

25G/50G dual rate verification

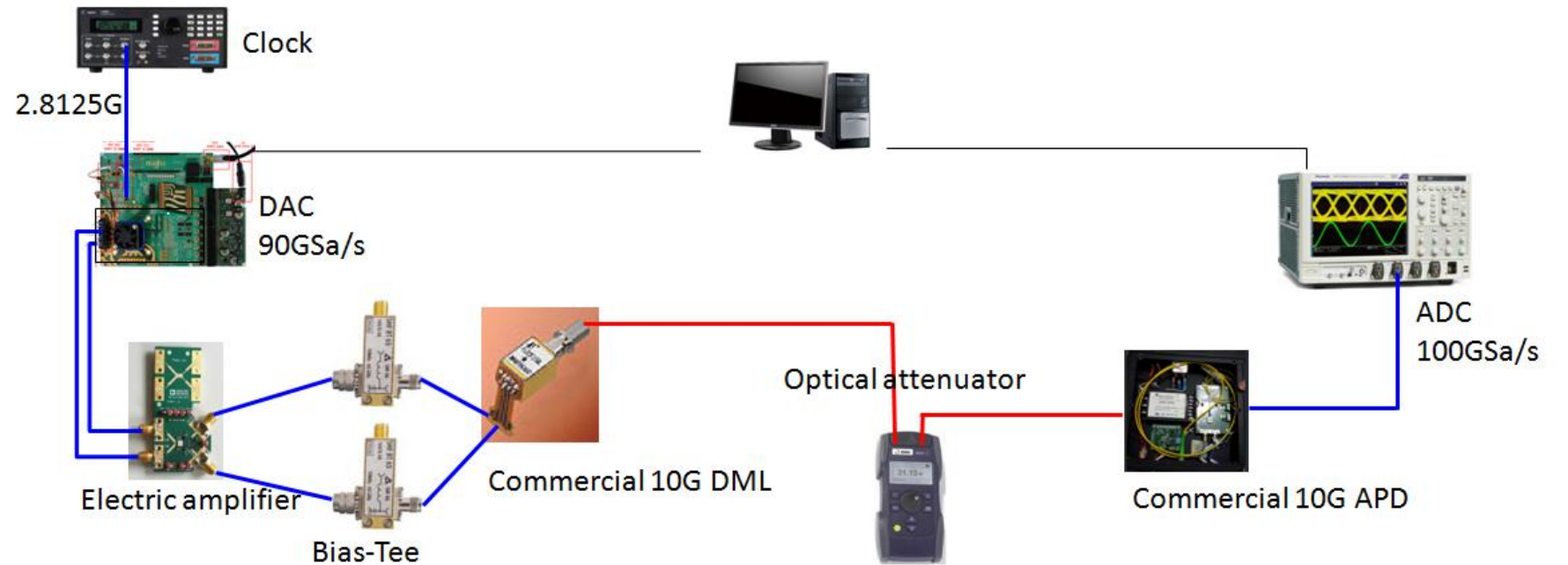
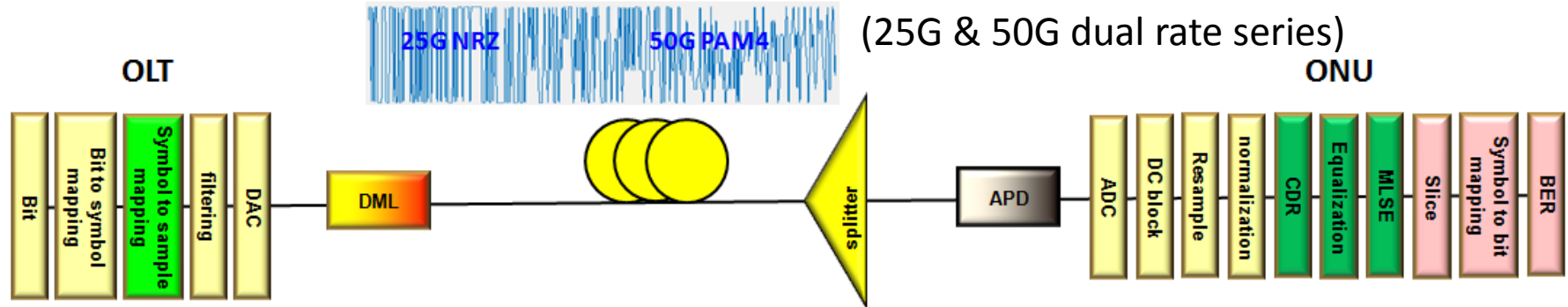
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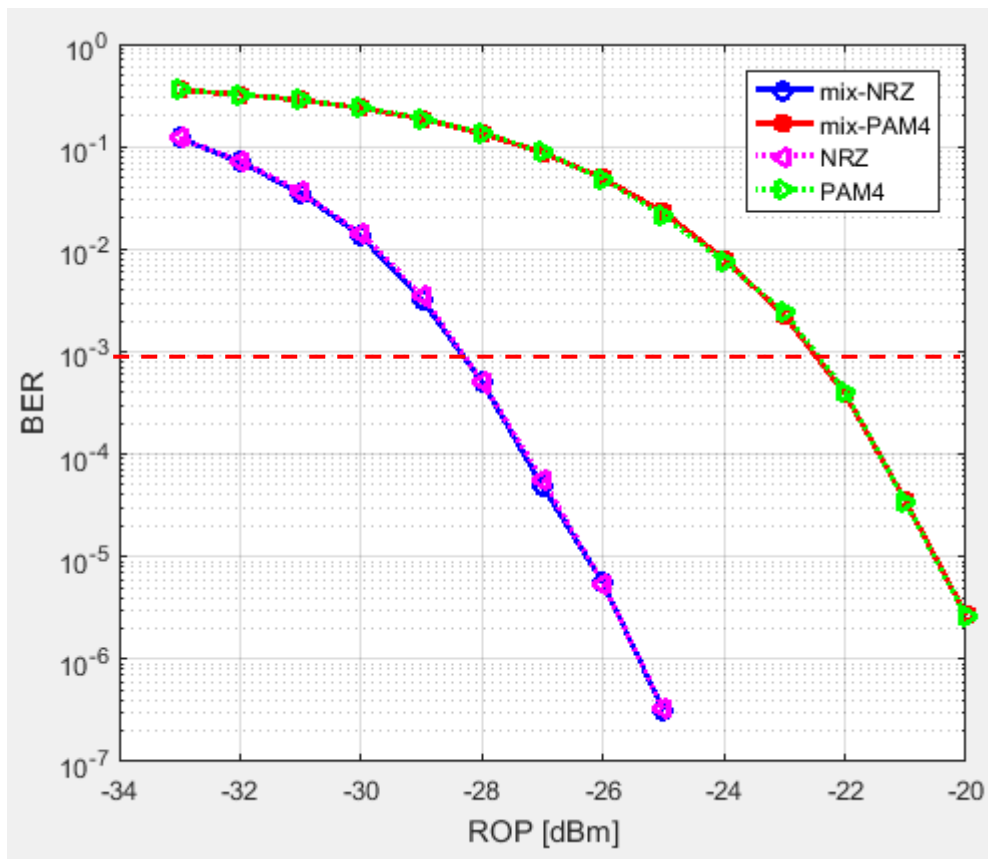
Introduction

- In several previous contributions, 25G/50G dual rate on a single wavelength solution has been analyzed, it has several advantages:
 - Help the operators smoothly evolve from 25G to 50G
 - Save the wavelength spectrum
 - Allow flexible PON systems
- One of main concern is that it may impact 25G ONUs' CDR when receive a 25G/50G dual rate signal
- This contributions further evaluate 25G/50G dual rate technical feasibility

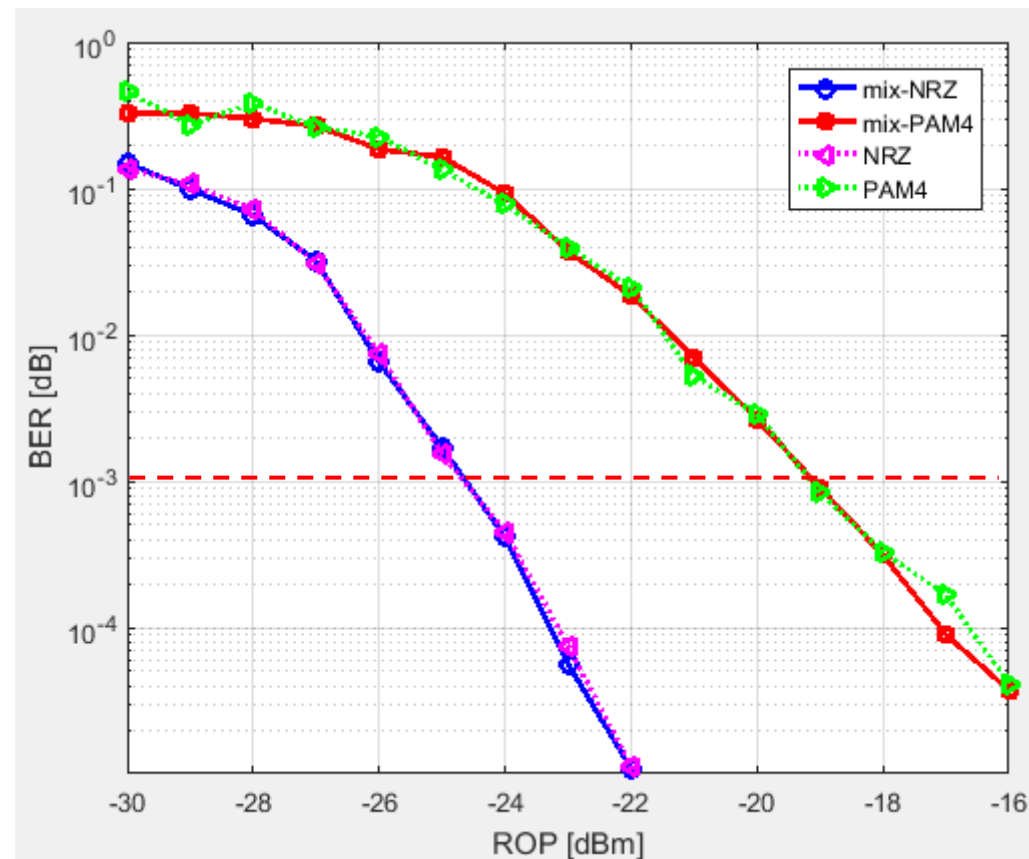
25G NRZ / 50G PAM4 dual rate Experiment Set up (based on ONUs with DSP)



◆ Simulation results

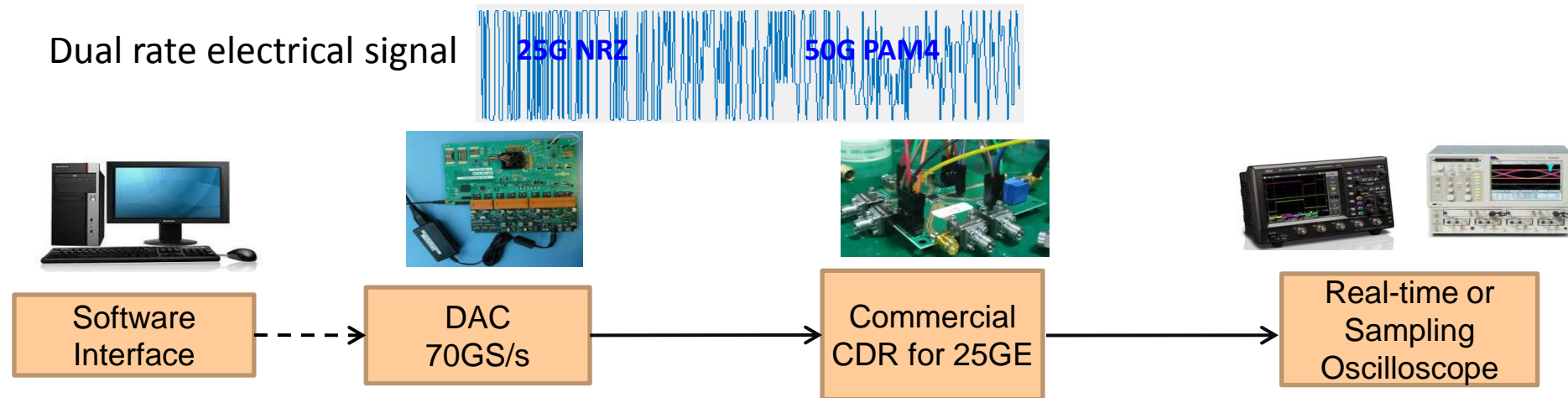


◆ Experiment results



Conclusion: 25Gaud NRZ/PAM4 dual rate is feasible and no sensitivity loss based on DSP technology in ONUs

25G/50G dual rate signal impact on traditional 25G CDR

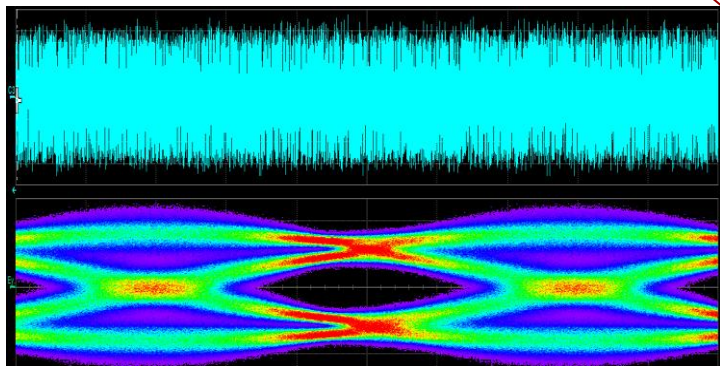


Note:

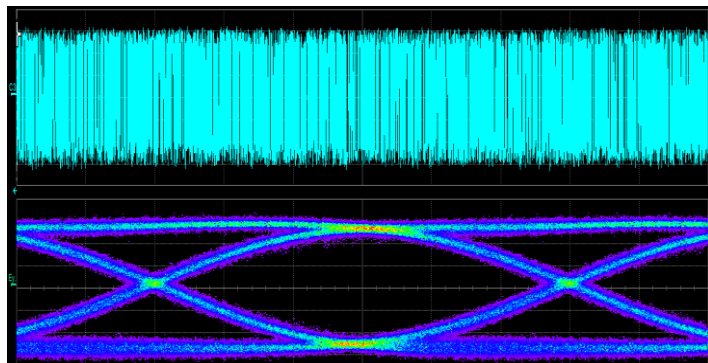
1. 25G Baud rate PAM4 or NRZ signal is generated by DAC;
2. The CDR chip is a commercial device only for recovering 25G NRZ signal;
3. The required trigger clock of the sampling oscilloscope is from CDR;

Experiment results measured by real time Oscilloscope

25G NRZ

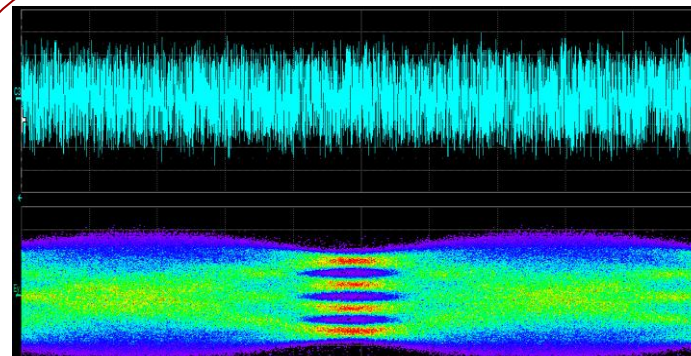


NRZ signal before CDR

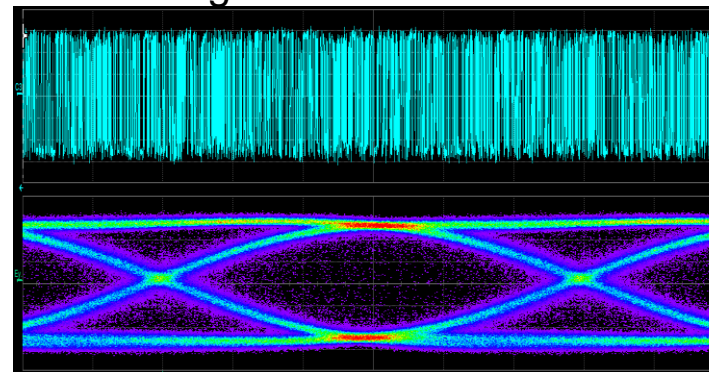


NRZ signal after CDR

25G PAM4

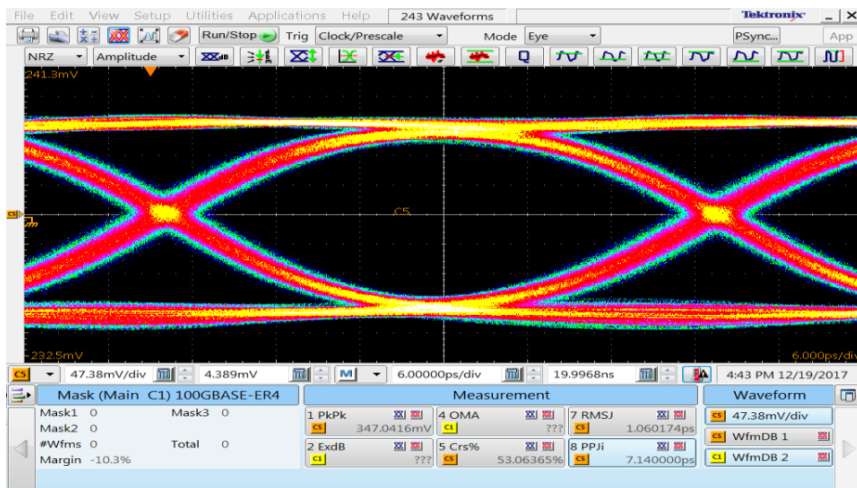


PAM4 signal before CDR

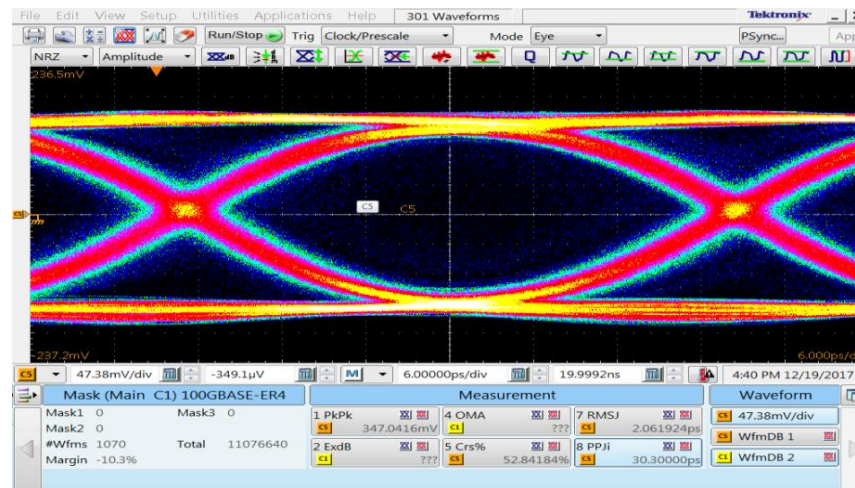


PAM4 signal after CDR

Experiment results measured by Sample Oscilloscope (triggered by 25G CDR output clock)



25G NRZ signal after CDR



50G PAM4 signal after CDR

- The output eye diagram of 25G NRZ signal is quite clean, while there a lot of splattering dots in the middle for PAM signal after 25G CDR
- No noticeable difference has been observed between two on output clock frequency and jitter

Summary

- Dual rate 25G NRZ and 50G PAM4 on a single wavelength transmission has been verified, there is no sensitivity impact on both based on DSP receiver
- 50G PAM4 electrical signal through a 25G CDR has been verified, no impact on output frequency and jitter has been observed.
- No impact on 25G receivers from 25GNRZ/50G PAM4 dual rate has been observed by far. More system verification based on 25G/50G optical signal can be done in future.

Thank you
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