OCLARO™

Big Ticket Item supporting Data for 10km 8x50G NRZ

Atsushi Takai, Oclaro Japan, Inc

Big Ticket Items

- This contribution provides:
  - Rx sensitivity using commercial available ROSA (Oclaro)
  - Dispersion penalty using commercial available EML TOSA (Oclaro)
  - Receiver feasibility using CMOS CDR test chip (Credo)

Item	Proposal	BTI Actions
10km SMF PMD	Cole_3bs_01_0115.pdf (NRZ)	Evaluate Coupling between electrical and optical interfaces RX Technical feasibility Dispersion penalty worst case (in SMF ad hoc) TDP. MPI RX sensitivity More Test results (prefer real data on all proposals)
	Kojima_3bs_01a_0115.pdf (NRZ)	Evaluate Coupling between electrical and optical interfaces RX Technical feasibility Dispersion penalty worst case (in SMF ad hoc) TDP. MPI RX sensitivity More Test results (prefer real data on all proposals)

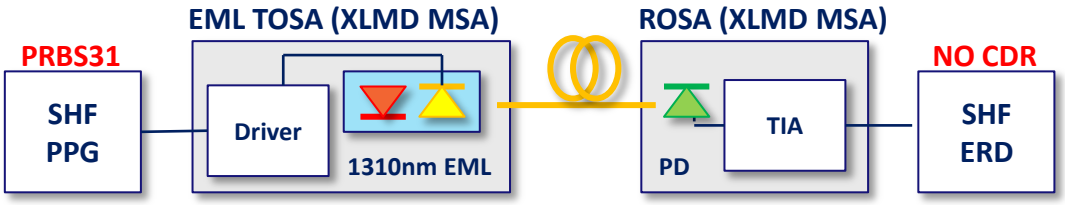
bti_3bs_01_0315.pdf

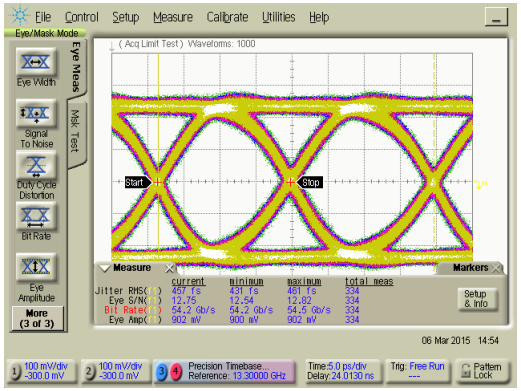
Experiment

- 53.2Gbit/s Transmission experiment
  - Commercial available 1310nm EML TOSA and ROSA (Oclaro)
  - High speed PPG and Error detector (SHF)
  - PRBS31 No-FEC
- 50Gbit/s transmission experiment using CMOS CDR test chip
  - Commercial available 1310nm EML TOSA and ROSA (Oclaro)
  - High speed NRZ CDR test chips (Credo)
  - PRBS31 pattern generation and error detection in the test chip
  - Dispersion penalty measurement using different fibers and EML wavelengths

1310nm 53Gbit/s NRZ Transmission

- 53.2Gbit/s transmission experiment using 1310nm EML TOSA
  - PRBS31, No-Equalization, No-CDR
  - Er=8.93dB

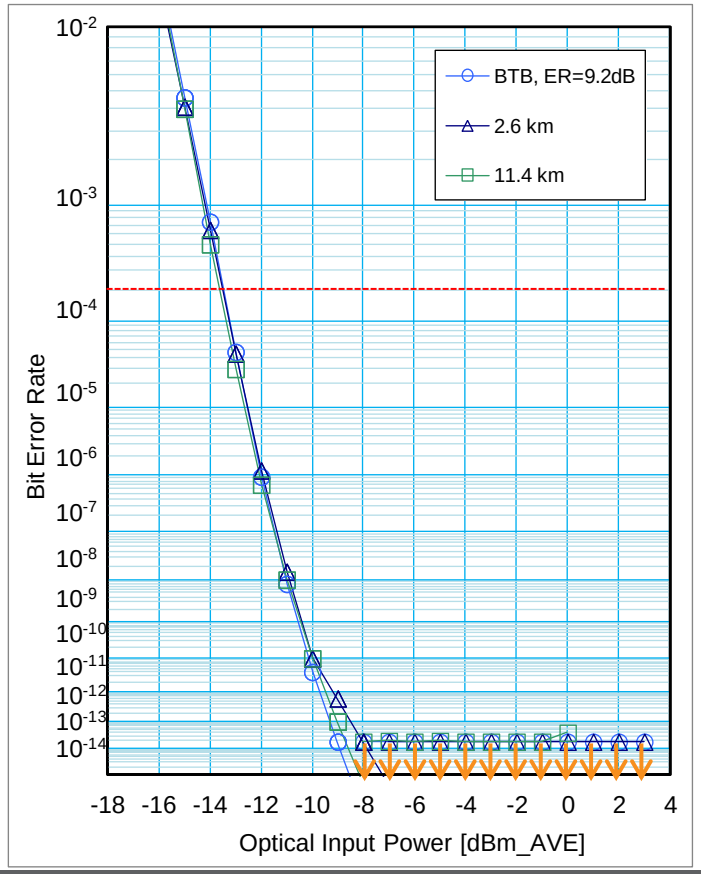


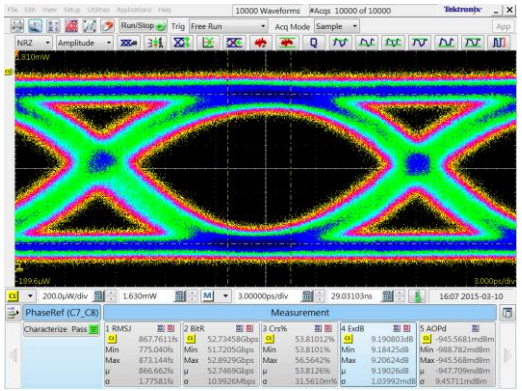


Electrical input

Experimental Result: 1310nm 53.2Gbit/s NRZ Transmission

- 53.2Gbit/s transmission experiment using 1310nm EML TOSA
  - No error floor down to 2e-14
  - BER curve bent was observed at low BER of <1e-11 due to No-CDR

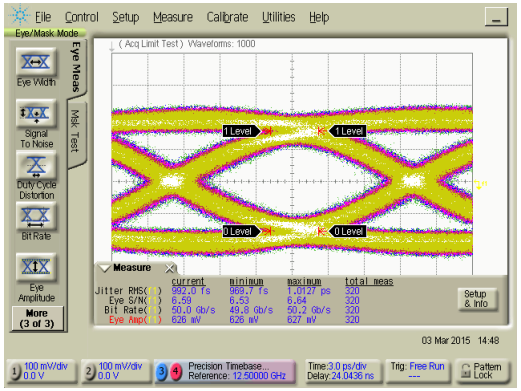




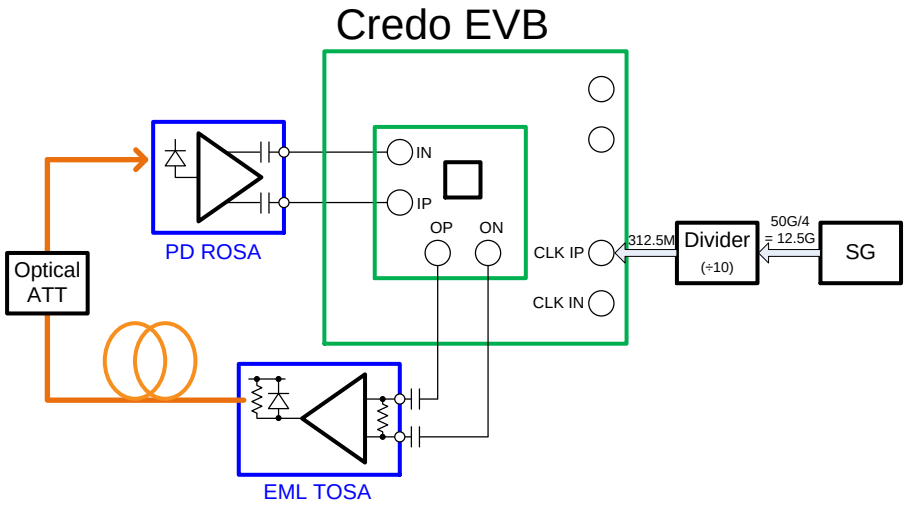
Optical output (Filtered)

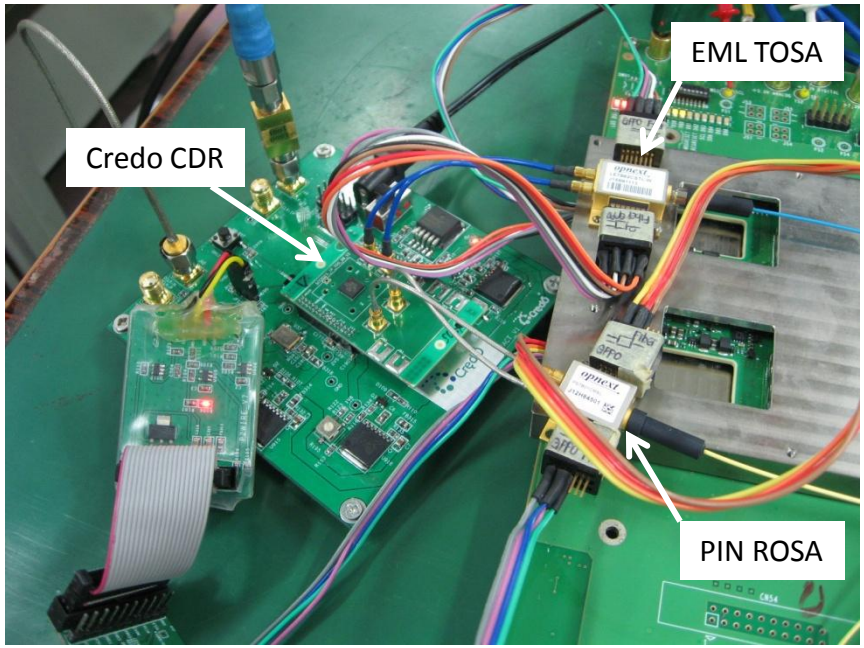
Experiment using Oclaro TOSA/ROSA and Credo CDR

- Credo CDR test chip
  - On chip PPG and ERD
  - 50Gbit/s NRZ PRBS31
- Three fiber cables
  - 2.6km SMF
  - 10km Furukawa fiber (shirao_3bs_01a_0315)
  - 24.3km SMF



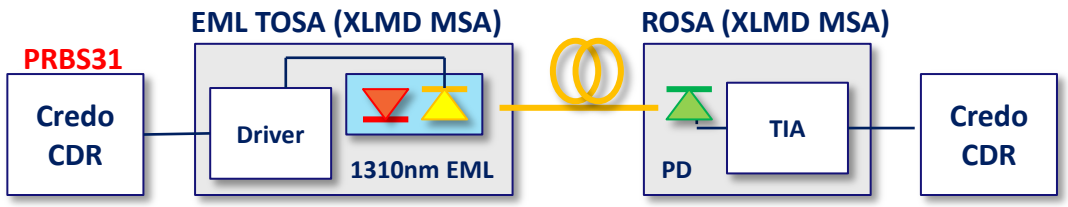
Electrical Waveform

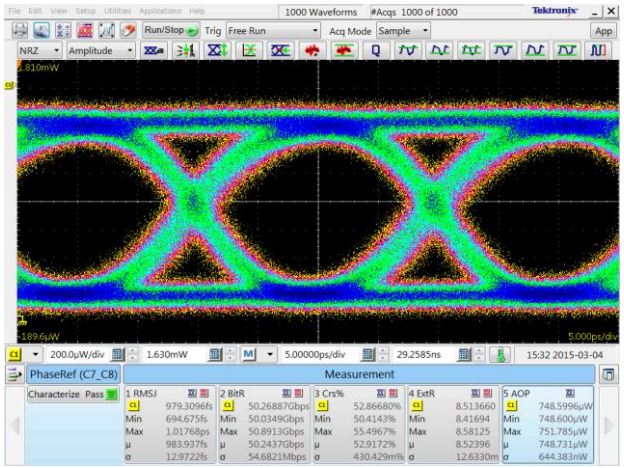




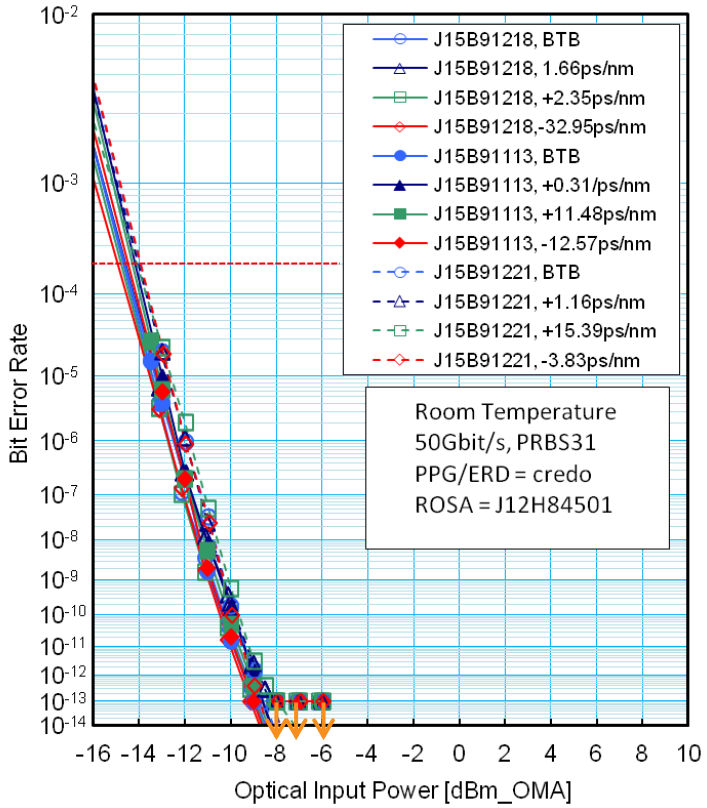
Measurement Result

- No error floor confirmed BER of down to 1e-13
  - PRBS31, No-FEC
- OMA sensitivity of <-14dBm was obtained



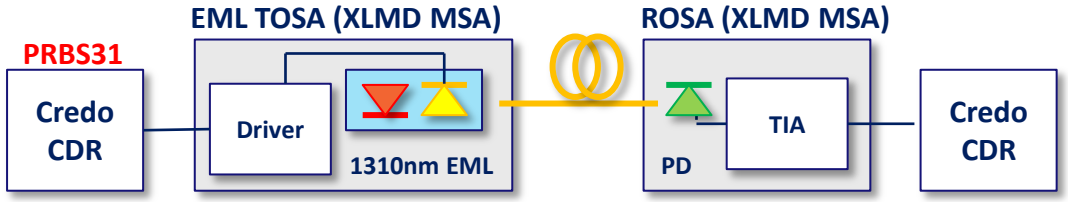


Optical Waveform



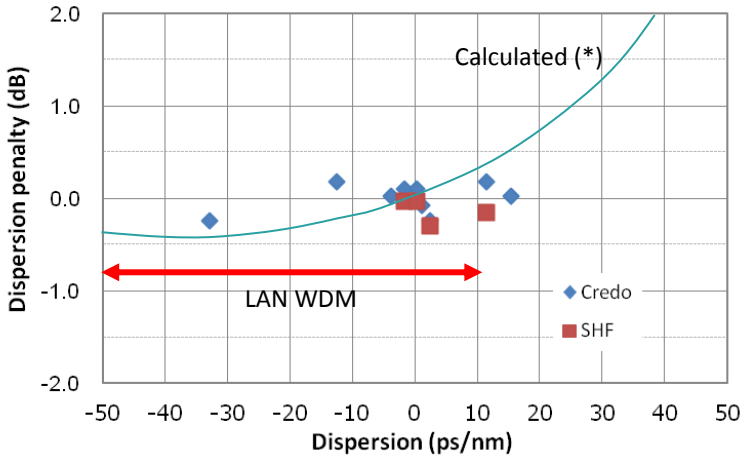
Dispersion Penalty

- Less than 1dB penalty within expected dispersion for LAN WDM wavelengths



Samples, wavelengths, B-to-B Sensitivities and three fiber dispersions (ps/nm)

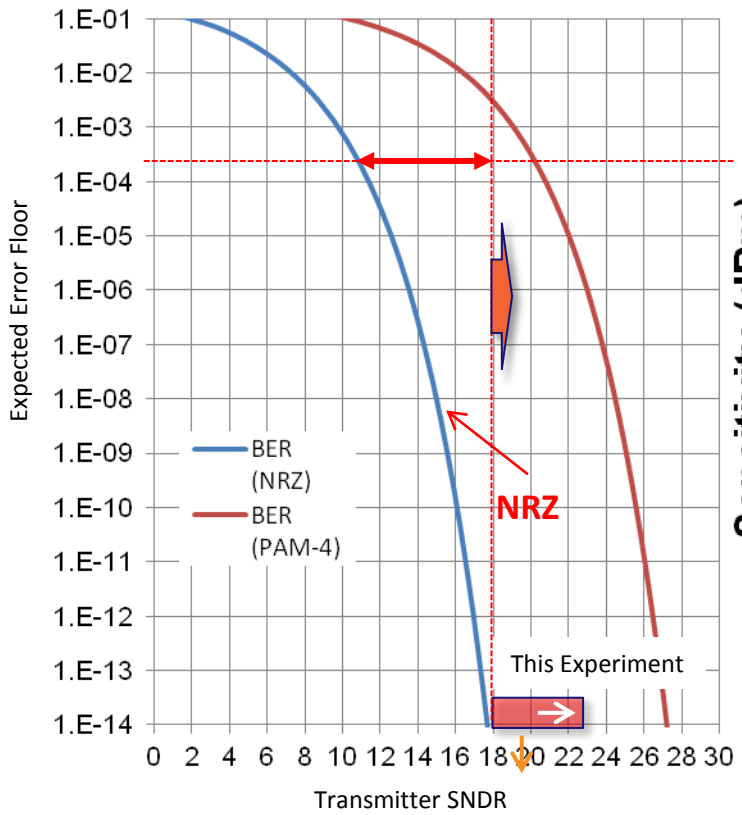
	J15B91218	J15B91113	J15B91221
Wavelength	1296.2 nm	1305.4 nm	1309.4 nm
B2B Pr OMA	-14.7 dBm	-14.6 dBm	-14.0 dBm
2.6km SMF	-1.66	0.31	1.16
10.0km SMF	2.35	11.48	15.39
24.3km SMF	-32.95	-12.57	-3.83

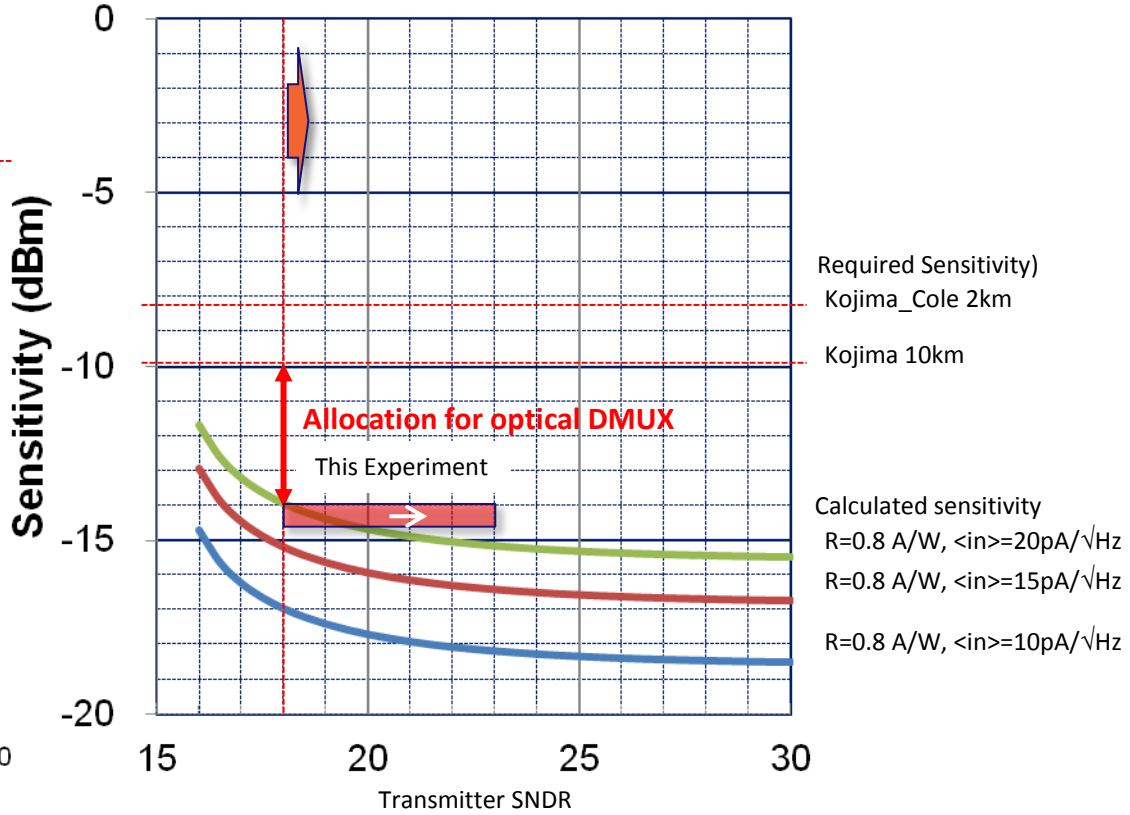


(*) shirao_3bs_01a_0315

Discussion on Experimental Result

- >3dB margin of estimated SNDR: No error floor level even down to BER of 2e-14
  - Estimated SNDR>18dB (expected SNDR is 21-23dB by calculation)
- 4dB margin of OMA sensitivity: Allocation for optical DMUX
  - Use of wider bandwidth TIA with 15pA/√ Hz will increase the margin





Thank you