

Minutes IEEE P802.3cy Greater than 10 Gb/s Electrical Automotive Ethernet PHY TF AdHoc meeting September 30, 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
Link Segment IL Measurement	Harsh Patel	Molex
MDI Connector IL	Thomas Müller Michael Angerbauer	Rosenberger
Time Domain Limits for RL	Hossein Sedarat	Ethernovia
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 10:07 am ET.

Introductions & Affiliations.

Presented file: [cy Task Force adhoc agenda 200930.pdf](#)

Reviewed the Attendance information related to the ad hoc.

1. Displayed the Participation slide and reviewed it.
2. Displayed patent slide deck, and reviewed it.
Call for Patents was made at 10:12am Eastern Time, none responded

3. Links to the copyright policy and participation policy were provided in the meeting reminder and no participant indicated they had not reviewed these.
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: Thanks to everyone who has submitted a contribution, especially those who have provided lab data in these challenging times. Today is the anniversary of the first multi vendor Ethernet specification. The November plenary will have an opening, middle, and ending meeting. This is because the meeting has been shifted for those who want to be able to attend OIF. P802.3cy will have at least 1 meeting during this time. You will need to attend 6 of the 8 meeting days to receive attendance credit.

Presentations/Discussion:

Presentation: [Link Segment IL Measurement](#) (Harsh Patel, Molex)

The presenter showed data on an 11 m cable at room temperature. The presented indicated that the suck out can be "removed" with a different cable construction, e.g. potentially going to a larger gauge size. The data provided is for 26 gauge.

Participants requested that s parameter files be provided to allow for the start of simulations on potential PHY designs.

There are tradeoffs between the gauge of wire, heavier, larger, which may be used for all lengths or only longer lengths. These compare to the complexity of the PHY.

It may actually be harder to remove suck-outs with larger gauge wires.

Since the components seem to be close to the limit, it is important that we don't just scale from ch as the cable scales, but the connector doesn't and has a smaller impact at higher frequencies.

Should we revisit SPP instead of STP to see the performance (both are shielded balanced pairs).

Question to the PHY vendors as to whether 7G is a good frequency to look at before new cables are developed for that frequency or for a different frequency.

Presentation: [MDI Connector IL](#) (Thomas Müller, Michael Angerbauer, Rosenberger)

The presenter presented data on connectors for high speed applications for both coax and shielded balanced pair cables. The presenter showed the measurement method and how they deembedded the connector performance from the measurement setup. The connector IL is small compared to the cable.

There is a request for RL measurements for the connector as this is generally where the connector has a larger impact.

Will the connection of the wires to the cables increase RL and/or IL?

May be able to share the s-parameters when tested as a complete cable assembly, but not as just a connector.

The IL will be slightly higher with temperature, maybe 20% higher, but difficulty as you can't leave the measurement fixture outside the chamber for a connector.

Adding test points around the connector can cause RL issues. As the connector IL is low, test points may not be needed.

Presentation: Time Domain Limits for RL (Hossein Sedarat, Ethernovia)

The presenter talked about the benefit of having time domain limits for RL. This is a different way of thinking about RL. The frequency based IL limit provides predictable pulse response for the cable. The RL limit line is an envelope and doesn't provide much information on the expected echo response or the construction of the cable. Proposes that the echo canceller may be able to be less complex with time domain RL limits. Propose defining a minimum IL per unit cable length. Designing the echo canceller to cover the major reflections may reduce the complexity by 10x.

Other PHY vendors see potential benefit with looking at the RL in the time domain.

Need to be careful with the slope for a average reflection power as this may penalize cables with lower insertion loss (see slide 14).

Need to have cable RL measurements before we go too deep into this topic.

The reflection on the board is grouped in with the reflection at the MDI connector.

Cable impedance has a nominal value +/- some value but they don't look at how many transitions between the max and min. This needs to be considered when looking at determining the micro reflections. May need a cable RL limit as the RL will be impacted by the cable's IL.

For more information on micro reflection look at the [presentation](#) from Ragnar Jonsson and Ramin Farjadrad from July 2020.

What is the impact of different impedance on cables on either side of an in-line?

Is it possible to limit the placement of the in-line connectors? This would not be possible when building vehicles as it would lead to "extra" cable that may have to be folded back in the harness that cause other issues.

There are cable groups that look at micro reflections which may be able to be brought into this group.

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

The To-Do list was updated offline based on presentations provided and those that are delayed. 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.

Closing Discussion

Any reminders, action items, etc.

Meeting adjourned at 12:14 PM ET.



















































Attendees (from emails)

First	Last	Affiliation
Ahmed	Gharba	Huawei
Brett	McClellan	Marvell
Chris	DiMinico	MC Communications, PHY-SI, SenTekse / Panduit
Chris	Mash	Ethernovia
Christian	Neulinger	MD Elektronik
Clark	Carty	Cisco
Dave	Hess	Cord Data
Emily	Choi	VSI
Eric	DiBiaso	TE Connectivity
Erwin	Koeppendoerfer	Leoni Kabel GmbH
Fred	Dawson	Chemours
George	Zimmerman	CME Consulting / ADI, Cisco, CommScope, Marvell, SenTekSe
German	Feyh	Broadcom
Harsh	Patel	Molex
Haysam	Kadry	Ford
Hideki	Goto	Toyota
Hossein	Sedarat	Ethernovia
Jan	De Geest	Amphenol
Kazuya	Takayama	Nitto Denko Corp.
Kirsten	Matheus	BMW
Larry	McMillan	Western Digital
Luisma	Torres	KDPOF
Makoto	Nariya	Sony
Manabu	Kagami	NITech (Nagoya Institute of Technology)
Marty	Gubow	Keysight
Masato	Shiino	Furukawa
Massad	Eyal	Valens
Michael	Reinhard	SEI ANTech
Michikazu	Aono	Yazaki

First	Last	Affiliation
Mike	Tu	Broadcom
Natalie	Wienckowski	General Motors
Nobuyasu	Araki	Yazaki
Peter	Wu	Marvell
Ragnar	Jonsson	Marvell
Rich	Boyer	Aptiv
Roland	Preis	MD Elektronik
Stephan	Hartmann	Siliconally GmbH
Steve	Carlson	High Speed Design, Robert Bosch GmbH, Ethernovia
Steve	Sedio	TDK
Sujan	Pandey	Huawei
Taiji	Kondo	MegaChips
Takashi	Fukuoka	Sumitomo Electric
Takeo	Masuda	OITDA/PETRA
Terry	Little	Foxconn Interconnect Technology
Thomas	Mueller	Rosenberger
Tom	Souvignier	Broadcom
Toshihiro	Ichimaru	Sumitomo
Tzahi	Madgar	Valens
Yasuhiro	Hyakutake	Adamant Namiki Precision Jewel
Yoshihiro	Niihara	Fujikura Ltd.
TOTAL	XX	Attendees
50		

Presenters (45)

📍 4915165224452 (West) ⓘ	💬	🔊	🔇	🖥️
🔴 Boyer, Rich - External Network	💬	🔇	⏸️	🖥️
👤 Brett McClellan (Marvell) Guest	💬	🔇	⏸️	🖥️
👤 Christian Neulinger - MD Elektronik Guest	💬	🔇	⏸️	🖥️
👤 Clark Carty (Cisco) Guest	💬	🔇	⏸️	🖥️
👤 Dave Hess, Cord Data Guest	💬	🔇	⏸️	🖥️
👤 Emily Choi, VSI Guest	💬	🔇	⏸️	🖥️
👤 Eric DiBiaso - TE Guest	💬	🔇	⏸️	🖥️
👤 Erwin Koeppendoerfer; LEONI Kabel GmbH Guest	💬	🔇	⏸️	🖥️
👤 Ford, Haysam Kadry Guest	💬	🔇	⏸️	🖥️
👤 Fred Dawson Chemours Guest	💬	🔇	⏸️	🖥️
👤 George Zimmerman Guest	💬	🔇	⏸️	🖥️
👤 German Feyh (Broadcom) Guest	💬	🔇	⏸️	🖥️
👤 Hideki Goto (Toyota) Guest	💬	🔇	⏸️	🖥️
👤 Hossein Sedarat (Ethernovia) Guest	💬	🔇	⏸️	🖥️
👤 Jan De Geest (Amphenol) Guest	💬	🔇	⏸️	🖥️
👤 Kazuya Takayama (Nitto Denko Corp.) Guest	💬	🔇	⏸️	🖥️
👤 Kirsten Matheus (BMW) Guest	💬	🔇	⏸️	🖥️
👤 Luisma Torres (KDPOF) Guest	💬	🔇	⏸️	🖥️
👤 Makoto Nariya (Sony) Guest	💬	🔇	⏸️	🖥️
👤 Manabu Kagami - NITech Guest	💬	🔇	⏸️	🖥️
👤 Masato Shiino, FURUKAWA Guest	💬	🔇	⏸️	🖥️
👤 Massad Eyal - Valens Guest	💬	🔇	⏸️	🖥️
👤 Michael Reinhard - SEI ANTech Guest	💬	🔇	⏸️	🖥️
👤 Michikazu Aono - Yazaki Guest	💬	🔇	⏸️	🖥️
👤 Mike Tu (Broadcom) Guest	💬	🔊	🔇	🖥️
👤 Molex, Harsh Patel Guest	💬	🔊	⏸️	🖥️
🔴 Natalie A. Wienckowski	💬	🔊	⏸️	🖥️
👤 Nobuyasu Araki, Yazaki Guest	💬	🔇	⏸️	🖥️
👤 Peter Wu, Marvell Guest	💬	🔇	⏸️	🖥️
👤 Ragnar Jonsson (Marvell) Guest	💬	🔇	⏸️	🖥️
👤 Roland Preis - MD-Elektronik GmbH Guest	💬	🔇	⏸️	🖥️
👤 Stephan Hartmann - Siliconally GmbH Guest	💬	🔇	⏸️	🖥️
👤 Steve Carlson (HSD, Bosch, Ethernovia) Guest	💬	🔇	⏸️	🖥️
👤 Steve Sedio (TDK) Guest	💬	🔊	🔇	🖥️

 Sujan Pandey (Huawei) Guest				
 Taiji Kondo, MegaChips Guest				
 Takashi Fukuoka -Sumitomo Electric Guest				
 Takeo Masuda [OITDA/PETRA] Guest				
 Terry Little (Foxconn Interconnect Technology) Guest				
 Thomas Müller [Rosenberger, Rosenberger] Guest				
 Toshihiro Ichimaru(Sumitomo) Guest				
 Tzahi Madgar Guest				
 Yasuhiro Hyakutake, Adamant Namiki Precision Jewel Guest				
 Yoshihiro Niihara - Fujikura,Fujikura Guest				

George Zimmerman

George Zimmerman - CME COnsulting/ADI, Cisco, Commscope, Marvell, SenTekSe

“chris” is Chris DiMinico

PARTICIPANTS



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Marty Gubow - Keysight Guest				
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