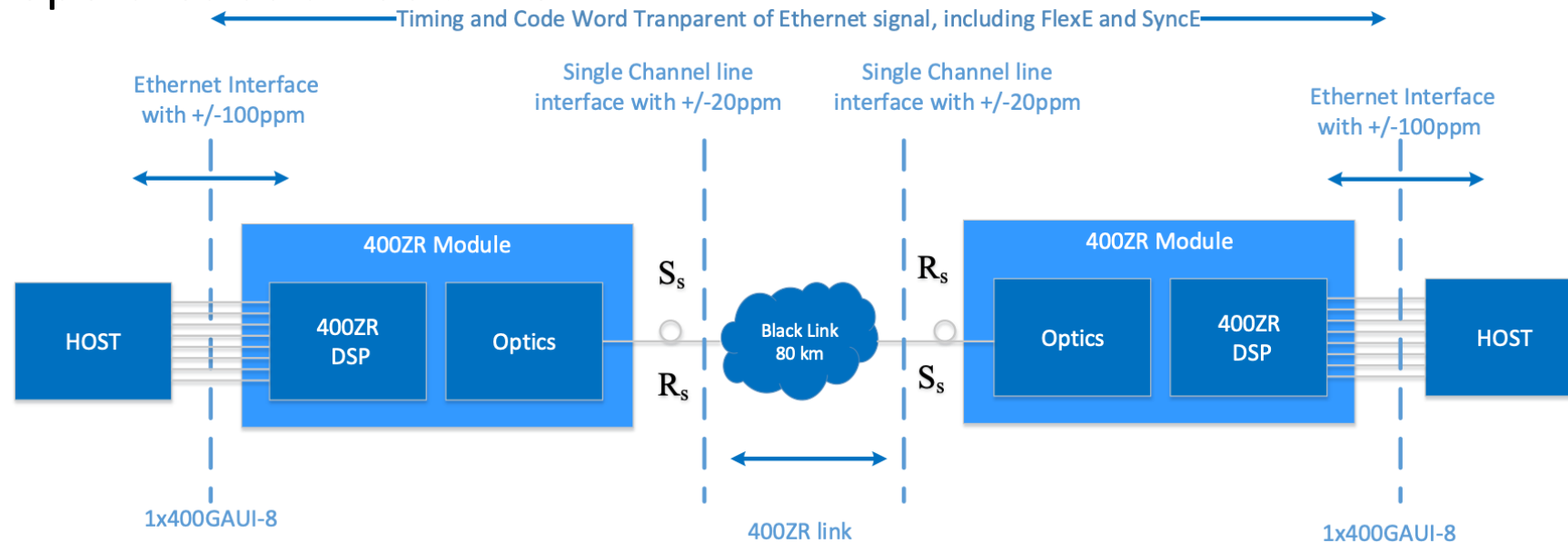


400ZR Interoperability Demo @ OFC 2023



What is 400ZR?

- 400ZR is an interoperable, cost-effective, 400Gb/s interface based on single-carrier coherent DP-16QAM modulation, low power DSP supporting absolute (Non-Differential) phase encoding/decoding, and a Concatenated FEC (C-FEC) with a post-FEC error floor $<1.0E-15$.
- 400ZR operates as a 400GBASE-R PHY.

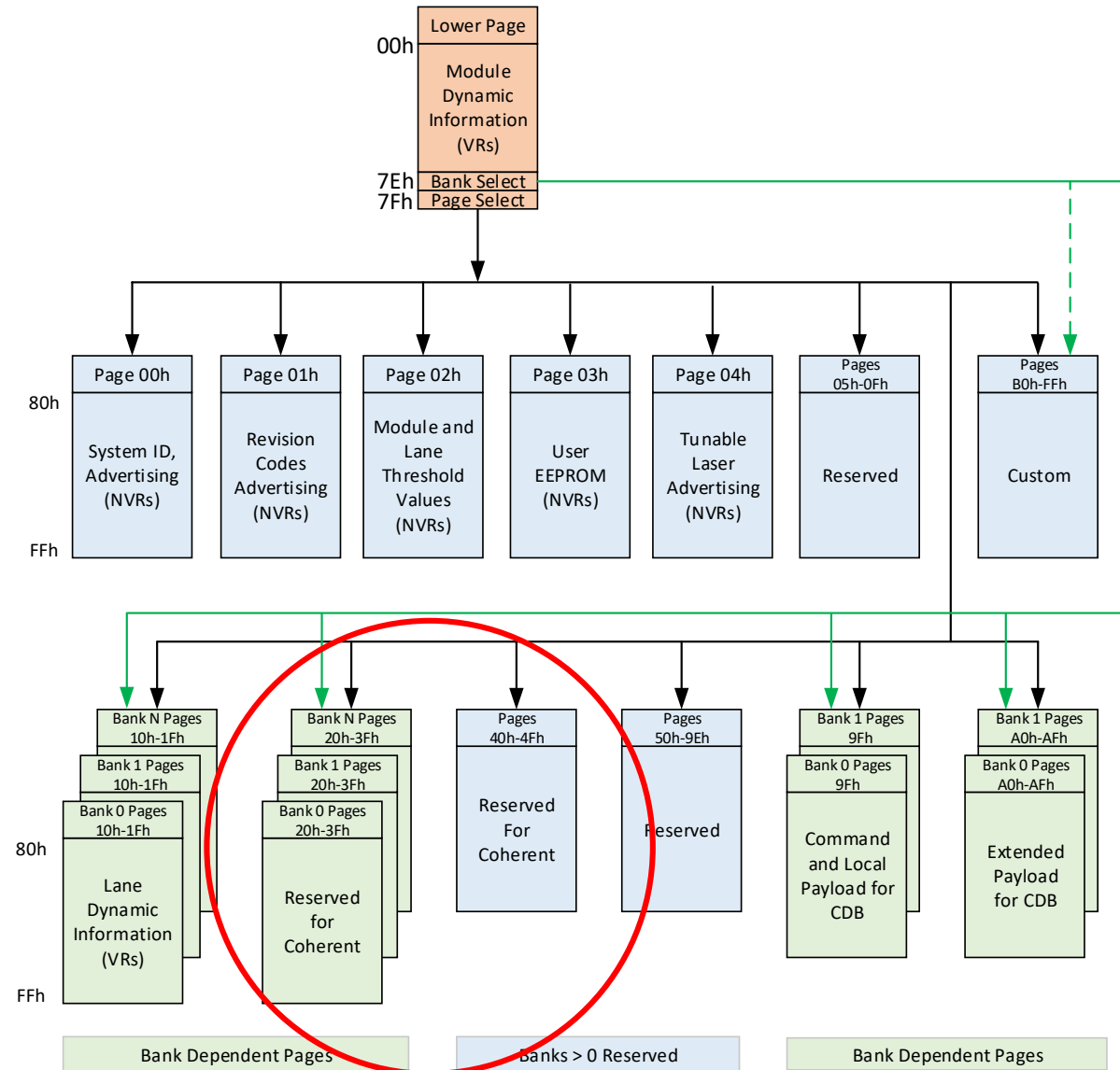


400ZR Strengths

- 400ZR enables the DCI application to happen without requiring significant additional equipment (size, space, power, expense).
- 400ZR interoperability supports an IPoDWDM infrastructure where switches are optically linked to each other over an open line system(OLS) using 400ZR modules.
 - Significant cost, space, and power savings by skipping grey optics and transport chassis.
- DCI network architectures built around OLS and 400ZR give data center operators and carriers greater choice in the equipment/components they use to build them.
- Low cost 400ZR allows data centers to be distributed across a region, providing more agility and scalability than the mega data center.

Coherent CMIS

- Defines the additions required to the Common Management Interface Specification (CMIS) to manage a coherent module.
- See more at the OIF CMIS demo!



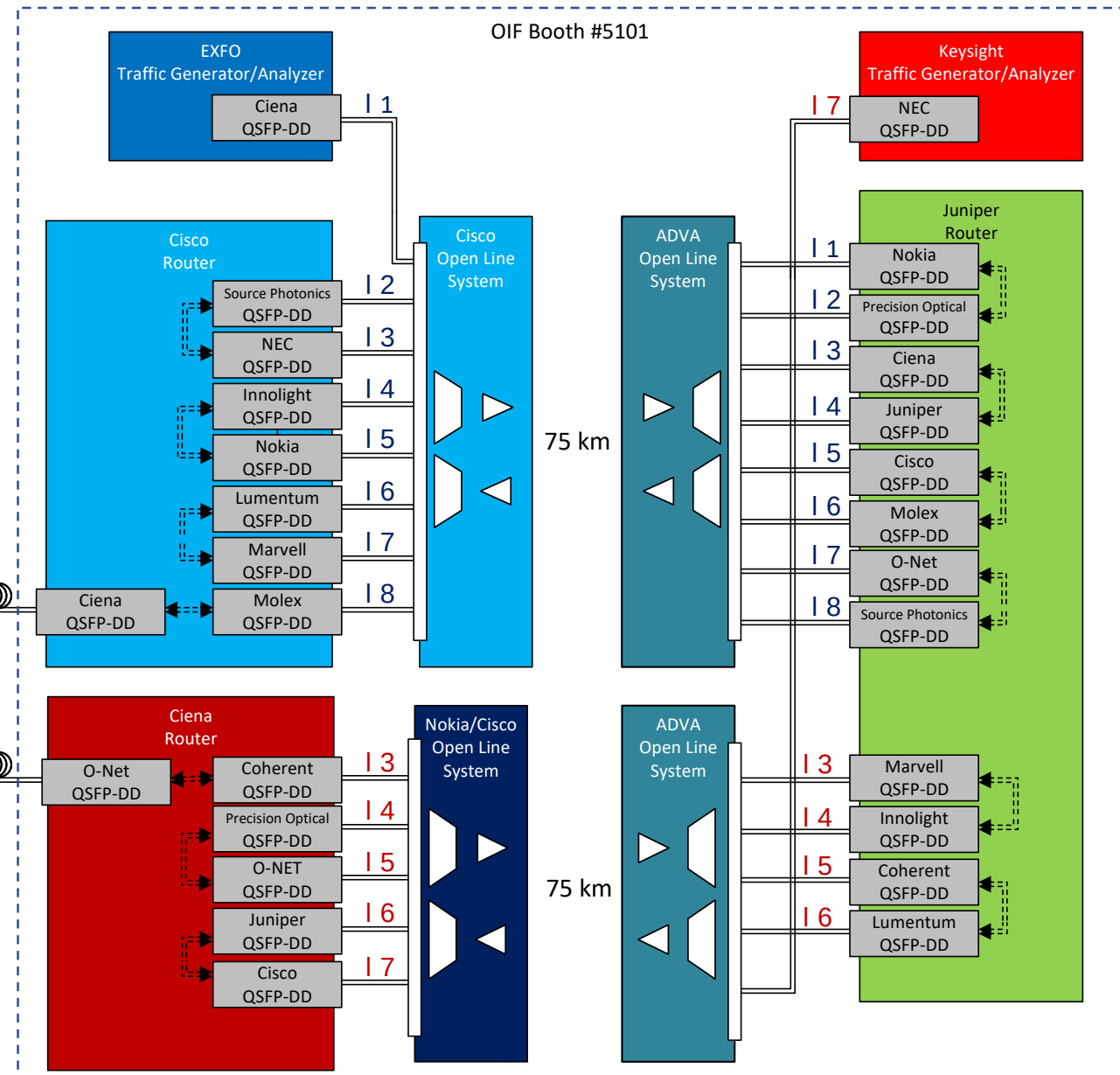
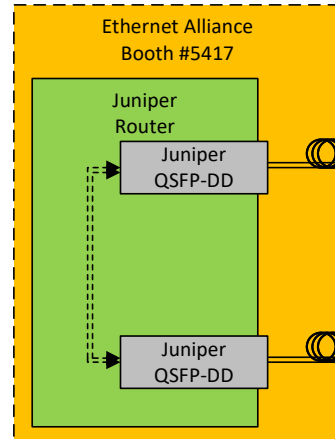
400ZR Implementation Agreement History

- November 2016 – 400ZR project started
- March 2020 - 400ZR 1.0 published
 - > 80 km DWDM
 - > 25 km point-to-point
 - 100GHz grid
- November 2022 - 400ZR 2.0 published
 - Added 75 GHz DWDM grid Application Code
 - General clarifications
- January 2023 - 400ZR 3.0 maintenance efforted started
 - Improved interoperability parameters
 - EVM?



400ZR Demo Block Diagram

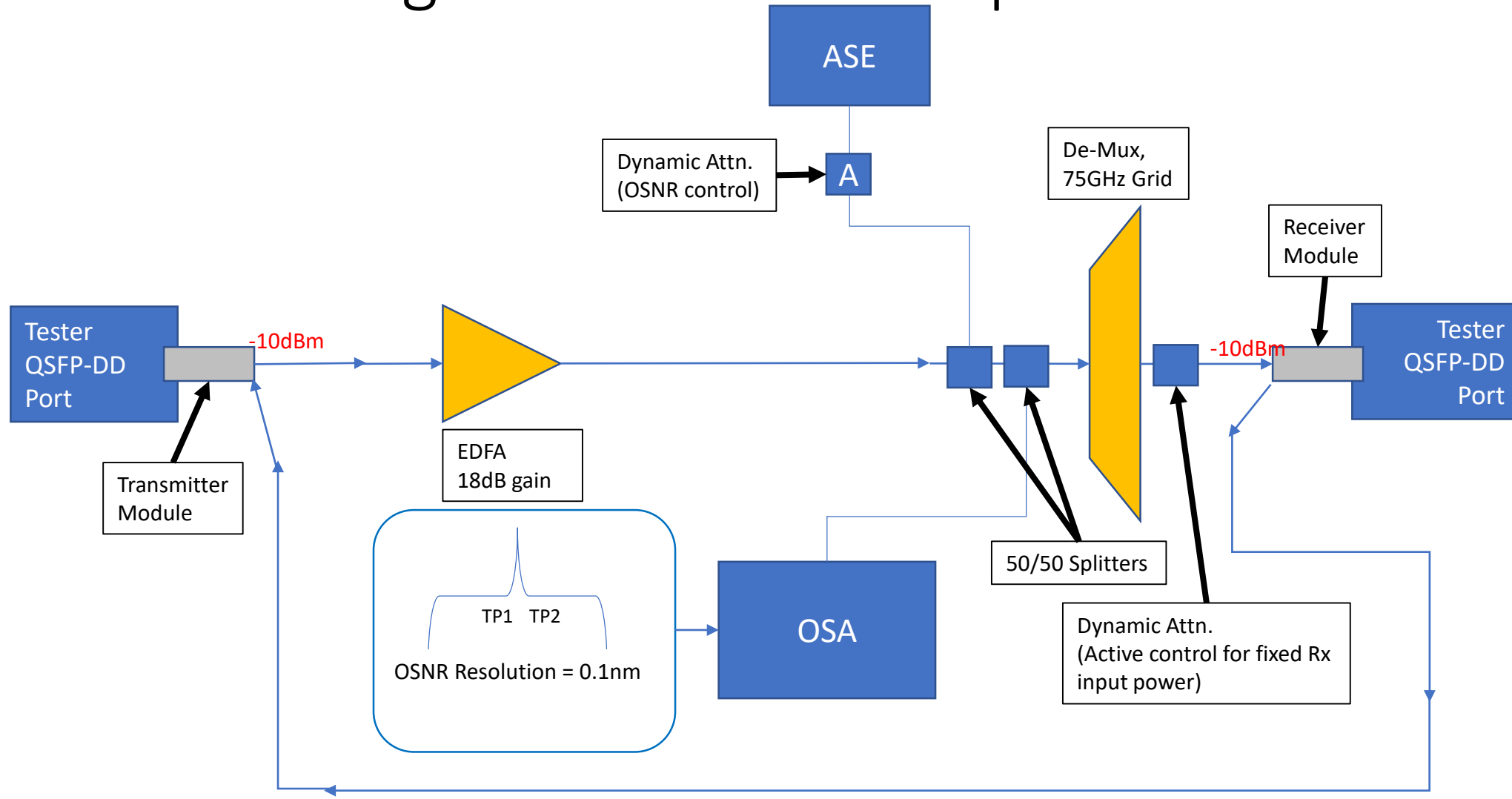
- 13 Module Vendors
 - 28 Modules
- Three Router Vendors
- Three OLS Vendors
- Two Test Equipment Vendors



400ZR Interop Demos

- OFC 2022 – 8 module vendors
 - 14 modules in demo
- ECOC 2022 – 8 module vendors
 - 22 modules in demo
 - White Paper: OIF 400ZR Interoperability ECOC 2022 Plugfest (November 2022)
- OFC 2023 – 13 module vendors
 - 28 modules in demo
 - White Paper: OIF 400ZR Interoperability OFC 2023 Plugfest (February 2023)

OIF 400ZR Plugfest rOSNR Interop

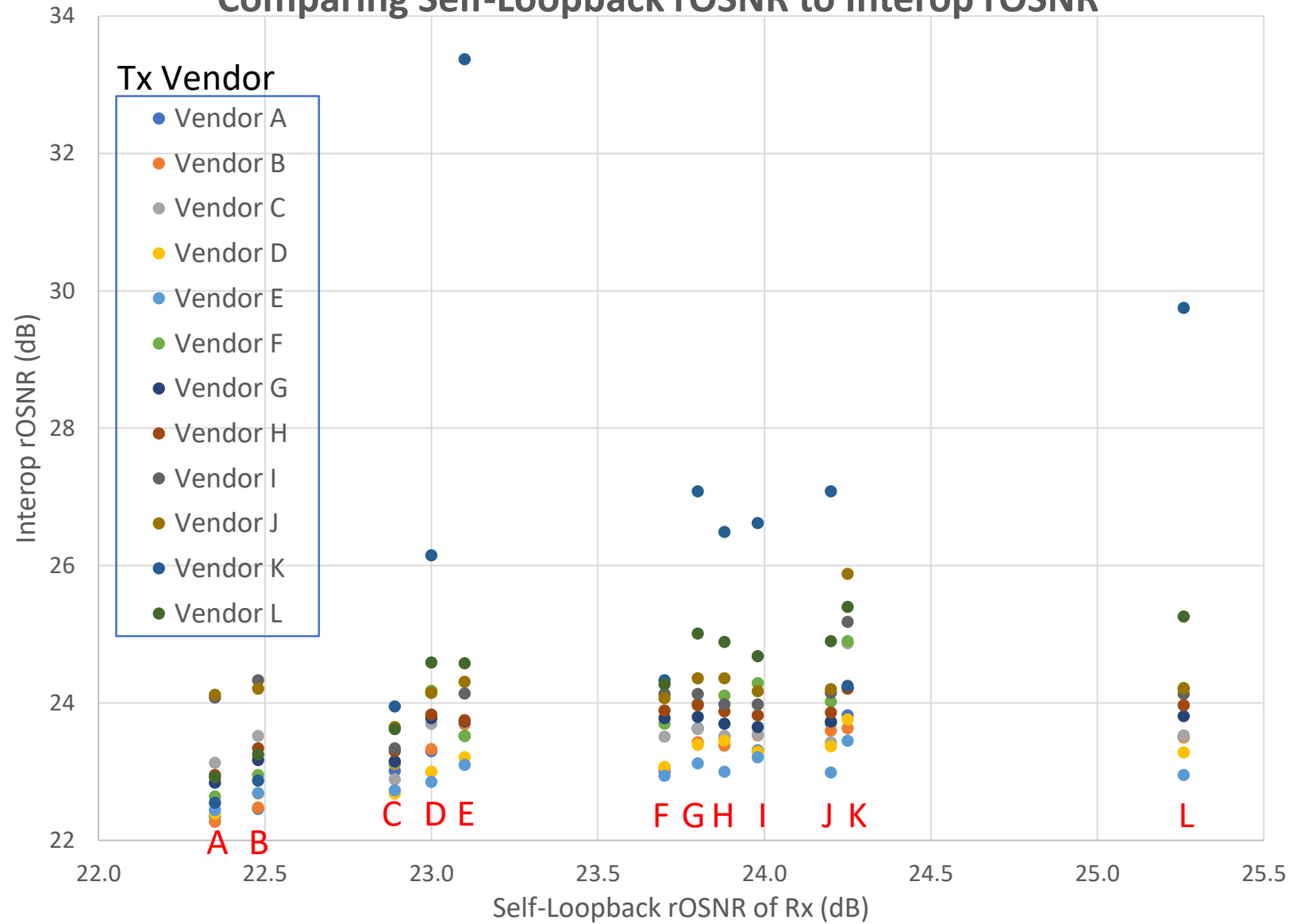


OIF 400ZR OFC 2023 Plugfest rOSNR Results

Receiver ↓	Transmitter											
	Vendor A	Vendor B	Vendor C	Vendor D	Vendor E	Vendor F	Vendor G	Vendor H	Vendor I	Vendor J	Vendor K	Vendor L
A	22.4	22.3	23.1	22.4	22.4	22.6	22.8	23.0	24.1	24.1	22.6	22.9
B	22.5	22.5	23.5	22.7	22.7	23.0	23.2	23.3	24.3	24.2	22.9	23.3
C	23.0	23.1	22.9	22.7	22.7	23.1	23.2	23.3	23.3	23.7	24.0	23.6
D	23.3	23.3	23.7	23.0	22.9	24.2	23.8	23.8	24.2	24.2	26.2	24.6
E	23.5	23.7	23.5	23.2	23.1	23.5	23.7	23.8	24.1	24.3	33.4	24.6
F	23.0	23.1	23.5	23.1	22.9	23.7	23.8	23.9	24.1	24.1	24.3	24.3
G	23.6	23.4	23.6	23.4	23.1	24.0	23.8	24.0	24.1	24.4	27.1	25.0
H	23.5	23.4	23.5	23.5	23.0	24.1	23.7	23.9	24.0	24.4	26.5	24.9
I	23.3	23.5	23.5	23.3	23.2	24.3	23.7	23.8	24.0	24.2	26.6	24.7
J	23.7	23.6	23.4	23.4	23.0	24.0	23.7	23.9	24.2	24.2	27.1	24.9
K	23.8	23.6	24.9	23.8	23.5	24.9	24.2	24.2	25.2	25.9	24.3	25.4
L	23.5	23.5	23.5	23.3	23.0	24.2	23.8	24.0	24.1	24.2	29.8	25.3

Loopback
rOSNR of
RX

Comparing Self-Loopback rOSNR to Interop rOSNR





OIF @ OFC
All Presentations,
Vendor Handouts,
and More!



Wednesday March 8th

"Bringing Order to Chaos – OIF" 3pm-4pm in Theater 3

Moderator: **Stephen Hardy**, *Lightwave*

Panelists:

Karl Gass, OIF PLL WG Optical Vice Chair

Vladimir Kozlov, LightCounting

Sterling Perrin, Heavy Reading;

Nathan Tracy, OIF MA&E Co-Chair PLL, TE Connectivity

Alan Weckel, 650 Group

Celebration Reception
4pm-5pm
Booth #5101