September 3-5, 2013

York, UK

Prepared by Chris Mash

IEEE 802.3bp Reduced Twisted Pair Gigabit Ethernet PHY Plenary meeting convened at 09:05, Tuesday, September 3, 2013 by Steven B. Carlson, 802.3bp Task Force Chair

Attendance is listed in Appendix A

Tuesday, 3 September 2013

Administrative Matters

- Appointment of Recording Secretary – Chris Mash
- Welcome and Introductions
- Review Agenda

Motion #1: Approve Agenda
M: Todd Herman S: Mehmet Tazebay
Voice Vote
MOTION: Passes Unanimous Without Opposition

- Confirmation that there are no press in the room.
- Task Force Decorum
- Review the Meeting Goals
- Reflector and Web location review
- Meeting Ground Rules Review
- Attendance policy and tool
- Important Bylaws and Rules
- Patent Policy was read and call made for Potentially Essential Patents.
    - **No Declarations of Patents were made.**
- Review of the IEEE Structure and Standards process
- P802.3bp Status
- Doing quite good on requesting and providing presentations on time

Presentation #1 - Chris DiMinico / Mehmet Tazebay: Channel Definitions Ad Hoc Report

Update from the ad-hoc meeting conference calls on Aug 8, Aug 15, Aug 29 , the goal has been the creation of baseline channel consensus proposal for presentation at sep interim.

- Reviewed IL proposal in (802.3bp baseline proposal-D0.2.pdf) updated with ILD term
- Reviewed RL and alien crosstalk proposals (herman_3bp_01_0713.pdf
- Balance specifications (Mehmet RTPGE_EMC_Limit_Lines_06662013.pdf)
- Time domain channel representation resulting from insertion loss (IL) (Anand Dabak dabak_3bp_01_0813)
- Reviewed presentation on cable balance measurements - (Michael Rucks RTPGEBalanceTestchannel_cableonly.pdf)
- Reviewed presentation on EMC/channel ad hoc discussion of balance parameter requirements (Stefan Buntz - buntz_3bp_01_0829.pdf)
- Car manufacturer feedback on cabling

Morning Break at 10.15

Presentation #2 - Mehmet Tazebay / Stefan Buntz: EMC & Noise Ad Hoc Report

2 conf calls since July Plenary meeting and review of previous work to date.

- Differential Channel Impairments
- EMC Noise & Limit Lines
- EMC Channel Transfer Function Modeling
- Alien XTALK
- In-Car Background Noise
- Impulse Noise
- Other Noise sources?

Review of previous work to date
Currently in 2nd phase – reach consensus on baseline limit for EM emissions (&mask) and based on that define TX PSD mask

Updates in following area:
New balance results measured (1pair 15m UTP w 4inline) and presented to the group during channel / EMC ad hoc.
3 different connector companies confirmed previously proposed mode conversion limit line is attainable for component level of connectors
There are 2 different 1 pair UTP cables which meet the component level model conversion limit line

York meeting goal is to establish a baseline proposal for mode conversion parameter of RTPGE link segment.

Discussion - concern that ISO BCI tests only go to 400MHz and higher frequencies could be difficult to couple effectively. MT commented that BCI injection probes can run upto 1GHz and this seems to be the best way going forward. Also difficult to decouple antenna transfer function if using radiated methods. SB commented that both methods could be required.

Discussion – does baseline specification refer to peak or RMS? No answer in the room, to be investigated further.

Presentation #3 – Shaoan Dai: Analysis of Immunity Transient Performance vs. Insertion Loss and BCI Limit Line

- Objective
- Interference Frequency vs. Transient SNR
- Interference Amplitude vs. Transient SNR
- Channel Insertion Loss vs. Transient SNR
- BCI Limit
- Conclusions
- Discussions

Discussion around different cables / connectors and balance of assembly and the different affects on the limit lines.

Presentation #4 – Anand Dabak: Analysis of PAM modulation to meet EMC/EMI requirements

- Look at the tradeoff analysis of the different PAM modulations to meet the EMC and EMI requirements defined in the channel model ad-hoc group to achieve the throughput rate in RTPGE

Discussion around encoding overhead.

Presentation #5 - Stefan Buntz: Performance Criteria for RTPGE

- Technical PHY related proposals for RTPGE need to be rated according to their suitability for automotive use
- The following slides list the criteria the car industry will be looking for when proposals for technical solutions are made
- This is to inform the participants

Discussion if transient errors are acceptable or not. Upto now, BCI assumes no errors.

Group adjourned for the day @ 12.25.

Wednesday 4 September 2013

Presentation #6 – Mehmet Tazebay: 802.3bp RTPGE mode conversion measurements for automotive link segments

- System EMC Testing (as previously proposed)
  - Stripline for emissions testing (using 2m UTP cable)
  - BCI for immunity testing (using 2m UTP cable)
- Critical parameter for RTPGE utilizing UTP solutions
  - Mode conversion limit line which directly defines the emissions and immunity
  - The previously proposed value corresponds to the most stringent emission limit line (15dBuV) and BCI immunity level (200mA) using 2m UTP cables as defined by the standard test configurations
  - Need to derive the mode conversion limit lines for RTPGE link segment (15m w/4-inline connectors)
- Test Setup
  - DUT 5cm over a ground plane (commonly used by automotive OEMs)
    - Will provide a consistent CM impedance among different measurements & setups
  - Components' Testing (cables, connectors, magnetics, etc.)
  - Designing good test heads & an accurate calibration is crucial for balance measurements.
  - There are two types of inline connectors considered in this study (#1, #2).

Discussion around untwisted length per connector and whether 10dB margin is enough to account for the untwisted amount.
Discussion around common mode GND connection and the difference between BCI standard and measured results.

Presentation #7 – Mehmet Tazebay: Calculated versus Direct Measurements for Bulk Current Injection Immunity Tests

- Investigate the correlation between calculated and direct BCI measurements
- Test Setups
  - Setup#1:Transfer Function Measurement (via 3-port VNA and 2-port VNA w/splitter)
  - Setup#2:Direct BCI Measurement (via scope w/splitter)
- Notes:
  - BCI test setup is arranged according to ISO 11452-4.

- The balance of the measurement setups is super critical (cables, equipments' balance & dynamic range etc.)
- A differential splitter is used to provide a precise balance measurement

Continued discussion around CM GND connection.

Discussion around baseline proposal for 15m link segment and how BCI testing on segments will correlate.

Presentation #8 – Chris DiMinico: Channel definitions ad hoc report

Reviewed presentation given yesterday (3 September)

Presentation #9 – Chris DiMinico: 1000base-tx link segment baseline proposal from Geneva meeting

Purpose – to propose a baseline

Discussion around IL and proposal of 18dB @ 500MHz. Preference from Phy guys is that IL @ 500MHz should be closer to 14/15dB

Presentation #10 –Thomas Muller: Insertion loss limit for IEEE 802.3bp

Presentation shows over temperature shows 15m with 4 inline connectors meets 14dB IL

Presentation #11 – Todd Herman: IL Model for RTPGE

Discussion around the model and possibility of looking at higher freq. cutoff.

Break for Lunch at 12.00. Meeting resumed at 13.45.

Motion #2 - Move that The IEEE P802.3bp Task Force affirms the proposed Baseline IL Channel Performance for link segment insertion to establish the absolute value across the frequency range through 500MHz.

M: Todd Herman S: Stefan Buntz
Technical 75%

Friendly amendment to add .3bp file number.
Discussion – request freq range to be increased.

Motion #3 - Friendly amendment to change to 700MHz.
M: Todd Herman S: Stefan Buntz – both agree to change the frequency range.

MOTION: Passes

Motion #4 - Friendly amendment to change IL to 15dB @ 500MHz.
M: Todd Herman S: Stefan Buntz – both disagree to change the IL to 15dB @ 500MHz
Technical 75%
MOTION: Fails

Motion #5 - request amendment to move IL to 15dB @ 500MHz
M: Chris DiMinico S: Ron Nordin

Discussion on amount of margin required and amount of margin in formula given in Motion 2.
Technical 75%

Vote
Y: 2 N: 11 A: 16
MOTION: Fails

Amended Motion #2 - Move that The IEEE P802.3bp Task Force affirms the proposed Baseline IL Channel Performance for link segment insertion to establish the absolute value across the frequency range through 700MHz. (herman_3bp_01_0913.pdf)

Discussion – cable vendors comment on moving high freq bound to 700MHz. Comment to be consistent with EMC & noise models upper limit of 600MHz.

Motion #6 - Friendly amendment to move to 600MHz as upper limit.
M: Todd Herman S: Stefan Buntz – both agree to change the upper limit range.
Technical 75%

MOTION: Passes

Motion #7– Friendly amendment to move to 700MHz.
M: Todd Herman S: Stefan Buntz – both disagree to change the IL to change the upper limit to 600MHz
Technical 75%

MOTION: Fails

Discussion – leave the limit at 600MHz but when the PHY's are tested & encoding scheme is determined then testing should occur > 600MHz.

Amended Motion #2 - Move that The IEEE P802.3bp Task Force affirms the proposed Baseline IL Channel Performance for link segment insertion to establish the absolute value across the frequency range through 600MHz. (herman_3bp_01_0913.pdf)

Technical 75%

Vote
Y: 25 N: 0 A: 4
MOTION: Passes

Revisited Geneva presentation - Return Loss limit proposal and supporting model

Discussion around the limit proposal and the data collected so far.

Presentation #12 – Thomas Muller: MDI connector performance

Measured results over 20cm cable + MDI connectors.

No consensus on return loss – to be discussed going forward in Ad Hocs.

Revisited Geneva presentation - RTPGE Prototype Channel & Alien test results

Motion #8 - Move that The IEEE P802.3bp Task Force affirms the proposed Baseline PSANEXT (in slide 11 in herman_3bp_01_0913.pdf) and PSAACRF (in slide 13 in herman_3bp_01_0913.pdf) for link segment specification over frequency range 1MHz - 600MHz. (alien crosstalk configuration in http://www.ieee802.org/3/bp/public/jul13/moffitt_3bp_01_0713.pdf)

M: Todd Herman S: Xiaofeng Wang
Technical 75%

Vote
Y: 18 N: 1 A: 10
MOTION: Passes

Discussion around 40m link segment IL and possible requirement for screened / shielded cable

Straw Poll #1 – Support optional link segment consisting of shielded/screened components

Y: 18 N: 2

Motion #9 – Move that the IEEE P802.3bp Task Force affirms the proposed Baseline Mode Conversion limit in (slide 13 tazebay_3bp_01a_0913.pdf) 10MHz-600MHz.

M: Mehmet Tazebay S: Stefan Buntz
Technical 75%

Vote

Y: 13 N: 6 A: 7
MOTION: Fails

Presentation #13 – George Zimmerman: PCS options for the RPTGE PHY

Recommendation to tentatively pick 64/65B coding for PHY design

Motion #10 – Move that PHY proposals focus on 64B/65B PCS encoding of data and control characters

M: George Zimmerman S: Mehmet Tazebay
Technical 75%

Vote
Y: 21 N: 0 A: 5
MOTION: Passes

Agenda items completed and meeting ended at 16.32

P802.3bp Task Force Sign-In Sheet - September 2013

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