



100G-ZR Transport in a Pluggable

Tyron Johnson

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100G ZR Coherent QSFP28



Features

8dBm Tx

Datarate 100GbE/OTU4
50/100GHz ITU Grid Full C-band Tunable
Reach:
80km Unamplified – 22dBm
300km Reach w/Line System + DCM – OSNR
dependent.
CAUI-4 Host Interface Support
Line Side DP-DQPSK
Duplex LC-UPC Connector
Digital Diagnostics Monitoring (DDM)
C-Temp and I-Temp Available
<5.5W Power Consumption

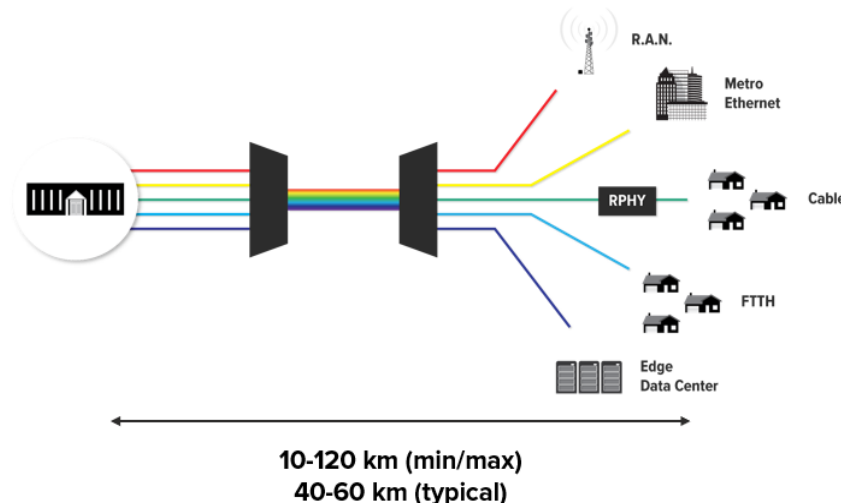
0dBm Tx

Datarate 100GbE/OTU4
50/100GHz ITU Grid Full C-band Tunable
Reach:
120km Unamplified – 30dBm
300km Reach w/Line System + DCM - OSNR
dependent.
CAUI-4 Host Interface Support
Line Side DP-DQPSK
Duplex LC-UPC Connector
Digital Diagnostics Monitoring (DDM)
C-Temp and I-Temp Available
<6W Power Consumption

Main Applications

- Point to point unamplified grey links up to 80km (-8dBm)/120km (0dBm).
- Point to point unamplified DWDM links up to 40km – 80km (Dependent on IL).
- Point to point amplified DWDM links up to 300km (Dependent on OSNR & network design).
- Brownfield applications with existing Optical Line Systems (OLS) that need additional 100G DWDM channels. In these applications the higher TX output power min. 0dBm version of the QSFP28 100G ZR may be required depending on ROADMs specifications.

In the Access/Edge space we expect up to 80km to cover 90% of the use cases.



Common Characteristics

- Wavelength Division Multiplexing (WDM)
- Variability of link lengths
- Large quantities of links with diverse protocols and data rates

100G Tunable DWDM – Product customization



1

EEPROM Management

- a) CMIS
- b) SFF-8636

2

TX Output power

- a) Low TX: min. -8.5 dBm
- b) High TX: min. 0 dBm

3

Data rate

- a) 100Gb Ethernet
- b) 100GbE / OTU4 multi-rate

4

Environment

- a) C-Temp (0 to 70 °C)
- b) I-Temp (-40 to +85 °C)

5

Chromatic Dispersion setting

- a) Default CD = 2,400 ps/nm
- b) Extended CD = 6,000 ps/nm

6

Tunable mode of operation

- a) Manual Tune
- b) Auto Tune

7

Manual Tune mode

- a) CLI Tunable
- b) External Tunable

8

Tunable Optical Filter (TOF)

- a) With TOF
- b) Without TOF



CMIS- Mgmt. Interface Options

1. CMIS Version – Common Management Interface Specification

CMIS is a newer way of managing transceivers that was introduced to focus on higher data rate and more complex optics

- CMIS 5.x and C-CMIS 1.x compliance
- CMIS pluggable and on-board modules allows a wider range of management features
 - DWDM Wavelength tuning via CLI
 - Application selection – Media/Host ID.
- Advanced monitoring parameters via VDM (CD, OSNR, DGD, etc)
- **Pros:**
 - More features and control vs legacy SFF version
 - Remote features (in-system) via CLI/GUI
- **Cons:**
 - Limited selection of NEM Hosts and SW compatibility



SFF-8636 MSA - Mgmt. Interface Options

2. SFF Version – Multi-source Agreement Small Form Factor

SFF-8636 is the legacy EEPROM memory map MSA used for management of almost all QSFP28 100G transceivers.

- Basic DDM/DOM parameters
 - Temperature
 - Tx/Rx power
 - Laser Bias
 - Voltage
- **Pros:**
 - Wide range of compatibility with QSFP28 routers/switches with older HW/SW revisions.
 - "External tunable" option via coding box/evaluation board.
- **Cons:**
 - Limited monitoring parameters.
 - Not recognized as "*true 100G ZR*" by NEM hosts.
 - Power draw – some hosts may not be able to support 5.5W/6W.



Alternative Solutions

Tuning:

The Tuning page is the central feature of the Precision OT Transceiver Tool. Designed to enable precise configuration of optical transceivers, users can fine-tune the device settings via an interactive slider that represents supported International Telecommunication Union (ITU) channels.

The screenshot shows the 'Tuning' interface of the Precision OT Transceiver Tool. It features a sidebar with navigation icons (home, waveform, refresh, mobile, settings) and a main content area. The main area displays the current ITU Channel # (48.5), Wavelength (1538.58 nm), and Frequency (194.85 THz). A horizontal slider allows users to select from supported ITU Channels (13.5 - 61.0), with values ranging from 191.35 THz / 1566.72 nm to 196.10 THz / 1528.77 nm. A 'Tune' button is present. Below the slider is a 'Result' field. The 'Current Info' section lists: ITU Channel: 48.5, Vendor: PRECISION, P/N: P-R-S10-10, Wavelength: 1538.58, OUI: [168,41,76], S/N: CE151113B0D, Frequency: 194.85, and Date Code: 151113. The bottom status bar shows icons for network, device, waveform, and light, along with the model number P-R-S10-10.





Alternative Solutions

Technology	Overall System Cost	Power Consumption	Operational Complexity	Installation Time	DWDM
Traditional Transport	\$\$\$\$\$	⚡⚡⚡⚡⚡	👤👤👤👤👤	🕒🕒🕒🕒🕒	Yes
CFP2-DCO	\$\$\$\$	⚡⚡⚡	👤👤👤	🕒🕒	Yes
PAM4 w/External EDFA+DCM	\$\$\$\$	⚡⚡⚡⚡⚡	👤👤👤👤	🕒🕒🕒	Yes
QSFP28 ZR4 QSFP28 <u>BiDi</u>	\$	⚡	👤	🕒	No
QSFP-DD 400G ZRx	\$\$\$	⚡⚡	👤👤	🕒	Yes
TQSFP28 ZR	\$\$	⚡	👤	🕒	Yes



Questions?