

Minutes IEEE P802.3cy Greater than 10 Gb/s Electrical Automotive Ethernet PHY TF AdHoc meeting August 31, 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 |
| On Using PAM4 Modulation | Ragnar Jonsson | Marvell |
| 802.3cy Test Fixture Considerations | Chris DiMinico Haysam Kadry | (MC Communications/PHY-SI LLC/ Panduit/SenTekse) Ford Motor Company |
| EMC REQUIREMENTS | Haysam Kadry | Ford Motor Company |
| 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 10:03 am ET.

Introductions & Affiliations.

Presented file: [cy Task Force adhoc agenda 08 31 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 10:07 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: We have a full agenda. Presenters and participants are asked to be concise. Please use the "raise hand" feature of Teams to enter the queue.

Presentations/Discussion:

Presentation: [On Using PAM4 Modulation](#) (Ragnar Jonsson, Marvell)

Ragnar presented data from calculations comparing different potential PAM modulations, including reach and SNR margin based on constant peak voltage. He also provided generalizations of impact of PAM on various PHY/link aspects. He also compared PAM4 to PAM5. This is not based on a specific implementation as one has not been provided for PAM5. It is dependent upon the number of bits to symbols, which could have overhead.

Based on a number of calculations and analyses Ragnar performed, PAM4 is the clear winner and should be selected for P802.3cy.

There was a question of how the DFE impacts the burst error length for PAM5. Ragnar will send a link to a presentation that explains this.

From Ragnar: In today's ad hoc I promised to send a link to some earlier analysis of DFE error propagation dependence on PAM modulation. Slides 4 and 5 of the following link talk about this:

https://www.ieee802.org/3/ch/public/jul18/farjarad_3ch_01d_0718.pdf

To get a better comparison between PAM4 and PAM5, a specific PAM5 proposal is needed. Future presentations on this would be welcome.

Presentation: [802.3cy Test Fixture Considerations](#) (Chris DiMinico, MC Communications/PHY-SI LLC/Panduit/SenTekse ; Haysam Kadry, Ford Motor Company)

Chris presented a proposal for a test fixture for P802.3cy based on the P802.3cy channel characteristics and the header and harness connectors in a mated state.

There was a question of whether the proposal for cy would be the same as ck. As it applies to cy, the proposal is for it to be the same.

For definition of the test points, see https://www.ieee802.org/3/cy/public/adhoc/zimmerman_3cy_090220.pdf.

Chris's and Haysam's reason for making the test fixture for the cable test assembly normative is that the error introduced by deembedding can be greater than that of the test fixture.

Presentation: [EMC REQUIREMENTS](#) (Haysam Kadry, Ford Motor Company)

Haysam presented information on potential higher frequency EMC requirements that are being investigated. Current requirements are up to 3 GHz. They are collecting information on performance at frequencies up to 6 GHz. There may be requirements added in the future, but what these may be are not known.

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.

Please send questions related to the following presentations from earlier meetings. If no questions are received the authors plan to create Motions for the September Interim based on the current content.

[802.3cy coupling- and screening attenuation](#)

[802.3cy Test Fixture Considerations](#)

Precoder as defined in ch (2 presentations on August 3rd)

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

Closing Discussion

Information for the upcoming 802.3 Interim was reviewed. This information is also available in the agenda.

Mr. Carlson reminded the members that we have one more ad hoc before the Interim to present content that you may want to do a motion on during the Interim. Thanks to all the participants for their hard work.

Meeting adjourned at 11:29 AM ET.

Attendees (download participant list, email)

| First | Last | Affiliation |
|-----------|------------------|--|
| | | |
| Ali | Javed | Molex |
| Brett | McClellan | Marvell |
| Chris | DiMinico | MC Communications, PHY-SI, SenTekse / Panduit |
| Chris | Goralka | Foxconn Interconnect Technology |
| Christian | Neulinger | MD Elektronik |
| Curtis | Donahue | Rohde & Schwarz) |
| Dan | Kennefick | Daikin America |
| Dave | Hess | Cord Data |
| Emilio | Cuesta | TE Connectivity |
| Eric | DiBiaso | TE Connectivity |
| Erwin | Köepfendorfer | Leoni Kabel GmbH |
| Fred | Dawson | Chemours |
| George | Zimmerman | CME Consulting / ADI, APL Group, Cisco Systems, CommScope, Marvell, SenTekSe |
| German | Feyh | Broadcom |
| Haysam | Kadry | Ford |
| Hossein | Sedarat | Ethernovia |
| Jae-yong | Chang | Keysight |
| Jim | Graba | Broadcom |
| Jonathan | Silvano de Sousa | GG - Austria |
| Junichi | Takeuchi | JAE |
| Kambiz | Vakilian | Broadcom |
| Keisuke | Kawahara | FURUKAWA ELECTRIC |
| Kirsten | Matheus | BMW |

| First | Last | Affiliation |
|--------------|-------------|--|
| Leon | Bruckman | Huawei |
| Louise | Yi | FIT |
| Manabu | Kagami | NI Tech (Nagoya Institute of Technology) |
| Martin | Glanzner | SEI ANTech Europe GmbH |
| Marty | Gubow | Keysight |
| Masato | Shiino | Furukawa |
| Matthew | Ronning | Sony |
| Michikazu | Aono | Yazaki |
| Mike | Tu | Broadcom |
| Natalie | Wienckowski | General Motors |
| Nobuyasu | Araki | Yazaki |
| Peter | Wu | Marvell |
| Ragnar | Jonsson | Marvell |
| Rich | Boyer | Aptiv |
| Qiwen | Zhong | Huawei |
| Sami | Akin | VW |
| Stefan | Andrä | SEI ANTech – Europe GmbH |
| Steve | Carlson | High Speed Design, Robert Bosch GmbH, Ethernovia |
| Sujan | Pandey | Huawei |
| Taiji | Kondo | MegaChips |
| Terry | Little | Foxconn Interconnect Technology |
| Thomas | Müller | Rosenberger |
| Tom | Souvignier | Broadcom |
| Toshihiro | Ichimaru | Sumitomo |
| Yoshihiro | Niihara | Fujikura Ltd. |
| Yusuke | Yano | NI Tech |
| | | |
| TOTAL | 49 | Attendees |