

QSFP28-BXU/BXD-10-100GD

**Single-Lambda 100GBASE, QSFP28-BiDi, SMF TRANSCEIVER, 10km
(BXU)1271/1331nm, (BXD)1331/1271nm, SIMPLEX LC CONNECTOR**

Product Features

- QSFP28 MSA package with LC connector
- Compliant to 100G Lambda MSA 100G-LR1-10
- Interoperable with IEEE 802.3cu
- Lane signaling rate 53.125GBd with PAM4
- High speed I/O electrical interface
- Two Wire Serial Interface with Digital Diagnostic Monitoring
- Support KP4 FEC inside the module and KP4 FEC shutdown
- Reaches up to 10km over SMF
- Maximum power consumption 4.5W
- 3.3V power supply voltage
- Compliant to RoHS2.0
- Case operating temperature:
 - Commercial: 0 ~ 70°C
 - Industrial: -40 ~ 85°C



Product Applications

- 100GBASE Ethernet Links
- Data Center

I. Maximum Ratings

Exceeding the limits below may damage the transceiver module permanently.

Parameter	Symbol	Min.	Typ.	Max.	Units
Storage Temperature	Ts	-40		85	°C
Relative Humidity (non-condensing)	RH	5		85	%
Supply Voltage	Vcc	0		3.6	V
Low Speed Signal Voltage Range		-0.3		4.0	V
ESD Sensitivity				±500V for RF	V
				±2kV for others	

II. Operating Specifications

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Case Operating Temperature	TOP	0		+70	°C	Commercial
		-40		+85		Industrial
Power Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Relative Humidity	RH	5		85	%	
Power Dissipation	PD			4.5	W	
Data Rate (Optical)	DRO		103.125	106.25	Gb/s	
Data Rate (Electrical)	DRE		26.5625		Gb/s	
Operating Link Distance	D			10	km	

III. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter						
Input Differential impedance	R _{in}		100		Ω	
Differential Termination Mismatch				10	%	
Differential Data Input Amplitude	V _{in} , PP			900	mV	
LPMode, Reset and ModSelL	V _{IL}	-0.3		0.8	V	
	V _{IH}	2		V _{CC} +0.3	V	
Receiver						
Output Differential Impedance	R _{out}		100		mV	
Differential Termination Mismatch				10	%	
Differential Data Output Amplitude	V _{out} , PP			900	Ps	
ModPrsL and IntL	VoL	0		0.4	V	
	VoH	V _{CC} -0.5		V _{CC} +0.3	V	

IV. Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Data Rate			103.125	106.25	Gb/s	
Data Rate Variation		-100		+100	ppm	
Lane Center Wavelength		1264.5	1271	1277.5	nm	
		1324.5	1331	1377.5		
Launch Power per Lane	Peach	-1.4		4.5	dBm	1, 2
Optical Modulation	POMA	0.7		4.7	dBm	3
Launch Power in OMA minus TEDECQ	ER>=4.5dB	-0.7			dBm	
	ER<4.5dB	-0.6				
TX & Dispersion eye closure	TDECQ			3.4	dBm	
Optical Extinction Ratio	ER	3.5			dB	
Side Mode Suppression Ration	SMSR	30			dB	
Launch Power of OFF Transmitter per Lane				-30	dBm	
Relative Intensity Noise	RIN			-136	dB/Hz	
Optical Return Loss Tolerance				15.6	dB	
Transmitter Reflectance				-26	dB	4
Receiver						
Data Rate			103.125	106.25	Gb/s	
Data Rate Variation		-100		+100	ppm	
Lane Center Wavelength		1324.5	1331	1377.5	nm	
		1264.5	1271	1277.5		
Damage Threshold	Rdam	5.5			dBm	5
Average Receive Power	Rpow	-7.7		4.5	dBm	6
Receiver Power (OMA) per Lane	Rovl			4.7	dBm	
Receiver Sensitivity [OMA] (max)	SENeach			-6.1	dBm	@BER2.4e-4
Stressed Sensitivity per Lane	SRS			-4.1	dBm	
Receiver Reflectance				-26	dB	
LOSS assert	Optical Power Alarm	-26		-12	dBm	
LOSS de-assert				-10	dBm	
Conditions of Stressed Receiver Sensitivity test:						
Stressed eye closure for PAM4 (SECQ)				3.4	dB	
SECQ-10*IgCeq				3.4	dB	

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Notes:

1. As the total average launch power limit has to be met, not all of the lanes can operate at the maximum average launch power ,each lane.
2. Average launch power, each lane(min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant: however, a value above this does not ensure compliance.
3. Even if the TDECQ<1.4dB for an extinction ratio of ≥ 4.5 dB or TDECQ<1.3dB for an extinction ratio of < 4.5 dB, the OMA outer (min) must exceed this value.
4. Transmitter reflectance is defined looking into the transmitter.
5. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level.
6. Average receiver power, each lane(min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance.
7. Measured with conformance test signal at TP3 for the BER specified in 《 100G-FR and 100G-LR1 Technical Specifications Rev 2.0 》
8. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

V. Ordering Information

Pivotal Part Number	Description
QSFP28-BXU-10-100GD	QSFP28, BiDi 1270TX/1330RX, 100G-LR1 SMF 10km (FEC), 100G DDM, C-Temp
QSFP28-BXU-10-100GDI	QSFP28, BiDi 1270TX/1330RX, 100G-LR1 SMF 10km (FEC), 100G DDM, I-Temp
QSFP28-BXD-10-100GD	QSFP28, BiDi 1330TX/1270RX, 100G-LR1 SMF 10km (FEC), 100G DDM, C-Temp
QSFP28-BXD-10-100GDI	QSFP28, BiDi 1330TX/1270RX, 100G-LR1 SMF 10km (FEC), 100G DDM, I-Temp

Notes:

1. Please contact sales for specific OEM Platform part numbers to fit your network.

Warranty

<https://pivotaloptics.com/warranty/>

Disclaimer

External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.