XLAUI/CAUI Electrical Specifications

**XLAUI/CAUI
AdHoc Meeting**

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Summary of Items Need Work

- **BER 1E-12 or BER 1E-15**

- **How to test transmitter compliance**

- **Compliance interconnect**

- **Jitter methodology**

BER 1E-12 or BER of 1E-15?

- **In application using xAUI the link aggregated BER could be 3E-12**
  - **MAC/ASIC to xAUI retimer**
  - **xAUI reimter to PMD back to xAUI**
  - **xAUI reitmer to MAC ASIC**

- **XFP defined appendix for BER 1E-15 and the budget for BER1E-15 came from reducing the channel length from 150 mm to 120 mm**
  - **Kept DJ at the TX the same**
  - **TJ for BER 1E-15=(TJ 1E-12 – DJ)*16/14 + DJ which increased the TJ from 0.3 UI to 0.321 UI.**

- **We have two options to support BER 1E-15:**
  - **Define TJ in xAUI based BER of 1E-15**
  - **Or reduce the channel length from 10" to 8".**

How to Test xAUI Transmitter for far end Compliance

- **XAUI had simple channel with just loss – too simplistic**

- **xAUI transmitter need to be tested with channel shown in ghaisi_01_0708 and pass far end mask.**
  - How to document these channels
    - Include s4p data – too much data
    - Provide a set of complex SDD21/SDD11 function fitted to each channel <2in, 5in, and 10in
  - Channels meeting SDD21 and SDD11 can be built for testing transmitters.
  - Captured transmitter output waveform can be convolved with channel to determine compliance.
  - A single pre-emphasis should result

- **In actual application pre-emphasis may be adjusted based on the trace length.**

Jitter Methodology

- **Use of MJSQ if the jitter PDF is not dual-dirac often results in DJ values which much smaller than high probability jitter BER<1E-3.**

- **In the case of xAUI the problem is much simpler as DJ is not used for the receiver specifications.**

  — **SFP+ just after 1 year of investigation replaced DJ at TP4 with BER at 1E-2.**

- **In xAUI DDJ and DDPWS captures the high probability jitter effect without the DJ baggage**

  — **Keep TJ the same**

    - **TJ is tested with PRBS31 or valid 64B/66B signal**

  — **Replace DJ of 0.17 UI with DDJ of 0.17UI and add DDPWS with value of 0.12 UI.**

    - **DDJ and DDPWS are tested with PRBS9**

Jitter Methodology cont.

- **It has been suggested non-EQJ Jitter for the receiver should be removed to allow more flexibility for system OEMs.**
  - non-EQJ of 0.42 UI leaves 0.2 UI for residual ISI which was helpful in the early 10Gig XFI receiver
- **As long as we limit the high probability jitter it is an acceptable alternative.**
  - The total jitter defined at BER of 1E-2 will limit the high frequency jitter for robust clock recovery.
  - Replace non-EQJ with TJ=0.42 @BER 1E-2