

100G Coherent QSFP28 C-band Tunable 80km DCO Transceiver

QSFP-ZR-100G-I

QSFP-ZR-100G-S-I



Applications

- Access and aggregation networks
- Cable TV networks
- Wireless front-haul & mid-haul

Features

- Digital Coherent Optics module, hot-pluggable QSFP28 form factor
- IEEE 100G Ethernet (CAUI-4) or ITU-T 100G OTN (OTL4.4) compliant host interface
- 100G optical coherent interface with DP-DQPSK modulation and Staircase FEC per IEEE Std. 802.3-2022 100GBASE-ZR or ITU-T G.709.2
- Transmission reach:
 - Up to 80km unamplified (loss limited)
 - Up to 120km amplified (dispersion limited, optionally extendable to 300km)
- Full C-band tunable, 50GHz or 100GHz grid
- Case temperature range -40°C to 85°C (I-temp)
- Power dissipation < 6.0W
- Remote digital diagnostics monitoring

Description

The 100G ZR QSFP28 DCO transceiver supports 100G transmission over distances up to 120km (dispersion limited, optionally extendable to 300km) for edge network applications. On the host side, the module can accommodate IEEE 100GE Ethernet or ITU-T OTN OTU4 signals. The line side coherent interface specifications are aligned with IEEE Std. 802.3-2022 100GBASE-ZR [6] .

Product Specifications

I. General Specifications

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Conditions	Symbol	Min	Typ	Max	Unit	Notes
Storage temperature		TS	-40		85	°C	
Case operating temperature		TOP	-40		85	°C	
Power Consumption		PHP	-		6	W	
Relative humidity	Non-condensing	RH	5		85	%	

II. Interface Modes

A. Host Interface Modes

Hos Interface ID [9]	Host Interface Description [9]	Modulation	Forward Error Correction Code	Nominal Symbol Rate (GBd)	Supported Line Interface IDs [9]
QSFP-ZR-100G-S-I and QSFP-ZR-100G-I					
65 [6]	CAUI-4 C2M without FEC	NRZ	None	25.78125	68, 192, 193
66 [6]	CAUI-4 C2M with RS(528,514) FEC	NRZ	RS(528,514)	25.78125	68, 192, 193
QSFP-ZR-100G-S-I Only					
57 [7]	OTL4.4 (ITU-T G.709/ Y.1331 G.Sup58)	NRZ	RS(255,239)	27.9525	192, 193

B. Line Interface Modes

Line Interface ID [9]	Line Interface Description [9]	Modulation	Forward Error Correction Code	Nominal Symbol Rate (GBd)	Spectral Shaping
QSFP-ZR-100G-S-I and QSFP-ZR-100G-I					
65 [6]	100GBASE-ZR (Clause 154)	DP-DQPSK	Staircase (SC)	27.9525	None

Line Interface ID [9]	Line Interface Description [9]	Modulation	Forward Error Correction Code	Nominal Symbol Rate (GBd)	Spectral Shaping
QSFP-ZR-100G-S-I Only					
192 [8]	OTU4 Long Reach	DP-DQPSK	Staircase (SC)	27.9525	None
193 [7]	OTU4 Short Reach	DP-DQPSK	RS(255,239)	27.9525	None

III. Optical Characteristics

A. Transmitter

Parameter	Conditions	Symbol	Min	Typ	Max	Unit	Notes
Channel Frequency Range	100GHz grid	V_C	191.400	193.700	196.100	THz	
	50GHz grid		191.350	193.700	196.100		
Tx output power		$P_{Tx,out}$	-8		-4	dBm	
Tx output power monitor range		$P_{Tx,mon}$	-10		-2	dBm	
Tx output power during tuning or when Tx disabled		$P_{Tx,dark}$			-35	dBm	
Tx in-band optical signal to noise ratio	Under modulation, $ \Delta f < 60$ GHz	$OSNR_{in}$	40			dB/0.1nm	
Tx out-of-band optical signal to noise ratio	Under modulation, $ \Delta f > 60$ GHz, excl. side mode peaks	$OSNR_{out}$	35			dB/0.1nm	
Tx reflectance					-20	dB	

B. Receiver

Parameter	Conditions	Symbol	Min	Typ	Max	Unit	Notes
Rx total input power	Broadband	$P_{Rx,tot}$	-30		3	dBm	
Rx signal input power (amplified)	Full Rx OSNR tolerance	$P_{Rx,sig}$	-18		1	dBm	
	Extended range		-22		3		1
Rx OSNR tolerance	Back-to-back, $P_{Rx,sig} > -18$ dBm	100G DQPSK SC	16.5			dB/ 0.1nm	
		100G DQPSK RS	21.5				

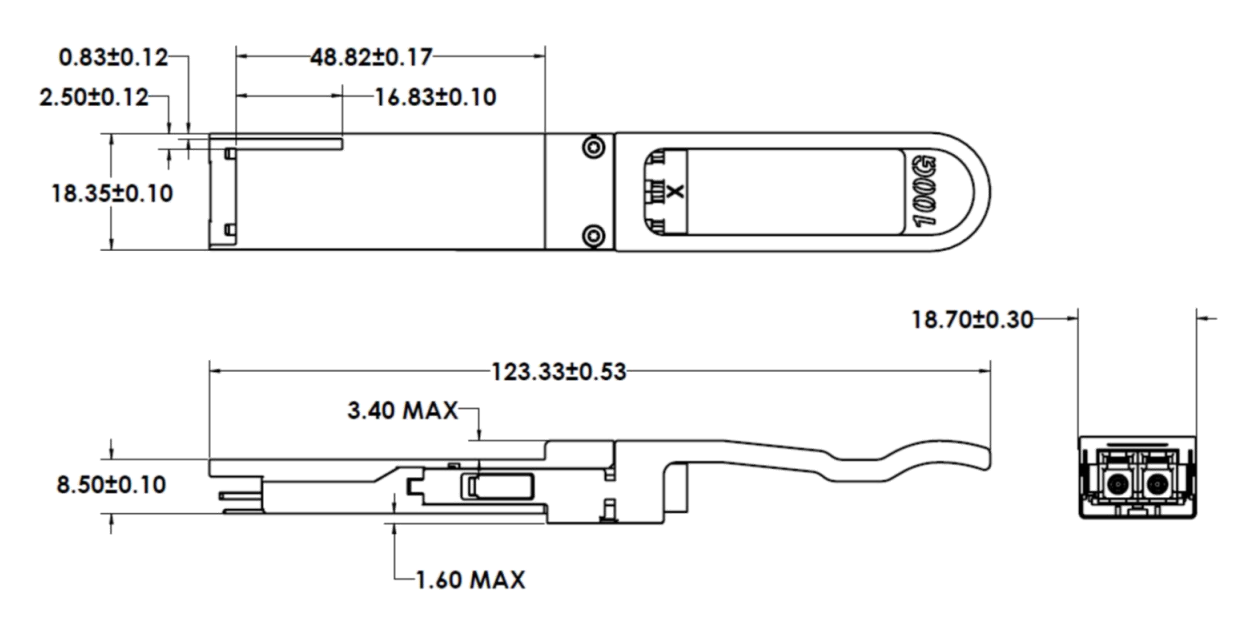
Parameter	Conditions	Symbol	Min	Typ	Max	Unit	Notes
Rx signal input power (unamplified)	OSNR > 35dB/0.1nm	100G DQPSK SC	-30		1	dBm	
		100G DQPSK RS	-24		1		
Rx signal input power monitor range		$P_{Rx,mon(s)}$	-21		3	dBm	
Rx total input power monitor range		$P_{Rx,mon(t)}$	-21		6	dBm	
Rx reflectance					-20	dB	

Notes:

[1] Rx signal input power range over which performance can be guaranteed with <1dB OSNR penalty relative to Rx OSNR tolerance limit

IV. Mechanical Specifications

The FS 100G QSFP28 ZR mechanical specifications are compliant to the applicable standards [1-5]. The pull tab color is White.



V. References

1. SNIA "Specification for QSFP+ 4X Module" SFF-8661 Rev. 2.5 (June 22, 2018).
2. SNIA "Specification for QSFP+ 4X 28 Gb/s Connector (Style A)" SFF-8662 Rev. 2.9 (June 8, 2018).
3. SNIA "Specification for QSFP+ 28 Gb/s Cage (Style A)" SFF-8663 Rev. 1.7 (October 19, 2017).
4. SNIA "Specification for QSFP+ 4X 28 Gb/s Connector (Style B)" SFF-8672 Rev. 1.2 (June 8, 2018).
5. SNIA "Specification for QSFP+ Cage" SFF-8683 Rev. 1.3 (October 19, 2017).
6. IEEE Computer Society "IEEE Standard for Ethernet", IEEE Std 802.3-2022.
7. ITU-T "Interfaces for the Optical Transport Network" G.709/Y.1331 Ed. 6.3 (February 2022).
8. ITU-T "OTU4 Long-Reach Interface" G.709.2/Y.1331.2 Ed. 1.1 (September 2020).
9. SNIA "Specification for SFF Module Management Reference Code Tables", SFF-8024 Rev 4.9 (May 24, 2021).

Order Information

Part Number	Description
QSFP-ZR-100G-I	QSFP28, 100GBase-ZR, C-band Tunable, SMF, 80km, -40°C to 85°C, LC, DCO, SFF-8636
QSFP-ZR-100G-S-I	QSFP28, 100GBase-ZR, C-band Tunable, SMF, 80km, -40°C to 85°C, LC, DCO, CMIS