Test Results on 25G CDR locking performance

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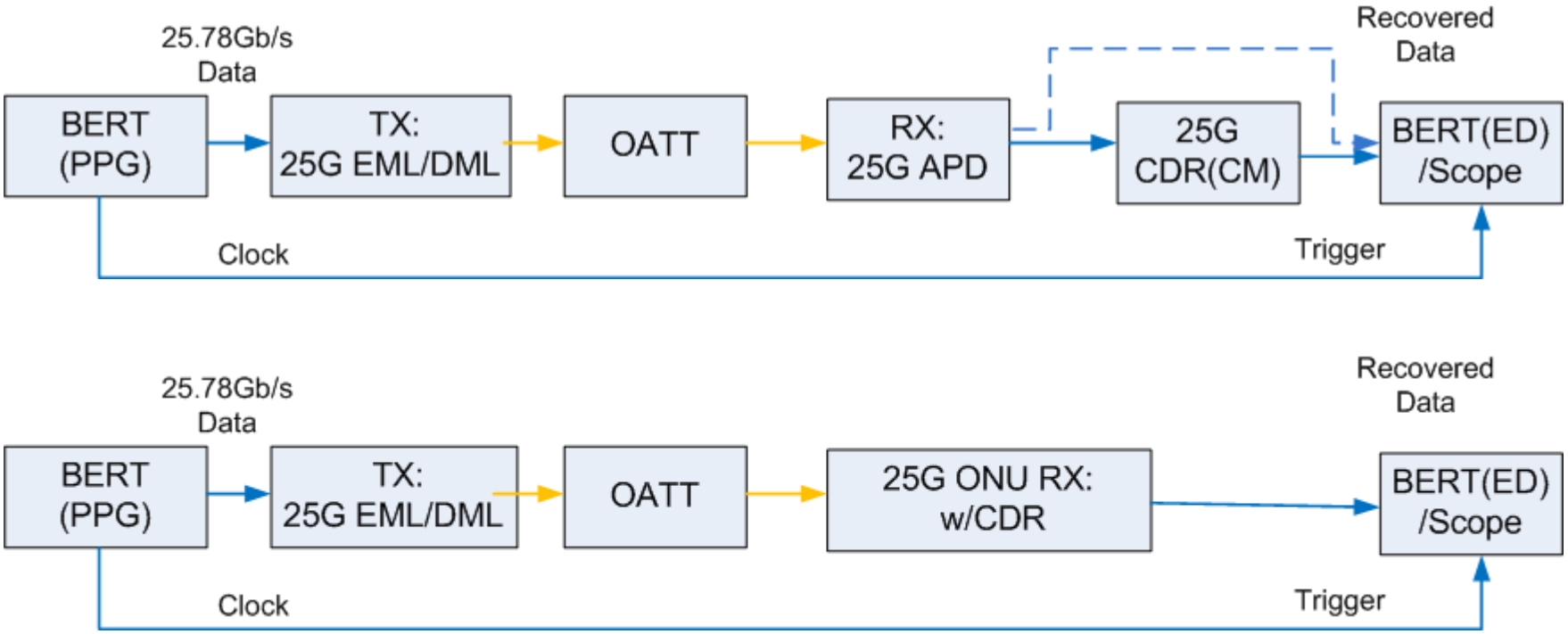
Introduction

- CDR lock performance of 25Gb/s signals in high BER condition such as BER~E-2 was mentioned in the last meeting (houtsma_3ca_1_0517, umeda_3ca_1_0517). It is important the CDR maintains lock at high BER to enable an enhanced FEC which can overcome the power budget problem.
- In this presentation, we show test results on 25G CDR locking performance in the high BER (i.e. 1E-3 and 1E-2).

Test Setup



- **TX 1:** 1310nm 25G EML with ER=9 dB @ PRBS2^31-1
- **TX 2**: 1310nm 25G DML with ER=5~6 dB @ PRBS2^31-1
- **RX1:** 25G APD ROSA +25G CDR(CM) with loop bandwidth of 20MHz
- **RX2**: 25G ONU RX(APD ROSA) w/CDR

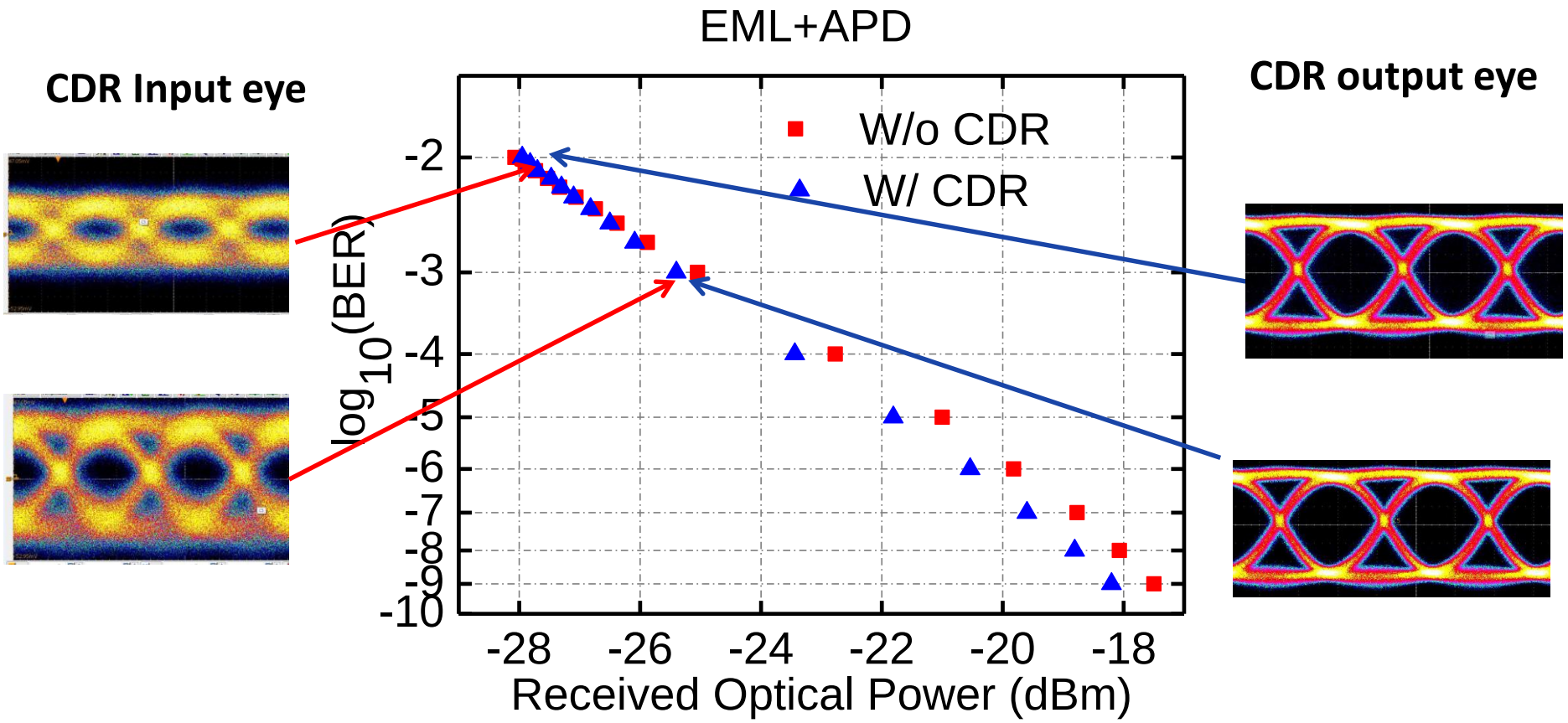
Test scenarios

No.	TX	RX	Slide
Scenario 1	25G EML	25G APD+25G CM CDR on Evaluation Board	Slide.5
Scenario 2	25G DML	25G APD+25G CM CDR on Evaluation Board	Slide.6
Scenario 3	25G EML	25G CM CDR in 25G ONU Transceiver	Slide.7
Scenario 4	25G DML	25G CM CDR in 25G ONU Transceiver	Slide.8

Test Description:

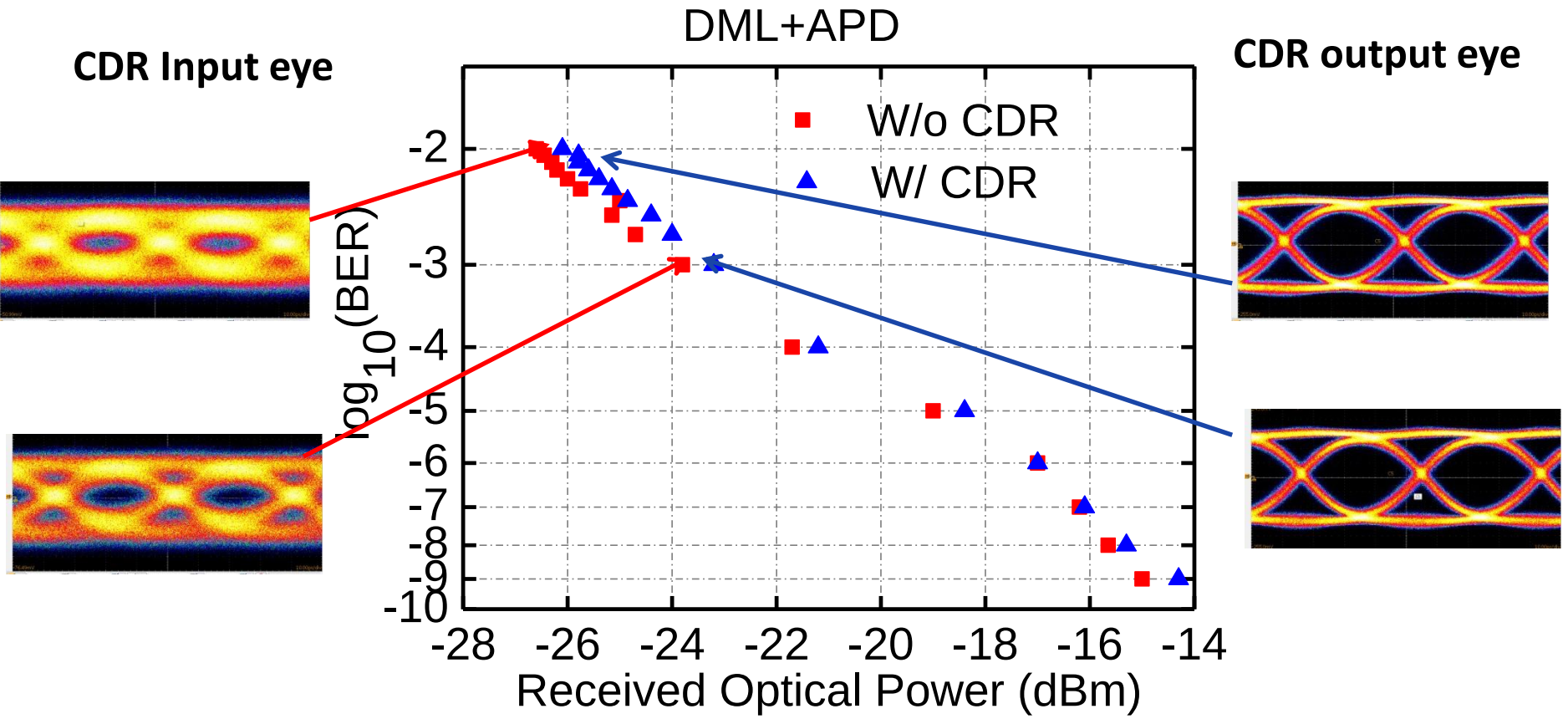
1. Without 25G CDR (or CDR bypass), the Rx Sen. is measured by BERT with the loopback clock.
2. With 25G CDR (or CDR on), the Rx Sen. is measured by BERT with the loopback clock.

Test Results: Scenario 1



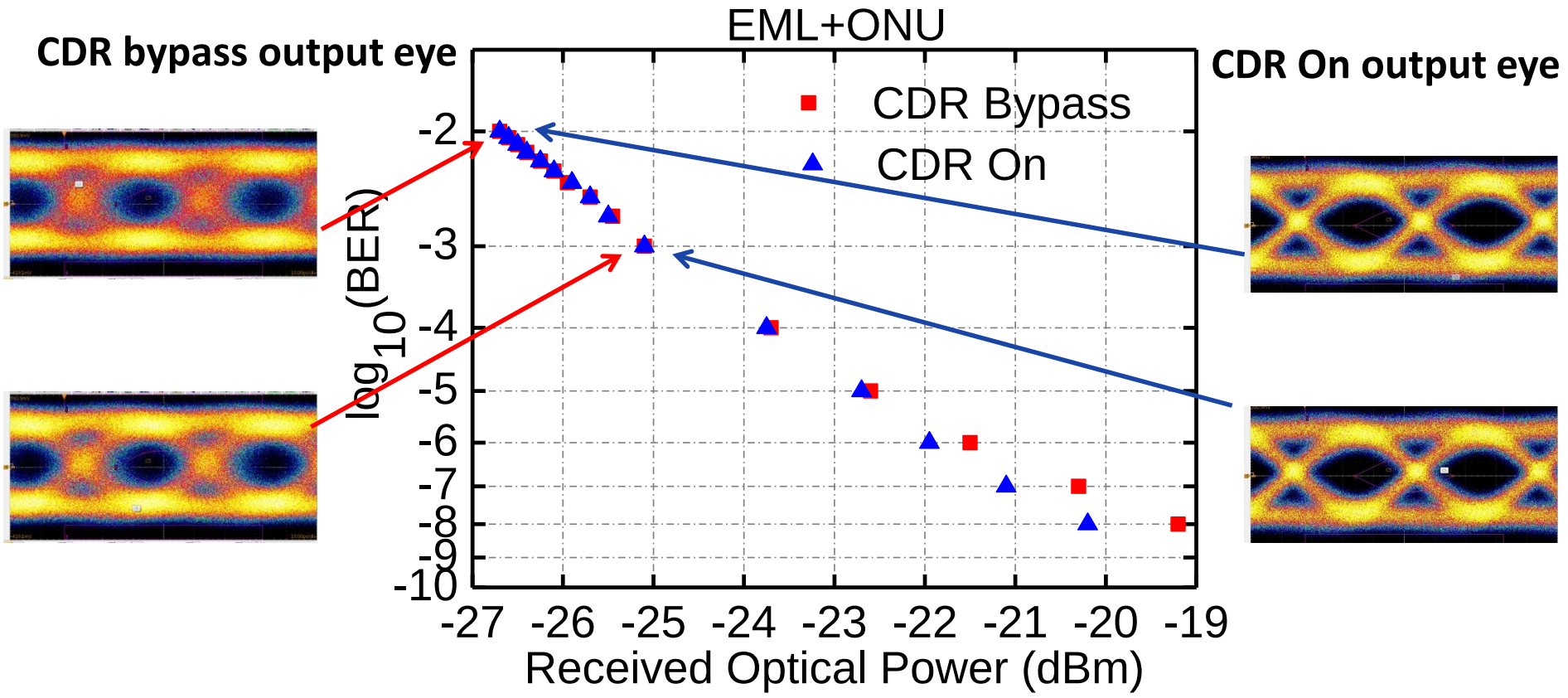
- ✓ The RX performance with and without CDR is almost the same.
- ✓ It shows the eye remains open and clear after 25G CDR at the BER of 1E-2.
- ✓ It demonstrates that the 25G CDR is still in the Lock state at the BER of 1E-2.

Test Results: Scenario 2



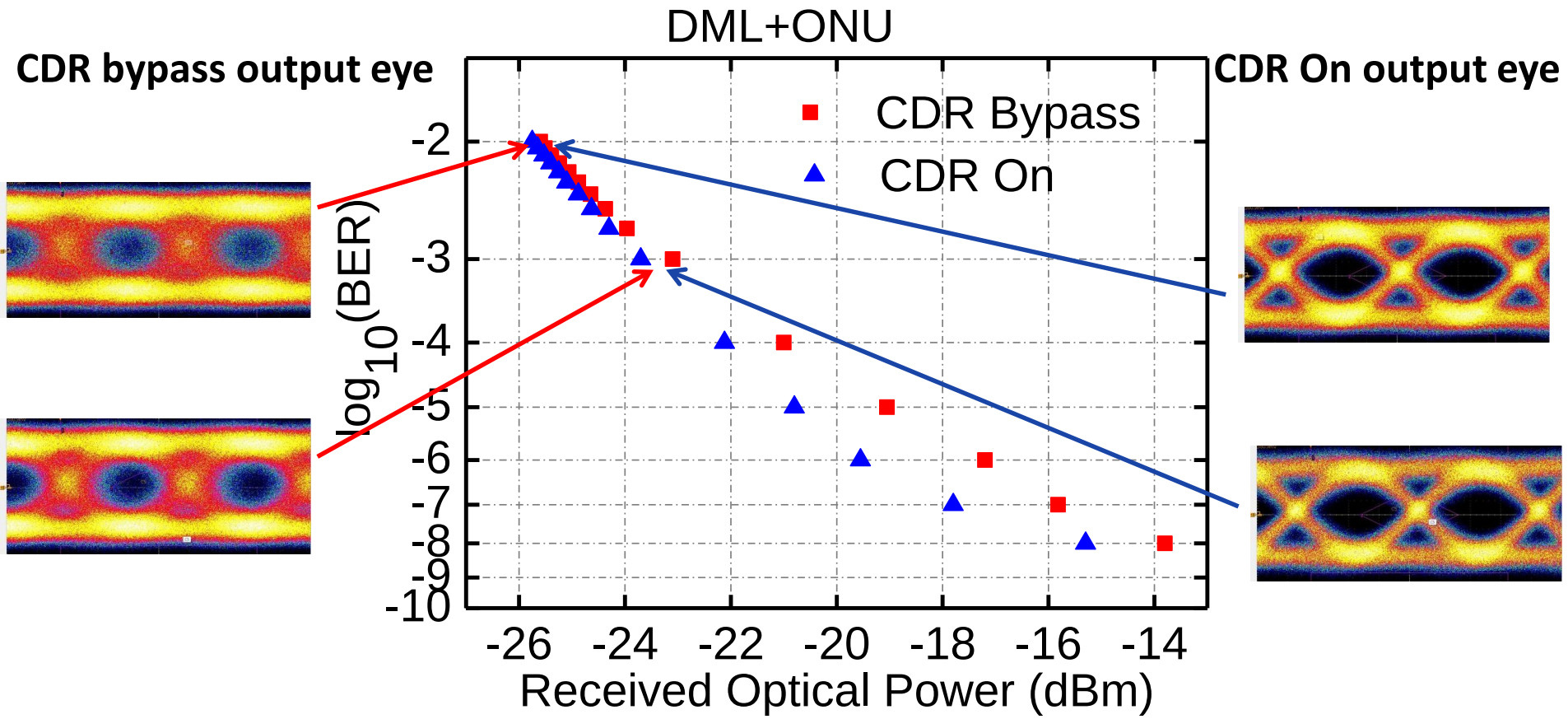
- ✓ The RX performance with and without CDR is almost same.
- ✓ It shows the eye remains open and clear after 25G CDR at the BER of 1E-2.
- ✓ It demonstrates that the 25G CDR is still in the Lock state at the BER of 1E-2.

Test Results: Scenario 3



- ✓ The RX performance for CDR on and CDR bypass is almost same.
- ✓ It shows the eye remains open and clear for 25G CDR on at the BER of 1E-2.
- ✓ It demonstrates that the 25G CDR is still in the Lock state at the BER of 1E-2.

Test Results: Scenario 4



- ✓ The RX performance for CDR on and CDR bypass is almost same.
- ✓ It shows the eye remains open and clear for 25G CDR on at the BER of 1E-2.
- ✓ It demonstrates that the 25G CDR is still in the Lock state at the BER of 1E-2.

Summary

- We tested the lock performance of 25G CM CDR in four different scenarios.
- The test results show that the 25G CM CDR is still in the lock state even under the high BER of 1.0e-2.
- The lock performance based on O+ laser with 20km transmission and at stressed receive sensitivity should be evaluated in the next step.
- The lock performance of BM CDR should also be evaluated in the next step.

Thank you

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