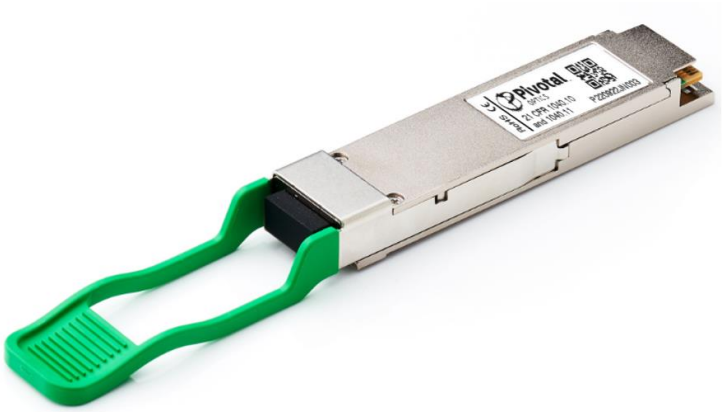
QSFP28-100G-CWDM4

Single-Rate 100GBase QSFP28 CWDM4 1271-1331nm 2km Transceiver

Product Features

- Hot-pluggable QSFP28 form factor
- Supports 103.1Gb/s aggregate bit rate
- Power dissipation < 3.5W
- RoHS compliant
- Single 3.3V power supply
- Loss budget of 5 dB on up to 2km of Single Mode Fiber (SMF) [with KR4 FEC]
- 4x25Gb/s CWDM transmitter
- 4x25G retimed electrical interface.
- Duplex LC receptacles
- I2C management interface
- Case operating temperature:
  - Commercial: 0 ~ 70°C



Product Applications

- 100G CWDM4 with FEC

I. Maximum Ratings

Exceeding the limits below may damage the transceiver module permanently.

Parameter	Symbol	Min.	Typ.	Max.	Units
Storage Temperature	Ts	-40		+85	℃
Maximum Supply Voltage	Vcc	-0.3		4	V
Relative Humidity (non-condensing)	RH	15		85	%
Receiver Damage Threshold (per lane)	PRdmg	3.5			dBm

II. Operating Specifications

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Case Operating Temperature	TC	0		+70	℃	Commercial
Supply Voltage	Vcc	3.135	3.3	3.465	V	
Supply Current	Icc			1.12	A	
Module Total Power	P			3.5	W	1
Data Rate (each lane)			25.78125	25.78125	Gb/s	
Link Distance (SMF)	D			2	km	

Notes:

1. Maximum total power value is specified across the full temperature and voltage range. Power consumption ≤ 3.5W when stabilized, but may be > 3.5W during locking acquisition.

III. Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Transmitter						
Lane Wavelength (range)	L0	1264.5		1277.5	nm	
	L1	1284.5		1297.5		
	L2	1304.5		1317.5		
	L3	1324.5		1337.5		
Signaling rate (each lane)		25.78125 ± 100ppm			Gbd	1
Extinction Ratio	ER	3.4			dB	
Transmit OMA per Lane	TxOMA1	-4		2.5	dBm	
Transmit OMA per Lane @TDP max	TxOMA2	-2			dBm	2
Transmit Average Power per Lane				2.5	dBm	8
Transmitter and Dispersion Penalty per Lane				3	dB	3
Side-Mode suppression ratio	SMSR	30			dB	
Launch Power (OMA-TDP)	OMA-TDP	-5			dBm	
Average launch power of OFF transmitter (each lane)	Poff			-30	dBm	
Transmitter reflectance	R_T			-12	dB	
Transmitter eye mask definition { X1, X2, X3, Y1, Y2, Y3 }		{ 0.31, 0.4, 0.45, 0.34, 0.38, 0.4 }				4

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Receiver						
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	L1	1284.5		1297.5		
	L2	1304.5		1317.5		
	L3	1324.5		1337.5		
Signaling rate (each lane)		25.78125 ± 100ppm			Gbd	5
Receive Saturation (OMA) per Lane	Rmax	2.5			dBm	
Damage threshold per Lane		3.5			dBm	
Unstressed Receiver Sensitivity (OMA) per Lane	RXsens			-10	dBm	6
Stressed Receiver Sensitivity (OMA) per Lane	SRS			-7.3	dBm	7
Conditions of stressed receiver sensitivity test						
Vertical Eye Closure Penalty	VECP	1.9			dB	
Stressed Jitter (J2)	J2	0.33			UI	
Stressed Jitter (J4)	J4	0.48			UI	
SRS eye mask definition { X1, X2, X3, Y1, Y2, Y3 }		{ 0.31, 0.4, 0.45, 0.34, 0.38, 0.4 }				
LOS Assert	LOSA			-11.6	dBm	
LOS Deassert	LOSD	-24		-13.6	dBm	
LOS Hysteresis	LOSH		1.5		dB	

Notes:

1. Transmitter consists of 4 lasers operating at 25.78Gb/s each.
2. At maximum TDP.
3. TDP value does not include MPI penalty.
4. Hit ratio of 5x10-5, per IEEE.
5. Receiver consists of 4 photodetectors operating at 25.78Gb/s each.
6. Sensitivity is specified at 5x10-5 BER.
7. Measured with CWDM4 MSA2 conformance test signal at TP3 for 5x10-5 BER.
8. Power value and power accuracy are with all channels on.

IV. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Consumption	p			5.5	W	
Supply Current	Icc			1585	mA	
Transmitter						
Signaling rate (each lane)		25.78125 ± 100ppm			Gbd	
Differential data input swing per lane	Vin,pp			900	mV	
Differential input return loss (min)	RLd(f)	9.5 – 0.37f, 0.01≤f<8 4.75 – 7.4log$_{10}$(f/14), 8 ≤f<19			dB	
Differential to common mode input return loss (min)	RLdc(f)	22-20(f/25.78), 0.01≤f<12.89 15-6(f/25.78), 12.89≤f<19			dB	
Differential termination mismatch				10	%	
Stressed input parameters:						
• Eye Width			0.46		UI	
• Applied pk-pk sinusoidal Jitter		Per IEEE 802.3bm Table 88-13				
• Eye Height			95		mV	
DC common mode voltage		-350		2850	mV	
Receiver						
Signaling rate (each lane)		25.78125 ± 100ppm			Gbd	
Differential data output swing	Vout,pp	100		400	mVpp	1
		300		600		
		400		800		
		600		1200		
Eye Width		0.57			UI	
Vertical eye closure				5.5	dB	
Differential output return loss (min)	RLd(f)	9.5 – 0.37f, 0.01≤f<8 4.75 – 7.4log$_{10}$(f/14), 8 ≤f<19			dB	
Common to differential mode conversion return loss (min)	RLdc(f)	22-20(f/25.78), 0.01≤f<12.89 15-6(f/25.78), 12.89≤f<19			dB	
Differential termination mismatch				10	%	
Transition time, 20% to 80%	Tr,Tf	12			ps	

Notes:

1. Output voltage is settable in 4 discrete ranges via I2C. Default range is Range 2 (400 – 800 mV).

Warranty

All transceivers feature a limited lifetime 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.