

Unconfirmed Meeting Minutes: IEEE P802.3ch Multi-Gigabit Automotive Ethernet PHY
Task Force
May 24-25, 2018
Pittsburgh, PA USA

Prepared by Jon Lewis

IEEE P802.3ch Multi-Gigabit Automotive Ethernet PHY Task Force meeting convened at 9:00 AM, Thursday, May 24, 2018 by Steve Carlson, Task Force Chair.

Attendance is listed in Appendix A

Administrative Matters

Mr. Carlson called for introductions and affiliations.

Mr. Carlson displayed the agenda in [agenda_3ch_01_0518.pdf](#).

- Mr. Carlson noted that there should be no recording or photography.
- Mr. Carlson asked if anyone was attending from the press including those who would run a public blog on this meeting. None responded.

The WG Chair reviewed the goals for the meeting, big ticket items, access to the reflector and website, and ground rules for the meeting.

Attendance, Mr. Carlson advised the group of the IEEE meeting attendance tool and procedures, including both the attendance book and the web attendance tracking tool.

The WG Chair reviewed the IEEE structure for standards development and the bylaws by which the Task Force is governed.

IEEE Patent Policy, at **9:15 AM**, Mr. Carlson showed the patent slides and proceeded to read aloud slides 1 and 2. Mr. Carlson made the call for potentially essential patents at **9:17 AM**, and none responded. Mr. Carlson then read aloud slides 3 and 4.

Mr. Carlson showed slide 16 entitled "Participation in IEEE 802 Meetings" and proceeded to read the slide aloud. Mr. Carlson asked if there was any discussion on the slide, none responded.

The Chair reviewed the IEEE 802.3 Standards process and where the Task Force was in the process and the process by which we will develop the standard.

The Chair noted that no liaisons were received.

The Chair then showed the locations of the approved project documents for the Task Force and reviewed the objectives for the Task Force.

Mr. Carlson reviewed slide 27-28 on presentation issues and noted that generally the group was following these guidelines.

Motion #1: Move to approve the agenda as shown in [agenda 3ch 01 0518.pdf](#)
M: Natalie Wienckowski **S:** Thomas Müller

Approved by voice without opposition (Procedural > 50%)

Motion #2: Move to approve the minutes of the March 2018 IEEE P802.3ch Multi-Gigabit Automotive Ethernet PHY Task Force Meeting.

M: George Zimmerman **S:** Phil Brownlee

Approved by voice without opposition (Procedural > 50%)

PRESENTATIONS:

Mr. Carlson then moved to the presentations for the meeting.

Title: Ad-Hoc Report ([zimmerman 3ch 01 0518.pdf](#))

Presenter: George Zimmerman, Commscope, Aquantia, CME Consulting, Cisco, ADI, BMW, APL Group

Wednesday, 7-9AM Pacific Time

– Ad hoc possibilities: 5/30, 6/13, 6/27

The next Ad hoc meeting will be announced via the reflector.

Title: Editors Report ([wienckowski 3ch 01 0518.pdf](#))

Presenter: Natalie Wienckowski, General Motors

The Chief Editor noted that we would review this document throughout the meeting after presentations on specific topics for discussion.

Title: 802.3ch channel insertion loss AWG26 and AWG24

([mueller 3ch 01 0518.pdf](#))

Presenter: Thomas Müller, Rosenberger

Title: 802.3ch channel performance at different temperatures

([ohni 3ch 01a 0518.pdf](#))

Presenter: Josef Ohni, MD Elektronik

The meeting broke for short break at 10:25 AM.

The meeting resumed at 10:45 AM.

After a brief administrative matter the Chair resumed presentation on link segment.

Title: Cable comparison (vernichel_3ch_01_0518.pdf)

Presenter: Ricky Vernickel, LEONI Kabel GmbH

Title: High Speed Channel Modeling and Analysis – Part 2

(DiBiaso 3ch 01 0518.pdf)

Presenter: Eric DiBiaso, TE Connectivity

The Chief Editor resumed discussion of the Editor's report

(wienckowski 3ch 01 0518.pdf) on Link Segment topics.

The meeting broke for lunch at 12:10 AM.

The meeting resumed at 1:33 PM.

The Chair resumed the meeting and discussed future meeting attendance.

Straw Poll #1: Attendance

Attend July 2018 802 San Diego, CA plenary:

Y: 22 N: 3 M: 7

Attend September 2018 interim, Dell EMC, Spokane, WA, USA:

Y: 17 N: 1 M: 13

Room count: 34

Presentations for the meeting continued.

Title: Multi-level PAM Study for M-Gig Automotive PHYs-II ([wu 3ch 01a 0518.pdf](#))

Presenter: Peter Wu, Marvell Semiconductor

Title: TX-PSD for PAM-M for Multi-Gig Automotive PHY and TX-PSD MASK

([wu 3ch 02a 0518.pdf](#))

Presenter: Peter Wu, Marvell Semiconductor

Title: Bandwidth, Modulation and SNR Comparison for Multi-Gigabit Automotive PHY ([souvignier 3ch 01c 0518.pdf](#))

Presenter: Tom Souvignier, Broadcom

Title: Preliminary Study of Noise Effects on Multi-Gigabit Automotive PHY Designs ([tu 3ch 01b 0518.pdf](#))

Presenter: Mike Tu, Broadcom

The meeting broke for short break at 3:15 PM.

The meeting resumed at 3:33 PM.

Title: 2.5G and 10G PHYs Modulation Scheme Proposal
([Pandey 3ch 01c 0518.pdf](#))

Presenter: Sujan Pandey, NXP Semiconductors

Title: Line modulation considerations for 2.5Gbps and 10Gbps Automotive Ethernet ([DenBesten 3ch 01b 0518.pdf](#))

Presenter: Gerrit W. den Besten, NXP Semiconductors

Title: Power/Area Tradeoffs in Multi-Gig BASE-T1 PHYs
([Farjadrad 3ch 01a 0518.pdf](#))

Presenter: Ramin Farjadrad, Aquantia; George Zimmerman, Commscope, Aquantia, CME Consulting, Cisco, ADI, BMW, APL Group

Title: 2.5GBASE-T1 PHY Strawman ([McClellan 3ch 01a 0518.pdf](#))

Presenter: Brett McClellan, Marvell

Title: 802.3ch ALSE ingress noise ([mueller 3ch 03 0518.pdf](#))

Presenter: Thomas Müller, Rosenberger

The Chair indicated that the start time for Friday would be 8:00 AM.

The meeting recessed for the day at 6:00 PM.

The meeting resumed at 8:08 AM.

The Chair called the meeting back to order and continued with the presentations for the meeting.

Title: 802.3ch coupling attenuation ([mueller 3ch 02a 0518.pdf](#))

Presenter: Thomas Müller, Rosenberger

Title: PHY discussion ([wienckowski 3ch 02 0518.pdf](#))

Presenter: Natalie Wienckowski, General Motors

Straw Poll #2: The 2.5GBASE-T1 PHY consider 1 bit per symbol (PAM2)

1. Yes	2. No	3. I don't know
1: 14	2: 8	3: 12

Straw Poll #3: The 2.5GBASE-T1 PHY consider 3 bits per symbol (PAM8)

1. Yes	2. No	3. I don't know
1: 4	2: 19	3: 11

Straw Poll #4: The 2.5G link segment specification should be independent from the 10G segment

1. Yes	2. No	3. I don't know
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1: 5 2: 12 3: 15

Straw Poll #5: The IL limit line should be changed to have a maximum frequency of 3 GHz

Y: 16 N: 9

Straw Poll #6: The RL limit line should be changed to have a maximum frequency of 3 GHz

Y: 3 N: 13

Straw Poll #7: The choice of line code & modulation for the 2.5G Clause may be different than the 10G/5G Clause.

1. Yes 2. No 3. I Don't Know
1: 20 2: 0 3: 12

Straw Poll #8: Should the Insertion loss limit be written based off of 15 m of 26AWG?

1. Yes 2. No 3. I Don't Care
1: 1 2: 3 3: 20

Straw Poll #9: What DC offset value would you be ok with in the Insertion Loss limit equation?

1. 0 2. 0.5 3. 1 4. I don't care (Chicago)
1: 3 2: 6 3: 8 4: 14

Straw Poll #10: What should the lower frequency limit be for the Insertion loss limit

1. 5 MHz (current)
2. 5 MHz to 50 MHz
3. 50 MHz to 100 MHz
4. > 100 MHz
1: 18 2: 0 3: 0 4: 0

Title: Proposal for 2.5G/5G/10GBASE-T1 Transmit Voltage Level

([tu 3ch 02a 0518.pdf](#))

Presenter: Mike Tu, Broadcom

Motion #3: Move to confirm minutes for ad hocs on 3/21, 4/18, and 5/16 as posted

M: George Zimmerman S: Natalie Wienckowski.

(Procedural > 50%)

Approved by voice without opposition

Motion Passes

Motion #4: Move to adopt 1Vpp as the transmit voltage level for 2.5G/5G/10GBASE-T1.

M: Tom Souvignier S: Sujan Pandey

(Technical >= 75%)

Y: 28 N: 2 A: 5

Motion Passes

Motion #5: Move to select Reed-Solomon FEC for 2.5GBASE-T1

M: Gerrit den Besten S: Amir Bar-Niv

(Technical \geq 75%)

Y: 29 N: 0 A: 8

Motion Passes

Motion #6: Move to select Reed-Solomon FEC for 5GBASE-T1 & 10GBASE-T1

M: Gerrit den Besten S: Ramin Farjadrad

(Technical \geq 75%)

Y: 27 N: 1 A: 8

Motion Passes

Motion #7: Move to adopt a new Insertion Loss Limit given by the equation:

$$IL_{dB}(f) \leq 0.0031 * f + 0.30 * \sqrt{f} + 1.5$$

as shown by the “gray curve” on page 25 of DiBiaso_3ch_01_0518.pdf for all 3 speeds for frequencies from 5MHz to 5.5GHz.

M: Eric DiBiaso S: Harsh Patel

(Technical \geq 75%)

Y: 10 N: 9 A: 17

Motion Fails

Motion #8: Move to adopt Coupling Attenuation Reference Test Limit given by the equation:

$$\begin{array}{ll} 70 & 30 \leq f \leq 750 \text{ MHz} \\ 50 - 20\log(f / 7500) & 750 \leq f \leq 5500 \text{ MHz dB} \end{array}$$

30 MHz $\leq f \leq$ 5500 MHz frequency f in MHz as shown on page 9 of mueller_3ch_02a_0518.pdf for all 3 speeds for frequencies from 30 MHz to 5500 MHz.

M: Thomas Müller S: Masood Sharif

(Technical \geq 75%)

Y: 19 N: 0 A: 17

Motion Passes

Motion #9: Move to instruct the Chief Editor to create D0.4 from D0.3 and adopted baseline from motions in the May Interim.

M: Natalie Wienckowski S: George Zimmerman

(Technical \geq 75%)

Approved by voice without opposition

Motion Passes

The meeting broke for short break at 10:05 AM.

The meeting resumed at 10:45 AM.

Natalie Wienckowski showed [P802 3ch timeline 20180318.pdf](#) and discussion commenced about current progress of the Task Force and the current [ToDo List](#).

The Chair asked if there was further business for the Task Force, none responded.

Adjournment

Motion #10: To adjourn the meeting.

M: Brett McClellan S: Sujan Pandey

Approved by voice without opposition (Procedural > 50%)

Motion Passes

The Meeting was adjourned at 11:21 AM

Appendix A: Attendees at the IEEE P802.3ch Multi-Gigabit Automotive Ethernet PHY Task Force Meeting, May 24-25, 2018.

IEEE P802.3ch Task Force May'18				5/24/18	5/25/18
Last Name	First Name	Employer	Affiliation	Thursday	Friday
Amason	Dale	NXP	NXP	X	X
Anslow	Peter	Ciena	Ciena	X	
Bar-Niv	Amir	Aquantia	Aquantia	X	X
Brownlee	Phillip	TDK	TDK	X	X
Carlson	Steve	High Speed Design	Robert Bosch	X	X
Caudron	Cedric	Aptiv	Aptiv	X	X
Chabot	Craig	UNH-IOL	UNH-IOL	X	
Choudhary	Mabud	OFS	OFS		X
Cin	Joseph	Amphenol	Amphenol	X	X
Den Besten	Gerrit	NXP Semiconductors	NXP Semiconductors	X	X
DiBiaso	Eric	TE Connectivity	TE Connectivity	X	X
Donahue	Curtis	UNH - IOL	UNH - IOL	X	
Farjadrad	Ramin	Aquantia	Aquantia	X	X
Fukuoka	Takashi	Auto Networks Tech	Auto Networks Tech	X	X
Gardner	Mike	Molex, LLC	Molex, LLC	X	
Gauthier	Claude	NXP Semiconductors	NXP Semiconductors	X	
Gelite	Tabiar	Renesas	Renesas		X
Goldberg	Jonathan	IEEE-SA	IEEE-SA	X	X
Graber	Steffen	Pepperl+Fuchs	Pepperl+Fuchs	X	X
Grau	Olaf	Robert Bosch	Robert Bosch	X	X
Hess	Dave	Cord Data	Cord Data	X	X
Hess	John	BelFuse	BelFuse	X	

IEEE P802.3ch Task Force May'18				5/24/18	5/25/18
Last Name	First Name	Employer	Affiliation	Thursday	Friday
Horner	Rita	Synopsys	Synopsys		X
Huszak	Gergely	Kone	Kone	X	X
Jones	Peter	Cisco	Cisco	X	
Kondo	Taiji	Megachips	Megachips	X	X
Kube	Kae	UNH-IOL	UNH-IOL	X	X
Laubach	Markus	Broadcom Ltd.	Broadcom Ltd.	X	X
Law	David	Hewlett Packard Enterprise	Hewlett Packard Enterprise	X	X
Lawlis	James	Ford Motor Company	Ford Motor Company	X	X
Lewis	Jon	Dell EMC	Dell EMC	X	X
Lin	Bin	TE Connetivity	TE Connectivity	X	X
Maguire	Valerie	Siemon	Siemon	X	
Masuda	Takeo	OITDA	OITDA	X	X
Matheus	Kirsten	BMW	BMW	X	
McCarthy	Mick	Analog Devices	Analog Devices	X	
McClellan	Brett	Marvell	Marvell	X	X
Medina	Marcel	Spirent	Spirent	X	
Mueller	Thomas	Rosenberger	Rosenberger	X	X
Neveux	Paul	Superior Essex	Superior Essex	X	
Nikolich	Paul	Self	802 Chair	X	X
Ohni	Josef	MD Elektronik	MD Elektronik	X	X
Pandey	Sujan	NXP	NXP	X	X
Patel	Harsh	Molex, LLC	Molex, LLC	X	X
Pozzebow	Dino	Microsemi	Microsemi		X
Remein	Duane	Huawei	Huawei	X	
Ryan	Timothy	UNH-IOL	UNH-IOL	X	

IEEE P802.3ch Task Force May'18				5/24/18	5/25/18
Last Name	First Name	Employer	Affiliation	Thursday	Friday
Shariff	Masood	Commscope	Commscope	X	X
Shigematsu	Masayuki	Innovation Core SEI, Inc.	Innovation Core SEI, Inc.	X	X
Souvignier	Tom	Broadcom Ltd.	Broadcom Ltd.	X	X
Sparrowhawk	Bryan	Leviton	Leviton	X	
Tazebay	Mehmet	Broadcom Ltd.	Broadcom Ltd.	X	
Thompson	Geoff	GraCaSI SA.	Independent	X	
Tu	Mike	Broadcom Ltd.	Broadcom Ltd.	X	X
Vanderlaan	Paul	Berk-Tek LLC	Berk-Tek LLC	X	X
Vernickel	Ricky	Leoni	Leoni	X	X
Voss	Bob	Panduit	Panduit	X	
Wang	Min	Waymo	Waymo	X	X
Wechsler	Christoph	Audi	Audi	X	X
Wienckowski	Natalie	GM	GM	X	X
Withey	James	Fluke	Fluke		X
Wu	Peter	Marvell	Marvell	X	X
Young	Adrian	Leviton	Leviton	X	
Zerna	Conrad	Frannhofer IIS	Frannhofer IIS	X	X
Zimmerman	George	CME Consulting	Commscope, Aquantia, CME Consulting, Cisco, ADI, BMW, APL Group	X	X