

802.3BT End to End Channel PAIR-TO-PAIR UNBALANCE MEETING NOTES
12 August 2014 – Meeting #11

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. 11](#), which was posted and mailed to the reflector.

The Chair reviewed the process for meetings and discussion ensued. In order to reduce churn with multiple updates of the website, the group agreed to:

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>

Attendance:

Yair Darshan, Microsemi, Chair

Christian BEIA / ST

George Zimmerman/ CME Consulting, Affiliations: Commscope

Chad Jones / Cisco

Dave Dwelley / LT

Geoff Thompson /

Ronald Tellas / Panduit

Rimboim Pavlik / Microsemi

Jean Picard / TI

Ken Bennett / Sifos

Rick Frosch / Phihong

Koussalya Balasubramanian / CiscoYair Darshan

Shariff Masood / Commscope

David Abramson / TI

David Law / HP
Victor Renteria / BEL
Paul VANDERLAAN / Berk-Tek LLC
Miklos Lukacs / Silicon Labs
Brian Buckmeier / BEL
Feldman Shahar / MSCC
[Sesha Panguluri/ Broadcom](#)

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. 11](#), there were no objections to the proposed agenda for this meeting.

5. Old business - Status review

Yair continued review of the presentation, reviewing the status from the previous meeting, and proposals for closing TBDs, PSE PI and PD PI, and a list of open issues remaining.

- The group agreed to the status and direction shown on slide 6 of the presentation, including replacing Annex K with links to the presentation that was on Annex K that show the analysis of the Channel P2PRUNB channel vs. proposed adhoc use cases including:
 - Addressing the baseline text TBDs from May 2014 motion.
 - Variable Channel Length, number of connectors up to 4.
 - Maximum C_P2PRunb 7.5% (TBD) or 0.10 whichever is greater. See details in http://www.ieee802.org/3/bt/public/jul14/darshan_01_0714.pdf

The presentation then continued on slide 7 into a review of Yair's proposal, see below.

5.1. Discussing proposal made by Yair Darshan at July 2014:

Name of presenter: Yair Darshan, Microsemi

Reference slides: http://www.ieee802.org/3/bt/public/jul14/darshan_01_0714.pdf

Discussion: 7.5% was considered the worst case analysis, and Yair proposed that a statistical analysis may follow giving a lower number after we complete the PSE PI, PD PI and Channel due to the fact that the worst case analysis numbers are the initial database for statistical analysis.

Yair proposed a resistance unbalance specification 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...

Yair then went on to discuss his views of the proposal made by Jeff Heath in the minority report of July 2014. He stated that an equation-based approach would be more complex and would not provide any benefit since the system imbalance would dominate, and the presenters proposed 7.5% did not cause any additional complexity per the work

presented at the adhoc in previous presentations. See http://www.ieee802.org/3/bt/public/jul14/darshan_01_0714.pdf Annex annexes addressing transformer Ibias calculations and Pair maximum current

5.2. Reviewing Dave Dwelley comments on (5.1) per his request at the adhoc meeting #10 at July IEEE meeting. (Verbal presentation)

Dave clarified that the proposal from Jeff was not an equation ($5\% + 0.1\text{ohms}$), but rather a “MAX” or logical “OR” of the greater of 5% or 0.1ohms.

Yair disagreed with the whether this would work.

Dave then stated that he supported the curves from Yair’s july presentation showing channel P2PRUNB vs. minimum cabling resistance in ohms (see slide 14 of Analyzing_Channel_Pair_To_Pair_Resistance_Unbalance_use_cases_rev_5b.pdf) that was sent to the reflector and to the adhoc site.

Dave resisted Yair’s prior comment suggesting that an equation form specification does not have value, mainly because the constraints on the transformer would impact the transformer design.

- He described a maximum power system (50-99W) with an active bridge in the PD, using a purely resistive PSE, at maximum reach, where the imbalance in the cable and cordage would dominate. In this case, the transformer bias currents could be > 1 milliamp, and Dave promised to detail this in a future presentation for next meeting #12.
- In this case, the difference between 5.5% and 7.5% would be material.
- A fixed number with margin in it in our cable unbalance spec would build in extra margin.
- 5% underestimates the middle cases. 5.5% is the worst case value at 100m per Yair’s curve.
- Mr. Dwelley suggested that a fixed number, as was a prior agreement was the wrong as it would either overestimate the long case or underestimate the short case.

Discussion:

- Yair suggested that there was an error in Mr. Dwelley’s analysis, and the two agreed to address the calculations by spreadsheet & further discussion offline and at the next meeting.
- Yair then reviewed the equation proposed on page 35 of the Analyzing_Channel_Pair_To_Pair_Resistance_Unbalance_use_cases_rev_5b.pdf , and offline, the two were going to review whether this was in fact the case that was being analyzed.

5.3 Reviewing Jeff proposal for the equation= $0.1\text{ohms}+5\%$. (see above)

5.4 Reviewing other proposals? (additional proposals were not offered)

5.5 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...

Dave Dwelley objected, Kousi suggested that people may be having difficulty getting off mute.

George Zimmerman agreed with Kousi and stated that while he did not object, he was not yet ready to accept the proposal, due to the disagreements in analysis noted earlier in the meeting.

There was agreement to hold off the straw poll until the next meeting, and to send in vote at that time by email.

AI (by Geoff Thompson): Looking at the proposal above (7.5% or 0.1 ohm whichever is greater), the issue is whether or not to replace that with an equation, and understand the value proposition of an equation by quantifying the margin left on the table by the fixed number proposal and the power capability left on the table

Dave agreed to show his figures to reconcile them, and reconcile to be ready for review by tomorrow.

The meeting ended at this point, without addressing the final agenda item:

5.6

PSE PI and PD PI concepts of how to proceed and

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%20OPD%20PI%20models%20and%20their%20unbalance%20requirements%20rev%20013b.pdf>
Slide 15.

6. Next meeting time: Tuesday, August 19, 2014 – 9am pacific time

7. Adjournment: 10:15am pacific time.