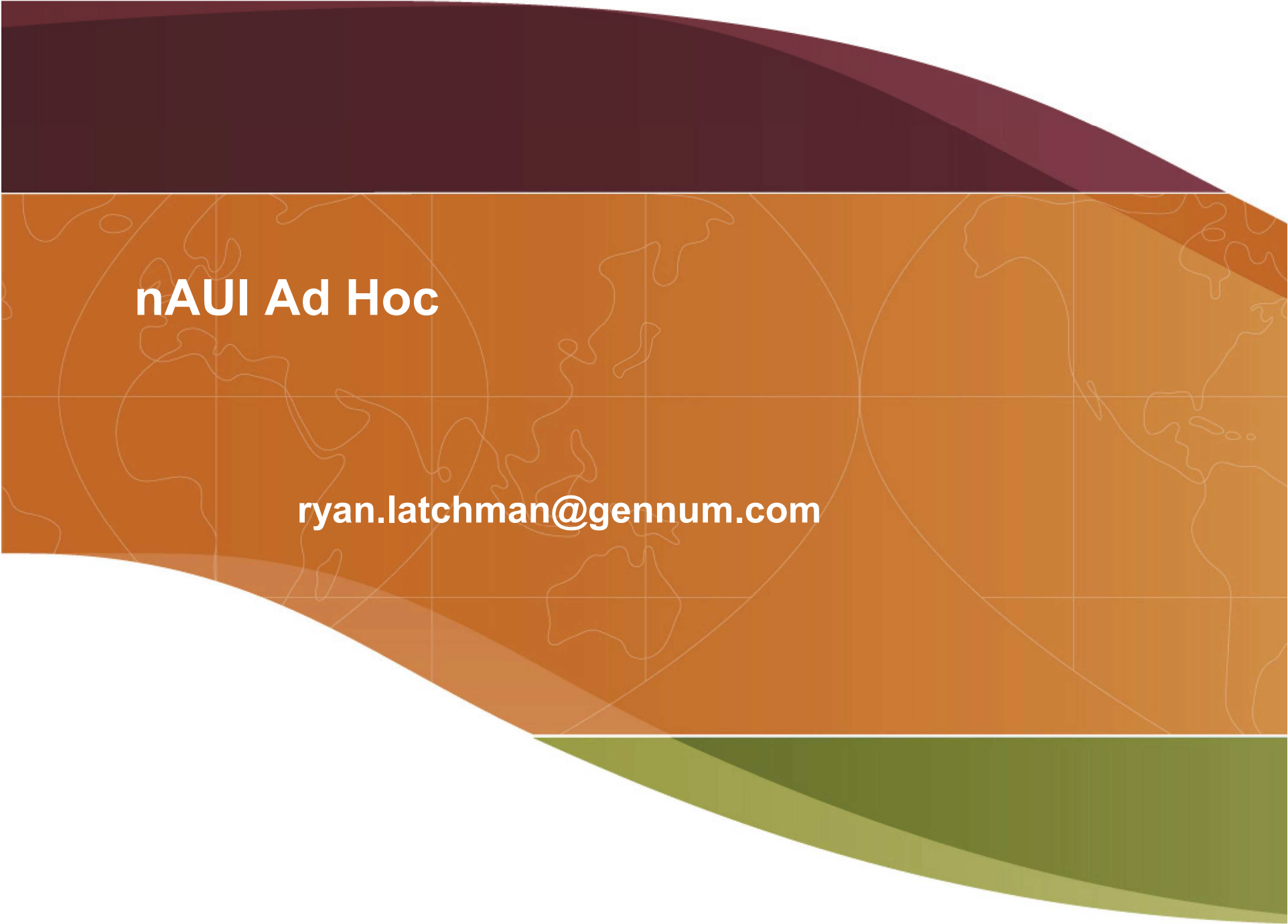


The background of the slide features a stylized world map in a light tan color, centered on the Atlantic Ocean. The map is overlaid on a dark maroon curved band at the top and a greenish-brown curved band at the bottom. The central area is a solid orange-brown color.

nAUI Ad Hoc

ryan.latchman@gennum.com

Agenda

1. Call for patents

1. (<http://standards.ieee.org/board/pat/pat-slideset.ppt>)

- Agenda

- XLAUI/CAUI Transmit Compliance Testing – Ali Ghiasi
- De-emphasis Specification & Channel Specification – Ryan Latchman
- Plan Forward

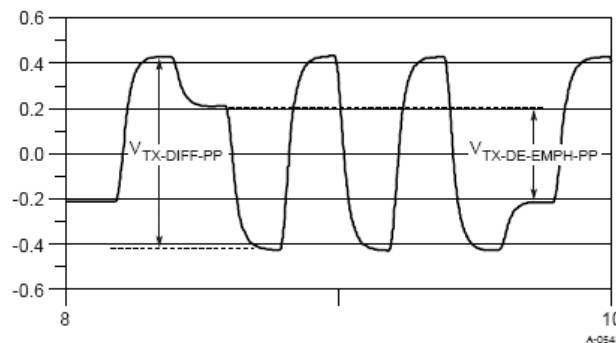
De-emphasis Proposal

- Add row to Transmitter Characteristics Table 83A-1

Parameter	Value	Units
Minimum De-emphasis	3.5	dB

83A.3.3.1 Output amplitude

- Driver differential output amplitude shall be less than 760 mVp-p **and greater than 380mVppd** including transmit equalization. DC referenced logic levels are not defined since the receiver is AC-coupled. Single-ended output voltage range shall be between -0.4 V and 4.0 V with respect to ground.
- **De-emphasis shall be the ratio between the amplitude following a transition and the amplitude during a non-transition bit as seen in equation EEE. Amplitude measurements are taken using an averaged waveform and taken at the center of the respective UI.**
- See Figure 83A–3 for an illustration of absolute driver output voltage limits, definition of differential peak-to-peak amplitude, and definition of pre-emphasis.



$$V_{TX-DE-RATIO} = -20 \log_{10} (V_{TX-DIFF-PP} / V_{TX-DE-EMPH-PP})$$

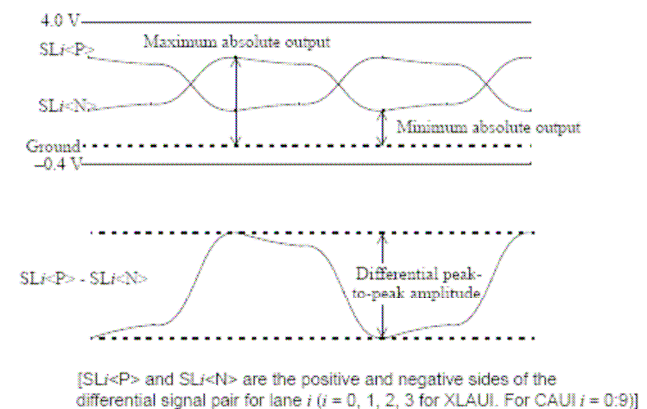
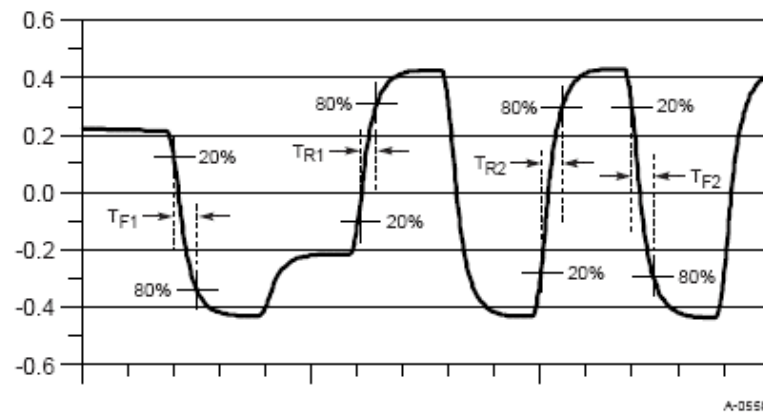


Figure 83A–3—Driver output voltage limits and definitions

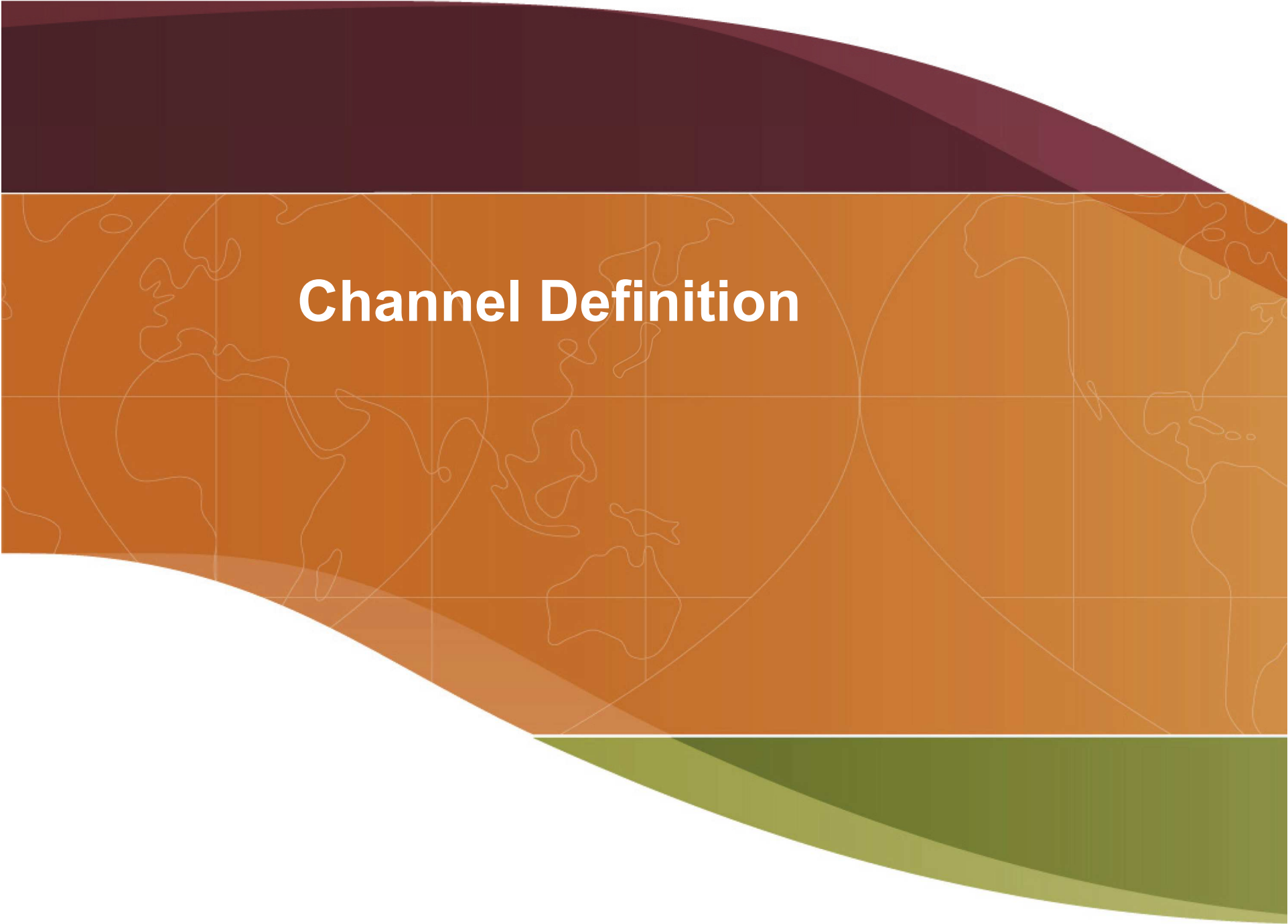
Rise / Fall Time

- Rise and fall times are measured from the 20% to the 80% levels of the differential voltage level. Note that, with de-emphasis, the voltage thresholds corresponding to 20% and 80% vary depending on the voltage level of the previous UI. Only those transitions crossing the zero threshold need to meet TR/TF limits defined in Table 83A-1. In Figure YYY, there are three distinct thresholds corresponding to deemphasized transitions from high to low, low to high, and full swing transitions in either direction. Rise / Fall Time must be validated for all four possible cases.



83A.3.3.5 Transmitter eye mask definition

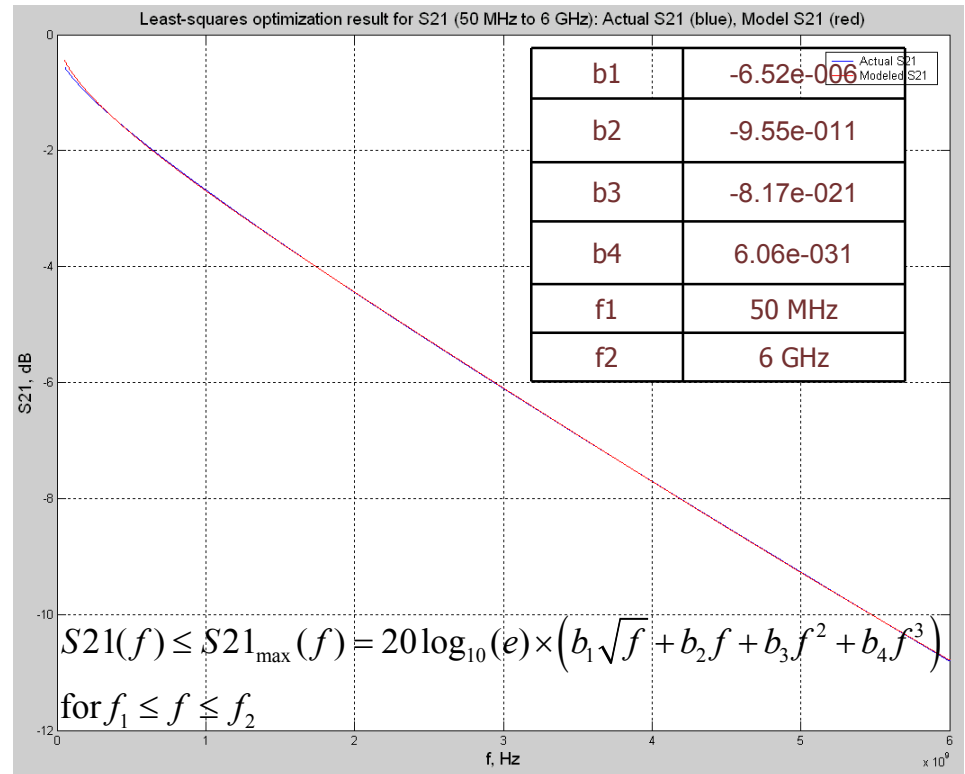
- The eye templates are given in Figure 83A–6 and Table 83A–1. The template measurement requirements are specified in 83A.5.1. The jitter requirements at the transmitter are for a maximum total jitter of 0.32 UI peak-to-peak and a maximum deterministic component of 0.17 UI peak-to-peak. The maximum random jitter is equal to the maximum total jitter minus the actual deterministic jitter. Jitter measurement requirements are described in 83A.5.2, and **are conducted with de-emphasis off.**

The background of the slide is a stylized world map in a light tan color, centered on the Atlantic Ocean. The map is overlaid on a dark orange background. The top of the slide features a dark maroon curved band, and the bottom features a green curved band. The text "Channel Definition" is centered in the orange area.

Channel Definition

Channel Definition

- See http://www.ieee802.org/3/ba/public/AdHoc/nAUI/latchman_xlc_03_1008.pdf for introduction
- Leverage KR Insertion-loss definition
 - See figure 69B-5
 - Table 69B-1
- **-10dB at 5.5GHz**
 - Gennum 15inch trace board
 - Least squares fit for eqn



Insertion Loss Definition (83A.4 Table YYY)

Parameter	40/100G XLAUI/CAUI	Units
b_1	-6.52e-006	
b_2	-9.55e-011	
b_3	-8.17e-021	
b_4	6.06e-031	
f_1	0.05	GHz
f_2	6	GHz
f_{max}	11.1	GHz

$$S21(f) \leq S21_{\max}(f) = 20 \log_{10}(e) \times (b_1 \sqrt{f} + b_2 f + b_3 f^2 + b_4 f^3)$$

$$\text{for } f_1 \leq f \leq f_2$$

$$S21(f) \leq S21_{\max}(f) = S21(f_2) - 1.7 \times 10^{-8} (f - f_2)$$

$$\text{for } f_2 \leq f \leq f_{\max}$$

Graph of Interconnect Characteristics (83A.4)

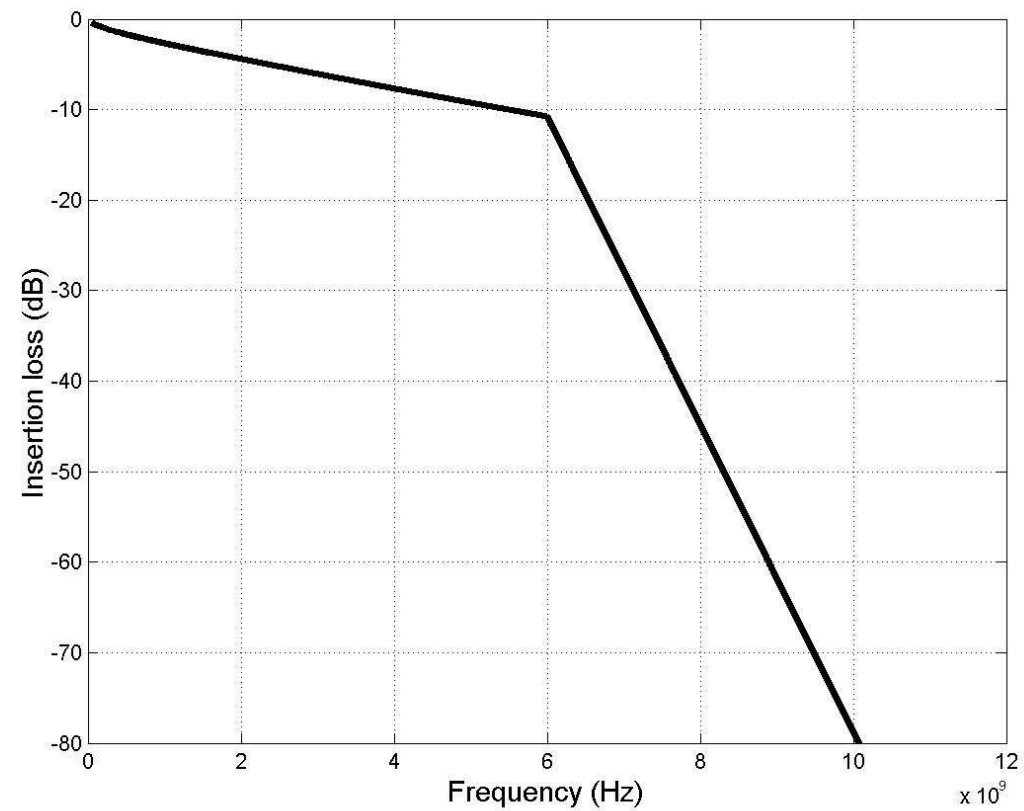
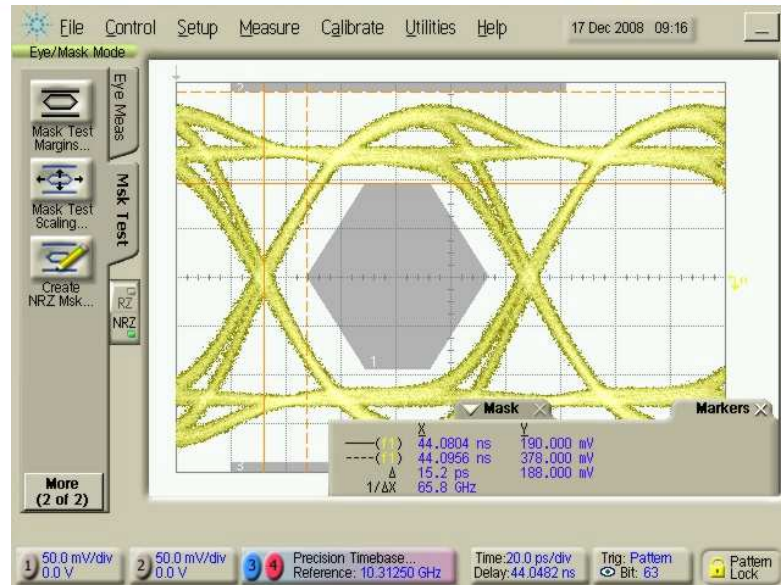


Figure xx – Insertion loss limit

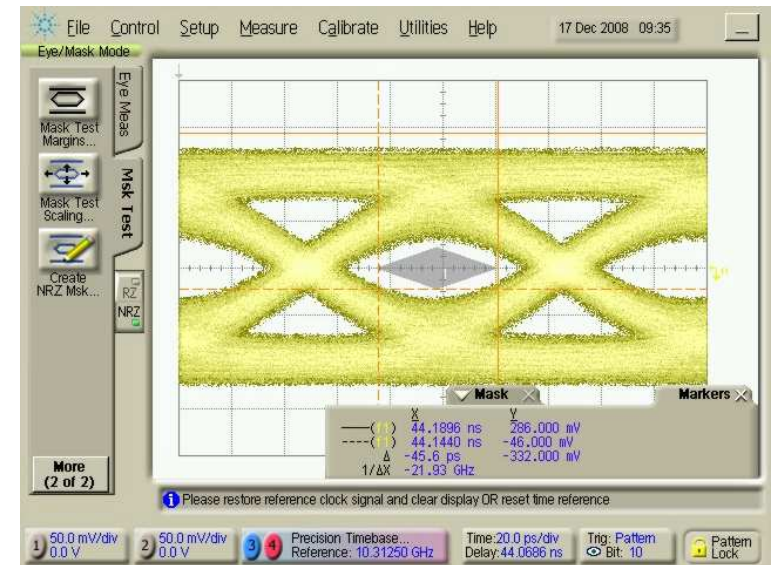
Interconnect Characteristics Text (83A.4)

- This section describes informative characteristics which are used to describe an XLAUI / CAUI channel.
- The informative values for insertion loss are summarized in table YYY and equation ZZZ. Other impairments such as crosstalk can have a material impact on the link performance and should be minimized

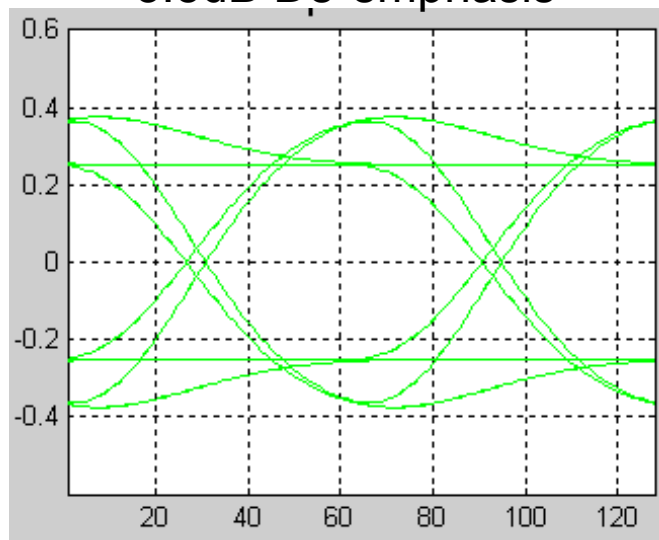
Combining Interconnect Definition with De-emphasis Specification



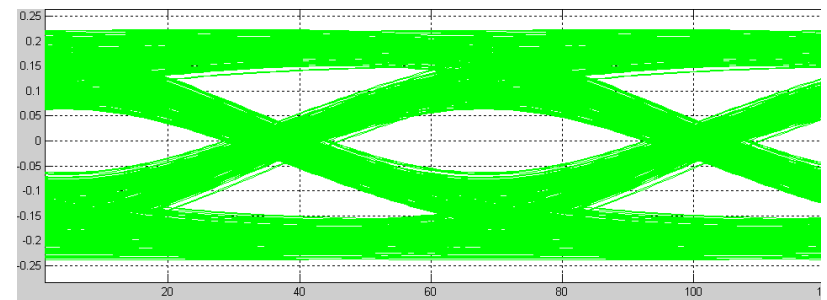
15" Trace



3.5dB De-emphasis



10dB Insertion Loss



Plan Forward

- Joint proposals to resolve comments
 - Group common comments within Adhoc
- Next Telecons:
 - Stressed Receiver Test
 - Joint Proposals