800ZR Pro OSFP Coherent Transceiver

CL800GOSFPZR

Product Features:

- Compliant with OSFP MSA, Type 2 package with the closed top heatsink
- Compliant with OIF 800ZR IA
- Support 100GbE/200GbE/400GbE/800GbE client signal
- C-band tunable, supporting 150 GHz grid spacing and 0.1 GHz fine- tuning
- EDFA inside, TX output power ranging from +1 to -10 dBm tunable at C-band (up to +4 dBm at 193.7 THz)
- Support ingress LF hold-off time configuration
- Support hitless firmware upgrade
- Duplex LC connector
- Operating case temperature: 0°C to 75°C
- Single 3.3 V power supply
- Typical power consumption 26 W (800GbE)
- RoHS 2 compliant

Functional Characteristics (Optical)

The following tables list the performance specifications for the various functional blocks of the integrated optical transceiver module.

Table 1 – Transmitter Optical Specifications

Parameter		Min.	Typ.	Max.	Unit	Note
Modulation format			16QAM		-	OFEC
Baud rate			118.2 ± 20 ppm		-	-
Transmitter frequency range		191.3	-	196.1	THz	Center frequency
Flexible DWDM grid		3.125	-	-	GHz	-
Frequency fine-tuning step		0.1	-	-	GHz	-
Laser frequency accuracy		-1.8	-	1.8	GHz	-
Laser linewidth		-	-	300	kHz	Tx and LO
TX spectral upper mask		-	-	(59.3, 0)	(GHz, dB)	Refer to
				(73.1, -10)(77.5, -15)		OIF-800ZR-IAdefinition and mask in Section 6.4.1
				(79.9, -20)		
TX spectral lower mask		(59.3, -9)	-	-	(GHz, dB)	Refer to
		(61.9, -20)(61.9, -35)				OIF-800ZR-IAdefinition and mask in Section 6.4.1
Laser frequency noise		-	-	See mask	Hz2/Hz	
Laser frequency noise-discrete tone amplitude		-	-	See mask	MHz	
Laser RIN	0.2 GHz ≤ f≤ 10 GHz Avg	-	-	-145	dB/Hz	-

	0.2 GHz ≤ f≤ 10 GHz Peak	-	-	-140		-
Tx clock phase noise (PN): maximum PN mask		-	-	See mask	dBc/Hz	
Maximum transmit output power	191.3-196.1THz	0	1	-	dBm	Maximum transmit output power over wavelength, temperature, and aging
	193.7 THz	3	4	-		
Minimum provisiona ble range of transmit output power	191.3-196.1THz	-10	-	1	dBm	-
	193.7 THz	-10	-	4		
Default transmit output power		0.5			dBm	-
Total output power with Tx disabled		-	-	-35	dBm	OutputDisableTx == true
Total output power during wavelength switching		-	-	-35	dBm	Applicable to modules with tunable optics
Transmit output power stability		-0.5	-	0.5	dB	Output short-term power stability when operating at a fixed wavelength and temperature.Measurement condition: 1 ms averaging time for 1-minute accumulation.
Optical power setting accuracy		-1	-	1	dB	-
Output power monitor accuracy		-1	-	1	dB	-
Transmit output power adjust step		0.1	-	-	dB	-
Inband (IB) OSNR		35	-	-	dB/12.5GHz	Inband OSNR is defined as the Tx signal power between the -20 dB Tx spectral mask frequency points, referenced to an optical noise bandwidth of 12.5 GHz (0.1 nm @ 193.7 THz) at the Tx signal peak frequency.
Out-of-band (OOB) OSNR		27	-	-	dB/12.5GHz	Out-of-band OSNR is defined as the Tx signal power between the -20 dB Tx spectral mask frequency points, referenced to the maximum optical noise power within any optical bandwidth of 12.5 GHz (0.1 nm @ 193.7 THz) outside of the -20 dB Tx spectral mask.
Transmitter reflectance		-	-	-20	dB	Looking into the Tx

Transmitter back reflection tolerance	-	-	-24	dB	Light reflected relative to Tx output power back to transmitter while still meeting Tx optical performance requirements.
Transmitter polarization dependent power	-	-	1.5	dB	-
X-Y skew	-	-	5	ps	-
DC I-Q offset (mean per polarization)	-	-	-26	dB	
I-Q instantaneous offset	-	-	-20	dB	Same formula definition as DC I-Q offset, however, any averaging period shall be < 1 μs to be consistent with the timescales of Rx DSP operations.Specification applies at any point in time. Allows for modulator bias controls/errors.
Mean I-Q amplitude imbalance	-	-	1	dB	-
I-Q phase error	-5	-	5	deg	-
I-Q skew	-	-	0.75	ps	-

Table 2 – Receiver Optical Specifications

Parameter	Min.	Typ.	Max.	Unit	Note
Modulation format		16QAM		-	OFEC
Baud rate		118.2 ± 20 ppm		-	-
Frequency offset between received carrier and LO	-3.6	-	3.6	GHz	Acquisition range
Input power range(amplified,OSNR tolerance defined)	-9	-	0	dBm	Signal power of the channel for the OSNR tolerance defined
Input power range (single wavelength unamplified,193.7 THz)	-19	-	0	dBm	RX OSNR > 35 dB,193.7 THz
Input power range (single wavelength unamplified, 191.3-196.1 THz)	-18	-	0	dBm	RX OSNR > 35 dB, 191.3-196.1 THzTHz
Input power damage threshold	13	-	-	dBm	Instantaneous input power
OSNR tolerance	-	25.5	27	dB/12.5GHz	The OSNR tolerance is referenced to an optical bandwidth of 12.5 GHz (0.1 nm @ 193.7 THz).
Pre FEC BER threshold	-	1.6e-2	1.9e-2	-	-
Optical return loss	20	-	-	dB	Optical reflectance at Rx connector input.
Chromatic dispersion (CD) tolerance	2400	-	-	ps/nm	Tolerance to chromatic dispersion
CD OSNR tolerance penalty	-	-	0.5	dB	OSNR tolerance penalty over OSNR tolerance due to chromatic dispersion
PMD tolerance (DGD, SOPMD)	10	-	-	ps	Tolerance to PMD with ≤ 0.5 dB penalty against OSNR tolerance when change in SOP is ≤ 1 krad/s.10 ps of average PMD

					(DGD, SOPMD)corresponds to:33 ps of DGDmax when SOPMD = 0 ps2272 ps2 of SOPMD when DGDmax =23.3 psDue to the statistical nature of PMD the DGDmax to DGDmean ratio is calculated at 3.3(4.1 x 10-6probability that instantaneous DGD exceeds DGDmax).
Peak PDL tolerance	3.5	-	-	dB	Tolerance to peak PDL with ≤ 1.8 dB penalty to OSNR tolerance when change in SOP is ≤ 1 krad/s.Test configuration: PDL emulator applied before noise loading.
Tolerance to change in SOP	50	-	-	krad/s	Tolerance to change in SOP with ≤ 0.5 dB additional OSNR penalty over all PMD and PDL values.
Optical input power transient tolerance	-2	-	2	dB	Tolerance to change in input power with ≤ 0.5 dB penalty to OSNR tolerance.Received power during transient shall be within the range defined by the input power range. OSNR penalty is referenced against the steady state required OSNR tolerance at the minimum power of the input transient.The 20% to 80% rise/fall times for the input power change shall be no faster than 50 microseconds, equivalent to a ≤ 24 mdB/ms maximum slew rate.
Adjacent channel crosstalk OSNR tolerance penalty	DWDM system dependent			dB	OSNR tolerance penalty due to crosstalk interference from neighboring channels.Back-to-back through the reference mux/demux filters specified.Neighboring channels conforming to the worst-case Tx spectral mask.Neighboring channels having 3 dB higher Tx output power relative to the channel under measurement and at worst case frequency offsets.
Intra-channel filtering penalty	DWDM system dependent			dB	Due to filtering effects with the reference 150 GHz mux/demux filters specified

Ordering Information

Table 3 - Ordering Information

Part No.	Specification					Application
	Package	Rate	Pout	Temperature	Reach	
CL800GOSFPZR	OSFP	800G	+1 dBm to-10 dBm	0°C to 75°C	120 km	800ZR

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