Minutes IEEE P802.3cy Greater than 10 Gb/s Electrical Automotive Ethernet PHY TF AdHoc meeting March 1, 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 and inter-pair skew measurement results	Thomas Müller	Rosenberger
P802.3cy OAM Proposal	Natalie Wienckowski	General Motors
MDI Parameters	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 10:04 am ET.

Introductions & Affiliations.

Presented file: cy_Task_Force_adhoc_agenda_a_03_15_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 and inter-pair skew measurement results (Thomas Müller, Rosenberger)

Thomas presented information on link segment alien crosstalk and skew between pairs. This presentation only covers individual shielded pairs in a bundle, not pairs under a single shield. Measured crosstalk at MDI, both near and far. This was to determine if the cable or the connector are the main source of crosstalk. The crosstalk is in the noise floor.

Measurements were done on 4, 10m cables bundled together. The cables tested were 4GHz STP as that was what was available. The near end cross talk is compliant with the ch limit extended to 10 GHz. The far end measurement is out of spec of an extended ch limit. This is due to the high IL. Even with a higher frequency cable, there are some issues with the distance from the noise floor to the level of crosstalk.

The difference in delay between two different pairs in an 8m cable was measured. Only the worst case delay between any two out of the four pairs was shown.

Thomas will do an update in the future when he has higher frequency cable available.

May want to consider changing the PSD to roll off at a higher frequency as there is little signal at higher frequencies at the far end of the cable, almost in the noise floor.

The board traces were included in the measurement and they're all on the same layer, separated by vias. The traces are in the middle of the board with the top and bottom layers grounded.

If multiple pairs are in a single shield, this may change the connector and PCB design which may increase the crosstalk between pairs.

There was a question on the delay between pairs with different cables and different cable transmission speeds. Thomas said he may do more work to try to answer this. The manufacturing tolerance in the length may have the most impact on the delay.

May want to look at what the crosstalk is with a "real" PCB without vias between signals on the PCB.

What impact might servicing the cables/systems have with crosstalk on the cable?

The delay shown is about 50 to 60 mm. This is typical of differences in cable lengths for 10m cables.

Presentation: P802.3cy OAM Proposal (Natalie Wienckowski, General Motors)

Natalie presented information on the OAM used with other BASE-T1 PHYs. Some questions to consider were raised that should be considered as part of the laning discussions.

Straw Polls:

Do we want to include an OAM? (Y-N-A) 23 – 0 – 3

Do we want to include the parameters defined in 802.3ch? (Y-N-A) 19 – 0 – 11

George's presentation didn't take into account where the OAM would go. This is typically part of the PCS. We may need some primitives defined between the PCS and PMA. We may need to remove some features to add new ones needed for the division of the PHY and/or due to additional pairs.

Is the OAM needed for ASIL status? Do OEM's use this for determining ASIL classification? Need to be answered in the future.

There will eventually be a Motion on this, but more information on the PHY design is needed before this can be finalized.

Presentation: MDI Parameters (Haysam Kadry, Ford Motor Company)

Haysam presented a proposal for Test Points (TPs) for a 802.3cy MDI. He proposed an IL limit for the MDI between these TPs.

He raised the question as to whether PoDL should be included in the MDI and whether this is feasible with the expected power consumption of these devices.

Do we need to specify specific test fixture performance for this Clause? Some current 802.3 high speed clauses include these including 92 and P802.3ck (162A?).

The MDI IL is expected to be a recommendation, not a "shall". This is what has been done in other Clauses. The plot was calculated using 5 to 10 nF.

It is assumed CMC is not needed due to the shielded cable. ESD protection devices are ignored as their capacitance is very low

TP1 is at the output of the mated connector without the cable.

Probably want to consider a higher "min" frequency than 1 MHz for these links.

The TPs are local to the Clauses. These can be defined specific to P802.3cy.

Are there other MDI parameters that need to be defined? RL, cross talk, common mode noise, etc.? Differential to Common Mode conversion between TP0 and TP1? Specific PCB high speed routing requirements are defined by each OAM and is generally not something that is included in an 802.3 spec.

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

There was not time to review the to-do list. 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 16th Plenary meeting is a Zoom meeting and is available on the 802.3 Calendar page.

The ad hoc meetings between the March and July Plenaries are available on the 802.3 Calendar page.

Meeting adjourned at 12:04 PM ET.

Attendees (snapshot of participants in meeting, email)

First	Last	Affiliation
Bert	Bergner	TE Connectivity
Bob	Grow	RMG Consulting
Brett	McClellan	Marvell
Carlos	Pardo	KDPOF
Chris	Mash	Ethernovia
Christian	Neulinger	MD Elektronik
Clark	Carty	Cisco
Cliff	Fung	Marvell
Dan	Kennefick	Daikin America
Dave	Hess	Cord Data
Eric	DiBiaso	TE Connectivity
Erwin	Köeppendörfer	Leoni Kabel GmbH
George	Zimmerman	CME Consulting / ADI, APL Group, Cisco Systems, CommScope, Marvell, SenTekSe

First	Last	Affiliation
Harald	Müller	Endress + Hauser
German	Feyh	Broadcom
Haysam	Kadry	Ford
Hideki	Nakagawa	AGC
Hossein	Sedarat	Ethernovia
Istvan	BakroNagy	EFFECT Photonics
Jamila	Borda	BMW
Jan	De Geest	Amphenol
Jim	Graba	Broadcom
Joe	Aronson	TI
Jonathan	Silvano de Sousa	GG - Austria
Kathryn	Dube	UNH-IOL
Kambiz	Vakilian	Broadcom
Louise	Yi	FIT
Luisma	Torres	KDPOF
Makoto	Nariya	Sony
Manabu	Kagami	NITech (Nagoya Institute of Technology)
Marty	Gubow	Keysight
Masato	Shiino	Furukawa
Michael	Reinhard	SEI ANTech
Michikazu	Aono	Yazaki
Mike	Tu	Broadcom
Natalie	Wienckowski	General Motors
Nobuyasu	Araki	Yazaki
Osamu	Yamada	Yazaki
Peter	Wu	Marvell
Ragnar	Jonsson	Marvell
Rich	Boyer	Aptiv
Roland	Preis	MD Elektronik
Shaowu	Huang	Marvell
Stefan	Gianordoli	GG Group
Steve	Carlson	High Speed Design, Robert Bosch GmbH, Ethernovia
Sujan	Pandey	Huawei
Tadashi	Takahashi	Nitto Denko Corporation
Taiji	Kondo	MegaChips
Terry	Little	Foxconn Interconnect Technology
Thomas	Müller	Rosenberger
Tzahi	Madgar	Valens
Yasuhiro	Hyakutake	Adamant Namiki Precision Jewel

First	Last	Affiliation
Yoshihiro	Niihara	Fujikura Ltd.
Yuji	Watanabe	AGC
TOTAL	**54**	**Attendees**