# Minutes Multi-Gigabit Optical Automotive Ethernet (OMEGA) Task Force Interim 21, 22, 28 and 29 September 2021

Attendance list as recorded in Webex participant list

Last Name	First Name	Employer	Affiliations	September	September	September	September
Abbott	lohn	Corning	Corping	213t	2211u V	20th	2501
Abboll	Sami	Volkswagen AG	Volkswagen AG	Λ	~	Λ	~
Amamiya	Vasushi	MegaChins	MegaChins				
Andrae	Stefan	SEL Antech-Europe	SELAntech-Europe GmbH	x			
	otenan	GmbH		~			
Aono	Michikazu	Yazaki	Yazaki	Х			
Araki	Nobuyasu	Yazaki	Yazaki				
Bergner	Bert	TE Connectivity	TE Connectivity				
Boyer	Rich	APTIV	APTIV				
Barbero	Fernando	KDPOF	KDPOF	Х	Х	Х	Х
Bordogna	Mark	Intel	Intel				
Borda	Jamila	BMW	BMW		Х	Х	Х
Brooks	Paul	Viavi Solutions	Viavi Solutions				
Bruckman	Leon	Huawei	Huawei				
Castro	Jose	Panduit	Panduit				
Chang	Jae-yong	Keysight	Keysight	Х		х	х
Choudhury	Mabud	OFS	OFS			Х	Х
Chuang	Keng Hua	HPE	HPE				
Cuesta	Emilio	TE Connectivity	TE Connectivity	Х		Х	
Dittmann	Markus	KDPOF	KDPOF	Х	х	Х	х
Donthu	Suresh	Corning	Corning	Х	Х	х	Х
Dube	Кае	UNH-IOL	UNH-IOL				
Eek	Magnus	Volvo Cars	Volvo Cars				
Felgenhauer	Alexander	Yazaki	Yazaki				
Fellhauer	Felix	Bosch	Bosch				
Ferretti	Vincent	Corning	Corning	Х	х	Х	
Fortusini	David	Corning	Corning				
Fukuoka	Takashi	AutoNetworks	AutoNetworks Technologies Ltd.:			Х	Х
		Technologies Ltd.	Sumitomo Electric Industries, Ltd.				
Giovanne	Laura	Broadcom	Broadcom				
Glanzner	Martin	SEI Antech-Europe GmbH	SEI Antech-Europe GmbH	х			
Gomez	Chisato	Nitto Denko Corporation	Nitto Denko Corporation	Х	х	х	х
Goto	Hideki	Toyota Motor	Toyota Motor Corporation	x	x	x	x
0010	indeki	Corporation		~	~	~	~
Grow	Robert	Robert M. Grow	RMG Consulting, KDPOF	Х	х	х	х
		Consulting					
Haasz	Jodi	IEEE-SA	IEEE-SA	Х	х	х	х
Hajduczenia	Marek	Charter	Charter Communications				
.,		Communications					
Harshbarger	Douglas	Corning	Corning Incorporated	Х	х	х	х
Hartmann	Stophon	Siliconally CmbH	Siliconally GmbH				
Havashi	Takohiro			×	v	v	v
	Hidopari			×	×	×	~
HIRASE	Bornd	AGC Bhoonix Contact	AGC Rhoaniy Contact	^	^	^	^
Нирра	David	Priodcom	Broadcom	_			v
Huang	Chaowin	Margall	Maryall				^
Hyakudai	Toshihico	Sony		+		+	+
Hyakutaka	Vacubica	Adamant Namiki	Adamant Namiki Prosicion Joural	v	v	v	v
пуакитаке	rasuniro	Precision Jewel	Audmant Namiki Precision Jewel	~	~	X	X
Isono	Hideki	FOC	FOC	Х	х	Х	Х
Jiménez	Andy	WESCO	WESCO				

		Ford Motor		Х	Х	Х	Х
Kadry	Haysam	Company	Ford Motor Company				
KAGAMI	Manabu	NI Tech	NI Tech	х	Х	Х	х
Kazuhiko	Ishibe	Anritsu	Anritsu				
Kamino	John	OFS	OFS		х	Х	
Kawahara	Keisuke	Furukawa Electric	Furukawa Electric	х	х	Х	х
ΚΙΚUTA	Tomohiro	Adamant Namiki	Adamant Namiki Precision Jewel	Х	Х	Х	х
-		Precision Jewel					
Kim	Joshua	Hirose USA	Hirose USA				
King	Roger	TRUMPF Photonic	TRUMPF Photonic Components			Х	
5	- 0 -	Components					
Kinningham	Alan	I-PEX	I-PEX				
Kobavashi	Shigeru	AIO Core	AIO Core	х	Х	Х	х
Koeppendoerfer	Erwin	Leoni	Leoni			Х	х
Kondo	Taiii	MegaChips	MegaChips	х	х	х	х
Kumadayazaki	Taketo			X			
Kurashima	Kazuvoshi	AGC	AGC	X	х	Х	х
Lackner	Hans	OoSCom GmbH	OoSCom GmbH			X	
Law	David	HPF	HPF	×	x	~	
Lewis	David	Lumentum	Lumentum	X	X	x	x
Liu	Karen	Lightwave	Lightwave	~	Λ	~	~
	Rorpard	Sonko	Sonko				
Lee	Sulvanus	Joviton					
Lee	Sylvarius			-			
Lingle	Robert	UFS	OFS	×	V	×	Y
Malicoat	David	Malicoat	Senko Advanced Components	X	X	X	X
		Networking					
Marilian	Ki a sali	Solutions		×	X		
Martino	Kjersti	Inneos	Inneos	X	X	X	X
Marques	Flavio	Furukawa electric					
Masuda	Takeo	OITDA/PETRA	OITDA/PETRA	X	X	X	X
Matheus	Kirsten	BMW	BMW				
McMillan	Larry	Western Digital	Western Digital				
Mueller	Harald	Endress + Hauser	Endress + Hauser				
Mueller	Thomas	Rosenberger	Rosenberger				
Murty	Ramana	Broadcom	Broadcom	Х		X	Х
Nakagawa	Hideki	AGC	AGC	Х	Х	Х	Х
New	Anthony	Prysmian Group	Prysmian Group				
Nicholl	Gary	Cisco	Cisco				
Nikolich	Paul	802 Chairman	802 Chairman				
Niihara	Yoshihiro	Fujikura	Fujikura	Х			
Ogura	Ichiro	Petra	Petra	Х	Х	Х	Х
Omori	Kumi	NEC	NEC				Х
Ortiz	David	KDPOF	KDPOF				
Pandey	Sujan	Huawei	Huawei		Х		
Pankert	Joseph	TRUMPF Photonic	TRUMPF Photonic Components			Х	х
		Components					
Pardo	Carlos	KDPOF	KDPOF	Х	Х	Х	Х
Parsons	Earl	Commscope	Commscope				
Peng	Semmy	Huawei	Huawei			Х	х
Pérez-Aranda	Rubén	KDPOF	KDPOF	Х	Х	Х	Х
Peteranderl	Ralf	Rosenberger	Rosenberger				
Petrarca	Ryan	TDK	TDK				Х
Pham	Phong	EastPoint	EastPoint				
Piehler	David	Dell	Dell	Х			
Pimpinella	Rick	Panduit	Panduit	Х			х
Pinzón	Plinio	KDPOF	KDPOF				
Pitwon	Richard	<b>Resolute Photonics</b>	Resolute Photonics	Х	Х		
Powell	William	Independent	Independent				Х
Preis	Roland	MD Elektronik	MD Elektronik	Х	Х	Х	х
		SEI Antech-Europe		Х			
Reinhard	Michael	GmbH	SEI Antech-Europe GmbH				
		Beckhoff					
Retting	Thomas	Automation	Becjhoff Automation				

Sambasivan	Sam	AT&T	AT&T	Х	Х	Х	Х
		Hubbell					
Savi	Olindo	Incorporated	Hubbell Incorporated				
Sawano	Hiroshi	OITDA		Х		Х	Х
Sayre	Edward	Samtec	Samtec				
Schmalzigaug	Thomas	HUBER+SUHNER	HUBER+SUHNER	Х			
Shukla	Priyank	Synopsys	Synopsys				
Shigematsu	Masayuki	Sumitomo Electric	Sumitomo Electric	Х	Х	Х	х
Shiino	Masato	Furukawa Electric	Furukawa Electric	Х	Х	Х	Х
Shukla	Priyank	Synopsys	Synopsys				
Silvano de Sousa	Jonathan	GG-Group	GG-Group	Х			
Simms	Bill	NVIDIA	NVIDIA	Х	Х	Х	Х
Su	Charles	Huawei	Huawei		Х	Х	х
Sun	Wensheng	Marvell	Marvell	Х	Х	Х	х
Sun	Yi	OFS	OFS				
Suzuki	Yasuo	KDPOF Japan	KDPOF		Х	Х	Х
Swanson	Steve	Corning Inc.	Corning Inc.	Х	Х	Х	Х
Takahashi	Ryutaro	Senko	Senko				
Takahashi	Satoshi	POF Promotion	POF Promotion	Х	Х	Х	Х
Takahashi	Tadashi	Nitto Denko	Nitto Denko Corporation	Х	Х	Х	Х
		Corporation					
Takayama	Kazuya	Nitto Denko	Nitto Denko Corporation	Х	Х	Х	Х
-	-	Corporation					
Tan	I-Hsing	Broadcom	Broadcom				
Theuerkom	Thomas	Corning	Corning				
Theodoras	James	HG Genuine	HG Genuine				
Torres	Luisma	KDPOF	KDPOF	Х	Х	Х	Х
Tsujita	Yuichi	Nitto Denko	Nitto Denko Corporation	Х	Х	Х	Х
		Corporation					
Tsuzaki	Nozomi	Independent	Independent	Х			
Ueno	Yuto	Sumitomo	Sumitomo	Х	Х	Х	Х
Vanderlaan	Paul	UL LLC	UL LLC	Х			Х
Walsh	Thomas	KDPOF	KDPOF	Х	Х		
WATANABE	Yuji	AGC	AGC	Х	Х	Х	Х
Wendt	Mattias	Signify	Signify				
Wienckowski	Natalie	General Motors	General Motors	Х	Х	Х	Х
Withey	James	Fluke	Fluke			Х	Х
Wiesner	Michael	Trumpf	Trumpf				
Xu	Xing	Huawei	Huawei			Х	Х
Yamada	Osamu	Yazaki	Yazaki				
Yang	Zhiping	Waymo	Waymo				Х
Yang	Yumeng	Huawei	Huawei				
Yasui	Hideshi	AGC	AGC	Х	Х	Х	Х
Yonemura	Masatoshi	NITech	NITech				
Yonezawa	Kenji	AGC	AGC				
Young	James	Commscope	Commscope				
Yurtin	John	APTIV	APTIV			Х	Х
Zhiwei	Yang	ZTE	ZTE				
Zhong	Qiwen	Huawei	Huawei				
Zhu	Liang	Marvell	Marvell				
i							

## Tuesday, 21st September 2021, 12:00 (noon) UTC

The meeting was called to order at approximately 12:01 UTC Tuesday 21st September 2021 Chaired by Robert Grow, IEEE P802.3cz Task Force Chair.

Mr. Grow presented *Agenda and General Information* (https://ieee802.org/3/cz/public/sep 2021/Agenda 3cz 01 0921.pdf).

Mr. Grow presented the agenda for the meeting. The agenda was approved by unanimous consent.

Mr. Grow moved to approve TF Ad Hoc and Interim minutes through July 2021. The minutes were 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. Swanson asked to present *Proposed IEEE 802.3cz PMD, MDI and Media Baseline Text for 10G and 25G O-band* 

(https://ieee802.org/3/cz/public/sep 2021/swanson 3cz 01 0921 A%20Review%20of%20PMD% 200ptions.pdf). This presentation is a review of the PMDs presented in the 802.3cz TF. Several aspects of the different PMDs have been compared (broad market potential, distinct identity, technical feasibility and economic feasibility) that correspond to the TF 802.3cz CSD. The presentation stated that appears to be no opposition to including PMD based on VCSEL 980 nm + OM3, and that the other PMD proposals do not address all of TF objectives and that do not meet the TF commitments to IEEE 802 in the TF CSD responses. Mr. Grow said that he expects continued discussion of proposals deemed to be inconsistent with approved TF CSD and Objectives, will only be allowed in debate on motions to ask the 802.3 WG to change CSD and/or objectives, or to split the project through PAR modifications and a new project. An open discussion started among several TF participants about CSD, distinct identity, and the possible impact on the TF work among others. Mr. Swanson and Mr. Grow provided answers to questions.

Mr. Abbott asked to present Fiber requirements for 802.3cz GI-POF

(https://ieee802.org/3/cz/public/sep 2021/abbott 3cz 01 0921 fiber requirements GI POF.pdf). This presentation shows the difference between the OM3 fiber validation and testing status versus GI-POF fiber. The summary of this presentation is that the GI-POF option is not ready. Several OM3 fiber aspects were remarked, like the presence of this fiber in IEEE standards in last 20 years, covering speeds from 10 Gb/s until 400 Gb/s and based on detailed round-robin test and validation among several independent vendors, and consensus about the relationship between VCSEL and OM3 fiber. On the other hand, GI-POF-based PMD presents several missing pieces about EMB definition and its relationship with the VCSEL launch condition, concerns about the short length EMB, and the lack of round-robin validation of GI-POF fiber and the combination of VCSEL and GI-POF fiber. Multiple comments and questions were made, and Mr. Abbott provided answers.

Having exhausted the scheduled presentations for today, the meeting was recessed at approximately 13:45 UTC.

### Wednesday, 22nd September 2021, 12:00 (noon) UTC

The meeting was called to order at approximately 12:00 UTC Wednesday 22nd September 2021 Chaired by Robert Grow, IEEE P802.3cz Task Force Chair.

Mr. Grow presented *Agenda and General Information* (https://ieee802.org/3/cz/public/sep\_2021/Agenda\_3cz\_01\_0921.pdf).

Mr. Grow noted the agenda for the meeting was approved during the opening teleconference.

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. Grow said that, until now, discussions about proposals that does not fulfill all TF objectives and/or CSD responses have been allowed. However, from now, only discussions about proposals outside our TF CSD and objectives, will be allowed unless as part of a discussion to modify TF objective or CSD responses. Mr. Grow reminded the TF that the change of TF objectives and/or CSD requires 802.3 WG approval.

Mr. Law indicated general support of Mr. Grow's statements.

Mr. Pérez-de Aranda provided an historical overview of system reliably presentations of the different PMD options during Study Group and Task Force.

Mr. Pitwon asked to present "Silicon photonics economic feasibility and optical fiber interconnect relative cost analysis for automotive applications" (

https://ieee802.org/3/cz/public/sep 2021/ogura 3cz 01 0921 SiPh EconomicFeasibility.pdf). This presentation shows figures about economic feasibility of silicon photonics (SiPh) solution. It includes a comparison between data center VCSEL based transceiver module and SiPh based transceiver module. Many questions were made about distinct identity, reliability, the availability of SiPh processes qualified for automotive, the use of the same transceiver integration level for data centers and automotive solutions, market segmentation, impact on the market of having several options, and other points – both pro and con questions/comment. Mr. Pitwon and Mr. Grow provided answers to various questions.

Mr. Torres asked to present the ToDo list. Mr. Torres asked Mr. Pitwon and Mr. Ogura about the scheduled presentations on Silicon Photonics + OM2/OM3 for September ("Attenuation and bandwidth measurements with consensus among independent laboratories at 1310 nm" and "50 Gb/s over 15m + 2IL link budget in the temperature range"). Mr. Ogura answered that the data for the link budget, attenuation and bandwidth have been delayed because the pandemic situation, and that these presentations are delayed without committed date. Mr. Abbott asked to have at least initial bandwidth measurements and launch condition at 1310 nm, in addition to a launch condition consensus definition at 1310 nm. Mr. Ogura agreed to provide two presentations about these topics by 26 October.

Mr. Torres asked Mr. Ogura about the presentations that are expected regarding SiPh GIPOF-based PMD. Mr. Ogura asked that he talked with Mr. Takayama and they agreed to withdraw this PMD from a future TF proposal.

Mr. Torres asked Mr. Takayama about the presentations that are expected regarding VCSEL + GIPOFbased PMD, as no presentation date has been committed yet. Mr. Takayama said that the "Bandwidth and attenuation measurements with consensus among independent laboratories at 850 nm and 980 nm" and "Link budget revision" can be shown by 19 January 2022.

The ToDo list was updated with the new information provided.

Mr. Grow reminded the TF participants that there are two TF Interim meetings scheduled next week (28 and 29 Sept).

Having exhausted the scheduled time, the meeting was recessed at approximately 13:58 UTC.

#### Tuesday, 28th September 2021, 12:00 (noon) UTC

The meeting was called to order at approximately 12:02 UTC Tuesday 28th September 2021 Chaired by Robert Grow, IEEE P802.3cz Task Force Chair.

Mr. Grow again showed the *Agenda and General Information* (https://ieee802.org/3/cz/public/sep 2021/Agenda 3cz 01 0921.pdf).

Mr. Grow presented the agenda for the meeting approved in the first interim series teleconference. There was no objection to additions to the presentation list.

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. Abbott asked to present Transceiver Requirements for 802.3cz: SiP

(https://ieee802.org/3/cz/public/sep 2021/abbott 3cz 02 0921 transceiver requirements SiP.pdf ). This presentation shows the challenges for including SiP and VCSEL in the same standard, including the need to study the launch conditions when 1310 nm over MMF and SiP is used, and the distinct identity requirements in the CSD. Many questions about the coupling of SiP into MMF fiber, economic feasibility, the amount of time needed to collect data about launching conditions, and if the identified technical work fits in the available project time were made. Mr. Abbott provided answers. Mr. Grow showed the P802.3cz approved PAR, CSD and Objectives, and remind the TF participants that any PMD proposal shall fulfil the relevant objectives and shall also be consistent with our approved CSD responses. Motions that propose changes on PAR, Objectives and/or CSD are also possible to make PMD proposal to be compliant with the TF documents.

Mr. Grow showed a presentation with a new timeline proposal. The TF was unable to generate a technically complete draft to be voted by WG in September 2021, so the current timeline is obsolete. After some discussion, Mr. Grow announced that the presentation will be posted, and a motion to decide how the timeline should be modified will be discussed in next meetings.

Having exhausted the agenda for today, the meeting was recessed at approximately 13:44 UTC.

#### Wednesday, 29th September 2021, 12:00 (noon) UTC

The meeting was called to order at approximately 12:01 UTC Wednesday 29th September 2021 Chaired by Robert Grow, IEEE P802.3cz Task Force Chair.

Mr. Grow presented *Agenda and General Information* (https://ieee802.org/3/cz/public/sep 2021/Agenda 3cz 01 0921.pdf).

Mr. Grow reviewed the agenda for the meeting approved Sep 21. The 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. Murthy asked to present *Source Wavelength for Low Cost Automotive Optical Links* (<u>https://www.ieee802.org/3/cz/public/sep\_2021/murty\_3cz\_01\_0921.pdf</u>). This presentation is a proposal for VCSEL wavelength specification from 850 to 980 nm. Questions and long discussion about reliability at high temperature, anti-reflection coating, interoperability, link budget, relative cost, assembly, GIPOF bandwidth and launch condition, parallelism with data center applications, and other topics followed. Mr. Murthy provided answers.

In the frame of the presentation discussion, Mr. Swanson asked the Chair about the compliance of the PMD GIPOF proposal with the TF objectives. Mr. Grow said that GIPOF proposal does not fulfill the current TF objectives, and that, to be considered, a motion to change the TF objectives is needed. Mr. Grow announced also that future presentation and discussion about topics considered out of scope because of TF PAR, CSD responses and objectives may not be allowed except in the context of motions to modify one or more of P802.3cz project documents (PAR, CSD responses and/or objectives).

Mr. Watanabe said that he does not agree with the Chairman statement. Mr. Grow informed Mr. Watanabe that he can appeal the Chair position as stated in the Robert's Rules and IEEE 802 WG P&P.

Mr. Grow presented briefly the next TF meetings, and announced that the next one on 12 October will be a TF Interim meeting. Mr. Grow encouraged TF participants to present motions about the PMD baselines on the table.

Having exhausted the scheduled time, the meeting was adjourned at approximately 14:06 UTC.

Recording secretary: Luisma Torres.