

CSMQ28HGBxx80

100 Gbps BIDI QSFP28 ZR4 Transceiver

Description

CSMQ28HGBxx80 is designed for 80km optical communication applications. This module contains 4-lane optical transmitter, 4-lane optical receiver and module management block including 2 wire serial inter-face. The optical signals are multiplexed to a single-mode fiber through an industry standard LC connector.

Features

- Supports 103.125 Gbps aggregate bit rate
- Built-in 4-channel Clock and Data Recovery (CDR) in TX and RX
- LAN WDM EML laser and PIN receiver with SOA
- Up to 80 km reach for G.652 SMF
- Hot-Pluggable 38-Pin Electrical Interface
- QSFP28 MSA compliant
- BIDI LC optical receptacle
- RoHS-10 compliant and lead-free
- Excellent EMI performance
- Single +3.3 V Power Supply
- Maximum Power Consumption 5.5 W
- Case Operating Temperature 0 °C to +70 °C

Applications

- 100GBASE-ZR4 Ethernet Links
- InfiniBand QDR and DDR Interconnects
- Telecom networking

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	T _S	-40	+85	°C	
Power Supply Voltage	V _{CC}	-0.3	4.0	V	
Relative Humidity (non-condensation)	RH	15	85	%	
Damage Threshold	THd	6.5		dBm	

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	T _{OP}	0		+70	°C	
Power Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Data Rate, each Lane			25.78125		Gbps	
Control Input Voltage High		2		V _{CC}	V	
Control Input Voltage Low		0		0.8	V	
Link Distance (SMF)	D			80	km	

Electrical Specifications

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Power Consumption	P			5.5	W	
Supply Current	I _{CC}			1585	mA	
Transmitter (each Lane)						
Input Differential Impedance	R _{in}		100		Ohm	
Differential Termination Mismatch				10	%	
Differential Data Input Amplitude	V _{in,PP}	180		1000	mV	
LPMode, ResetL, and ModSelL	V _{IL}	-0.3		0.8	V	
	V _{IH}	2		V _{CC} +0.3	V	
Receiver						
Differential Data Output Amplitude	V _{out, PP}	350		900	mV	
Differential Termination Mismatch				10	%	
Transition Time, 20% to 80%		9.5			ps	
ModPrsL and IntL	V _{OL}	0		0.4	V	
	V _{OH}	V _{CC} -0.5		V _{CC} +0.3	V	

Optical Specifications

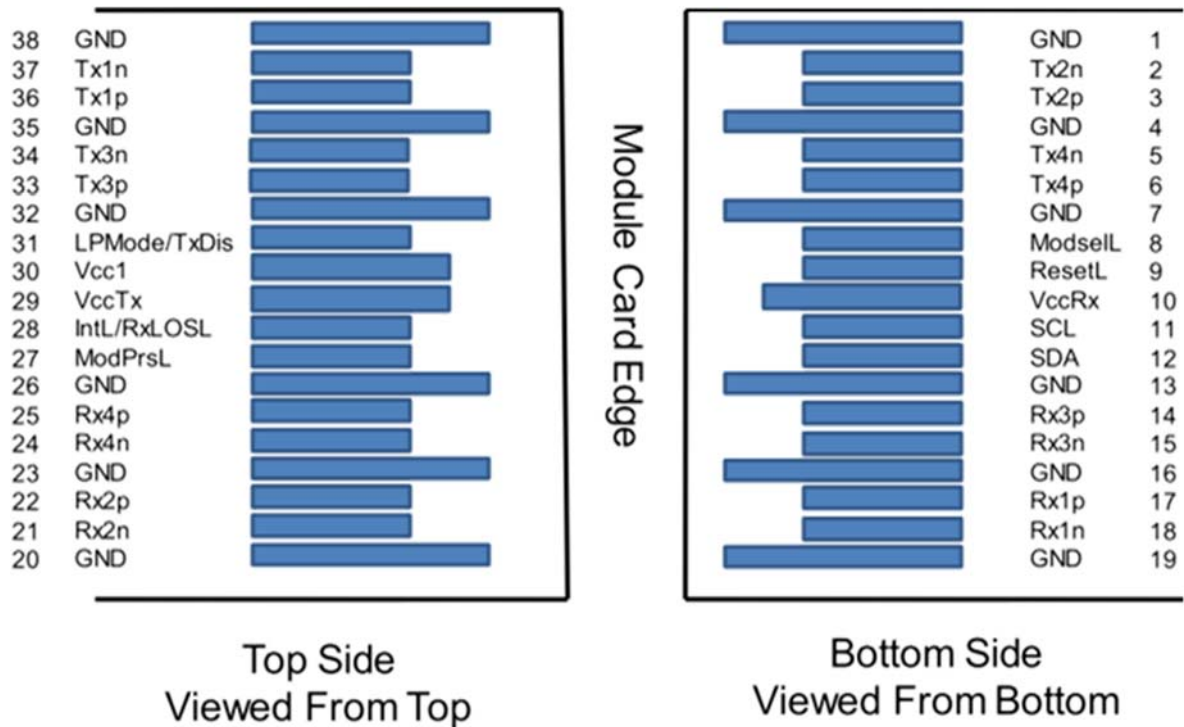
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Center Wavelength	L0	1272.55	1273.55	1274.54	nm	
	L1	1276.89	1277.89	1278.89	nm	
	L2	1281.25	1282.26	1283.27	nm	
	L3	1285.65	1286.66	1287.68	nm	
	L0	1294.53	1295.56	1296.59	nm	
	L1	1299.02	1300.05	1301.09	nm	
	L2	1303.54	1304.58	1305.63	nm	
	L3	1308.09	1309.14	1310.09	nm	
Signaling Rate, Each Lane			25.78125		Gbps	
Side-Mode Suppression Ratio	SMSR	30				
Total Launch Power	Pt	8			dBm	
Average Launch Power, Each Lane	Pavg	2		6	dBm	
Extinction Ratio	ER	6			dB	
Difference in Launch Power Between Any Two Lanes (OMA)	Ptx,diff			3.6	dB	
Average Launch Power of OFF Transmitter, Each Lane	Poff			-30	dBm	
Transmitter Reflectance	RT			-12	dB	
RIN20OMA	RIN			-130	dB/Hz	
Optical Return Loss Tolerance	TOL			20	dB	
Transmitter Eye Mask {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				

Receiver						
Center 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	1310.09	nm	
	L0	1272.55	1273.55	1274.54	nm	
	L1	1276.89	1277.89	1278.89	nm	
	L2	1281.25	1282.26	1283.27	nm	
	L3	1285.65	1286.66	1287.68	nm	
Signaling Rate, Each Lane			25.78125		Gb/s	
Average Receive Power, Each Lane		-30		-7	dBm	
Input Saturation Power (Overload), Each Lane	Psat			-7	dBm	
Receiver Reflectance				-26	dB	
Average Receiver Sensitivity, Each Lane	SEN			-26	dBm	1
LOS Assert	LOSA	-40			dBm	
LOS De-Assert	LOSD			-27	dBm	
LOS Hysteresis	LOSH	0.5			dB	

Notes:

1. Measured at 25.78125 Gbps, ER = 8.2 dB, BER < 5E-5, PRBS = 2³¹-1 NRZ.

Pin Diagram



Pin Descriptions

Pin	Symbol	Name/Description	Plug Seq.	Notes
1	GND	Ground	1	1
2	Tx2n	Transmitter Inverted Data Input	3	
3	Tx2p	Transmitter Non-Inverted Data Input	3	
4	GND	Ground	1	1
5	Tx4n	Transmitter Inverted Data Input	3	
6	Tx4p	Transmitter Non-Inverted Data Input	3	
7	GND	Ground	1	1
8	ModSelL	Module Select	3	
9	ResetL	Module Reset	3	
10	VccRx	+3.3 V Power Supply Receiver	2	2
11	SCL	2-Wire Serial Interface Clock	3	
12	SDA	2-Wire Serial Interface Data	3	
13	GND	Ground	1	1
14	Rx3p	Receiver Non-Inverted Data Output	3	
15	Rx3n	Receiver Inverted Data Output	3	
16	GND	Ground	1	1
17	Rx1p	Receiver Non-Inverted Data Output	3	
18	Rx1n	Receiver Inverted Data Output	3	

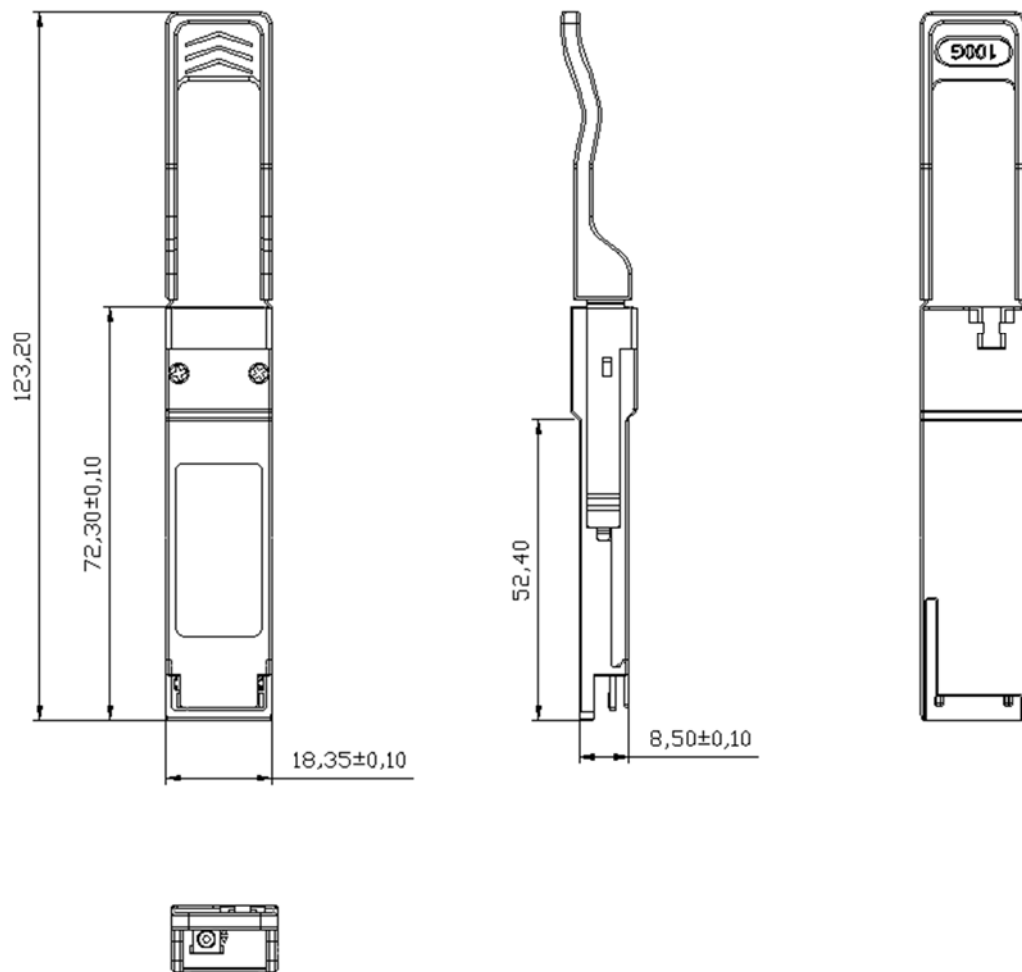
19	GND	Ground	1	1
20	GND	Ground	1	1
21	Rx2n	Receiver Inverted Data Output	3	
22	Rx2p	Receiver Non-Inverted Data Output	3	
23	GND	Ground	1	1
24	Rx4n	Receiver Inverted Data Output	3	
25	Rx4p	Receiver Non-Inverted Data Output	3	
26	GND	Ground	1	1
27	ModPrsL	Module Present	3	
28	IntL	Interrupt	3	
29	VccTx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

Notes:

1. GND is the common reference for signal and supply power within the QSFP28 module. All GND pins are common and should be connected directly to the host board signal ground plane.
2. VccRx, Vcc1, and VccTx are the receiver and transmitter power supplies and shall be applied concurrently. These pins may be internally connected within the QSFP28 module in any combination. Each connector pin is rated for a maximum current of 1000 mA.

Control and status pins, including ModSelL, ResetL, LPMODE, ModPrsL, and IntL, follow the QSFP28 MSA and SFF-8636 interface definitions.

Mechanical Diagram



Unit: mm

Ordering Information

Part Number	Product Description
CSMQ28HGB2380	1273-1287T/1295-1309R, 106.25 Gbps, LC, 80 km, 0 °C to +70 °C, Latch Color: Green
CSMQ28HGB3280	1295-1309T/1273-1287R, 106.25 Gbps, LC, 80 km, 0 °C to +70 °C, Latch Color: Blue

For More Information

Tel: +886-2-8227 1877

E-mail: sales@cosmo-ic.com

Web: <http://www.cosmo-ic.com>