Module TX eye measurement method proposal

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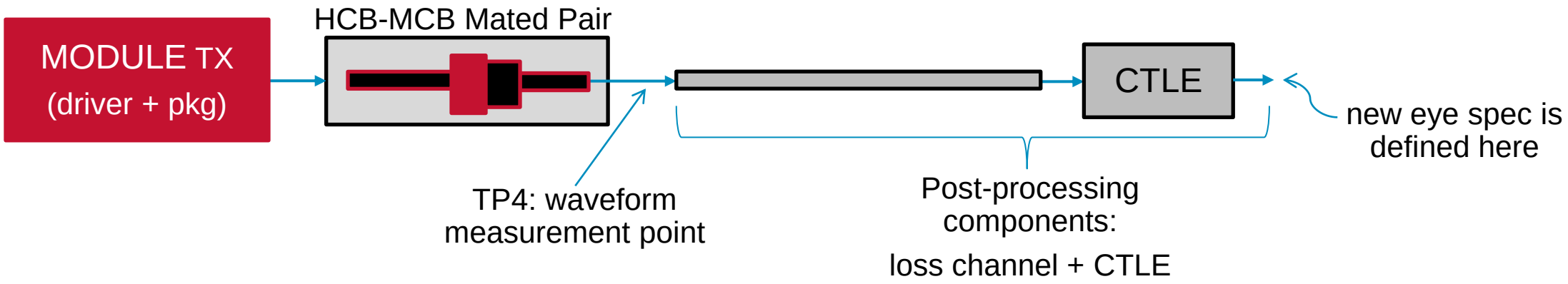
CDAUI-8 C2M Module output specification

- Spec updated to include the module TX pre-cursor component
  - Keep the measurement point same as before at the MCB output
    - Approx. 3.5-4dB loss
  - Define a ‘near-end’ eye and a ‘far-end’ eye
- Near-end eye
  - Represents the short length case
  - Measured and post processed as before
- Far-end eye
  - In the post processing phase, include a ‘loss channel’ to represent the remainder of the loss budget
  - Update the eye-spec such that the TX would have to provide the desired pre-cursor component

Far-end eye: o/p measurement + post processing setup

- Measurement Method:
  - Module TX coefficient set to [-0.1 0.9]
  - Measure the waveform at the module compliance board output
  - Post processing:
    - loss–channel to represent the far-end scenario
    - 4th order Bessel-Thomson low-pass with 33GHz 3dB b/w
    - Search over all CTLE settings to obtain the best eye opening

- Simulation setup to obtain the far-end eye spec:



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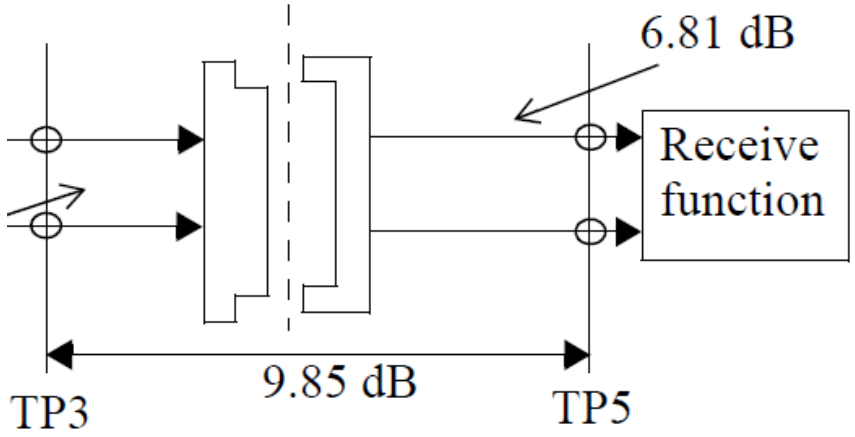
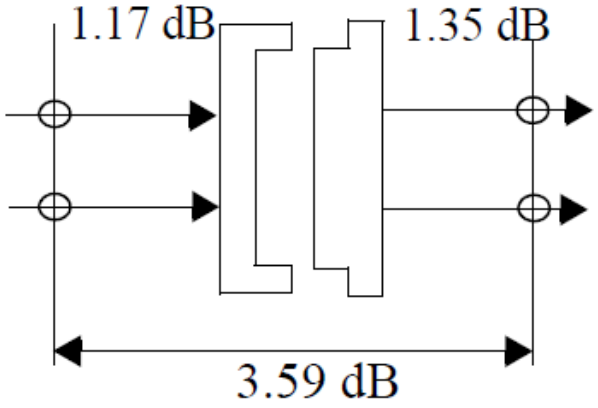
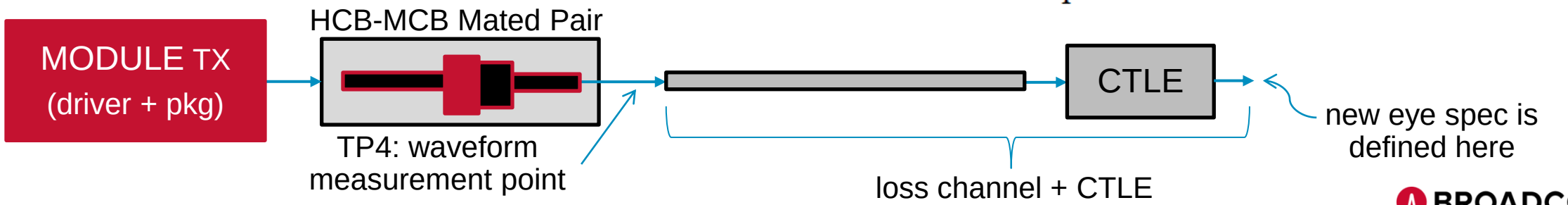
Component Models

- Adopted from Clause 92 & Annex 92A
- Total Loss:
  - 9.85dB @ 12.89GHz
- HCB-MCB Mated Pair:
  - TP3 to TP4
  - 3.59dB loss @ 12.8906 GHz
- Loss Channel:
  - Representative receiver PCB path (TP4 to TP5)
  - Model provided in 92.10.7.1.1
  - 6.26dB loss at 12.89GHz





Mated cable assembly and test point test fixture



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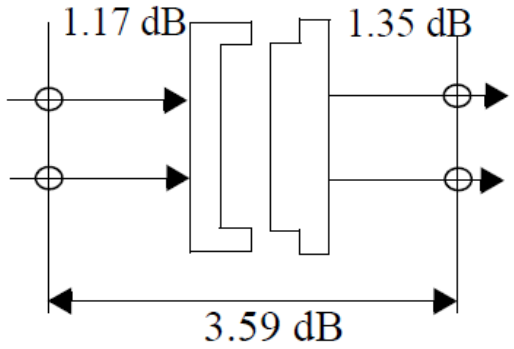
Component Models Continued…

- HCB-MCB Mated Pair:
  - TP3 to TP4
  - 3.59dB loss @ 12.8906 GHz per diagram
  - Nominal insertion loss given by equation 92A-4

    $IL_{MatedTF}(f) = 0.1148*sqrt(f) + 0.287*f$

    with f = 12.8096GHz, we get $IL_{MatedTF}(f)$ = 4.1118dB!

    with f = 13.2812GHz, we get $IL_{MatedTF}(f)$ = **4.23**dB



Mated cable assembly and test point test fixture

- Loss Channel:
  - Representative receiver PCB path (TP4 to TP5)
  - Model provided in 92.10.7.1.1
  - 6.26dB loss at 12.89GHz for 150mm, **5.74dB** at 13.2812GHz with 135mm
- **Total worst-case loss modeled: ~10.0dB**

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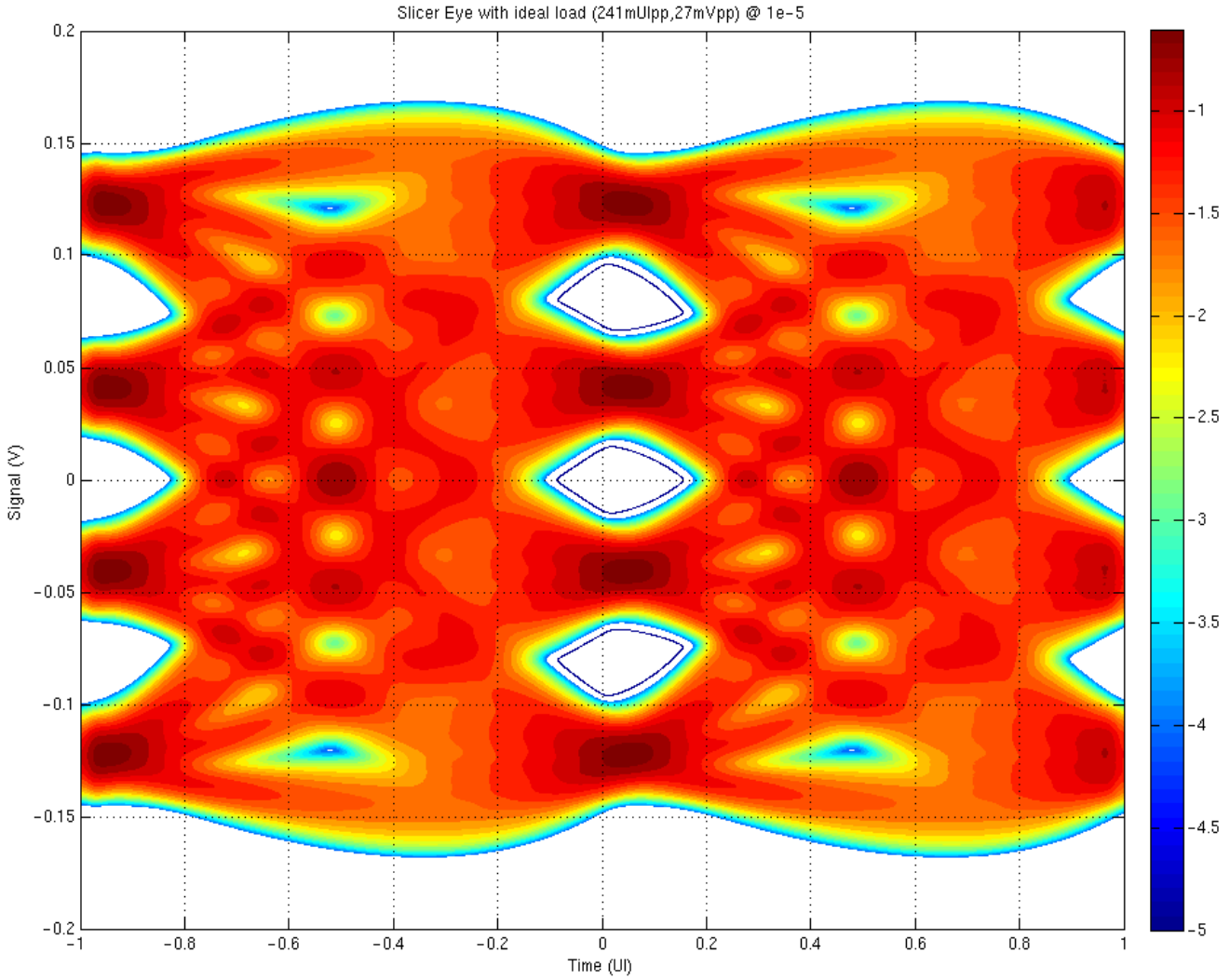
Far-end eye parameters

Parameter	Value
ESMW	175mUI
Eye Width	230mUI
Eye Height	25mV



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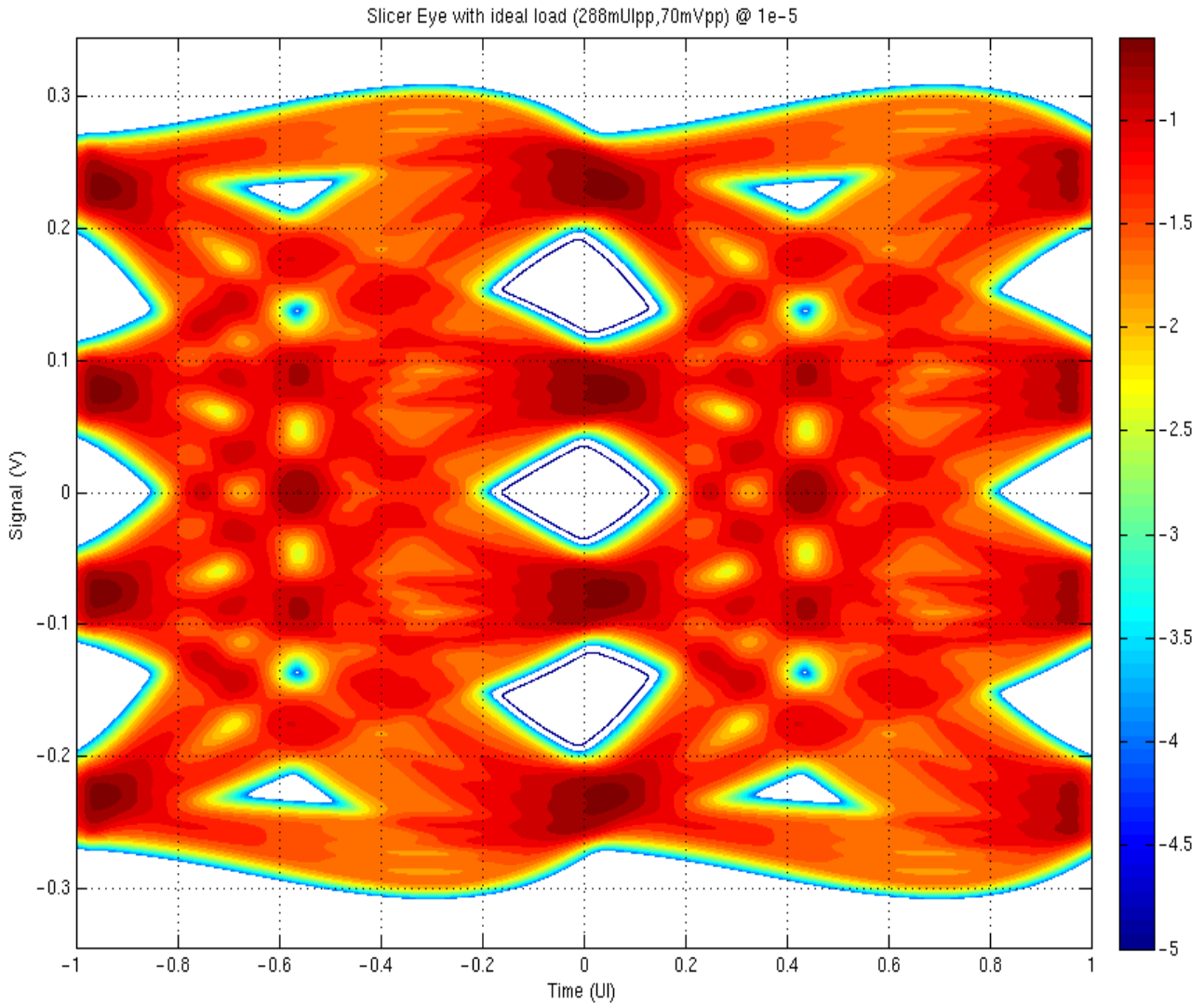
Near-end eye parameters

HCB-MCB model and CTLE sweep

Parameter	Value
ESMW	225mUI
Eye Width	250mUI
Eye Height	70mV



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