

Meeting Minutes
IEEE P802.3bq Channel Model Ad Hoc
October 29th, 2013
Prepared by Pete Cibula and Brad Booth

Meeting Agenda:

- 1) Roll call - Record attendance, attendees' names and affiliations
- 2) Reminder of IEEE patent policy: www.ieee802.org/3/patent.html
- 3) Houskeeping:
 - a) Review & approve meeting agenda.
 - b) Approve meeting minutes from the October 16th meeting (unapproved minutes are available at the P802.3bq public area)
- 4) New business for the October 29th ad hoc meeting as follows:
 - a) Channel Modeling ad hoc sub-team updates with discussion
 - i) PCB transmission lines & noise for 10GBASE-T systems (B. Booth and P. Cibula) - Update on data collection on PCB transmission lines and noise for 10GBASE-T systems with discussion.
 - ii) MDI-to-MDI cabling channel (C. DiMinico and W. Larsen) – Update on MDI-to-MDI cabling channel efforts with discussion
 - iii) MDI & isolation path (M. Grimwood and G. Zimmerman) – Update on data collection for MDI and isolation path with discussion.
 - b) New contributions with discussion
 - i) 40GBASE-T ICM (Brian Buckmeier and Victor Renteria, Bel/TRP Connector)
- 5) General Discussion and meeting wrap-up
 - a) Review action items from the October 16th meeting
 - b) Suggestions for future presentations
 - c) Next steps/future meetings

The 10th meeting of the P802.3bq Channel Modeling Ad Hoc was called to order at 8:07 AM Pacific Time.

- 1) Participants were asked to email B. Booth or P. Cibula a note confirming their attendance. The attendance record at the bottom of these minutes is a compilation of email confirmations and an online meeting log.
- 2) P. Cibula reminded everyone of the patent policy. Those not familiar with it were directed to the URL above.
- 3) Houskeeping & general updates:

- a) The agenda was reviewed with those in attendance; no modifications were suggested and the agenda was approved without opposition. The agenda stands approved.
 - b) Participants were informed that the [October 16th meeting minutes](#) were completed and would be posted to the channel modeling ad hoc area.
- 4) The meeting was then opened to hear new business for the October 29th ad hoc meeting as follows:
- a) Channel Modeling ad hoc sub-team updates
 - i) PCB transmission lines & noise for 10GBASE-T systems (B. Booth and P. Cibula).
 - (1) Efforts are ongoing to evaluate the effects of channel impedance variations using 90 ohm and 110 ohm targets, as well as to characterize the robustness of the host PCB trace channel model with respect to stability, causality, and passivity.
 - (a) Post-meeting update on model robustness: Causality and passivity have been confirmed; stability has been confirmed for typical PCB trace delays and is now being evaluated with longer delays.
 - ii) MDI-to-MDI cabling channel (C. DiMinico and W. Larsen).
 - (1) No specific update was provided as the subteam has completed their main body of work. Some follow-up discussion around the scaling methodology shared at the October 16th meeting provided the following key points:
 - (a) Equations associated with the methodology are being developed and will be posted to the ad hoc public area.
 - (b) Contributions are being planned to address concerns related to considering and comprehending phase effects in scaling methodologies, and to follow up on the pessimism of models with respect to return loss and crosstalk.
 - (c) The scaling methodology will remain as a discussion topic in the general ad hoc since it affects all subteams.
 - iii) MDI & isolation path (M. Grimwood and G. Zimmerman)
 - (1) The subteam has been working towards contributions for the November meeting. Some recent work is shared in the following 40GBASE-T ICM contribution to this meeting.
 - b) New contribution
 - i) [40GBASE-T ICM](#) (Brian Buckmeier, Victor Renteria - Bel Fuse Inc./ TRP Connector)
 - (1) The presenters shared s16p measurements of an ICM (integrated magnetic module) designed to support 40GBASE-T requirements while maintaining electrical and mechanical backwards compatibility with current twisted pair interconnects. Presented measurements included insertion loss, return loss, NEXT and FEXT. It was further noted that the module demonstrates an OCL > 160uH and meets IEEE hipot specifications. The contribution includes a definition of the 16 port model for use with s16p data available from the ad hoc [channel data](#) page.

- (2) Meeting participants discussed several aspects of the model, providing the following observations and comments:
 - (a) While all component characteristics were not included in the presentation, they can be derived from the s16p data (example: common-mode to differential-mode conversion).
 - (b) Pair C (pins 4 & 5 of the RJ45/8P8C modular connector) shows notably different characteristics. It is believed to be an “outlier” but was included so that participants could comment on potential variability and begin to consider how much variation we can tolerate in the channel (In this context, the variation could be mapped into anticipated yield curves).
 - (c) Contributors noted that they believe that parameters can fit comfortably in about a 4dB window, and that a more restrictive range could make ICM design and manufacturing a bit more challenging.
 - (d) Contributors further noted that some characteristics may be better than actually reported due to suspected limitations in test fixtures. Potential improvements to test fixtures were discussed, including general descriptions of improvements in other fixtures (using the DPMF - Direct Plug Measurement Fixture – as an example). This area was identified as an opportunity for collaboration and further work.
 - (3) Concluding remarks included the observation that the ICM as presented is a x1 form factor. It is believed that this can be extended to 2xN form factors for switching applications with the same density as current 10GBASE-T components.
- c) Closing discussion – Future meetings
- i) Participants were reminded of upcoming deadlines for submission for the November IEEE 802 Plenary in Dallas, TX.
 - ii) Given that the 1st post-Plenary ad hoc meeting falls on the day before the US Thanksgiving holiday, participants agreed that the meeting should be re-scheduled to an earlier date.
- 5) The next meeting was tentatively scheduled for Tuesday, November 26th, 2013 at 8:00AM PDT. The meeting will be confirmed with a message and meeting announcement to the P802.3bq reflector.

The P802.3bq Channel Modeling Ad Hoc meeting was adjourned at 8:48 AM Pacific Daylight Time.

Meeting Attendance

Name	Employer	Affiliation (if different)
Anna An	FIT-Foxconn	
Brad Booth	Microsoft	
Yakov Belopolsky	Bel Fuse, Inc.	
Brian Buckmeier	Bel Fuse, Inc.	
Dave Chalupsky	Intel	
Pete Cibula	Intel	
Chris DiMinico	MC Communications	Panduit
Thuyen Dinh	Pulse	
Harry Forbes	Nexans	

