Minutes
Multi-Gigabit Optical Automotive Ethernet (OMEGA)
Task Force Interim
15 June 2021

Attendance list as recorded in Webex participant list

Last Name	First Name	Employer	Affiliations	June 15th
Abbott	John	Corning	Corning	X
Amamiya	Yasushi	MegaChips	MegaChips	
Andrae	Stefan	SEI Antech-Europe GmbH	SEI Antech-Europe GmbH	
Aono	Michikazu	Yazaki	Yazaki	
Araki	Nobuyasu	Yazaki	Yazaki	X
Bergner	Bert	TE Connectivity	TE Connectivity	
Boyer	Rich	APTIV	APTIV	
Barbero	Fernando	KDPOF	KDPOF	X
Bordogna	Mark	Intel	Intel	
Brooks	Paul	Viavi Solutions	Viavi Solutions	
Bruckman	Leon	Huawei	Huawei	
Chang	Jae-yong	Keysight	Keysight	
Choudhury	Mabud	OFS	OFS	X
Chuang	Keng Hua	HPE	HPE	
Cuesta	Emilio	TE Connectivity	TE Connectivity	X
Dittmann	Markus	KDPOF	KDPOF	X
Donthu	Suresh	Corning	Corning	X
Eek	Magnus	Volvo Cars	Volvo Cars	
Felgenhauer	Alexander	Yazaki	Yazaki	X
Ferretti	Vincent	Corning	Corning	X
Fortusini	David	Corning	Corning	
Fukuoka	Takashi	AutoNetworks Technologies Ltd.	AutoNetworks Technologies Ltd.; Sumitomo Electric Industries, Ltd.	X
Giovanne	Laura	Broadcom	Broadcom	
Glanzner	Martin	SEI Antech-Europe GmbH	SEI Antech-Europe GmbH	
Gomez	Chisato	Nitto Denko Corporation	Nitto Denko Corporation	X
Goto	Hideki	Toyota Motor Corporation	Toyota Motor Corporation	X
Grow	Robert	Robert M. Grow Consulting	RMG Consulting, KDPOF	X
Hajduczenia	Marek	Charter Communications	Charter Communications	
Harshbarger	Douglas	Corning Incorporated	Corning Incorporated	X
Hartmann	Stephan	Siliconally GmbH	Siliconally GmbH	
Hayashi	Takehiro	HAT Labs	HAT Labs	X
HIRASE	Hidenari	AGC	AGC	X
Horrmeyer	Bernd	Phoenix Contact	Phoenix Contact	
Huang	David	Broadcom	Broadcom	X
Huang	Shaowu	Marvell	Marvell	
Hyakutake	Yasuhiro	Adamant Namiki Precision Jewel	Adamant Namiki Precision Jewel	X
Isono	Hideki	FOC	FOC	
Kadry	Haysam	Ford Motor Company	Ford Motor Company	X
KAGAMI	Manabu	NI Tech	NI Tech	X
Kazuhiko	Ishibe	Anritsu	Anritsu	
Kamino	John	OFS	OFS	
Kawahara	Keisuke	Furukawa Electric	Furukawa Electric	X
KIKUTA	Tomohiro	Adamant Namiki Precision Jewel	Adamant Namiki Precision Jewel	X
Kim	Joshua	Hirose USA	Hirose USA	
King	Roger	TRUMPF Photonic Components	TRUMPF Photonic Components	X

Kobayashi	Shigeru	AIO Core	AIO Core	X
Koeppendoerfer	Erwin	Leoni	Leoni	
Kondo	Taiji	MegaChips	MegaChips	X
Law	David	HPE	HPE	X
Lewis	David	Lumentum	Lumentum	X
Liu	Karen	Lightwave	Lightwave	
Lee	Bernard	Senko	Senko	
Lee	Sylvanus	Leviton	Leviton	
Lingle	Robert	OFS	OFS	
Malicoat	David	Malicoat Networking Solutions	Senko Advanced Components	X
Martino	Kjersti	Inneos	Inneos	X
Marques	Flavio	Furukawa electric	Furukawa Electric	
Masuda	Takeo	OITDA/PETRA	OITDA/PETRA	
McMillan	Larry	Western Digital	Western Digital	
Mueller	Harald	Endress + Hauser	Endress + Hauser	
Mueller	Thomas	Rosenberger	Rosenberger	
Murty	Ramana	Broadcom	Broadcom	X
Nakagawa	Hideki	AGC	AGC	
New	Anthony	Prysmian Group	Prysmian Group	X
Nicholl	Gary	Cisco	Cisco	
Nikolich	Paul	802 Chairman	802 Chairman	X
Niihara	Yoshihiro	Fujikura	Fujikura	
Ogura	Ichiro	Petra	Petra	X
Omori	Kumi	NEC	NEC	
Ortiz	David	KDPOF	KDPOF	X
Pandey	Sujan	Huawei	Huawei	
Pankert	Joseph	TRUMPF Photonic Components	TRUMPF Photonic Components	X
Pardo	Carlos	KDPOF	KDPOF	X
Pérez-Aranda	Rubén	KDPOF	KDPOF	X
Pham	Phong	EastPoint	EastPoint	
Piehler	David	Dell	Dell	
Pimpinella	Rick	Panduit	Panduit	
Pinzón	Plinio	KDPOF	KDPOF	X
Pitwon	Richard	Resolute Photonics	Resolute Photonics	X
Preis	Roland	MD Elektronik	MD Elektronik	X
Reinhard	Michael	SEI Antech-Europe GmbH	SEI Antech-Europe GmbH	
Sambasivan	Sam	AT&T	AT&T	
Savi	Olindo	Hubbell Incorporated	Hubbell Incorporated	
Sawano	Hiroshi	OITDA		
Sayre	Edward	Samtec	Samtec	
Shukla	Priyank	Synopsys	Synopsys	
Shigematsu	Masayuki	Sumitomo Electric	Sumitomo Electric	
Shiino	Masato	Furukawa Electric	Furukawa Electric	X
Shukla	Priyank	Synopsys	Synopsys	
Silvano de Sousa	Jonathan	GG-Group	GG-Group	X
Sun	Wensheng	Marvell	Marvell	X
Sun	Yi	OFS	OFS	
Suzuki	Yasuo	KDPOF Japan	KDPOF	X
Swanson	Steve	Corning Inc.	Corning Inc.	X
Takahashi	Ryutaro	Senko	Senko	X
Takahashi	Satoshi	POF Promotion	POF Promotion	X
Takahashi	Tadashi	Nitto Denko Corporation	Nitto Denko Corporation	X
Takayama	Kazuya	Nitto Denko Corporation	Nitto Denko Corporation	X
Tan	I-Hsing	Broadcom	Broadcom	
Theodoras	James	HG Genuine	HG Genuine	
Torres	Luisma	KDPOF	KDPOF	X
Tsujita	Yuichi	Nitto Denko Corporation	Nitto Denko Corporation	X

Tsuzaki	Nozomi	Independent	Independent	X
Ueno	Yuto	Sumitomo	Sumitomo	X
WATANABE	Yuji	AGC	AGC	X
Wendt	Mattias	Signify	Signify	
Wienckowski	Natalie	General Motors	General Motors	X
Wiesner	Michael	Trumpf	Trumpf	
Xu	Xing	Huawei	Huawei	X
Yamada	Osamu	Yazaki	Yazaki	
Yasui	Hideshi	AGC	AGC	X
Yonezawa	Kenji	AGC	AGC	X
Yurtin	John	APTIV	APTIV	
Zhiwei	Yang	ZTE	ZTE	
Zhu	Liang	Marvell	Marvell	

Tuesday, 15th June 2021, 12:00 (noon) UTC

The meeting was called to order at approximately 12:02 UTC Tuesday 15th June 2021
Chaired by Robert Grow, IEEE P802.3cz Task Force Chair.

Mr. Grow presented *Agenda and General Information* (https://www.ieee802.org/3/cz/public/15_jun_2021/Agenda_3cz_01_150621.pdf).

Mr. Grow presented the agenda for the meeting. The presentations were switched to be shown before the D1.1 comment resolution. Mr. Grow announced that the presentation from Mr. Takayama is still not ready. IEEE legal department must approve the content before the presentation, as it includes comparative cost data. Mr. Grow also asked participants of future relative cost presentations to submit them well in advance because it could take a couple of weeks to be reviewed by the IEEE legal department.

The modified agenda was approved by unanimous consent.

Mr. Grow asked the audience if there was anybody from the press. No one responded to the call.

Mr. Grow issued the call for essential patent claims. No one responded to the call. He also presented the slides on the IEEE Copyright Policy and participation guidelines.

Mr. Pinzón asked to present *Modal noise vs misalignment losses in MMFs connectors* (https://www.ieee802.org/3/cz/public/15_jun_2021/pinzon_3cz_01_150621.pdf). This presentation shows the dependence between the insertion losses due to misalignments in Butt-coupled and Expanded-beam connectors with the Modal Noise. Mr. Pinzón also showed that tilt misalignment in EBO and radial displacement in BC are equivalent, and that it is also true for the radial displacement in EBO and the tilt misalignment in EC. Therefore, the manufacturing tolerances for EBO and BC connectors will be very similar. Several questions were made and Mr. Pinzón provided answers.

Mr. Murty asked to present *850 nm VCSEL Automotive Applications* (https://www.ieee802.org/3/cz/public/15_jun_2021/giovane_3cz_01a_150621.pdf). This presentation shows an example of 850nm VCSEL operation @ 50 Gb/s using PAM4 in the automotive temperature range with equalization in the transmitter side. It also shows an estimation of the VCSEL reliability (wear out failure mode) considering an equivalent number of years at 70ºC given a differential temperature between ambient and VCSEL substate of 10 and 20K jointly with different bias current. Mr. Murty said that for the 850nm VCSEL Data Center case, the random failure mode is more frequent than the wear out failure mode. A number of questions regarding the accuracy of extrapolating 850nm data center random failure mode data or 940/980nm sensors random failure mode data to the automotive case were made, and Mr. Murthy provided answers.

Mr. Pérez-de-Aranda asked to present *VCSEL reliability comparison. Annex: possible cause behind results of [4]* (https://www.ieee802.org/3/cz/public/15_jun_2021/perezaranda_3cz_01_150621_vcsel_reliability_annex.pdf) This presentation shows the possible cause behind the difference between VCSEL

reliability results of 850nm and 980nm shown in previous TF meetings. Mr. Pérez-de-Aranda showed that the assumptions made on the 850nm reliability data extrapolated from data center 850nm VCSELs shown in (https://www.ieee802.org/3/cz/public/8_jun_2021/giovane_3cz_01_080621.pdf) are not compatible with physics governing VCSELs. Specifically, the voltage drop of the VCSEL device is not constant with the biasing current. Additionally, the thermal resistance is not constant with the temperature. Mr. Pérez-de-Aranda pointed out that, even considering these wrong assumptions, the required bias current to reach the reliability level required by the automotive application for the 850nm VCSEL shown in (https://www.ieee802.org/3/cz/public/8_jun_2021/giovane_3cz_01_080621.pdf) should be 5 mA. Mr. Pérez-de-Aranda asked Mr. Murty for more visibility in the above mentioned 850nm VCSEL parameter dynamics to obtain comparable reliability data for 980 and 850nm VCSEL devices. Several questions were made and Mr. Pérez-de-Aranda provided answers. During discussions, Mr. Murty said that 980nm VCSELs have better wear out failure behavior, but random failures dominate and are difficult to collect. Mr. Pankert mentioned that extensive experience over 940/980nm random failures already exist in VCSELs for sensor applications.

Mr. Swanson asked to present *Straw Polls* (https://www.ieee802.org/3/cz/public/15_jun_2021/swanson_3cz_01b_150621_straw_polls.pdf). The presentation shows a list of 9 Straw Polls related with the several PMD options that have been discussed in the TF. Mr. Swanson reminded the participants that several PMD options have been presented, but with different amount of technical and comparative cost data behind each one. Mr. Swanson present his vision about the situation and will present the Straw Polls for voting in the next TF meeting. Some questions were made, and Mr. Swanson provided answers.

Mr. Grow asked to defer some of the question and answers about Mr. Swanson's presentation to next meeting, and proposed to start with this discussion next week.

Having exhausted the available time, D1.1 Comment Resolution was deferred also to the next meeting.

The meeting was adjourned at approximately 14:08 UTC.