

QSFP28-ZR4+-100GD

Single-Rate 100GBase QSFP28 ZR4 1294-1310nm SMF 100km Transceiver

Product Features

- Compliant with QSFP28 Standard:
 - SFF-8661, SFF-8636
- High speed I/O electrical interface (CAUI-4) compliant with IEEE 802.3bm-2015
- 100GBASE-ZR4 point-to-point Ethernet links
- Rx sensitivity of -30dBm with enabled ZR4 FEC in host for up to 100km SMF
- Single 3.3V Supply Voltage
- Maximum power consumption 5.5W
- LAN WDM EML laser and SOA+PIN Receiver
- Universal QSFP28 MSA package with duplex LC connector
- Complies with EU Directive 2011/65/EU (RoHS compliant)
- Class 1 Laser
- Case operating temperature:
 - Commercial: 0 ~ 70°C



Product Applications

- 100GBASE-ZR4 Ethernet Links
- Infiniband QDR and DDR interconnects
- Telecom networking

I. Maximum Ratings

Exceeding the limits below may damage the transceiver module permanently.

Parameter	Symbol	Min.	Typ.	Max.	Units
Storage Temperature	T _s	-40		85	°C
Power Supply Voltage	V _{CC}	-0.5		3.6	V
Relative Humidity (non-condensation)	RH	5		95	%
Data Input Voltage Differential	IVDIP-VDINI	-		1	V
Control Input Voltage	VI	-0.3		V _{CC} +0.5	V
Control Output Voltage	IO	-20		20	mA

II. Operating Specifications

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Case Operating Temperature	TC	0		70	°C	Commercial
Power Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Instantaneous peak current at hot plug	ICC_IP			2200	mA	
Sustained peak current at hot plug	ICC_SP			1815	mA	
Maximum Power Dissipation	PD			5.5	W	
Maximum Power Dissipation, Low Power Mode	PDLP			1.5	W	
Aggregate Bit Rate	ABR		103.125		Gb/s	
Data Rate (each lane)	DRL		25.78125		Gb/s	
Control Input Voltage High	VIH	V _{CC} *0.7		V _{CC} +0.3	V	
Control Input Voltage Low	VIL	-0.3		V _{CC} *0.3	V	
Two Wire Serial Interface Clock Rate				400	kHz	
Module power supply noise tolerance 10 Hz - 10MHz (peak-to-peak)				66	mVpp	
Rx Differential Data Output Load			100		ohms	
Link Distance (SMF)	D	2		100	km	

Notes:

1. 40km without FEC and 100km with FEC

III. Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Lane Wavelength (range)	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	25.78125	Gb/s	
Side-Mode suppression ratio	SMSR	30				
Total Average Optical Launch Power	POUT			12.5	dBm	
Average Launch Power Tx_Off (Each Lane)	POUT_OFF			-30	dBm	
Average Optical Launch Power (Each Lane)	POUTL	3.5		6.5	dBm	
Extinction Ratio	ER	8			dB	
Spectral Width	$\Delta\lambda$			1	nm	
Optical Modulation Amplitude (Each Lane)	OMA	4.2		7	dBm	
Transmitter and Dispersion Penalty (Each Lane)	TDP			2.2	dB	
Launch Power in OMA minus TDP (Each Lane)	OMA-TDP	1.5			dBm	
Difference in launch power between any two lanes (OMA)	DT_OMA			3	dB	
Optical Return Loss Tolerance	ORLT			20	dB	
RIN20OMA	RIN			-130	dB/Hz	
Transmitter Reflectance	TR			-12	dB	
Transmitter eye mask { X1, X2, X3, Y1, Y2, Y3 }		{ 0.25, 0.4, 0.45, 0.25, 0.28, 0.4 }				

QSFP28-ZR4+-100GD

Single-Rate 100GBASE, QSFP28, ZR4+, SMF TRANSCEIVER
 1294-1310nm, 100km REACH, DUPLEX LC CONNECTOR

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Receiver						
Lane Wavelength (range)	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	
Receiver Sensitivity (OMA) per Lane				-30	dBm	
Stressed Receiver Sensitivity in OMA (each lane)				-24.5	dBm	
Stressed Receiver Sensitivity Test Conditions:						
Stressed Eye J2 Jitter (Each Lane)			0.33		UI	
Stressed Eye J9 Jitter (Each Lane)			0.48		UI	
Vertical Eye Closure Penalty			2		dB	
Damage Threshold for Receiver	Pin, damage	-7			dBm	
Average Receive Power (Each Lane)		-28		-5	dBm	
Receive Power in OMA (Each Lane), Overload	OMA			-4.5	dBm	
Receiver Reflectance	RXR			-26	dB	
LOS Assert	LOSA	-40			dBm	
LOS De-assert	LOSD			-30	dBm	
LOS hysteresis	LOSH	0.5			dB	

Notes:

1. Measured with conformance test signal at TP3 for the BER = 5x10⁻⁵

IV. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Consumption	p			5.5	W	
Transmitter						
Differential Data Output Amplitude	V _{OUT} , PP			900	mVpp	
Differential Termination Mismatch				10	%	
Transition Time, 20 to 80%	TR	12			Ps	
ModPrsL and IntL	V _{OL}	0		0.4	V	IOL=4mA
	V _{OH}	V _{CC} -0.5		V _{CC} +0.3	V	IOL=4mA
Receiver						
Differential Data Input Amplitude	V _{IN} , PP	95		900	mVpp	
Differential Termination Mismatch				10	%	
LPMODE, Reset and ModSelL	V _{IL}	-0.3		0.8	V	
ModPrsL and IntL Differential Data Input Amplitude	V _{IH}	2		V _{CC} +0.3	V	
	V _{IN} , PP	95		900	mVpp	

V. Ordering Information

Pivotal Part Number	Description
QSFP28-ZR4-100GD	QSFP28, 1310nm, ZR4+ EML SMF 100km with FEC, 100G DDM, C-Temp
QSFP28-ZR4-100GDI	QSFP28, 1310nm, ZR4+ EML SMF 100km with 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.