

Minutes IEEE P802.3cy Greater than 10 Gb/s Electrical Automotive Ethernet PHY TF AdHoc meeting December 15, 2020

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
Symmetrical 2-pair and Asymmetrical 1-pair TDD operation SNR Margin with updated parameters	Kamal Dalmia	Aviva Links
Link segment insertion loss measurements	Christian Neulinger	MD Elektronik
Automotive link segment measurement results	Thomas Müller	Rosenberger
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 10:02 am ET.

Introductions & Affiliations.

Presented file: [cy Task Force adhoc agenda 12 15 20.pdf](#)

1. Reviewed the Attendance information related to the ad hoc.
2. Displayed the Participation slide and reviewed it.
3. Displayed patent slide deck, and reviewed it.
Call for Patents was made at 10:06 am Eastern Time, none responded
4. 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: Symmetrical 2-pair and Asymmetrical 1-pair TDD operation SNR Margin with updated parameters (Kamal Dalmia, Aviva Links)

Kamal shared the assumptions he used to do his calculations. He used the Calculator provided by Ragnar and evaluated 25 Gb/s operation over 1-pair with echo cancellation and 2-pair without echo cancellation, with both PAM4 and PAM5. He then evaluated 25 Gb/s operation over 1-pair using TDD with and without echo cancellation, e.g. 25Gb/s in each direction (symmetric) or 24.75 Gb/s in one direction and 0.25 Gb/s in the other direction (asymmetric), with both PAM4 and PAM5.

A participant remarked on the fact that Kamal use PSD_brick for the PSD-mask. He stated that when zero-order-hold is used for the PSD mask, PAM4 is better than PAM5. This is also more realistic as was discussed last week. Kamal agrees that zero-order-hold is more realistic, but he had created the presentation last week prior to that discussion and did not update the presentation.

80C was used instead of 70C to account for ageing on the cable. It is agreed that not all of the cable is at a high temperature at the same time.

There was a question as to whether Kamal had considered FDD. He stated that FDD can lead to higher EMC issues and he believes TDD is better. It also allows changing which direction sends the bulk of the data on the fly.

PAM5 may have some advantages not shown here, like the fact that it has a lower Nyquist frequency.

There was some discussion on how to use this model to compare to the ch margin.

Kamal feels the trade-off for extra copper in 2-pairs is worth the reduction in silicon and power in the PHY.

For TDD there is some overhead for the "switchover" from one direction to the other. Kamal expects this to be between 50 and 100 ns.

George wants everyone to remember that the initial assumptions and the sensitivity of the parameters can have a large impact on the final result.

Keep in mind that the Calculator Ragnar provided is a compass, not a GPS. This is not enough for the final design. This helps to find a direction to go, but can not be used for the final solution.

Presentation: [Link segment insertion loss measurements](#) (Christian Neulinger, MD Elektronik)

Christian presented IL data on 7m and 11 m link segments with in-line connectors. All data was taken at room temperature. He feels that the straw-man limit suggested does not allow room for ageing and temperature.

Additional testing will be done on these and other cable assemblies to be shared at a future date.

Presentation: [Automotive link segment measurement results](#) (Thomas Müller, Rosenberger)

Thomas presented data on a 7m STP link segment including in-line connectors. The purpose is to show RL and the impact of the in-line connectors on IL. He showed RL at -40C, 20C, and 105C. This shows that temperature has a minor effect on RL which may be due to the change in IL with temperature. He compared the microreflections to the new proposal from Ragnar and showed that it is reasonable for this cable.

Kamal requested that Thomas provide the propagation delay on the STP and SDP cable for both 7m and 11m. He wants to know if the SDP delay is less than STP due to the shorter cable length with fewer twists. The delay can be seen from the echo response plots.

This is the same STP cable whose data was shared on Dec. 1st.

There was a question on RL at higher frequencies and whether it could be expected to go up or stay level at higher frequencies. Most of the RL is due to impedance differences which have the most impact at lower frequencies.

What should be used as the worst case cable for RL? What is the shortest first segment we could see? Based on OEM feedback it is 0.25 m followed by a segment that is at least 1m in length, with the third segment at least 1 m as well.

There is a potential to have a 90 degree in-line connector to fit the available space.

Thomas indicated that the 802.3ch RL limit is reasonable to use for P802.3cy with the frequency extended.

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

The To-Do list was 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

Thanks for the quality presentations once again. Please use the reflector to continue these discussions.

The December 29th meeting has been cancelled as there are not many participants expected.

Results of participation poll from 12/8/20:

		Dec 22 TUE	Dec 29 TUE	Jan 5 TUE	Jan 12 TUE
		10:00 AM 12:00 PM	10:00 AM 12:00 PM	10:00 AM 12:00 PM	10:00 AM 12:00 PM
44 participants	+	✓29	✓15	✓35	✓42

Meeting adjourned at 11:59 AM ET.

Attendees (snapshot of participants in meeting, email)

First	Last	Affiliation
Bo	Zhang	Inphi
Bob	Grow	RMG Consulting
Brett	McClellan	Marvell
Chris	DiMinico	MC Communications, PHY-SI, SenTekse / Panduit
Christian	Neulinger	MD Elektronik
Clark	Carty	Cisco
Cliff	Fung	Marvell
Dan	Kennefick	Daikin America
Daniel	Koppermüller	MD Elektronik
Dave	Hess	Cord Data
Doug	Oliver	Ford
Emilio	Cuesta	TE Connectivity
Eric	DiBiaso	TE Connectivity
Erwin	Koependoerfer	Leoni Kabel GmbH
George	Zimmerman	CME Consulting / ADI, Cisco, CommScope, Marvell, SenTekSe
Harsh	Patel	Molex

First	Last	Affiliation
Haysam	Kadry	Ford
Hideki	Goto	Toyota
Hossein	Sedarat	Ethernovia
Istvan	BakroNagy	EFFECT Photonics
Jonathan	Silvano de Sousa	GG - Austria
Kamal	Dalmia	Aviva Links
Kambiz	Vakilian	Broadcom
Kirsten	Matheus	BMW
Larry	McMillan	Western Digital
Leon	Bruckman	Huawei
Louise	Yi	FIT
Luisma	Torres	KDPOF
Makoto	Nariya	Sony
Manabu	Kagami	NITech (Nagoya Institute of Technology)
Martin	Glanzner	SEI ANTech
Marty	Gubow	Keysight
Mike	Tu	Broadcom
Natalie	Wienckowski	General Motors
Nobuyasu	Araki	Yazaki
Patrick	Casher	FIT - Foxconn
Peter	Wu	Marvell
Ragnar	Jonsson	Marvell
Rich	Boyer	Aptiv
Roland	Preis	MD Elektronik
Shaowu	Huang	Marvell
Stefan	Gianordoli	GG Group
Steve	Carlson	HSD, Bosch, Ethernovia
Sujan	Pandey	Huawei
Taiji	Kondo	MegaChips
Terry	Little	Foxconn Interconnect Technology
Thomas	Müller	Rosenberger
Tom	Souvignier	Broadcom
Yoshihiro	Niihara	Fujikura Ltd.
TOTAL	49	Attendees

Presenters (45)

- 👤 Bob Grow - RMG Consulting Guest
- 🔴 Boyer, Rich - External Network
- 👤 Brett McClellan (Marvell) Guest
- 👤 chris diminico Guest
- 👤 Christian Neulinger - MD Elektronik Guest
- 👤 Clark Carty (Cisco) Guest
- 👤 Cliff Fung (Marvell) Guest
- 👤 Dan Kennefick Guest
- 👤 Daniel Koppermüller - MD Elektronik Guest
- 👤 Dave Hess, Cord Data Guest
- 👤 Doug Oliver [Ford] Guest
- 👤 Emilio Cuesta (TE Connectivity) Guest
- 👤 Eric DiBiaso - TE Guest
- 👤 Erwin Koeppendoerfer; Leoni Kabel GmbH
- 👤 George Zimmerman (CME Consulting/ADI,)
- 👤 Haysam Kadry (Ford) Guest
- 👤 Hideki Goto (Toyota) Guest
- 👤 Hossein Sedarat (Ethernovia) Guest
- 👤 Jonathan Silvano de Sousa (GG - AUSTRIA)
- 👤 Kamal Dalmia - Aviva Guest
- 👤 Kambiz Vakilian(Broadcom) Guest
- 👤 Kirsten Matheus (BMW) Guest
- 👤 Larry McMillan (Western Digital) Guest
- 👤 Leon Bruckman (Huawei) Guest
- 👤 Luisma Torres (KDPOF) Guest
- 👤 Makoto Nariya (Sony) Guest
- 👤 Manabu Kagami - NITech Guest
- 👤 Martin Glanzner, SEI ANTECH Guest
- 👤 Marty Gubow - Keysight Guest
- 👤 Mike Tu (Broadcom) Guest
- 👤 Müller, Thomas Guest
- 🔴 Natalie A. Wienckowski
- 👤 Nobuyasu Araki YAZAKI Guest
- 👤 Patel, Harsh Guest
- 👤 Peter Wu, Marvell Guest
- 👤 Ragnar Jonsson (Marvell) Guest
- 👤 Roland Preis - MD-Elektronik GmbH Guest
- 👤 Shaowu Huang (Marvell) Guest
- 👤 Steve Carlson (HSD, Bosch, Ethernovia) Guest
- 👤 Sujan Pandey (Huawei) Guest
- 👤 Taiji Kondo, MegaChips Guest
- 👤 Terry Little (Foxconn Interconnect Technology)
- 👤 Thomas Müller [Rosenberger, Rosenberger] Guest
- 👤 Tom Souvignier (Broadcom) Guest
- 👤 Yoshihiro Niihara - Fujikura Ltd.
- Patrick Casher (FIT-Foxconn)
- Louise Yi (FIT)
- Stefan Gianordoli, GG Group

bo zhang

Sorry I was not able to rename, bo zhang,
Inphi

Istvan BakroNagy (EFFECT Photonics)