Minutes
Multi-Gigabit Automotive Optical PHY Study Group (OMEGA)
12-13 November 2019

Attendees

Name	Employer	Affiliations
Abbott, John	Corning	Corning
Andersdoiter. Amelia	self	self
Andrae, Stefan	SEI Antech-Europe GmbH	SEI Antech-Europe GmbH
Aono, Michikazu	Yazaki	Yazaki
Araki, Nobuyasu	Yazaki	Yazaki
Bergner, Bert	TE Connectivity	TE Connectivity
Choudhury, Mabud	OFS	OFS
Eek, Magnus	Volvo Car Corp.	Volvo Car Corp
GHARBA, Ahmed	Huawei	Huawei
Gianordoli, Stefan	GG-Grouip	GG-Group
Grow, Robert	Robert M. Grow Consulting	RMG Consulting, KDPOF
Gubow, Marty	Keysight	Keysight
HIRASE, Hidenari	AGC	AGC
Hyakutake, Yasuhiro	Adamant Namiki Precision Jewel	Adamant Namiki Precision Jewel
Jonsson, Ragnar	Marvell	Marvell
Kadry, Haysam	Ford Motor Company	Ford Motor Company
KAGAMI, Manabu	NI Tech	NI Tech
Kondo, Taiji	Megachips	Megachips
Koppermüller, Daniel	MD Elektronik	MD Elektronik
Masuda, Takeo	OITDS/PETR	OITDA/PETR
Mueller, Thomas	Rosneberger	Rosenberger
Neulinger, Christian	MD Elektronik	MD Elektronik
Ogura, Ichiro	PETRA	PETRA
Ohni, Josef	MD Elektronik	MD Elektronik
OTA, Naoto	AGC	AGC
Pardo, Carlos	KDPOF	KDPOF
Pérez-Aranda, Rubén	KDPOF	KDPOF
Pimpinella, Rick	Panduit	Panduit
Powell, Bill	Nokia	Nokia
Pries, Roalnd	MD Elektronik	MD Elektronik
Rodenkirchen, Robert	Yazaki	Yazaki
Shiino, Matsato	Furukawa Electric	Furukawa Electric
Swanson, Steve	Corning Inc.	Corning Inc.
Takayama, Kazuya	Nitto Denko Corp.	Nitto Denko Corp.
Toshiaki, Sakai	Socionext	Socionext
Vanderlaan, Paul	UL LLC	UL LLC
WABANABE, Yuji	AGC	AGC
Walsh, Thomas	KDPOF	KDPOF
Wang, Alvin	Huawei	Huawei
WANG, Xuehuan	Huawei	Huawei
Ward, Lisa	Ronde & Schwaz	Ronde & Schwaz
Wienckowski, Natalie	General Motors	General Motors
Wu, Man-Lim	Media Tek	Media Tek
YANG, Yumeng	Huawei	Huawei
ZHANG, Xingxin	Huawei	Huawei
Zhu, Chunhui	Futurewei	Futurewei

Monday, 20 January 2020, 09:00

Mr. Robert Grow, Study Group Chair called the meeting to order. No one responded to the request to act as Recording Secretary for the meeting, so Mr. Grow recorded these minutes. Attendees were asked to introduce themselves noting their employer and any other affiliations.

Mr. Grow presented the agenda.

Motion 1

Approve the agenda:

M: C. Pardo S: S. Swanson
Procedural. Approved by voice without objection.

Motion 2

Approve the November 2019 study group minutes.

M: C. Pardo S: J. Abbott
Procedural. Approved by voice without objection.

Mr. Grow then reviewed the general tasks to be performed in a Study Group and expectations of participants ("Agenda and General Information" presentation). This presentation included review of the slides Guidelines for IEEE SA meetings, IEEE SA Copyright Policy and Participation in the Individual Process (which now replaces the Participation in IEEE 802 slide).

Mr. Magnus Eek presented "Input - Automotive Use-cases and Requirements Multi Gigabit". Questions and other points were made during the presentation. The presentation focused on requirements from an auto manufacturer, including speeds, topologies and environmental requirements.

Mr. Robert Rodenkirchen presented "Optical Technologies From POF Solutions to Next Generation, Challenges". He reviewed the current state of automotive optical technology, and how current techniques can help with higher speeds and that higher speeds of operation are technically feasible. The presentation indicates the feasibility of multi-gigabit optical automotive links. Discussion included tradeoffs between glass fiber an POF.

"50 Gb/s PAM4 transmission with InGaAs 25G VCSEL" was a detailed presentation on VCSEL testing presented by Mr. Rubén Pérez-Aranda. Discussion included questions for clarification, as well as questions related to implementation approaches, and tradeoffs between device lifetime and increased current density to achieve higher data rates. The test results that the data for feasibility of 25 Gb/s is strong, but 50 Gb/s single lane is less clear that a VCSEL pushed to that rate will still meet automotive failure rate requirements.

"A study for highly-reliable optical transceiver based on Si Photonics technology" presented a method to provide increased link reliability by using redundant optical transmitters. Questions included the impact of extra components on redundant optics devices, availability of optical lasers used in the redundant device, and if any limitations on encoding were introduced by the approach.

Mr. Takashi Fukuoka presented "Optical Fiber Harness for Multi-X Automotive Applications". A number of questions were asked about details of the testing including vibration (and resonant frequencies), if dust conditions that would exist in a manufacturing environment were adequately represented, and similar topics related to the presentation's point that existing components demonstrate technical feasibility while providing an acceptable optical loss budget.

The suitability of using GI-POF was covered in "Plastic Optical Fiber for Automotive", Mr. Naoto Ota and Mr. Yuji Watanabe reviewed previous and existing uses of POF in automobiles, and standardization work for new POF fiber types.

Mr. Pérez-Aranda presented two presentations on "25 Gb/s transmission over harsh environment multimode fiber", each presenting test dada of a different fiber. Mr. Steve Swanson helped to enable the first fiber tests, and Mr. Mabud Choudhury and Mr. John Earnhardt helped enable the second tests. Both tests reinforced the viability of 25 Gb/s serial transmission for the harsh automotive environment. In answering questions. Mr. Pérez-Aranda referred to his November presentation as where the questions were answered.

Mr. Carlos Pardo revisited his November presentation on possible objectives. The draft objective modifications were based on straw polls. On the question of removing an auto-negotiation objective, removal was favored 13 to 2. Addition of objectives for rates greater than 25 Gb/s was vigorously

discussed. Addition of an objective for 50 Gb/s was favored 13 to 6. Addition of a 100 Gb/s objective was favored 15 to 1. With at least 40 people in the room, obviously many participant did not vote.

Morning, afternoon, and lunch breaks were taken during the day. The SG recessed for the day at approximately 17:40.

Tuesday, 21 January 2020, 08:00

Mr. Grow called the meeting to order. Discussion on objectives continued, with Mr. Pardo leading the discussion. When objective discussion was exhausted, he went on to the proposed CSD responses. When edits were complete and discussion exhausted, Mr. Grow went to the PAR documents. Again, edits were made, and when exhausted, Mr. Grow invited any motions related to project documents.

MOTION 3

Request the IEEE 802.3 Chair pre-submit the proposed IEEE P802.3cz Multi Gigabit Automotive Optical PHYs PAR,
http://www.ieee802.org/3/OMEGA/public/jan_2020/P802_3cz_PARa_Detail.pdf, and CSD
http://www.ieee802.org/3/OMEGA/public/jan_2020/CSD_OMEGA_DRAFT_01a_0120.pdf, for consideration at the IEEE 802 March plenary meeting.

M: C. Pardo

S: R. Pimpinella

Y: 22, N: 0, A: 1

Mr. Grow took the future meeting polls, and asked if there was any other business. He reviewed future meetings, thanked the participants, and having reached the end of the agenda invited a motion to adjourn.

Motion 4

Move to adjorn.

M: C. Pardo

S: P. Vanderlaan

Procedural (>50%). Approved by voice without objection.

The meeting was adjourned at approximately 10:10.