

100Gbps QSFP28 BIDI Transceiver, 80KM Reach

Product Features

- 4x25Gb/s LAN WDM Blue or Red Side TOSA, LAN WDM Red or Blue Side ROSA with SOA
- Support 100GBASE-BIDI for line rate of 103.125Gbps and OTU4 for line rate of 111.81Gbps
- Compliant with IEEE 802.3-2012 Clause 88 standard IEEE 802.3bm CAUI-4 chip to module electrical standard ITU-T G.959.1-2012-02 standard
- Simplex LC connector
- Single +3.3V power supply operating
- Temperature range commercial grade: 0~+70℃ , industrial grade: - 40 ~85℃
- RoHS Compliant Part

Applications

- 100G BASE Ethernet
- Data center network

Description

This transceiver provides 100GBase-BX throughput up to 80km over single-mode fiber (SMF) using wavelengths of 1273.54, 1277.89, 1282.26, 1286.66nm- TX/1295.56, 1300.05, 1304.58, 1309.14nm-RX(1295.56, 1300.05, 1304.58, 1309.14nm- TX/1273.54, 1277.89, 1282.26, 1286.66nm-RX) via an LC connector. This bidirectional unit must be used with another transceiver or network appliance of complimenting wavelengths. Digital diagnostics functions are also available via the I2C interface, as specified by the QSFP28 MSA, to allow access to real-time operating parameters. With these features, this easy to install, hot swappable transceiver is suitable to be used in various applications, such as 100G Ethernet, data center, and storage area networks applications.

Absolute Maximum Ratings

It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module.

Table 1-Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Note
Storage Temperature	TS	-40	85	°C	
Operating Case Temperature	TOP	0	70	°C	
Power Supply Voltage	VCC	-0.5	4	V	
Relative Humidity (non-condensation)	RH	0	85	%	

Recommended Operating Conditions

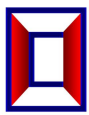
Table 2-Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Note
Operating Case Temperature	TOP	0		70	°C	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Power Consumption				6.5	W	
Supply Current	Icc		1200	1800	mA	
Aggregate Bit Rate	BRAVE	-	103.125	-	Gb/s	
Transmission Distance	TD		-	80	KM	Over SMF

Optical Characteristics

Table 3 -Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Transmitter						
Blue Side Four Lane Wavelength Range	1	1272.54	1273.54	1274.54	nm	
	2	1276.89	1277.89	1278.89	nm	
	3	1281.25	1282.26	1283.27	nm	
	4	1285.65	1286.66	1287.68	nm	
Red Side Four Lane Wavelength Range	1	1294.56	1295.56	1296.56	nm	
	2	1299.05	1300.05	1301.05	nm	
	3	1303.58	1304.58	1305.58	nm	
	4	1308.14	1309.14	1310.14	nm	
Side-mode Suppression Ratio	SMSR	30	-	-	dB	
Total Average Launch Power	PT	8	-	12.5	dBm	
Average Launch Power, each Lane		+2	-	6.5	dBm	
Difference in Launch Power between any two Lanes (OMA)		-	-	3	dB	
Extinction Ratio	ER	6	-	-	dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.25, 0.4, 0.45, 0.25, 0.28, 0.4}				
Optical Return Loss Tolerance		-	-	20	dB	
Average Launch Power OFF Transmitter, each Lane	Poff			-30	dBm	
Relative Intensity Noise	Rin			-130	dB/HZ	
Optical return loss tolerance				20	dB	
Transmitter reflectance		-	-	12	dB	



Receiver						
Red Side Four Lane Wavelength Range	1	1272.54	1273.54	1274.54	nm	
	2	1276.89	1277.89	1278.89	nm	
	3	1281.25	1282.26	1283.27	nm	
	4	1285.65	1286.66	1287.68	nm	
Blue Side Four Lane Wavelength Range	1	1294.56	1295.56	1296.56	nm	
	2	1299.05	1300.05	1301.05	nm	
	3	1303.58	1304.58	1305.58	nm	
	4	1308.14	1309.14	1310.14	nm	
Total Damage Threshold	THd			5.5	dBm	
Receiver Sensitivity per Lane	R			-28	dBm	
Average Power at Receiver Input, each Lane	R	-28		0	dBm	
LOS De-Assert	LOSD			-29	dBm	
LOS Assert	LOSA	-40			dBm	
LOS Hysteresis	LOSH	0.5			dB	

Electrical Characteristics

Table 4 -Electrical Characteristics

The following electrical characteristics are defined over the recommended operating environment

Parameter	Symbol	Min	Typ	Max	Unit	Note
Data Rate per Channel		-	25.78125		Gbps	
			27.9525			
Power Consumption		-	4	6.5	W	
Supply Current	I _{cc}		1.2	1.8	A	
Control I/O Voltage-High	V _{IH}	2.0		V _{cc}	V	
Control I/O Voltage-Low	V _{IL}	0		0.7	V	
Inter-Channel Skew	TSK			35	Ps	
RESETL Duration			10		Us	
RESETL De-assert time				100	ms	
Power On Time				100	ms	
Transmitter						
Single Ended Output Voltage Tolerance		0.3		V _{cc}	V	
Common mode Voltage Tolerance		15			mV	
Transmit Input Diff Voltage	V _I	150		1200	mV	
Transmit Input Diff Impedance	Z _{IN}	85	100	115		
Data Dependent Input Jitter	DDJ		0.3		UI	
Receiver						
Single Ended Output Voltage Tolerance		0.3		4	V	
Rx Output Diff Voltage	V _o	370	600	950	mV	
Rx Output Rise and Fall Voltage	Tr/Tf			35	ps	
Total Jitter	TJ		0.3		UI	

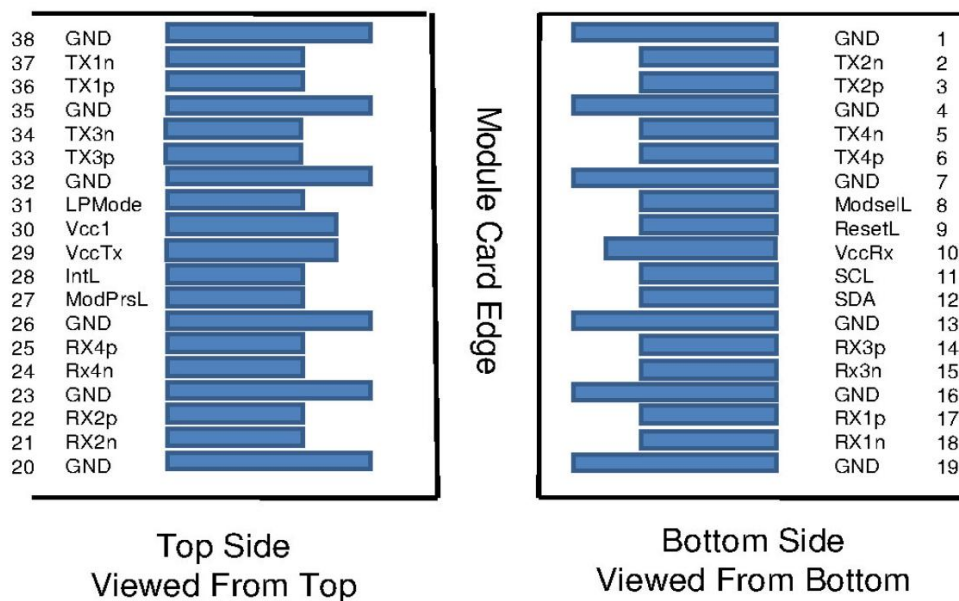
Digital Diagnostics

Table 5 -Digital Diagnostics

Parameter	Symbol	Min	Max	Unit	Note
Temperature Monitor Absolute Error	DMI_Temp	-3	3	°C	Cover full operating temperature range
Supply Voltage Monitor Absolute Error	DMI_VCC	-0.1	0.1	V	Cover full operating temperature range
Channel RX Power Monitor Absolute Error	DMI_RX_Ch	-3	3	dB	
Channel Bias Current Monitor	DMI_Ibias_Ch	-10%	10%		
Channel TX Power Monitor Absolute Error	DMI_TX_Ch	-3	3	dB	

Edge connector and pinout description

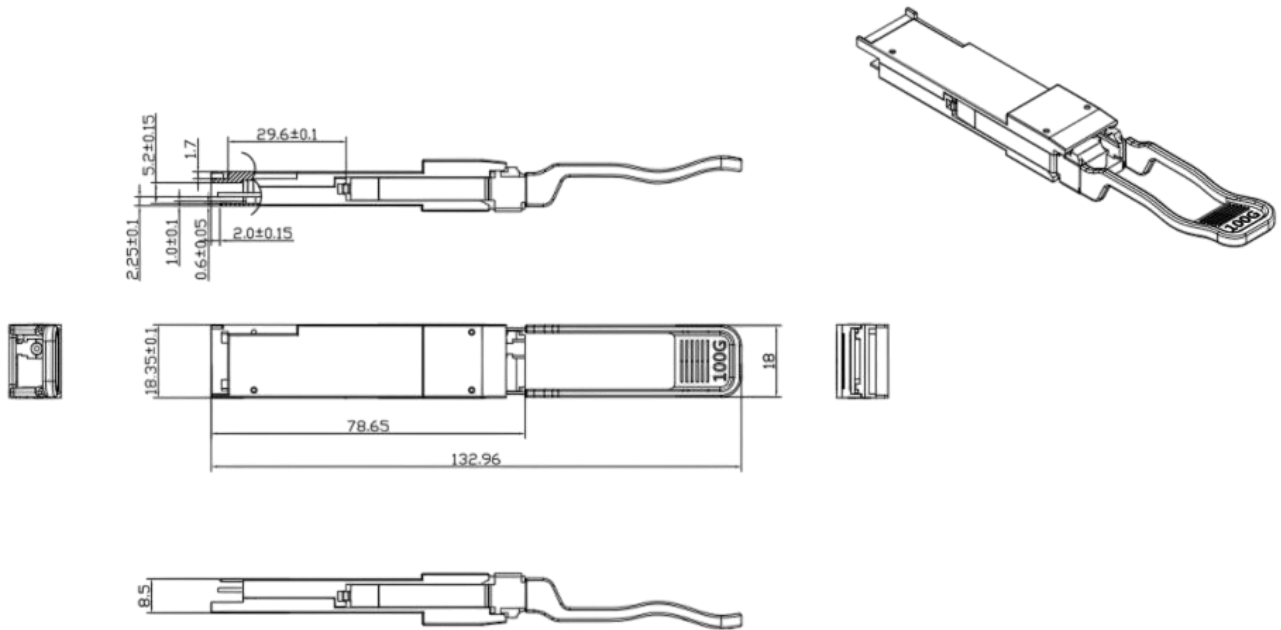
The electrical pinout of the QSFP28 module is shown in Figure 1 below.



Pin	Symbol	Name/Description	Notes
1	GND	Transmitter Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data output	
4	GND	Transmitter Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data output	
7	GND	Transmitter Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	VccRx	3.3V Power Supply Receiver	2
11	SCL	2-Wire serial Interface Clock	
12	SDA	2-Wire serial Interface Data	
13	GND	Receiver Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Receiver Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Receiver Ground	1
20	GND	Receiver Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	

23	GND	Receiver Ground	1
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Receiver Ground	1
27	ModPrsl	Module Present	
28	IntL	Interrupt	
29	VccTx	3.3V power supply transmitter	2
30	Vcc1	3.3V power supply	2
31	LPMODE	Low Power Mode, not connect	
32	GND	Transmitter Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Output	
35	GND	Transmitter Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Output	
38	GND	Transmitter Ground	1

Mechanical Dimension



Order Information

Part No.	Data Rate	Fiber Type	Distance	Optical Interface	DDM
HC-Q28-B23L-80D/ HC-Q28-B32L-80D	103.125Gbps	SMF	80KM	Simplex LC	Y
Temp	Commercial grade: 0~+70℃ ,Industrial grade: - 40 ~85℃				