802.3BT End to End Channel PAIR-TO-PAIR UNBALANCE MEETING NOTES
19 August 2014 – Meeting #12

NOTE: Participants using both telephone line and the audio capability of the Fuze meeting platform which cause echos and disable the unmute function. So use only one audio access and not two

Participants are encouraged to review IEEE meeting guidelines available at the following URL - https://development.standards.ieee.org/myproject/Public/mytools/mob/preparslides.pdf

The proposed agenda for the meeting follows.

9 AM Pacific Time meeting start (one hour meeting planned)

1. Reminder of IEEE patent policy
   www.ieee802.org/3/patent.html
   The Chair reminded the meeting participants of the IEEE patent policy and asked if there was anyone unfamiliar with the IEEE patent policy. No responses were heard.

2. Agenda and process
   Yair reviewed the presentation Channel Pair To Pair Resistance Imbalance Adhoc Meeting no. 12, which was posted and mailed to the reflector.

   The Chair reviewed the process for meetings as agreed at the prior meeting:
   Submit presentations requests on the Wednesday (anywhere on earth) following the previous meeting (i.e., 6 days prior to the meeting), with the pdfs uploaded 3 days before the meeting.

3. Roll call : Please send an email indicating your attendance, employer and affiliation to mailto:ydarshan@microsemi.com.

Meeting #12 Attendees list approved by mail massage.

Yair Darshan , Chair / Microsemi
Christian BEIA / ST
George Zimmerman/ CME Consulting, Affiliations: Commscope
Chad Jones / Cisco
Dave Dwelley / LT
Geoff Thompson /
Ronald Tellas / Panduit
Rimboim Pavlik / Microsemi
Shariff Masood / Commscope
Sterling Vaden
Ken Bennett / Sifos
Koussalya Balasubramanian / Cisco
Brian Buckmeier / BEL
Shahar Feldman / MSCC
Rick Frosch / Phihong
Fred Schindler / Seen Simply

4. Agenda:

The Chair discussed the proposed agenda for this meeting, shown on slide 4 of the presentation: Channel Pair To Pair Resistance Imbalance Adhoc Meeting no. 12, there were no objections to the proposed agenda for this meeting.

5. New Business:

The chair moved directly to the discussion of new contributions:

5.1. Presenter: Dave Dwelley, Linear Tech

Title: E2EUNB SPICE Simulation

Brief description: The presenter discussed simulation of the end-to-end pair-to-pair unbalance using SPICE, and a deck that has been provided to the ad hoc for upload to the website. The presenter outlined the methodology and hoped to present final numbers at the next meeting.

Discussion:

- Christian commented that the modeling was similar to a model previously proposed by him in the Task Force. The presenter agreed, and noted some additional models.
- Yair commented that the presentation was not directly addressing the points from the prior meeting, but added information, some of which was related to information previously presented. The presenter acknowledged these effects were directly addressed, but rather presented the tool he was using and planned to present the conclusions at the next meeting, and, if these were not addressed, the presenter would accept the current proposal. Yair also stated ~~his view~~ that prior ad-hoc work was done with SPICE and other tools like MATLAB for better visibility and understanding of issues and making sure that we have accurate and valid results, and that the prior SPICE models used were verified with lab tests. Yair pointed the group to a SPICE model presented in: pages 14 and 15 at: http://www.ieee802.org/3/bt/public/unbaladhoc/Comparison%20between%20proposed%20base%20line%20text%20and%20equation%20form%20and%20addressing%20FAQ.pdf.

5.2. Presenter: Yair Darshan, Microsemi

Title: Comparison between proposed base line text and equation form and addressing FAQ.

Brief description: Addressing questions/opinions/concerns made by Dave Dwelley as reflected by minutes meeting including our email exchange and phone conference between Yair and Dave on Wednesday August 13, 2014. The presenter described the ~~a~~ channel equation that was used to support the current base line text with "0.1Ω or 7.5% whichever is greater" and then showed how this equation is included in the system end to end equation, and show ~~claimed that~~that there were no "double margins". He emphasized that the specification being discussed is only for the cabling channel, and that pair current will be a function of the full system end-to-end P2PRUNB, which includes the channel, PSE and PD PI elements as well. He maintained that even with margin for a 100m channel the PSE and PD elements dominate this relationship.

Based on his results, he suggested that the worst case will be at channels with less than 100m.

Additional references: The presenter referred to Annex G5 of Channel Pair To Pair Resistance Imbalance Adhoc Meeting no. 12, deck for examples with Spice simulations based on the Annex F model and Annex G1 database with some variations on the parameters to demonstrate the point.

Yair also discussed problems with using equation form.
For further details, please see the above referenced presentation.

Discussion:

Dave asked if there was a spice netlist to be posted, Yair agreed to supply a netlist which would be posted.

Question of clarification – the 'confirmation with magnetics vendors' was this confirming that a 9ma change was insignificant or was this a confirmation of the entire calculation? Yair promised offline links to the supporting material, which are provided below:

http://www.ieee802.org/3/bt/public/unbaladhoc/Analzing_Channel_Pair_To_Pair_Resistance_Unbalance_use_cases_rev_6.pdf

Annex D1: Example for calculation of Ibias for a system with 26% unbalance at 1mm and 10% unbalance at 100 for a 12.5 ohm channel at 100m as an example. Confirmed by magnetic vendors. (same for Annex C1 regarding the magnetics.)
Annex K: Calculation of Ibias. Contribution from Thuyen , Pulse.

Geoff Thompson asked what is the value of using equation and if there is a value? Yair responded that based on his presentation and calculations, there is no value.

5.3. Discussion: Summarizing points of agreements and disagreements
5.4. Straw-poll to choose one of the proposals as the adhoc recommendations.

Yair asked whether there were any objections to the proposal of:

> 33.1.4.3 Pair Operation Channel Requirement for Pair to Pair Resistance Unbalance 4P pair operation requires the specification of resistance unbalance between each two pairs of the channel, not greater than 100 milliohms or 7.5% whichever is greater. Resistance unbalance between the channel pairs is a measure of the difference of resistance of the common mode pairs of conductors used for power delivery. Channel pair to pair resistance unbalance is defined by…

The proposed straw poll was for participants to send their recommendations for channel specification (or abstention from the poll) per the options listed below:

Option 1: Current base line text with 0.1 ohm or 7.5% whichever is greater
Option 2: Equation form C_P2PRUNB = $(R_{max} – R_{min} + 0.08\Omega) / (R_{max} + R_{min} + 0.032\Omega)$

With the understanding that the numbers, e.g., 7.5% and 0.1 ohm, were subject to change based on input from cabling standards bodies.

The note taker was asked to put together a precise statement of the straw poll and forward to the ad hoc group. There were several suggestions

There were various proposals for modifications to the straw poll, additions of data, and alternative baseline text. For now, the proposer (Yair) chose to focus the straw poll on the two options above, and to refer participants to the materials previously presented in the ad hoc, particularly in the past two meetings. Please see the website for these files.

5.5. PSE PI and PD PI concepts of how to proceed – the following presentation was put off to the next meeting, but given FIRST priority for the next meeting, before other presentations.

To discuss the proposals for PSE PI made by:
(a) http://www.ieee802.org/3/bt/public/jul14/bennett_01_0714.pdf Slide 14.
(b)http://www.ieee802.org/3/bt/public/unbaladhoc/Generating%20the%20PSE%20and%20PD%20PI%20models%20and%20their%20unbalance%20requirements%20rev%20013b.pdf Slide 15.

6. Next meeting time: Tuesday, August 26, 2014 – 9am pacific time
7. Adjournment: 10:16am pacific time.