

Unconfirmed Meeting Minutes: IEEE P802.3dm Asymmetrical Electrical Automotive Ethernet Task Force

September 18-19, 2024
IEEE 802.3 Interim Meeting Series, Hamburg Germany

Prepared by George Zimmerman

IEEE P802.3 Task Force meeting convened at 1:16 PM CEST, Wednesday, September 18, 2024, by Jon Lewis, IEEE P802.3dm Task Force Chair.

Attendance is listed in Appendix A

Presentation: https://www.ieee802.org/3/dm/public/0924/agenda_3dm_01b_0924.pdf
Presenter: Jon Lewis, Chair.

Mr. Lewis turned to presentation [agenda_3dm_01b_0924.pdf](https://www.ieee802.org/3/dm/public/0924/agenda_3dm_01b_0924.pdf) and reviewed the agenda for the meeting.

The chair reminded the group that attendance credit would be taken from IMAT, and that as announced by the 802.3 Working Group Chair, IMAT registration would be for individual slots (AM1, AM2, PM1, and PM2) through the day's meeting.

Approval of Agenda: The chair asked whether there were additions or corrections to the agenda, and there were none. He announced that the agenda was approved.

Approval of Previous Meeting Minutes: The chair announced that the minutes from the Task Force meeting on July 17 at the 802 plenary had been posted, and that the attendance had been revised as requested, resulting in the document - (https://www.ieee802.org/3/dm/public/0724/Unconfirmed_minutes_3dm_071724_r1.pdf) and asked whether there were any further additions or corrections to them. There were none. Additionally, the minutes from the 6 ad hoc meetings held between the July plenary and this meeting were posted, and he asked if there were any additions or corrections to those. There were none.

He then entertained the following motion:

MOTION #1:

Move to approve:

Task Force minutes from 17 July 2024

https://www.ieee802.org/3/dm/public/0724/Unconfirmed_minutes_3dm_071724_r1.pdf

Ad Hoc Minutes:

https://www.ieee802.org/3/dm/public/adhoc/080124/Unconfirmed_minutes_3dm_080124.pdf

https://www.ieee802.org/3/dm/public/adhoc/080724/Unconfirmed_minutes_3dm_080724.pdf

https://iee802.org/3/dm/public/adhoc/081424/Unconfirmed_minutes_3dm_081424.pdf
https://iee802.org/3/dm/public/adhoc/082224/Unconfirmed_minutes_3dm_082224.pdf
https://iee802.org/3/dm/public/adhoc/082824/Unconfirmed_minutes_3dm_082824.pdf
https://iee802.org/3/dm/public/adhoc/090524/Unconfirmed_minutes_3dm_090524.pdf

M: Peter Jones
S: Max Turner
(Procedural >= 50%)

Motion passes without objection

The Chair then resumed the review of presentation [agenda_3dm_01b_0924.pdf](#):

- Mr. Lewis noted that there should be no recording or photography without permission.
- Mr. Lewis asked if anyone was attending from the press including those who would run a public blog on this meeting – there were no indications from the group,

Mr. Lewis then continued review of the presentation, reviewing decorum, information for the reflector, private area, and ground rules.

The chair announced that the meeting was being conducted as part of the IEEE 802.3 interim meeting series and that registration, including payment of meeting fees, was required for attendees. He further announced that attendance without properly registering is subject to penalties under IEEE 802 rules.

The Chair announced that as this meeting was an electronic Task Force meeting, under 802.3 rules, only working group voters may vote.

Attendance.

The chair reminded the group that IMAT participants can only claim IMAT attendance credit if they attend 75% of a meeting slot's duration, and that officers may remove IMAT attendance if a participant is found to attend less than 75% of a slot's duration. He further reminded the group of the rules for gaining and maintaining voting rights.

The Chair advised the group that attendance would be taken from IMAT, and that zoom attendance would be used to reconcile the attendance, but IMAT was the official record. He then reminded attendees that they should show their employer & affiliation, and how to set these to make them correct.

IEEE Structure, Policies

Mr. Lewis continued review of the IEEE SA structure, where to find the rules, and asked whether anyone in the room or online had not seen the various policy slides this week. There were no responses. He therefore announced that he would show the slides and summarize.

IEEE SA Patent Policy, Mr. Lewis reviewed slides 0 through 4 of the IEEE SA Patent Policy (slides 15-19 of the agenda deck) and read aloud the patent policy (slide 2) of the IEEE SA patent policy from [agenda_3dm_01b_0924.pdf](#) and made the call for patents on the slide labeled "Ways to Inform IEEE" (1:32 pm).

There was no response to the call for patents at **1:33pm**.

Other IEEE Policies

Mr. Lewis reviewed the slides on the IEEE SA copyright, Participant behavior (ethics), IEEE individual participation, and fair and equitable consideration policies as shown in the agenda deck. (1:36PM). There were no questions.

Mr. Lewis reviewed the standards development process for IEEE and where this Task Force is in the process.

LIAISONS

The chair noted that no new liaison letters had been received by IEEE 802.3 and assigned to the Task Force.

Other Procedures

The chair announced that the group would review a sample timeline during closing business discussions.

The chair then also announced guidelines for the meeting and use of meeting times, setting a time limit of 30 minutes for presentation and Q&A. He added that a presenter with more than one presentation could request dividing the time unequally between multiple presentations as long as the total time fit within 30 minutes per presentation.

The Chair completed a review of the presentation, showing the order of presentations.

Consent to hear late presentations: The chair announced there were two presentations received after the deadline under the announced procedures, but were posted at the same time as the others. He asked if there was any objection to hearing those presentations in the normal order presented in the agenda deck. There was no objection to hearing the presentations in normal order.

Ad hocs: The chair thanked the chairs of the link segment & noise models ad hocs, and asked members to consider what ad hocs were needed to progress work between this meeting and the November plenary. Further, the chair announced that material previously discussed in ad hocs would have precedence for the November agenda. Fully new material would be placed at the end of the agenda. (Note – this was clarified that extensions of material previously discussed in the task force meeting would also be prioritized. Only material not previously introduced – at the chair’s sole discretion – would be placed at the end of the agenda and potentially given less time.)

PRESENTATIONS

The Chair then moved to the presentations for the meeting.

(1:38PM)

Title: 802.3ch EEE Overview

URL: https://www.ieee802.org/3/dm/public/0924/EEE_8023ch_Overview_Tran_09182024.pdf

Presenter: Ky-Anh Tran; Aeonsemi

Discussion: The presenter presented an overview of how energy efficient ethernet works in 2.5G/5G/10GBASE-T1 PHYs, including entry and exit to LPI and latency parameters.

Questions were asked and answered.

(1:58 PM)

The chair announced that the next scheduled presenter, was unavoidably delayed, and asked the task force whether there was any objection to skipping his presentation and taking it when the presenter was available.

There was no objection, and presentations resumed with the next scheduled presenter.

(1:59PM)

Title: Latency requirements for automotive camera systems

URL: https://www.ieee802.org/3/dm/public/0924/matheus_dm_01_latency2c_09182024.pdf

Presenter: Kirsten Matheus; BMW

Discussion: The presenter presented an overview of latency issues in automotive cameras. Considerations included functional safety, human factors, and rolling shutters vs. global shutters, and distance moved.

Questions were asked and answered.

(2:32PM)

Title: Power and Latency Considerations

URL: https://www.ieee802.org/3/dm/public/0924/Power_and_Latency_8023ch_Tran_09182024.pdf

Presenter: Ky-Anh Tran; Aeonsemi

Discussion: The presenter presented a discussion of latency in some traffic profiles for 802.3dm comparing 802.3ch phy frame latency using EEE and ASA MLE. Additionally, he briefly discussed power savings with EEE.

Questions were asked and answered.

At 3:09 PM, the chair announced it was time for the afternoon break, to resume at 3:30pm.

(3:30 PM) The meeting resumed with presentations, starting with the presentation that had been delayed earlier.

Title: Automotive system view requirements for networked video

URL: https://www.ieee802.org/3/dm/public/0924/Gollob_dm_03c_System_View_20240918.pdf

Presenter: Christoph Gollob; BMW

Discussion: The presenter presented some observations for machine vision applications.

Questions were asked and answered.

(4:04PM)

Title: MII / XGMII options and their technical implications

URL: https://www.ieee802.org/3/dm/public/0924/Kleinwaechter_dm_091824.pdf

Presenter: Mathias Kleinwaechter; In-Tech

Discussion: The presenter presented some options for the xMII interface.

Questions were asked and answered.

(4:30PM)

Title: Relation between xMII, latency, and duplexing method

URL: https://www.ieee802.org/3/dm/public/0924/matheus_dm_02b_Mllandlatency_09182024.pdf

Presenter: Kirsten Matheus; BMW

Discussion: The presenter presented a systems overview and some analyses of xMII latencies in upstream and downstream.

Questions were asked and answered.

(4:58PM)

Title: "Receiver Complexity in Code-Multiplexing Systems" – aka Echo in asymmetric duplex system with spreading

URL: https://www.ieee802.org/3/dm/public/0924/sedarat_3dm_202409.pdf

Presenter: Hossein Sedarat; Ethernovia

Discussion: The presenter presented an analysis of an asymmetric transmission PHY, based on overlapped frequencies with spreading of the low-rate signal.

Questions were asked and answered. One participant suggested that the ideas might be further developed in a collaborative fashion in an ad hoc.

The chair announced that the meeting would recess for the day (5:33 PM CEST, 18 September 2024).

The meeting resumed at 0802 AM CEST Thursday, 19 September, 2024.

Presentation: https://www.ieee802.org/3/dm/public/0924/agenda_3dm_01b_0924.pdf

Presenter: Jon Lewis, Chair.

Mr. Lewis turned to presentation [agenda_3dm_01b_0924.pdf](https://www.ieee802.org/3/dm/public/0924/agenda_3dm_01b_0924.pdf) and briefly reviewed the agenda for the meeting. As part of the review, he announced that the meeting was being conducted as part of an IEEE 802.3 interim meeting series, with registration required which requires payment of a fee. He then asked whether any individuals needed to review the IEEE patent policy, individual participation, and copyright policy slides. There were no requests. He showed the slides relating to IEEE policies in the agenda deck, and there were no questions. He then briefly reviewed the plan for conducting the meeting, presentation and question time limits and procedure. There were no questions.

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Following the review of process, presentations resumed in the order announced:

(8:08AM)

Title: Upstream PHY Latency

URL: https://www.ieee802.org/3/dm/public/0924/Lo_3dm_01_0924.pdf

Presenter: William Lo; Axonne

Discussion: The presenter presented a discussion of algorithmic latency due to MII as well as various PHY processing in ASA-MLE and in 10GBASE-T1 with and without EEE, as well as a proposal for 802.3dm asymmetric traffic.

Questions were asked and answered.

(8:28AM)

Title: Effects of system interface on latency

URL: https://www.ieee802.org/3/dm/public/0924/turner_dm_v01_SystemLatency_2024-09.pdf

Presenter: Max Turner; Ethernovia

Discussion: The presenter presented a discussion of system latency, including the interface to the camera or control ecu, such as GPIO or I2C, and then discussed a budget for the phy latency by making a proposal for a single hop latency to consider that might allow both existing interfaces (GPIO/I2C) and still allow for future faster interfaces.

Questions were asked and answered.

(there was a momentary interruption for attendance login and a network interruption)

(9:09AM)

Title: System and Latency Requirements

URL: https://www.ieee802.org/3/dm/public/0924/Houck_Fuller_3dm_03_0917.pdf

Presenter: TJ Houck; Marvell

Discussion: The presenter presented some examples of latency in automotive systems and how they relate to interfaces.

Questions were asked and answered.

(9:40AM)

Title: Considerations and questions regarding latency

URL: https://www.ieee802.org/3/dm/public/0924/gorshe_3dm_01a_2409.pdf

Presenter: Steve Gorsche; Microchip

Discussion: The presenter presented some views on system latency and budgets.

Questions were asked and answered.

(10:09AM)

The chair announced that it was time for the morning break. The group would break for 30 minutes, and resume at **10:40 AM**.

The meeting resumed at 10:40 AM with presentations.

(10:41AM)

Title: Proposed Asymmetrical Modulation

URL: https://www.ieee802.org/3/dm/public/0924/Lo_3dm_02_0924.pdf

Presenter: William Lo; Axonne

Discussion: The presenter presented a proposal for PCS and FEC along the lines of the modulation analysis from https://www.ieee802.org/3/dm/public/0724/sedarat_3dm_202407.pdf with a pam2 or dme mapping on the upstream and 802.3ch-based modulation in the high data rate direction.

Questions were asked and answered.

(11:04AM)

Title: Asymmetric modulation scheme

URL: https://www.ieee802.org/3/dm/public/0924/jonsson_3dm_01_09_15_24.pdf

Presenter: Ragnar Jonsson; Marvell

Discussion: The presenter presented a modulation scheme using DME in the low rate direction and leveraging 802.3ch (Clause 149) for the high rate direction.

Questions were asked and answered.

(11:37 PM)

Title: Comparing modulation schemes

URL: https://www.ieee802.org/3/dm/public/0924/jonsson_razavi_3dm_01_09_15_24.pdf

Presenter: Ragnar Jonsson, Alireza Razavi, Paul Fuller; Marvell

Discussion: The presenter compared the modulation used by ASA-MLE and the proposal in https://www.ieee802.org/3/dm/public/0924/jonsson_3dm_01_09_15_24.pdf

Questions were asked and answered.

(12:11 PM) – the chair announced that the group was breaking for lunch until 1:15 PM.

The meeting reconvened at 1:15 PM, and resumed presentations.

(1:17PM)

Title: Analysis of PoC inductors in automotive camera applications

URL: https://www.ieee802.org/3/dm/public/0924/jingcong_dm_2024Sep_v2.pdf

Presenter: Jingcong Sun, Motorcomm

Discussion: The presenter presented an overview of inductors commonly used for power over coax in automotive applications and the frequency ranges they operate over. He also compared them to potential 802.3dm candidate technologies.

Questions were asked and answered.

(1:44PM)

Title: Beyond the crystal: Innovating ADAS with Simplified Sensor Modules

URL: https://www.ieee802.org/3/dm/public/0924/Houck_Ragnar_Fuller_3dm_01_0917.pdf

Presenter: TJ Houck, Marvell

Discussion: The presenter discussed the advantages of eliminating the use of a crystal at the camera module as well as relation of the phy duplexing mode to the challenges associated with crystal-less operation.

Questions were asked and answered.

(2:06PM)

Title: Link segment insertion loss and return loss

URL: https://www.ieee802.org/3/dm/public/0924/bergner_3dm_01_18_09_24.pdf

Presenter: Bert Bergner; TE Connectivity

Discussion: The presenter presented an analysis of insertion loss and return loss based on measurements and previous presentations, and offered updates and a proposal.

Questions were asked and answered.

The meeting paused for participants to register attendance.

(2:39PM)

Title: IL limit line proposal

URL: https://www.ieee802.org/3/dm/public/0924/Zerna_802.3dm_01_240918_IL_Limit_Proposal.pdf

Presenter: Conrad Zerna; Aviva Links

Discussion: The presenter presented some proposals for coaxial cable limit lines referencing presentations, ISO and IEEE standards, and industry specifications (ASA)

Questions were asked and answered.

(2:45PM)

The chair indicated that the next item on the agenda was the break, but that it was too early. He therefore previewed a potential timeline and discussed work that the task force could do to go forward.

The chair also clarified his earlier announcement regarding presenting material at ad hocs prior to presentation in November. See “note” under Adhocs at the beginning.

At **2:55PM**, the Chair announced the start of the afternoon break, until **3:15 PM**.

The meeting resumed at 3:20PM

(3:23 PM)

Title: Insertion loss and return loss limits

URL: https://www.ieee802.org/3/dm/public/0924/jonsson_3dm_02_09_15_24.pdf

Presenter: Ragnar Jonsson; Marvell

Discussion: The presenter presented a discussion of impacts of return loss and poor connectors on PHYs, and a proposal for insertion loss and return loss limits. Questions were asked and answered.

(3:44 PM)

Title: Power over Coaxial Cable Optimization and Signaling Trade-off

URL: https://www.ieee802.org/3/dm/public/0924/Chini_Tazebay_3dm_01a_0924.pdf

Presenter: Ahmad Chini & Mehmet Tazebay; Broadcom

Discussion: The presenter presented a review of inductors and impact on MDI and channel return loss based on existing applications notes. Questions were asked and answered.

(4:22 PM)

At 4:22PM the Chair announced that we had completed the presentations for the day.

Formation of Ad Hocs:

The chair announced that with consultation of the ad hoc chairs, the existing ad hocs had completed their usefulness and would be hibernated.

He then announced the formation of a new General Ad Hoc, covering all topics in the Task Force, and that Max Turner & Natalie Wienckowski would co-chair.

The General Ad Hoc would meet October 10, 2024; 0600 – 0900 Pacific US time.

There was discussion that the ad hoc allocated 3 hours to have time, and if there wasn't 3 hours' worth of business, it might end early.

Timeline

The chair announced he didn't feel like the group was ready to vote on the timeline at this time, but for people to consider it.

STRAW POLLS AND MOTIONS

The chair announced that he had not received any requests for motions or straw polls. He asked the group if there were any that were offered. There were no responses.

- (includes error detection and reporting, latency)
- Max Turner - Chair
- **As Needed based on project need:**
- General Ad Hoc or off-cycle interim meeting to progress the project outside of normal interim/plenary meeting cycle.
 - Single occurrence

FUTURE MEETINGS

Mr. Lewis reviewed future meetings from the agenda presentation and announced the next meeting would be the week of November 11-15 at the IEEE 802 plenary meeting session (in-person with remote access) in Vancouver, British Columbia. Specific days that week had not been chosen yet, but the goal was to provide 2 full days for 802.3dm.

The chair also announced he planned on implementing an online system for requesting presentations in the task force. Details will be forthcoming.

The Chair indicated that the agenda had been exhausted.

Mr. Lewis adjourned the meeting at **4:41PM CEST**.

Appendix A: Attendees at the IEEE P802.3dm Asymmetrical Electrical Automotive Ethernet Task Force Meeting, Sept 18-19, 2024

Name	Employer	Affiliation	Day 1	Day 2
Ahuja, Ramanjit	ON Semiconductor	ON Semiconductor	X	X
Arndt, Christoph		Continental Automotive Technologies GmbH	X	X
Arroyo, Hector		Analog Devices Inc.	X	
Bar-Niv, Amir	Aquantia Corp	Marvell	X	X
Benyamin, Saied	Ethernovia	Ethernovia	X	X
Bergner, Bert	TE Connectivity Germany GmbH	TE Connectivity	X	X
Borda, jamila josip	BMW Group	in-tech GmbH	X	X
Brychta, Michal	Analog Devices Inc.	Analog Devices Inc.	X	X
Cordaro, Jay		Analog Devices Inc.	X	X
Dalmia, Kamal	Aviva Links Inc	Aviva Links Inc	X	X
de Koos, Andras	Microchip Technology Inc	Microchip Technology Inc	X	X
Donahue, Curtis	Rohde & Schwarz	Rohde & Schwarz	X	X
Ganesan, Aravind	Texas Instruments Inc.	Texas Instruments Inc.	X	X
Gerl, Markus	MD Elektronik	MD Elektronik	X	X
Goel, Sachin	Aviva Links Inc	Aviva Links Inc	X	X
Gollob, Christoph		BMW Group	X	X
Gorshe, Steven Scott	Microchip Technology, Inc.	Microchip Technology, Inc.	X	X
Goto, Hideki	Toyota Motor Corporation	Toyota Motor Corporation	X	X
Graber, Steffen	Pepperl+Fuchs SE	Pepperl+Fuchs SE	X	X
Haydt, Mary Sue	Microchip Technology, Inc.	Microchip Technology, Inc.	X	X
Hogenmueller, Thomas	Robert Bosch GmbH	Robert Bosch GmbH	X	X
Hoshino, Masayuki		Continental Automotive	X	X
Houck, TJ		Marvell	X	X
Hu, Mark		Aptiv	X	X
Huszak, Gergely	Self	KONE	X	X
HYAKUTAKE, YASUHIRO	Orbray Co., Ltd.	Orbray Co., Ltd.	X	X
Jones, Chad	Cisco Systems, Inc.	Cisco Systems, Inc.	X	X
Jones, Peter	Cisco Systems, Inc.	Cisco Systems, Inc.	X	X
Jonsson, Ragnar	Marvell Semiconductor, Inc.	Marvell	X	X
Kikuta, Tomohiro	Orbray Co., Ltd.	Orbray Co., Ltd.	X	X
Kleinwaechter, Mathias		in-tech GmbH	X	X
Koeppendoerfer, Erwin	LEONI Kabel GmbH	LEONI	X	X
Lackner, Hans	QoSCom GmbH	QoSCom GmbH	X	X

Lasry, Ariel	Qualcomm Technologies, Inc	Qualcomm Technologies, Inc	X	X
Lewis, Jon	Dell Technologies	Dell Technologies	X	X
Lo, William	Axonne Inc.	Axonne Inc.	X	X
Lou, Wei		Broadcom Corporation	X	X
Maguire, Valerie	Copperopolis	Copperopolis, affiliated with CME Consulting and Cisco	X	X
mash, chris	Nupero Ltd	Ethernovia Inc	X	X
Matheus, Kirsten	BMW Group	BMW Group	X	X
Mcclellan, Brett	Marvell Semiconductor, Inc.	Marvell Semiconductor, Inc.	X	X
Mueller, Thomas	Rosenberger	Rosenberger	X	X
Murray, Brian	Analog Devices Inc.	Analog Devices Inc.	X	X
Neulinger, Christian	MD Elektronik	MD Elektronik	X	X
Ng, Hiok Tiaq	Aviva Links Inc.	Aviva Links Inc.	X	X
Pardo, Carlos	Knowledge Development for POF SL	KDPOF	X	X
Paul, Michael	Analog Devices Inc.	Analog Devices	X	X
Pineda, Luis	LP Tech Advisors, LLC	LP Tech Advisors, LLC (Samsung; 7Rays; Ethernovia)	X	X
Pischl, Neven	Broadcom Corporation	Broadcom Corporation	X	X
Razavi, Alireza	Marvell	Marvell	X	X
Reinhard, Michael	SEI Automotive Europe GmbH	SEI Automotive Europe GmbH	X	X
Schreiner, Stephan	Rosenberger Hochfrequenztechnik GmbH & Co. KG	Rosenberger	X	X
Sedarat, Hossein	Ethernovia	Ethernovia	X	X
SERIZAWA, NAOSHI	Yazaki Corporation	Yazaki Corporation	X	X
Sharma, Rohit		Molex Incorporated	X	X
shirani, ramtin	Ethernovia	Ethernovia	X	X
sisk, jason	University of New Hampshire InterOperability Laboratory (UNH-IOL)	University of New Hampshire InterOperability Laboratory (UNH-IOL)	X	X
Sporer, Guenter		NXP Semiconductor	X	X
Strohmeier, Heiko	Robert Bosch GmbH	Robert Bosch GmbH	X	X
Sun, jingcong		Motorcomm Electronic Technology Co	X	X
Tan, Yuxuan	Motorcomm	Motorcomm	X	X
TAZEBAY, MEHMET	Broadcom Corporation	Broadcom Corporation	X	X
Thompson, Geoffrey	GraCaSI S.A.	INDEPENDENT	X	X
Torres, Luisma	Knowledge Development for Plastic Optical Fiber	Knowledge Development for Plastic Optical Fiber	X	X

Tran, Ky-Anh	Aeonsemi Inc	Aeonsemi Inc	X	X
Tu, Mike	Broadcom Corporation	Broadcom Corporation	X	X
Turner, Max	Ethernovia	Ethernovia	X	X
Veloso Cauce, Gumersindo	BMW Group	BMW AG; BMW Group	X	X
Wang, Shun-Sheng	Realtek Semiconductor Corp.	Realtek Semiconductor Corp.	X	X
Watanabe, Yuji	AGC Inc.	AGC	X	X
Wienckowski, Natalie	IVN Solutions LLC	IVN Solutions LLC; Ethernovia	X	X
Wu, Peter	Marvell Semiconductor, Inc.	Marvell Semiconductor, Inc.	X	X
YASUKAWA, MASAKI	NEC Magnus Communications, Ltd.	NEC Magnus Communications, Ltd.	X	X
Zerna, Conrad	Aviva Links Inc	Aviva Links Inc	X	X
Zhang, Tingting	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	X	X
Zhuang, Yan	Huawei Technologies Co., Ltd	Huawei Technologies Co., Ltd	X	X
Zimmerman, George	CME Consulting, Inc.	CME Consulting/ADI, APL Group, Cisco, Marvell, OnSemi, SenTekSe LLC, Sony	X	X
Ancel, Patrice		BMW AG		X
Chini, Ahmad	Broadcom Corporation	Broadcom Corporation		X
Kapoor, Samay	Aviva Links	Aviva Links Inc.		X
Li, Pei-Rong	MediaTek Inc.	MediaTek Inc.		X
Withey, James	Fluke Corporation	Fluke Corporation		X

ZOOM PARTICIPATION ONLY – NO IMAT RECORD

Name	Affiliation	Day 1	Day 2	Attendance/Registration
Ancel, Patrice	BMW	X	X	
Banet, Nadav	Valens	X	X	
De Sousa, Jonathan	GG Group		X	
Haasz, Jodi	IEEE-SA		X	
Jin, Edward	Molex	X		
Klein, Christian	Bosch	X	X	
Silvano, Jonathan	GG Group		X	