

Block error histogram measurement for 200Gb/s optical PMD

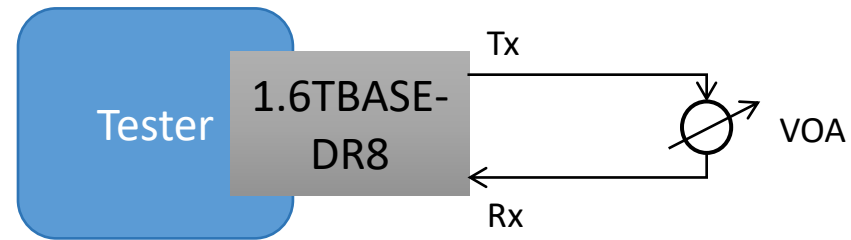
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Introduction

- BLER is the new error ratio metric for link performance and determining receiver sensitivity. However, to get the required full 16 error histogram with good confidence requires too long time to implement.
- Block error histogram mask method as defined in 174A.9.5 balances test time, readability and confidence. To reduce the test time, extrapolation is needed when using the block error histogram mask method.
- The presentation will provide block error histogram measurement data to support the discussion on the extrapolation method used in receiver sensitivity test.

Test Conditions

- DUT: Two different 1.6TBASE-DR8 optical modules
- Tester: ONE1600, VIAVI
- Method: Block error histogram of each lane was measured.
- Conditions:
 - Test time: 2s, 5s, 1min, 15 mins
 - Contribution of the very short AUI interface was ignored.



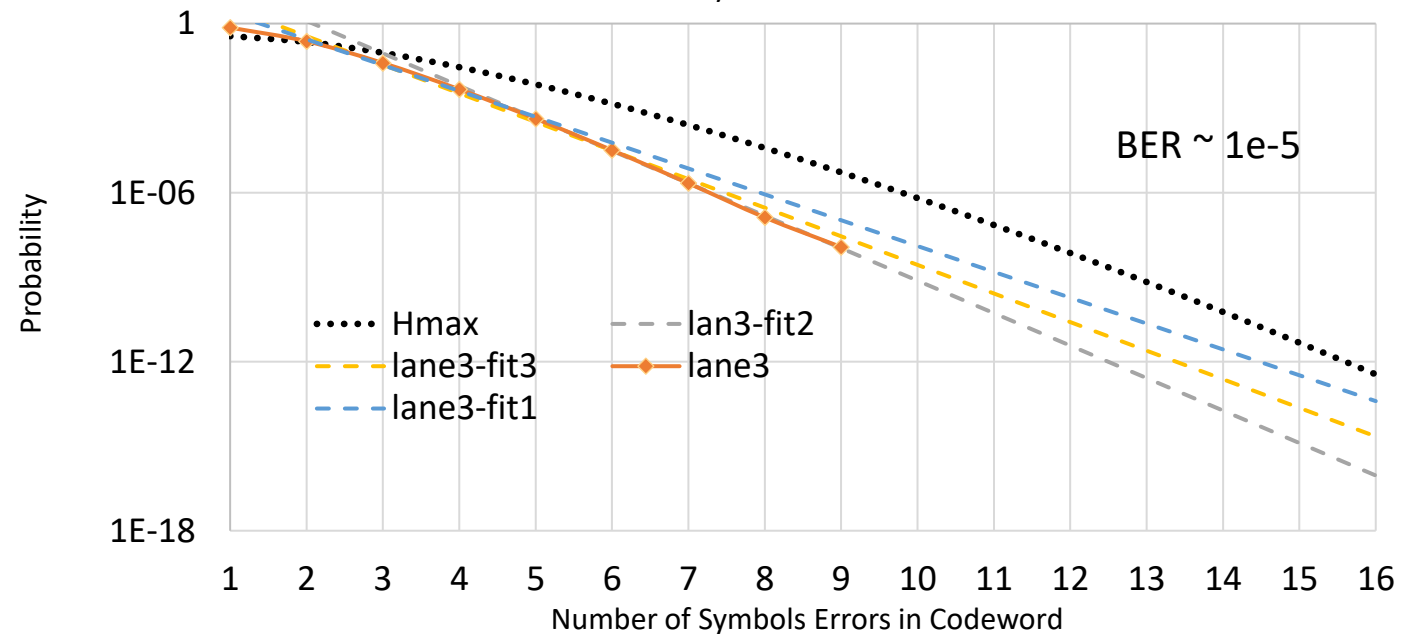
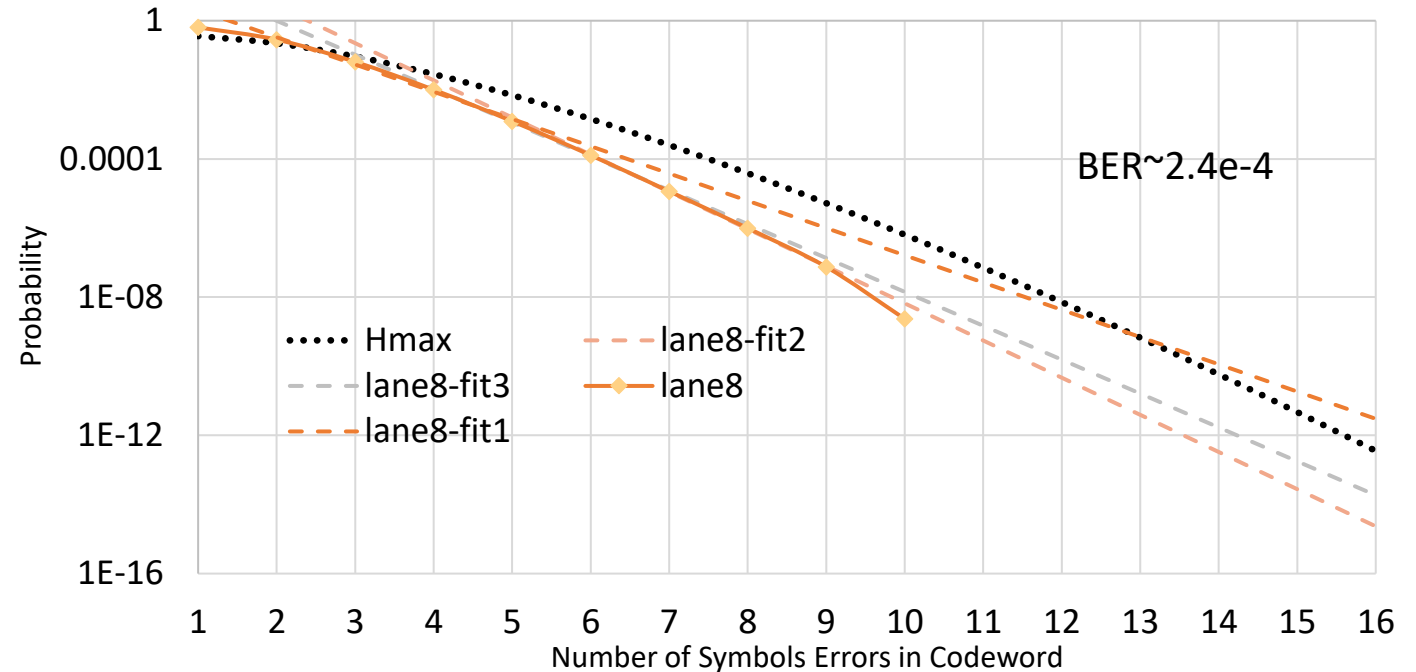
Different fitting strategy

Fit1 : bin 2 ~ 4

Fit2 : max bin n to n-2, max bin count>3

Fit3 : all bins with probability >1e-6

- Use higher bins fit the trend better.
- Fit1 using the lower 3 bins (2~4) is more conservative, may report false fail. Can be used as guard band of the histogram slope.



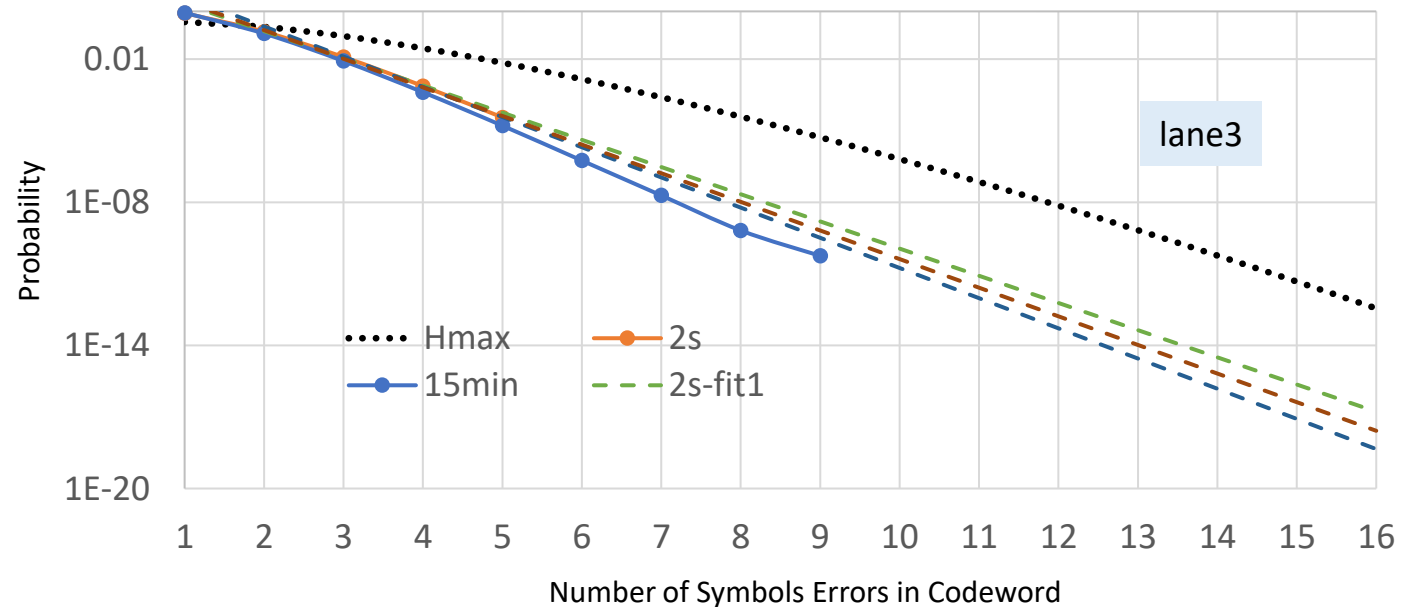
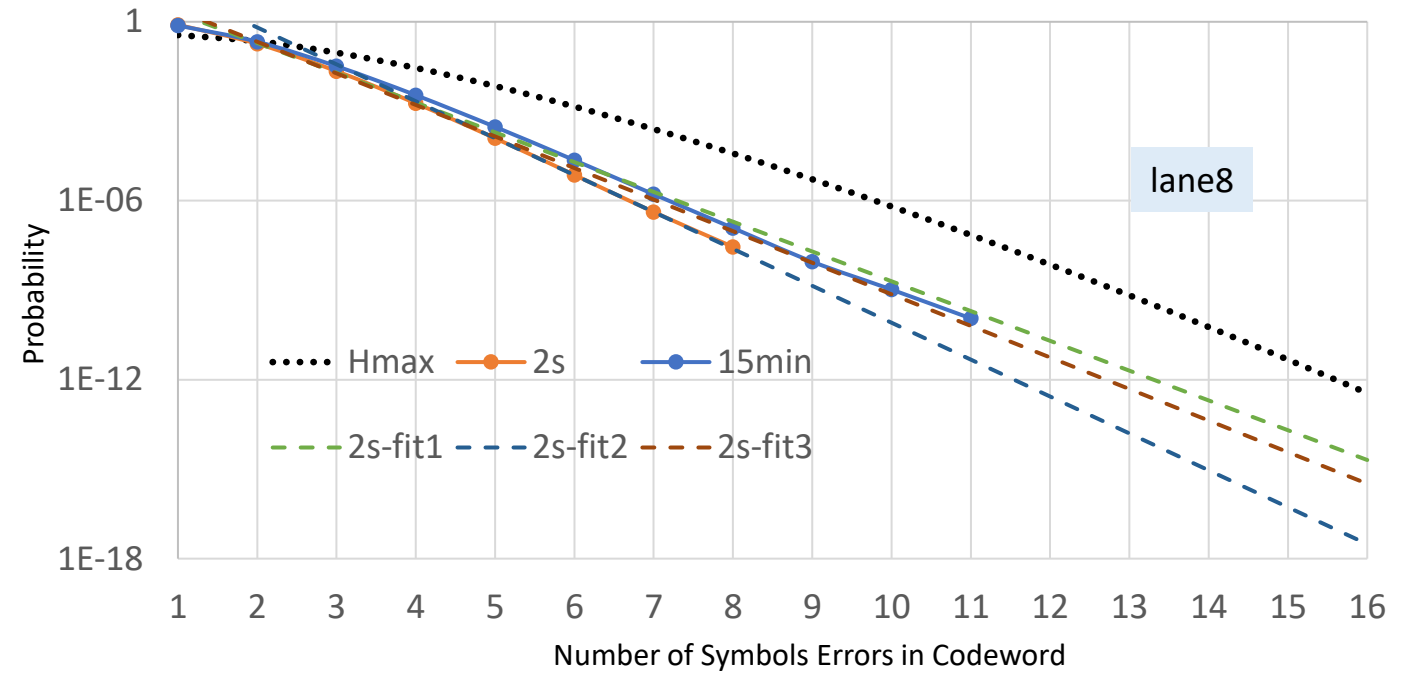
Fitting of shorter test time vs data of longer test time

Fit1 : bin 2 ~ 4

Fit2 : max bin n to n-2, max bin count>3

Fit3 : all bins with probability >1e-6

- Use higher bins fit the trend better.
- Longer test time result could deviate from Fit2 of short test time, while using the more conservative Fit1 helps bound the result.



Summary

- We showed block error histogram measurement result of two 200Gb/s/lane 1.6T optical modules.
- The Block error histogram mask method was used. Three different fitting and extrapolation strategies were compared, including those proposed in comment 226, 296 and the method proposed by Roberto Rodes in the offline remedy discussion.
- The data showed that the remedy as suggested in [maniloff_3dj_01_2605](#) provides a viable and practical extrapolation method.