

Minutes IEEE P802.3cy Greater than 10 Gb/s Electrical Automotive Ethernet PHY TF AdHoc meeting March 23, 2021

Prepared by Natalie Wienckowski

Proposed Agenda:

| Title | Presenters(s) | Affiliation(s) |
|---|------------------------------------|--|
| Agenda | Natalie Wienckowski (ad hoc Chair) | General Motors |
| TF Chair's Comments | Steve Carlson | High Speed Design, Robert Bosch GmbH, Ethernovia |
| LINK SEGMENT ALIEN CROSSTALK MEASUREMENT RESULTS | Harsh Patel | Molex |
| A Limit for Cumulative Power of Micro-Reflections | Hossein Sedarat | Ethernovia |
| Metrics for Micro-Reflection Limit | Ragnar Jonsson | Marvell |
| P802.3cy To-do list | Natalie Wienckowski | General Motors |
| Closing Remarks | Steve Carlson | High Speed Design, Robert Bosch GmbH, Ethernovia |

See [adhoc webpage](#) for agenda deck and presentations

Agenda/Admin Natalie Wienckowski as ad hoc chair:

Meeting began at 10:05 am ET.

Introductions & Affiliations.

Presented file: [cy Task Force adhoc agenda a 03 23 21.pdf](#)

1. Reviewed the Attendance information related to the ad hoc.
2. Displayed patent slide deck and asked if any participant had not read the IEEE-SA Patent Slides slide set, none responded.
Call for Patents was made at 10:10 am Eastern Time, none responded

3. Displayed the IEEE-SA Copyright policy slide and asked if any participant had not read the IEEE copyright slide set, none responded.
4. Displayed the IEEE-SA Participation slide and reviewed it.
5. Reminded participants to indicate full names and employer/affiliation for the meeting minutes.

Instructions for subscribing to the reflector may be found at <http://www.ieee802.org/3/cy/reflector.html>. If you cannot subscribe to the reflector for some reason, and need additional assistance please contact the Task Force chair.

Chair's comments: None at this time.

Presentations/Discussion:

Presentation: [LINK SEGMENT ALIEN CROSSTALK MEASUREMENT RESULTS \(Harsh Patel, Molex\)](#)

Harsh presented information on link segment alien crosstalk between pairs of 6m and 9m, each with 2 in-lines. He shared the test setup used. Based on the measured data, Harsh suggested the ANEXT and AACRF limits from ch could be extended in frequency.

He will repeat the test with 11m in the future. This may slightly increase the noise level.

It may be better to have a FEXT limit instead of an AACRF limit as the AACRF is impacted by the IL. This is an issue when the cable has a "suck out". Alternatively, the IL could be extrapolated to be consistent through the suck out and then used to calculate the AACRF.

There was a question if the AACRF could be improved to enable the maximum value at 10GHz to be similar to that of 4GHz for ch. More data is needed to determine this.

Presentation: [A Limit for Cumulative Power of Micro-Reflections \(Hossein Sedarat, Ethernovia\)](#)

Hossein presented his proposal for a limit on cumulative power for micro-reflections. He provided some background on previous micro-reflection presentations and assumptions. He showed different possible cable profiles that have the same "total power" but different distributions which would require different cancelation techniques.

Hossein proposed a method to calculate a Cumulative Power Limit and explained why he thinks this is useful. He proposed a possible limit line for cumulative power of the micro-reflections.

There was a question about the potential issue shown on slide 6 for the "pathological" case. This has not been seen in actual cable measurements to date. This could potentially be a kink in the cable that is not due to a connector. This would be a large reflection that was not cancelled in the set of large reflections cancelled.

There is no specific significance to the corner at 10ns on slide 11. This is just showing an example curve. The specific details would need to be determined based on cable data.

Service ability and damage over time needs to be considered. This type of limit may impact what cables can be used in service.

Presentation: [Metrics for Micro-Reflection Limit](#) (Ragnar Jonsson, Marvell)

Ragnar presented an updated proposal for micro-reflection limit text which he plans to request a motion on during the March 30th Interim meeting. He discussed the changes made and some background on the reason for the changes.

He proposed including two limits: Limit on Residual Echo Metric (REM) and Limit on Echo Tail Metric (ETM).

He is not proposing specific values, instead he proposed metrics to use and how to calculate them.

He showed examples of cables that may pass or fail depending upon the limit that is used.

There was a question as to why we are discussing a time domain limit, e.g. micro-reflection limits. The reason for this is that at higher data rates, sampling rates have to increase. Doubling the sample rate increases the echo canceller complexity by 4x. From ch to cy, the echo canceller cancellation increases by a factor of 2.5^2 .

What is the impact on the receiver if the echo is not completely cancelled? This is a trade off that is being proposed to be resolved by the micro-reflection limit. Please see the calculator for additional information.

May need to ensure enough “segments” are cancelled in case the in-line straddles the predetermined time since the samples are at predefined points in time. This may require 1.2 to 1.5 times the number of segments cancelled compared to the number of connections.

Presentation: [P802.3cy To-do list usage](#) (Natalie Wienckowski, General Motors)

The to-do list was reviewed and updated. Participants are urged to review the list for topics they can support and for missing topics. Please send a message to the reflector with requested changes to the list.

The current list can be found on this page: [To Do spreadsheets](#)

Closing Discussion

The March 30th Interim meeting is a Zoom meeting and is available on the 802.3 Calendar page.

Some people are having issues with accessing “more details” on the 802.3 calendar. Steve will update the P802.3cy calendar notices to make sure the link is available as plain text for those whose employers block the Google calendar.

Meeting adjourned at 11:51 AM ET.

Attendees (snapshot of participants in meeting, email)

| First | Last | Affiliation |
|-----------|------------------|--|
| | | |
| Brett | McClellan | Marvell |
| Chris | DiMinico | MC Communications, PHY-SI, SenTekse / Panduit |
| Christian | Neulinger | MD Elektronik |
| Clark | Carty | Cisco |
| Cliff | Fung | Marvell |
| Emilio | Cuesta | TE Connectivity |
| Eric | DiBiaso | TE Connectivity |
| George | Zimmerman | CME Consulting / ADI, APL Group, Cisco Systems, CommScope, Marvell, SenTekSe |
| German | Feyh | Broadcom |
| Harsh | Patel | Molex |
| Haysam | Kadry | Ford |
| Hossein | Sedarat | Ethernovia |
| Istvan | BakroNagy | EFFECT Photonics |
| Jim | Graba | Broadcom |
| Jonathan | Silvano de Sousa | GG - Austria |
| Kambiz | Vakilian | Broadcom |
| Louise | Yi | FIT |
| Makoto | Nariya | Sony |
| Manabu | Kagami | NITech (Nagoya Institute of Technology) |
| Mike | Tu | Broadcom |
| Natalie | Wienckowski | General Motors |
| Nobuyasu | Araki | Yazaki |
| Peter | Wu | Marvell |
| Ragnar | Jonsson | Marvell |
| Rich | Boyer | Aptiv |
| Roland | Preis | MD Elektronik |
| SJ | Yu | Foxconn Interconnect Technology |
| Stefan | Gianordoli | GG Group |
| Stephan | Hartmann | Siliconally GmbH |

| First | Last | Affiliation |
|--------------|-------------|--|
| Steve | Carlson | High Speed Design, Robert Bosch GmbH, Ethernovia |
| Steve | Swanson | Corning |
| Sujan | Pandey | Huawei |
| Taiji | Kondo | MegaChips |
| Terry | Little | Foxconn Interconnect Technology |
| Thomas | Müller | Rosenberger |
| Tom | Souvignier | Broadcom |
| Yusuke | Yano | NI Tech |
| | | |
| TOTAL | 37 | Attendees |