C/ 66	SC 66.4.	1	P103	L 40	# I-179	C/ 166	SC 166.2		P66	L	# 1-177	
Mcclellan	, Brett	-	Marvell Semi	conductor, Inc.		Mcclellan,	Brett	М	arvell Semi	conductor, Inc.		
Comment	Type T R	Commen	nt Status R		EEE	Comment	Type TR	Comment Sta	tus R		Interfaces definition	
The c 0. I de	current definition't believe th	on of PHD.CAP. is could actually	LPI does not pre work with dynan	clude dynamic cha nic changes while	anging between 1 and the link is up.	There Witho	is no definition ut a definition of	for PMA interfaces f these interfaces, f	to the PCS his specific	s. ation is technica	ally incomplete.	
Suggeste	dRemedy					Suggested	dRemedy					
on page 103 line 40 insert the following text "The value of PHD.CAP.LPI shall not change." Response Response Status U						Insert a new subclause 166.2.1 Technology Dependent Interface with definitions for PMA interfaces.						
												REJE
The is version	ssue raised b on.	y the author of th	e comment is al	ready covered by	the current draft	This F compl	CT. PHY specificatio eteness and int	n makes use of se eroperability.	vice interfa	ces where need	ed for technical	
In page 69, line 10: "PHD.CAP.LPI is used by the PHY to advertise that Energy-Efficient Ethernet (EEE) is						Inclusion of a PMA interface is not necessary for an implementer to build a compliant and interoperable PHY implementation.						
In su	In subclause 45.2.3.90.4 it is stated:						Note that 802.3cz does not specify Autonegotiation, and therefore primitives specified in other clauses to support this feature (i.e, Clause 97 and 98) are not needed.					
"Sett	"Setting bit 3.2348.0 to one shall enable the advertisement of local PHY EEE ability (see			C/ 166	SC 166.2		P 66	L 1	# <u>I</u> -176			
166.4). Setting bit	3.2348.0 to zero	shall prevent est	tablishment of EEI	E operation with the	Mcclellan,	Brett	М	arvell Semi	conductor, Inc.		
link p 45.2.3	artner. If the I 3.91.14) settii	BASE-U PHY do na bit 3.2348.0 h	es not have EEE as no effect. Cha	ability (bit 3.2349	.0 = 0, see ertisement enable	Comment	Type TR	Comment Sta	tus R		Interfaces definition	
value shall only take effect after a PMA reset (see 166.3.4.1). Bit 3.2348.0 has no specified default value."						There is no definition for Technology Dependent Interfaces link_control and link_status which are used throughout Clause 166 without indicating where link_control comes from, or where link_status goes to. Without a definition of these interfaces, this specification is technically incomplete.						
						Suggested	dRemedy					
						Insert link_c	a new subclaus	e 166.2.1 Technol status	ogy Depend	dent Interface wi	th definitions for	
						Response		Response Stat	us U			
						REJE	CT.					
						This P compl	PHY specificatio eteness and int	n makes use of se eroperability.	vice interfa	ces where need	ed for technical	
						Auton (i.e, C	egotiation, and t lause 97 and 98	therefore primitives 3) are not needed.	specified i	n other clauses	to support this feature	
						link_c registe	ontrol and link_s er bits.	status are mapped	in subclaus	e 166.13 (Table	: 166-22) to MDIO	
) (h - i i			· · · · · · · · · · · · · · · · · · ·		(!			01 13			
. 1 PE: 1 P	k/technical re	juirea ⊨K/ealtor	iai required GR/	general required	i/lechnical E/editorial G	general			C/ 16	0	Page 1 of 4	

SC 166.2

Mcclellan, Brett

C/ 166

P**66**

Marvell Semiconductor, Inc.

L1



Interfaces definition

Comment Type TR Comment Status A

This PHY specification lacks a definition of service primitives and interfaces between sublayers.

Without a definition of these interfaces, this specification is technically incomplete.

SuggestedRemedy

Insert a new subclause 166.2 2.5GBASE-AU,

5GBASE-AU, 10GBASE-AU, 25GBASE-AU, and 50GBASE-AU service primitives and interfaces.

Response

ACCEPT IN PRINCIPLE.

SC 166.2

This PHY specification makes use of service interfaces where needed for technical completeness and interoperability.

Response Status U

However, the three first paragraphs of the subclause 166.2.1 can be changed to mirror other BASE-R clauses.

Page 66 lines 5 to 7,

Change "The 2.5GBASE-AU, 5GBASE-AU, or 10GBASE-AU PCS couples a 10 Gigabit Media Independent Interface (XGMII), see Clause 46, to the 2.5GBASE-AU, 5GBASE-AU, or 10GBASE-AU Physical Medium Attachment (PMA) sublayer."

to

"The PCS service interface of 2.5GBASE-AU, 5GBASE-AU, or 10GBASE-AU is the 10 Gigabit Media Independent Interface (XGMII), which is defined in Clause 46. The 2.5GBASE-AU, 5GBASE-AU, or 10GBASE-AU PCS provides all services required by the XGMII and couple it to the 2.5GBASE-AU, 5GBASE-AU, or 10GBASE-AU Physical Medium Attachment (PMA) sublayer."

Page 66 lines 9 to 10,

Change "The 25GBASE-AU PCS couples a Media Independent Interface for 25 Gb/s operation (25GMII), see Clause 106, to the 25GBASE-AU PMA sublayer." to "The 25CBASE AU PCS consists interface in the Media Independent Interface for 25 Cl

"The 25GBASE-AU PCS service interface is the Media Independent Interface for 25 Gb/s operation (25GMII), which is defined in Clause 106. The 25GBASE-AU PCS provides all services required by the 25GMII and couple it to the 25GBASE-AU PMA sublayer."

Page 66 lines 12 to 13,

Change "The 50GBASE-AU PCS couples a Media Independent Interface for 50 Gb/s operation (50GMII), see Clause 132, to the 50GBASE-AU PMA sublayer."

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn SORT ORDER: Clause, Subclause, page, line C/ 166 SC 166.2 Page 2 of 4 17/11/2022 10:06:43

to: "The 50GBASE-AU PCS service interface is the Media Independent Interface for 50 Gb/s operation (50GMII), which is defined in Clause 132. The 50GBASE-AU PCS provides all services required by the 50GMII and couple it to the 50GBASE-AU PMA sublayer."

C/ 166	SC 166.6.3.2	P116	L 40	# I-107
Murty, Ra	imana	Broadcom Ind	с.	
Comment	Type TR	Comment Status R		Wavelength
Cente justific pereza shoule	er wavelength (rang cation for not acce aranda_3cz_01b_(d be expanded to a	ye) is defined over the narro oting other source waveleng 080621_vcsel_reliability.pdf allow a wide range of supplie	w range of 970 - ths, such as the , are erroneous. ers to participate.	990 nm. The one given in The wavelength range
Suggestee	dRemedy			
Expar	nd the center wave	length range to 840 - 990 ni	m.	
Response	;	Response Status U		
REJE There The fo 108 w [begin Propo wavel https:/	CT. is no consensus t ollowing is backgro ithin the P802.3cz n proposed respons osal already discus ength range was n //www.ieee802.org	o make a change. und on multiple hours of dis Task Force (acting as the c se to #i-107] sed at Montreal plenary me ot reached (see /3/cz/public/jul_2022/Minute	ecussion on comi comment resoluti eting (July 2022) es_3cz_01_0722.	ments #i-107 and #i- on group). . Consensus to modify .pdf Motion #3 and
comm Range wavel 52-7. The T device and b out re	e of +/- 10 nm is co ength, i.e. C/138 1 X and RX characto e samples operatin ias current of up to liability cannot be	cz/D2.1). onsistent with other projects 38.7.1, Table 138-8. C/95 9 eristics have been derived w ig in a range of backside ter 0 8 mA. It was demonstrated achieved with 850nm VCSE	that use differen 5.7.1, Table 95-6 vith margin consident mperature betwee d during the proje L devices using	t nominal center 6. C/52 52.5.1, Table dering real 980nm en -40°C and +125°C ct that required wear- similar current

densities. It was also demonstrated that in order to marginally meet the wear-out reliability requirements, the bias current should be reduced < 5 mA in high temperature, therefore reducing the speed and optical power and increasing the RIN of the VCSEL devices, hence making much more difficult the PHY implementation. On top of that, it was also demonstrated that 980nm devices are much less dependent with temperature, so they present a much more uniform threshold current between -40 and 125°C. 850nm devices could be optimized for high temperature, but degrading (or making impossible) operation at low temperature and viceversa.

Technology for manufacturing 980nm VCSEL devices is widely available. It was developed during last decade for sensor devices. Producing reliable, high speed, low noise, and efficient VCSELs at 980nm is much easier than at 850nm. This will allow to expand the availability of manufacturers that can supply photonics for BASE-AU PHYs in automotive industry.

[end proposed response to #i-107]

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn SORT ORDER: Clause, Subclause, page, line

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presentations on the VCSEL reliability were made during comment resolution ussion (see https://www.ieee802.org/3/cz/public/oct_2022/murty_3cz_01_1022.pdf and s://www.ieee802.org/3/cz/public/oct_2022/perezaranda_3cz_02_1022_vcsel_rel.pdf), in tion to an in-depth discussion of the impact on system technology and testing when the elength range is extended as proposed in #i-107 and #i-108.

w Poll (all individuals attending allowed to vote) to accept the above proposed onse result: Yes 19 No 5 Abstain 8. on (only 802.3 voting members allowed to vote) to accept the above proposed onse failed: Yes 13 No 6 Abstain 5.

re was no other proposal for a response to the comment. Therefore it was concluded there is no consensus to make the change proposed by the comment.

C/ 166	SC	166.6.3.3	P117	L 40	# I-108
Murty, Ra	mana		Broadcom Ir	nc.	
Comment	Туре	TR	Comment Status R		Wavelength
Cente photo datac	er wavel detecto om.	length (rang	e) is defined over the narro detect a wide range of way	ow range of 970 - velengths have be	990 nm. "Rainbow" en widely used in
Suggeste	dReme	dy			
Expar	nd the c	enter wavel	ength range to 840 - 990 r	nm.	
Response	9		Response Status U		
REJE	CT.				
There	e is no c	onsensus to	o make a change.		
There	e is no c	onsensus to	o make a change. 		
The fo 108 w	The following is background on multiple 108 within the P802.3cz Task Force (act			scussion on com comment resoluti	ments #i-107 and #i- on group).
[beair	n propos	sed respons	e to #i-108]		

Proposal already discussed at Montreal plenary meeting (July 2022). Consensus to modify wavelength range was not reached (see

https://www.ieee802.org/3/cz/public/jul_2022/Minutes_3cz_01_0722.pdf Motion #3 and comment #32 to P802.3cz/D2.1).

Expanding the center wavelength range to 840 - 990nm will imply that all the components between light emission and reception, including the photodetector, have to be validated and qualified to meet all the requirements for the full range of spectrum. This includes coupling optics in TX and RX as well as inline connections and fiber. Assuming butt-coupling and physical contact connectivity, which can be wavelength agnostic, as a feasible solution for automotive application just because it is used in data-centers may be an erroneous assumption.

Expanded beam optics, physical contact, and air gap connections are under consideration by connector makers to supply a robust, low cost, and fully automated terminated optical connectivity technology to automotive industry based on OM3 fiber. In the implementation of optical coupling, lenses and EBO connections, wavelength dependent refractive index and absorption of used materials needs to be considered. If same materials have to support reflow soldering, automotive environmental and mechanical conditions and perform well in a much wider range of wavelengths, then we are imposing constraints that will limit the solutions and will finally increase the cost without necessity.

Transceiver is not only affected by the materials used for optical coupling but also photodetector.

[end proposed response to #i-108]

Two presentations on the VCSEL reliability were made during comment resolution discussion (see https://www.ieee802.org/3/cz/public/oct_2022/murty_3cz_01_1022.pdf and https://www.ieee802.org/3/cz/public/oct_2022/prezaranda_3cz_02_1022_vcsel_rel.pdf), in

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn SORT ORDER: Clause, Subclause, page, line

addition to an in-depth discussion of the impact on system technology and testing when the wavelength range is extended as proposed in #i-107 and #i-108.

Straw Poll (all individuals attending allowed to vote) to accept the above proposed response result: Yes 19 No 5 Abstain 8. Motion (only 802.3 voting members allowed to vote) to accept the above proposed response failed: Yes 13 No 6 Abstain 5.

There was no other proposal for a response to the comment. Therefore it was concluded that there is no consensus to make the change proposed by the comment.

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IEEE P802.3cz D3.1 Multi-Gigabit Optical Automotive Ethernet 1st Sponsor recirculation ballot comments

C/ 0	SC 0	Р	L	# R1-64
Wiencko	owski, Natalie	General Moto	ors Company	
Commer	nt Type GR	Comment Status A		Hyperlinks
The	re are no hyperlink	s in the document and there	are no bookm	arks.
Suggest	edRemedy			
Add	missing hyperlinks	s and add bookmarks.		
Respons	se	Response Status U		
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