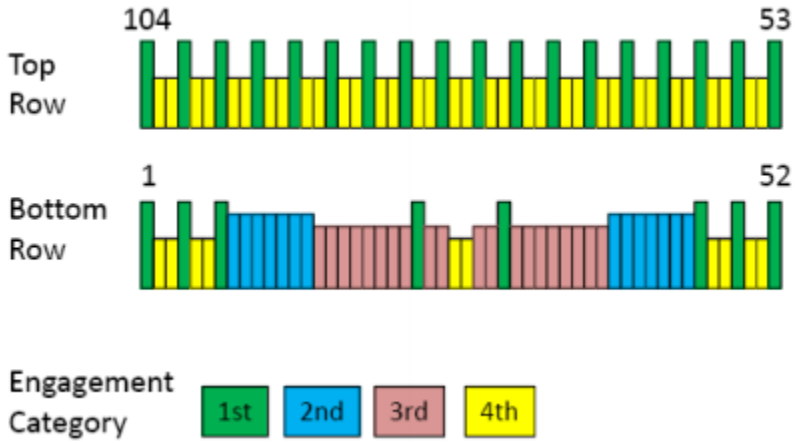
Regulatory Compliance

- ESD to the Electrical PINs: compatible with MIL-STD-883 Method 3015
- ESD to the Duplex LC Receptacle: compatible with IEC 61000-4-2
- Immunity compatible with IEC 61000-4-3
- EMI compatible with FCC Part 15 Class B EN55022 Class B (CISPR 22B) VCCI Class B
- Laser Eye Safety compatible with FDA 21CFR 1040.10 and 1040.11 EN60950, EN (IEC) 60825-1,2
- RoHs compliant with 2002/95/EC 4.1&4.2 2005/747/EC

Pin Descriptions

	Bottom (Nx25G)
1	GND
2	*(TX_MCLKn)*
3	*(TX_MCLKp)*
4	GND
5	N.C.
6	N.C.
7	3.3V_GND
8	3.3V_GND
9	3.3V
10	3.3V
11	3.3V
12	3.3V
13	3.3V_GND
14	3.3V_GND
15	VND_IO_A
16	VND_IO_B
17	PRG_CNTL1
18	PRG_CNTL2
19	PRG_CNTL3
20	PRG_ALRM1
21	PRG_ALRM2
22	PRG_ALRM3
23	GND
24	TX_DIS
25	RX_LOS
26	MOD_LOPWR
27	MOD_ABS
28	MOD_RSTn
29	GLB_ALRMn
30	GND
31	MDC
32	MDIO
33	PRTADR0
34	PRTADR1
35	PRTADR2
36	VND_IO_C
37	VND_IO_D
38	VND_IO_E
39	3.3V_GND
40	3.3V_GND
41	3.3V
42	3.3V
43	3.3V
44	3.3V
45	3.3V_GND
46	3.3V_GND
47	N.C.
48	N.C.
49	GND
50	*(RX_MCLKn)*
51	*(RX_MCLKp)*
52	GND

	Top (4x25G)
104	GND
103	N.C.
102	N.C.
101	GND
100	TX3n
99	TX3p
98	GND
97	TX2n
96	TX2p
95	GND
94	N.C.
93	N.C.
92	GND
91	N.C.
90	N.C.
89	GND
88	TX1n
87	TX1p
86	GND
85	TX0n
84	TX0p
83	GND
82	N.C.
81	N.C.
80	GND
79	*(REFCLKn)*
78	*(REFCLKp)*
77	GND
76	N.C.
75	N.C.
74	GND
73	RX3n
72	RX3p
71	GND
70	RX2n
69	RX2p
68	GND
67	N.C.
66	N.C.
65	GND
64	N.C.
63	N.C.
62	GND
61	RX1n
60	RX1p
59	GND
58	RX0n
57	RX0p
56	GND
55	N.C.
54	N.C.
53	GND



Pin	Symbol	Name/Description	Ref.
1	GND	Ground	
2	TX_MCLKn	No connect	
3	TX_MCLKp	No connect	
4	GND	Ground	
5	N.C.	No connect	
6	N.C.	No connect	
7	3.3V_GND	3.3V ground; tied with ground	
8	3.3V_GND	3.3V ground; tied with ground	
9	3.3V	3.3V module supply voltage	
10	3.3V	3.3V module supply voltage	
11	3.3V	3.3V module supply voltage	
12	3.3V	3.3V module supply voltage	
13	3.3V_GND	3.3V ground; tied with ground	
14	3.3V_GND	3.3V ground; tied with ground	
15	VND_IO_A	Module vendor IO A; do not connect	
16	VND_IO_B	Module vendor IO B; do not connect	
17	PRG_CNTL 1	Programmable control 1;MSA default: TRXIC_RSTn;”0”: reset;”1” or NC: not used	1

18	PRG_CNTL 2	Programmable control 2; MSA default: Hardware interlock LSB; Default “0”: ≤9 W	1
19	PRG_CNTL 3	Programmable control 3: MSA default: Hardware interlock MSB; Default “1”: ≤9 W	1
20	PRG_ALRM 1	Programmable alarm 1; MSA default: HIPWR_ON; “1”: module power up completed, “0”: module not high powered up	
21	PRG_ALRM 2	Programmable alarm 2; MSA default: MOD_READY, “1”: Ready, “0”: not Ready	
22	PRG_ALRM 3	Programmable alarm 3; MSA default:: MOD_FAULT, “1”: Fault, “0”: no Fault	
23	GND	Ground	
24	TX_DIS	Transmitter disable for all lanes; “1” or NC: transmitter disabled; “0”: transmitter enabled	1
25	RX_LOS	Receiver loss of optical signal; “1”: low optical signal, “0”: normal condition	
26	MOD_LOPWR	Module low power mode; “1” or NC: module in low power mode, “0”: power on enabled	1
27	MOD_ABS	Module absent; “1” or NC: module absent; “0”: module present. Pull up resistor on host.	
28	MOD_RSTn	Module reset; “0”: reset the module; “1” or NC: module enabled	2
29	GLB_ALRMn	Global alarm; “0”: alarm in any MDIO alarm register; “1”: no alarm condition. Pull up resistor on host.	
30	GND	Ground	
31	MDC	Management interface clock input	
32	MDIO	Management interface bi-directional data	
33	PRTADR0	MDIO physical port address bit 0	
34	PRTADR1	MDIO physical port address bit 1	
35	PRTADR2	MDIO physical port address bit 2	
36	VND_IO_C	Module vendor IO C; do not connect	
37	VND_IO_D	Module vendor IO D; do not connect	
38	VND_IO_E	Module vendor IO E; do not connect	
39	3.3V_GND	3.3V ground; tied with ground	
40	3.3V_GND	3.3V ground; tied with ground	
41	3.3V	3.3V module supply voltage	
42	3.3V	3.3V module supply voltage	
43	3.3V	3.3V module supply voltage	
44	3.3V	3.3V module supply voltage	

45	3.3V_GND	3.3V ground; tied with ground	
46	3.3V_GND	3.3V ground; tied with ground	
47	N.C.	No connect	
48	N.C.	No connect	
49	GND	Ground	
50	RX_MCLKn	No connect	
51	RX_MCLKp	No connect	
52	GND	Ground	
53	GND	Ground	
54	N.C.	No connect	
55	N.C.	No connect	
56	GND	Ground	
57	RX0P	25 Gbps receiver data; Lane 0	
58	RX0n	25 Gbps receiver data; Lane 0	
59	GND	Ground	
60	RX1P	25 Gbps receiver data; Lane 1	
61	RX1n	25 Gbps receiver data; Lane 1	
62	GND	Ground	
63	N.C.	No connect	
64	N.C.	No connect	
65	GND	Ground	
66	N.C.	No connect	
67	N.C.	No connect	
68	GND	Ground	
69	RX2P	25 Gbps receiver data; Lane 2	
70	RX2n	25 Gbps receiver data; Lane 2	
71	GND	Ground	
72	RX3P	25 Gbps receiver data; Lane 3	
73	RX3n	25 Gbps receiver data; Lane 3	
74	GND	Ground	
75	N.C.	No connect	
76	N.C.	No connect	
77	GND	Ground	
78	REFCLKp	Module reference clock. No connect.	
79	REFCLKn	Module reference clock. No connect.	
80	GND	Ground	
81	N.C.	No connect	
82	N.C.	No connect	
83	GND	Ground	
84	TX0p	25 Gbps transmitter data; Lane 0	
85	TX0n	25 Gbps transmitter data; Lane 0	
86	GND	Ground	
87	TX1p	25 Gbps transmitter data; Lane 1	
88	TX1n	25 Gbps transmitter data; Lane 1	

89	GND	Ground	
90	N.C.	No connect	
91	N.C.	No connect	
92	GND	Ground	
93	N.C.	No connect	
94	N.C.	No connect	
95	GND	Ground	
96	TX2p	25 Gbps transmitter data; Lane 2	
97	TX2n	25 Gbps transmitter data; Lane 2	
98	GND	Ground	
99	TX3p	25 Gbps transmitter data; Lane 3	
100	TX3n	25 Gbps transmitter data; Lane 3	
101	GND	Ground	
102	N.C.	No connect	
103	N.C.	No connect	
104	GND	Ground	

Notes:

1. Pull-Up resistor (4.7 kOhm to 10 kOhm) is located within the CFP2 module
2. Pull-Down resistor (4.7 kOhm to 10 kOhm) is located within the CFP2 module

■ Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		+4.0	V	
Storage Temperature	TS	-40		+85	°C	
Operating Humidity	RH	0		85	%	

■ Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Power Supply Voltage	Vcc	3.13	3.30	3.47	V	
Power Supply Current	Icc	-	-	2	A	Commercial
Case Operating Temperature	Tc	0	-	+70	°C	Commercial
Bit Rate Each Lane	Br		25.78		Gbps	
9/125um G.652 SMF	Lmax	-	-	10	km	

Electrical Characteristics (TOP=25°C, Vcc=3.3Volts)

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Low Speed Electrical Characteristics						
Low speed control and sense signals, 3.3 V LVCMOS,Vcc=3.3V						
Outputs low voltage	VOL	-0.3		0.2	V	
Output high voltage	VOH	Vcc-0.2			V	
Input low voltage	VIL	-0.3		0.8	V	
Input high voltage	VIH	2		Vcc+0.3	V	
Low speed control and sense signals, 1.2 V LVCMOS						
Outputs low voltage	VOL	-0.3		0.2	V	
Output high voltage	VOH	1.0		1.5	V	
Input low voltage	VIL	-0.3		0.36	V	
Input high voltage	VIH	0.84		1.5	V	
Input capacitance	C			10	pF	
MDC clock rate		0.1		4	MHz	
High Speed Electrical Specifications						
Transmitter electrical input from host						
Differential voltage pk-pk				900	mV	
Common mode noise (rms)				17.5	mV	
Differential termination mismatch				10	%	
Transition time		10			ps	2
Common mode voltage		-0.3		2.8	V	
Eye width		0.4			UI	1
Eye height		100			mV	1
Receiver electrical output to host						
Differential voltage pk-pk				900	mV	
Common mode noise (rms)				17.5	mV	
Differential termination mismatch				10	%	

Transition time				9.5	ps	2
Vertical eye closure				6.5	dB	
Eye width		0.57			UI	1
Eye height		240			mV	1

Notes:

1. At 10-15 probability
2. 20% to 80%

■ Optical Characteristics (TOP=25°C, Vcc=3.3 Volts)

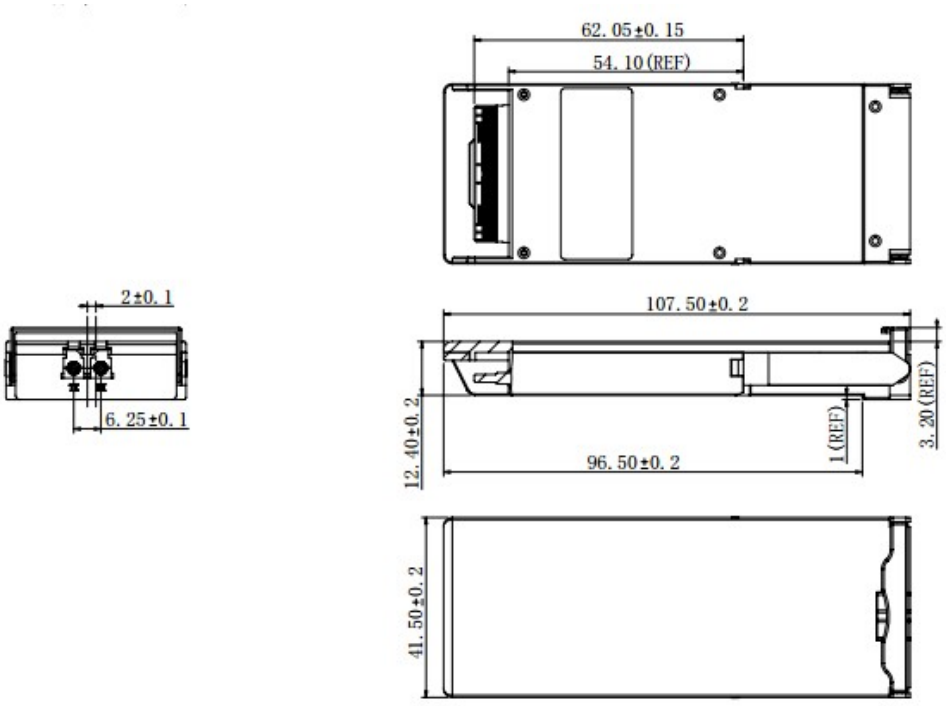
Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Optical Wavelength	L0	1294.53	1295.56	1296.59	nm	
	L1	1299.02	1300.05	1301.09	nm	
	L2	1303.54	1304.58	1305.63	nm	
	L3	1308.09	1309.14	1310.19	nm	
Side-mode Suppression Ratio	SMSR	30			dB	
Total Average Launch Power	PT			10.5	dBm	
Average Launch Power, each Lane		-4.3		4.5	dBm	
Optical Modulation Amplitude, each Lane	OMA	-1.3		4.5	dBm	
Extinction Ratio	ER	4	7		dB	
TDP, each Lane	TDP			2.2	dB	
Relative Intensity Noise	RIN			-130	dB/Hz	
Transmitter Reflectance	RT			-12	dB	
Receiver						
Receiver Sensitivity (OMA), each lane	SENS	-	-	-8.6	dBm	1,2
Receiver Overload		4.5	-	-	dBm	
Difference in Receive Power between any two Lanes (OMA)				5.5	dB	
LOS De-Assert	LOSD	-	-	-12	dBm	

LOS Assert	LOSA	-25	-	-	dBm	
LOS Hysteresis	-	0.5	-	-	dB	

Notes:

1. Measured with conformance signals defined in FC-PI-2 Rev. 10.0specifications.
2. Measured with PRBS 2^{31}-1 at 10^{-12}BER.

■ Mechanical Specifications



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■ Digital Diagnostic Monitoring Interface

Four transceiver parameter values are monitored. The following table defines the Monitory parameter's accuracy.

Parameter	Range	Accuracy	Calibration
Temperature	0 to +70°C	±3°C	Internal
Voltage	2.97 to 3.63V	±3%	Internal
TX Power	-5 to 5dBm	±3dB	Internal
Bias Current	0 to 100mA	±10%	Internal
RX Power	-12 to 2.5dBm	±3dB	Internal