



Channel Model Ad Hoc: Agenda and General Information

Channel Model Ad Hoc Teleconference
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If you are present on today's call, please send me an e-mail indicating your attendance.



Schedule of Events

- Teleconference: Thursday, February 10 (10am PST)
 - Methodology to derive time-domain data.
- Teleconference: Wednesday, February 23 (10am PST)
 - Identify time-domain parameters.
- Teleconference: Wednesday, March 2 (10am PST)
 - As needed.
- Wednesday, March 9 (midnight EST)
 - Deadline for requests for presentation time.
- Tuesday, March 14 – Thursday, March 16
 - IEEE P802.3ap Task Force Meeting
 - Hyatt Regency, Atlanta, GA



From January...

- Move that normative channel specification be defined in the time domain (applies to analysis and not necessarily measurement).

PASSED (23/2/9)

- Direct the channel model ad hoc to include reference transmitter, receiver, terminations (package and IC), and TP4-TP5 segment in the normative channel specification.

PASSED (25/1/10)



Meeting Agenda

- Compliance methodology “food for thought”
- Integration of transmitter, receiver effects
- Extrapolation to DC, conversion to time domain
- Walk-in items.



Methodology Example (XAUI)

- Defines near-end template
- Defines near-end jitter
- Defines compliance channel
- Defines far-end template measured at the output of the compliance channel
- Defines jitter tolerance specification
- No normative specification of insertion loss, return loss, NEXT, or FEXT
 - Channel implicitly defined by (a) whatever is better than the compliance channel or (b) whatever interoperates with the transmitter and receiver.



Methodology Example (-CX4)

- Defines near-end pulse template
- Defines near-end jitter
- Defines channel insertion loss
- Defines channel return loss
- Defines channel NEXT and MDFEXT
- Defines channel ELFEXT and MDELFFEXT
- Receiver definition is to simply operate at BER better than 10^{-12} when faced with a compliant transmitter and a compliant channel.



10GBASE-KR Status

- Defines transmitter near-end jitter.
- Methodology to specify adaptive transmitter to be defined.
- Defines interconnect insertion loss (informative).
 - Informative NEXT and FEXT specification expected to follow.
- Normative interconnect specification methodology to be defined.
- Receiver defined to operate at BER better than 10^{-12} when connected to a compliant transmitter through a compliant channel.
- Receiver interference tolerance specification (informative).
 - Includes compliance channel definition.
- Question: Are we over-specifying the problem?



Suggested Minimum Sets

- Set #1

- Define normative transmitter near-end jitter
- Define methodology to specify adaptive transmitter
 - Normative, utilize compliance channel?
- Define informative interconnect specifications
- Define normative receiver interference tolerance

- Set #2

- Define normative transmitter near-end jitter
- Define methodology to specify adaptive transmitter
 - Normative, utilize near-end pulse mask?
- Define normative interconnect specifications
 - Define informative interconnect specifications as a “courtesy”
- Define receiver to operate at BER better than 10^{-12} when connected to a compliant transmitter through a compliant channel



Integration of TX / RX Effects

- Requires two-port representation (S-parameters) of channel.
 - Frequency domain characterization (*.s4p, differential mode *.s2p)
 - Perhaps time domain, combined differential TDR and TDT, may also serve.
- Cascade transmitter and receiver components with channel.
 - S-parameters to ABCD-parameters
 - Multiply ABCD matrices.
 - ABCD parameters back to S-parameters.
 - Matrix conversions may be found at:
<http://qucs.sourceforge.net/tech/node5.html>
- Key issue: what is the definition of the transmitter and receiver components?



Extrapolation

- Conversion of SDD21 vector to time domain requires extrapolation to DC.
 - May not be necessary if source data is from time-domain.
 - Simple linear extrapolation of magnitude and phase has proven insufficient for some cases (skin effect).
- **No algorithms provided for discussion at this meeting.**
- Maximum measurement frequency of 15GHz results in approximately 3 samples/ baud at 10.3125Gbaud.
 - To increase the sample rate, extrapolation to the desired Nyquist frequency is also required.
 - Zero-padding is the most convenient option (frequency content above 15GHz probably does not have a strong influence in the time domain response).



Action Items...

- Methodology to define adaptive transmitter.
 - Solicit proposals for March 2005 plenary.
- Define transmitter and receiver components for the interconnect specification methodology.
 - May be utilized by normative and informative methodologies.
 - The simpler the better.
 - Utilize model adopted by signaling ad hoc?
- Identify agreed-upon methodology to extrapolate to DC.
 - Discuss on reflector?
- Identify critical time-domain parameters and bounds.
- Eliminate redundancy from the specification suite.
 - ...or decide that we do want redundancy.