RQ-100GBD10-T27/RQ-100GBD10-T33

100Gbps QSFP28 BIDI Single Lambda Transceiver, 1271/1331nm, Single Mode, 10km Reach

Features

- Supports 100GBASE-LR1- 10 BIDI
- Lane signaling rate 106.25Gb/s with PAM4
- Up to 10km transmission on SMF
- EML Laser and PIN receiver
- 4x25.78Gb/s with NRZ electrical interface (CAUI-4)
- High speed I/O electrical interface
- I2C interface with integrated Digital Diagnostic monitoring
- QSFP28 MSA package with simplex LC connector
- Single +3.3V power supply
- Support HW TX_DIS and RX_LOS for telecom application
- Maximum power consumption 4 W
- Operating case temperature: 0 to +70 °C
- Compliant to 802.3cu, SFF-8636&SFF-8679 standard
- Complies with EU Directive 2015/863/EU

Application

- 100GBASE-LR1- 10 BIDI

Absolute Maximum Ratings

Table 1-Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	Ts	-40	-	+85	°C	
Supply Voltage	Vcc	-0.5	-	+4.0	V	
Operating Relative Humidity	RH	-	-	+85	%	

Recommended Operating Conditions

Table 2-Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	TC	0	-	+70	°C	
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Power Supply Current	ICC	-	-	1.21	A	
Maximum Power Dissipation	PD	-	-	4	W	
Data Rate(optical)	DRo	-	106.25	-	Gb/s	
Transmission Distance	TD	-	-	10	km	Over SMF

Optical Characteristics

Table 3-Optical Characteristics

Transmitter							
Parameter		Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength	RQ-100GBD10-T27	CW	1264.5	1271	1277.5	nm	
	RQ-100GBD10-T33		1324.5	1331	1337.5	nm	
Average Launch Power		PTX	-1.4	-	4.5	dBm	1
Outer Optical Modulation Amplitude		OMA	0.7	-	4.7	dBm	1
Launch power in OMA minus TDECQ(min)		OMA-TDECQ	-0.7	-	-	dBm	ER≧4.5 dB
			-0.6	-	-	dBm	ER<4.5dB
Transmitter and dispersion eye closure for PAM4 (TDECQ) (max)		TDECQ	-	-	3.4	dBm	
Average Output Power (Laser Turn off)		P0UT-OFF	-	-	-30	dBm	
Side Mode Suppression Ratio		SMSR	30	-	-	dB	
Extinction Ratio		ER	3.5	-	-	dB	
Receiver							
Center Wavelength	RQ-100GBD10-T27	CW	1324.5	1331	1337.5	nm	
	RQ-100GBD10-T33		1264.5	1271	1277.5	nm	
Damage threshold		PDamage	5.5	-	-	dBm	2
Average Rx Power		PRX	-7.7	-	4.5	dBm	3
Receive power_OMAouter		POMA	-	-	4.7	dBm	
Receiver sensitivity_OMAouter		SEN _OMA	-	-	-6.1	dBm	4
Los Assert		LosA	-26	-	-12	dBm	
Los De-Assert		LosDA	-	-	-10	dBm	

Los Hysteresis	LosH	0.5	-	-	dB	

Notes:

1. The optical power is launched into SMF.
2. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level. The receiver does not have to operate correctly at this input power.
3. Average receive power, each lane (min) is informative and not the principal indicator of signal strength.
4. Measured with conformance test signal at TP3 using the test pattern PRBS31Q or scrambled idle for stressed receiver sensitivity for the BER= 2.4x10-4.

Electrical Characteristics

Table 5-Electrical Characteristics

Transmitter (Module Input)						
Parameter	**Symbol**	**Min.**	**Typical**	**Max.**	**Unit**	**Notes**
Input Differential Impedance	Rin	-	100	-	Ohm	
Differential Data Input Amplitude	VIN,P-P	80	-	900	mVpp	
Differential termination mismatch (max)	D-mismatch	-	-	10	%	
DC common-mode input voltage		-0.3	-	2.8	V	
Transition time(20%~80%)	Tr Tf	10	-	-	ps	
LPMode, Reset and ModSelL / Tx dis	VIL	-0.3	-	0.8	V	
LPMode, Reset and ModSelL / Tx dis	VIH	2.0	-	VCC+0.3	V	
Receiver (Module Output)						
Output Differential Impedance	Rout	-	100	-	Ohm	
Differential Data Output Amplitude	VOUT,P-P	-	-	900	mVpp	
Differential termination mismatch (max)	D-mismatch	-	-	10	%	
Transition time, 20% to 80%	Tr Tf	12	-		ps	
ModPrsL and IntL/ Rx los	VOL	0	-	0.4	V	
ModPrsL and IntL/ Rx los	VOH	VCC-0.5	-	VCC+0.3	V	

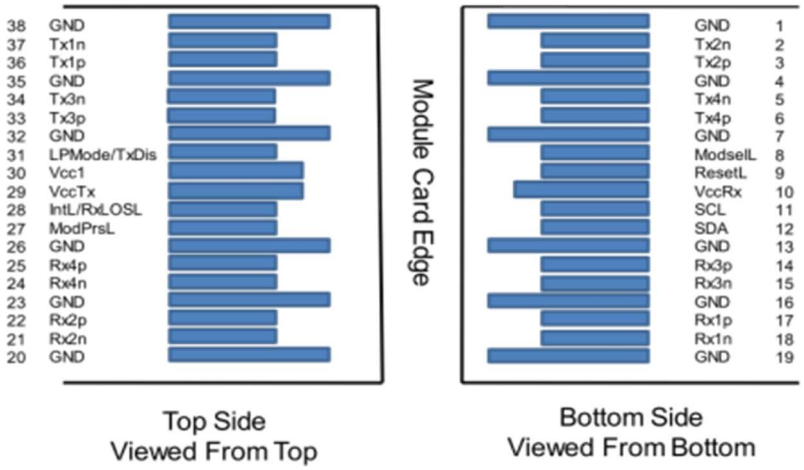
Digital Diagnostics

Table 6-Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	ºC	Internal
Voltage	0 to VCC	0.1	V	Internal
Tx Bias Current	0 to 100	10%	mA	Internal
Tx Output Power	-1.4 to 4.5	±3	dBm	Internal
Rx Power	-7.7 to 4.5	±3	dBm	Internal

Pin Assignment

Pin Diagram



Pin Descriptions

Table 6- 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		NC		3	
6		NC		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	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	3	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data	3	
13		GND	Ground	1	
14		NC		3	
15		NC		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		NC		3	
25		NC		3	

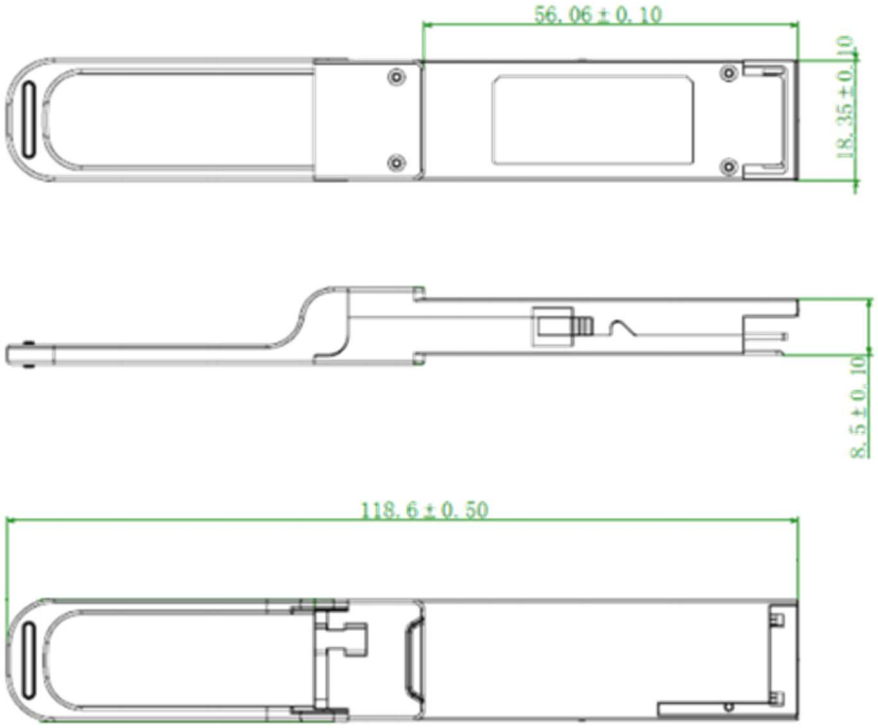
26		GND	Ground	1	1
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL	Interrupt	3	
29		VccTx	+3.3 V Power Supply transmitter	2	2
30		Vcc1	+3.3 V Power Supply	2	2
31	LVTTL-I	LPMode	Low Power Mode	3	
32		GND	Ground	1	1
33		NC		3	
34		NC		3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Output	3	
38		GND	Ground	1	1

Note :

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.

Mechanical Dimension



Order Information

Table 7- Ordering information

Part Number	Description
RQ-100GBD10-T27	100G QSFP28 BIDI Transceiver, TX1271nm/RX1331nm, Simplex LC, 10km, 0~+70°C, with DDM
RQ-100GBD10-T33	100G QSFP28 BIDI Transceiver, TX1331nm/RX1271nm, Simplex LC, 10km, 0~+70°C, with DDM