C/ 1 S	SC 1.3	P 31	L <b>9</b>	# 232
Dawe, Piers		Nvidia		
Comment Type	e ER	Comment Status A		

In the standards world, there is no such thing as QSFP112, and no expectation that there will be a specification of that name. QSFP specifications are published by the SFF Committee (now part of SNIA), and are mostly independent of operating speed.

#### SuggestedRemedy

Delete "QSFP112", add the relevant SFF specifications: some of SFF-8661 SFF-8662 SFF-8672 SFF-8663 SFF-8683 SFF-8679 SFF-8636 REF-TA-1011 SFF-8665 (take advice from the SFF committee for which).

Response Response Status C

ACCEPT IN PRINCIPLE.

In 1.3, list the following normative references:

DSFP MSA Dual small form factor pluggable module, Rev. 1.0 September 12, 2018 OSFP MSA Specification for OSFP octal small form factor pluggable module, Rev 3.0 March 14th, 2020

QSFP+ - Specification for QSFP+ 28 Gb/s 4X Pluggable Transceiver Solution SFF-8665, Rev 1.9, June 29, 2015

QSFP-DD800 MSA QSFP-DD Specification for 800G operation, Rev 1.0 March 6, 2020 SFP+ Specification for SFP+ Module and Cage, SFF-8432, Rev 5.2a November 30, 2018 SFP-DD MSA SFP-DD Hardware Specification for SFP double density 2X pluggable transceiver, Rev 3.0 April 10, 2019

Throughout the draft... Replace "SFP112" with "SFP+" Replace "SFP112-DD" with "SFP-DD" Replace "QSFP112" with "QSFP+" Replace "QSFP112-DD" with "QSFP-DD800"

Implement with editorial license.

C/ 93A	SC 93A.1.2.4	P <b>198</b>	L <b>50</b>	# 132
Hidaka, Ya	asuo	Credo Semico	onductor	
Comment	Type <b>T</b>	Comment Status A		COM

Scattering parameter of the second transmission line segment  $S^{(12)}$  is used in EQ 93A-16b without its definition by new COM parameters  $z_p2$  and  $Z_c2$ .

### SuggestedRemedy

Insert the following statement at the end of 93A.1.2.3,

For clauses that includes a second package transmission line segment by parameters  $z_p2$  and  $Z_c2$ , the scattering parameters for the second package transmission line are defined by Equation (93A-12a), Equation (93A-13a) and Equation (93A-14a). The units of  $z_p2$  are mm.

 $rho2 = (Z_c2 - 2^*R_0) / (Z_c2 + 2^*R_0)$  (93A-12a)

 $s^{(12)_11(f)} = s^{(12)_22(f)} = rho2^{(1-exp(-gamma(f)^{2}z_p^2))} / (1 - rho2^{2}exp(-gamma(f)^{2}z_p^2))$  (93A-13a)

 $s^{12}_{1} = s^{12}_{1} = (1-rho^{2}) \exp(-gamma(f)^{*}z_{p2}) / (1 - rho^{2}exp(-gamma(f)^{*}z_{p2})) (93A-14a)$ 

The second transmission line scattering parameter matrix is then denoted as S^(I2).

Response Response Status C ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

C/ 120F	SC 120F.3.2.2	2 P <b>208</b>	L 10	# 169	C/ 120F	SC 120F.4.1	P 212	L 18	# 187
Ran, Adee	•	Intel			Ghiasi, Ali	I	Ghiasi Quant	tum/Inphi	
Comment	Туре <b>т</b>	Comment Status A		bucket	Comment	Type TR	Comment Status A		
"The re	eference impedar	nce for common-mode retur	n loss measuren	nents is 25 Ohm"	Norma	alized DFE taps	are larger than necessary		
Is this places mode)	statement helpful in existing clause return loss.	l (or even correct) for D-C c es. This clause does not dis	onversion? It doe cuss common-m	es not appear in similar node (to common-	<i>Suggested</i> The la ghiasi	<i>IRemedy</i> Irgest DFE taps _3ck_01_0620	observed for C2C channels B	1max=0.65 and	B2-B6(max)=0.1. See
Practic with a	cally, the conversi reference of 50 C	ion RL is obtained from sing	le-ended s-para	meter measurements	Response ACCE	PT IN PRINCIP	Response Status <b>C</b> LE.		
S <i>uggested</i> Delete	<i>Remedy</i> this sentence.				[Edito	r's note: change	subclause from 120F.4.2.]		
Response ACCEI	PT IN PRINCIPLE	Response Status <b>C</b> E.			The fo http://v Chano	Ilowing presenta www.ieee802.org	ation was reviewed by the tasl g/3/ck/public/20_07/ghiasi_3c 65	< force: k_01a_0720.pdf	
Delete For bo	the referenced so the 163 and 120F,	entence. add text elsewhere similar	to 162.11.1 to sp	pecify the reference	Chang	je bmax(2) to 0. je bmax(3:6) to (	15 0.1		
impeda	ance for differenti	al-mode and common-mod	e.		_				
C/ 120F	SC 120F.4.1	P <b>212</b>	L <b>5</b>	# 133					
Hidaka, Ya	asuo	Credo Semio	conductor		-				
Comment <sup>-</sup> As sho C2C.	<i>Type</i> <b>TR</b> own in sun_3ck_a	Comment Status <b>D</b> dhoc_01_030420, f_LF = f_	_b/40 is better th	an f_LF = f_b/80 for					
S <i>uggested</i> Chang	<i>Remedy</i> e f_LF from f_b/8	0 to f_b/40 in table 120F-6.							
Proposed I REJEC	Response CT.	Response Status Z							
This co	omment was WIT	HDRAWN by the comment	er.						

C/ 120F SC 120F.4.1

C/ 120F	SC 120	F.4.1	P 212	L 19	# 235	C/ 120G	SC	120G.3.2	P 22	4	L 37	# 195
Dawe, Pier	rs		Nvidia			Ghiasi, Ali			Ghiasi	Quantum/	Inphi	
Comment	Туре Т	R Con	nment Status A			Comment 7	Гуре	TR	Comment Status	Α		
lt isn't	reasonable	e to expect a	real receiver to provid	de a DFE tap stre	ngth of -0.85.	Refere	nce eq	ualizer to me	asure nearend and	d farend ne	ed to be define	ed
Theref	ore, the ch	annel should	not be specified as if	f the receiver can	do that. Further, there	Suggested	Remea	ly				
sensibl	le limits ca	n be chosen	without burdening the	e channels. See	comment against	Refere	nce the	• 4T DFE, bu	t with following exc	ception for	near end B1m	ax=0.15 and B2-
162.11	.7 and nev	v Heck prese	ntation for more expla	anation		B4(ma	k)=0.05	5, far end equ	alizer B1max=0.3	5, B2-B4(m	ax)=0.1. see	ghiasi_03ck_02_0620
Suggested	Remedy					Response		F	Response Status	С		
Add m	inimum ta	weight limits	5:			ACCEF	PT IN F	RINCIPLE.				
Tap 1:	min +0.3					[Editor	e noto:	changed SC	/nage/line from 12		//81	
All othe	er taps: mi	n -0.04 (same	e as KR)				s note.	changed 50	/page/inte noni 12	.01 .4.2/211	/40]	
Update	e definition	of COM in 93	3A.1.			The fol	lowing	presentation	was reviewed by t	the task for	ce:	
lesponse		Resp	onse Status <b>C</b>			http://w	ww.iee	e802.org/3/c	k/public/20_07/ghi	iasi_3ck_02	2_0720.pdf	
ACCE	PT IN PRI	NCIPLE.				For TP	4a NE	measuremer	nt, set b_max to {0	.4,0.15,0.1	,0.1}	
The ee			the fellowing management			For TP	4a FE	measuremen	t, set b_max to {0	.4,0.15,0.1,	,0.1}	
I ne co http://ie	eee802.or	s referring to 1/3/ck/public/a	the following present adhoc/iun17_20/heck	ation: 3ck adhoc 01	061720.pdf	Implem	ont wit	h editorial lic	ansa			
		, 0, 01, p 0, 01, 0, 0										
Impler	nent the fo	llowing with e	ditorial license:			C/ 120G	SC	120G.1	P 21	9	L 17	# 172
Add mi	inimum tai	o weight limits				Ran, Adee			Intel			
Tap 1:	min +0.3	Ū				Comment 7	Гуре	Т	Comment Status	Α		
Tap 2:	min +0.05	n 0.04				The fig	ure sho	ows a host in	sertion loss of up t	to 11.9 dB,	but in 120G.3.	4.1.1 (module
	er taps. mi	11-0.04				stresse "repres	a inpu ents 11	t procedure) ( 6 dB channel	one of the test cas loss with an addit	ional allowa	2 dB Insetion in ance for host t	oss, which ransmitter package
Update	e definition	of COM in 93	3A.1.			loss". T	he info	ormative grap	h at 120G.4.1 also	o looks like	16 dB.	anonimicor publicago
						Suggested	Remea	ly				
						Likely,	change	e the value in	the figure to 16 dl	В.		
						Response		F	Response Status	с		
						, ACCEF	PT IN F	RINCIPLE.		•		
						_						
						120G.3	6.4.1.1 r inclu	(P232/L8) ret	fers to the channel	l IL, which i s opposed	s from host tra	ansmitter to module
							1 Inclu		sinner package, a	s opposed	to the host iE.	
						In Figu	re 120	G-2, the char	nel loss, which is	a sum of th	ne section loss	es, is 16 dB.
						It would	d be he	elpful to show	the aggregate los	s in the fia	ure.	
									33 3			
						In Figu as 16 c	re 1200 IB.	G-2, designat	te the insertion los	s from hos	i component to	o module component
						Also, ir	1200	6.4.1, add a c	ross reference ba	ck to Figure	ə 120G-2.	
YPE: TR/	technical r	equired ER/e	editorial required GR	/general required	T/technical E/editorial G/	general				C/ 120G	_	Page 3 of 13
	ISTATUS	: D/dispatche	d A/accepted R/reje	ected RESPON	SE STATUS: O/open W/w	ritten C/closed	Z/with	ndrawn		SC 120G.	.1	7/29/2020 1:20:08

SORT ORDER: Clause, Subclause, page, line

C/ 120G	SC 120G.3.2	P <b>224</b>	L 36	# 131	C/ 120G	SC 120G.3.2	P 224	L 36	# 130
Hidaka, Ya	isuo	Credo Semi	conductor		Hidaka, Ya	ISUO	Credo Semic	conductor	
Comment	Type <b>TR</b> Co	omment Status A			Comment	Type TR Co	omment Status A		
Table descrip	120G-3 specifies far-e ption in 120E.3.2.1.2 is	nd pre-cursor ISI ratio s not relevant for 1200	with a reference	to 120E.3.2.1.2. Some	The ne defined	ar-end eye and far-en d. Table 120G-3 refers	nd eye of module outputs to 120E.3.3.2.1 for fai	t characteristics r-end eye height	(at TP4) are not well , but 120E.3.3.2.1 is
Suggested	Remedy				host st	ressed input test.			
Add a	sub clause describing	far-end pre-cursor ISI	ratio in 120G.3.2	2.1, similar to	Suggested	Remedy	and and for and		A sheetlan ta
120E.3	3.2.1.2 like the followin	ig:			Add a 120E.3	sub clause describing 3.2.1.1 like the followir	near-end and far-end eng:	eys in 120G.3.2	.1, similar to
captur calcula referer	e the PRBS13Q wave ite the linear fit pulse unce receiver at TP4 far	form corresponding to using the procedure de -end in Table 120G-9	o the far-end eye efined in 162.9.3 for which the far	(see TBD) and 1.1. Any setting of the -end eye width and	The ne	ar-end eye is measur	ed using the method in	120G.5.2.	
height The pe the line / p_ma	satisfy the limits in Ta eak amplitude of the lir ear fit pulse 1 UI prior ix.	ble 120G–3, may be un near fit pulse is p_max to the time of the pulse	ised. The pre-cursor e peak. The pre-	ISI p_pre is the value of cursor ISI ratio is p_pre	For the (~9.6 c in the l defined	e far-end eye, the sign IB loss at Nyquist) tha nost trace. The host cl d in 162.11.7.1.1 with	al measured at TP4 is it represents the worst hannel is the host recei an exception to use z_	first convolved v case channel lo iver PCB signal p = 244.7 mm.	with a host channel ss with some reflection path S^(HOSPR) The methods in
Response	Res	sponse Status <b>C</b>			120G.t	-2 and TBD are then -end pre-cursor ISI ra	used to measure eye n	ieignt, eye wiatr	i, vertical eye closure,
ACCE	PT IN PRINCIPLE.								
To be	consistent with the me	thodology in 120G.5.2	2 the setting crite	ria should be based on	Chang	e the references in Ta	ble 120G-3.		
EH and	d VEC. 162.9.3.1.1 inc	cludes both capture an	d linear fit metho	ods. Some clarification	Response	Re	sponse Status C		
of the	reference is necessary	/.			ACCEI	PT IN PRINCIPLE.			
In 120 "Captu	G.3.2, add a subclaus re the PRBS13Q wave	e describing far-end p eform corresponding t	re-cursor ISI rations of the far-end eye	o as follows: and calculate the linear	Implen host ch	nent the suggested rem nannel.	medy with the exceptio	n that C0 and C	1 are not included in the
fit puls	e using the procedure	defined in 162.9.3.1.1	<ol> <li>Any valid settir which the far-end</li> </ol>	ig of the reference	Implen	ant with editorial licer	200		
eye clo	sure satisfy the limits	in Table 120G–3 may	be used.	cyc neight and vertical	Impici		130.		
The pe the line / p_ma	eak amplitude of the lin ear fit pulse 1 UI prior (x."	near fit pulse is p_max to the time of the pulse	a. The pre-cursor e peak. The pre-	ISI p_pre is the value of cursor ISI ratio is p_pre					
Chang Implen	e the reference in Tab nent with editorial licer	le 120G-3 to point to t ise.	he new subclaus	e.					

C/ 120G SC 120G.3.2

C/ 120G	SC 12	20G.3.2	P 224	L <b>44</b>	# 238	C/ 120G	SC	120G.3.3.2	2	P <b>227</b>	L 37	# 212
Dawe, Pier	rs		Nvidia			Ghiasi, Ali			(	Shiasi Quar	ntum/Inphi	
Comment	Туре	TR	Comment Status A		bucket6	Comment 7	уре	TR	Comment St	atus A		
Unlike The mo hosts. schem control	CR and odule out But it ma les that b lling mult	KR, the h tput is su ay turn or ourden the iple modu	nost receiver can't choose w pposed to be set to a comp ut that that's not feasible. Y e simple module output and ules.	hat the module romise that's go 'et we want to a the manageme	output should be like. od enough for all void fussy tuning nt entity that may be	I he reference 4T equalizer will be calibrated with ideal HCB-MCB vs host channels with long barrel via, need to make sure the host is not over stressed given that host channel has more impairments. SuggestedRemedy abiasi, 02, 0620 investigates use of C0/C1 as in the CR methodology as one option, this						
Suggested	Remedy					ghiasi_02_0620 investigates use of C0/C1 as in the CR methodology as one option, this method may result variation in the measurement due to interference but perhaps a better						
First cf Second use a b Third c channe one, by loss. E and los host ca setting Don't tr	th present plan. ost receiver sort out its cha nodule to use one of just tw ss host channels. Module r of specify, based on knowle efined at TP4 and after loss oss setting. Generous over simple means. Consider r ge the module.	for low loss host of both. Host selects reference and channel ss setting, after loss 1 two loss ranges so the max for the low loss	TP4 ne far end viable o reduce on VEC <i>Response</i> ACCEF It appe	increa potion. VEC a VEC a VEC a VEC a VEC	ncrease eta is increase ised by 2x f The 3rd op and increas with eta_0= PRINCIPLE at the comm	a_0 from 4.1E- ed by 5x to acc from 4.1E-8. T ption is just ke se VEO. 1st op =4.1E-8, 3rd op <i>Response Sta</i> E. nent is proposii	t (TP4a) evolution	ti for the board in channel impairment tion show that in 4.1 E-8 without ( ase eta_0, 2nd o C0/C1.	ence receiver used for			
Response			Response Status C			measurement of the host stressed input (1P4a) eye opening parameters.						
ACCE		RINCIPLE				The following presentation was reviewed by the task force: http://www.ieee802.org/3/ck/public/20_07/ghiasi_3ck_02_0720.pdf						
Resolv	ve using t	the respo	nse to comment #175.			Resolv	- usin	the same	channel chara	cteristics ar	honted in the res	conse to comment #130
C/ 120G	SC 12	20G.3.3	P <b>227</b>	L <b>3</b>	# 215	Resolv	2 donių	g the sume				
Maki, Jeffe	ery		Juniper Netw	orks								
Comment There is for the the hose to adopt	<i>Type</i> is no pre host as f st as mus ption and	TR scription for the me st as the l adheren	Comment Status A for channel equalization. Th odule. Module implementer host must know what it can to the standard.	ne standard needs s need to know expect of the m	ds to be as prescriptive what they can expect of odule. Both are parties							
Suggested	Remedy											
Add the	e followir ided by a	ng senter an adaptiv	nce after the first sentence over equalizer in the host."	of the subclause	, "Channel equalization							
Response ACCE	PT.		Response Status C									

C/ 120G	SC 120G.3.3.2	P 227	L 37	# 178	C/ 120G	SC 120G.3.3.2	2 P 227	L <b>49</b>	# 115
Ran, Adee		Intel			Hidaka, Ya	ISUO	Credo S	Semiconductor	
Comment	Туре Т	Comment Status A			Comment 7	Type TR	Comment Status A	۱.	
With tv host st	vo available modu ressed input shou	le settings, one for near-er Id be allowed to choose wi	nd and one for fa then module setting	r-end, a host tested for ng it prefers.	Far en See hid	d eye height of ho daka_3ck_01_072	st stressed input test 20, slide 7.	is TBD.	
The tes after a meetin Suggested Chang Response ACCEF Comm and hig by the	st should be modi frequency-depend g the required BE <i>Remedy</i> e 120G.3.3.2.1 te PT IN PRINCIPLE ent #175 adopted gh-loss host chann host.	fied to let the host calibrate dent attenuator as specifier R at one of the settings is at and Figure 120G–8 per to <i>Response Status</i> <b>C</b> a pair of TP4 TX settings to hels. The setting is to be set	the stress eithe for module out sufficient. he comment. o address low-lo elected as approp	r at the MCB output, or out far-end testing. ss priate	Suggested Changu Response ACCEF The fol http://w http://w The va value fo Set tha	Remedy e TBD to 24mV. PT IN PRINCIPLE lowing presentation ww.ieee802.org/3 ww.ieee802.org/3 lue for TP4a FE EH as or TP4 FE EH as tt TP4a FE EH tar	Response Status C Response Status C Response reviewed by Rok/public/20_07/ghia Rok/public/20_07/hida H should match the v adopted by comment rget value to 24 mV.	the task force. isi_3ck_02_0720.pdf ika_3ck_01_0720.pdf ralue for TP4 FE EH. <sup>-7</sup> #177 is 24 mV.	The
Implem	nent the suggeste	d remedy with editorial lice	nse.		Implem	ent with editorial	license		
C/ <b>120g</b>	SC 120g.3.3.2	P <b>227</b>	L <b>49</b>	# 197				1.05	"
Ghiasi, Ali Comment 7 Far end Suggested Far end Response ACCEF The fol http://w http://w The va value f	Type <b>TR</b> d VEC is not listed Remedy d VEC=7.5 dB, se PT IN PRINCIPLE lowing presentation www.ieee802.org/3 www.ieee802.org/3 lue for TP4a FE V or TP4 FE VEC a	Ghiasi Quan Comment Status A de ghiasi_3ck_02_0620 Response Status C s. Dns were reviewed by the t B/ck/public/20_07/ghiasi_30 B/ck/public/20_07/hidaka_3 /EC should match the valu s adopted by comment #17	ask force. k_02_0720.pdf ck_01_0720.pdf e for TP4 FE VE 7 is 7.5 dB.	C. The	Ghiasi, Ali Comment T Module Suggested This sh Response ACCEF [Editor' Implem	Type TR e stress eye heigh Remedy hould be the same PT IN PRINCIPLE s note: change S hent the suggeste	Ghiasi ( Comment Status A t is TBD e as TP1a 15 mV Response Status C C/page/line from 1200 d remedy.	Quantum/Inphi	# 200
Set tha	at TP4a FE stress	ed eye VEC target value to	7.5 dB.						
Implem	nent with editorial	license.							

C/ 120G SC 120G.3.4.1

C/ 120G SC 120G.3	3.4.1 <i>P</i> 230	L <b>38</b>	# 114	C/ 120G	SC 120G.5.2	2	P 235	L <b>5</b>	# 39
Hidaka, Yasuo	Credo Semi	conductor		Brown, Mat	t		Huawei Tech	nologies Canac	Ja
Comment Type TR	Comment Status A			Comment T	уре Т	Comment S	Status D		
Eye height of modul	e stressed input test is TBD.			The sing	gle-ended term	nination resistor	value is not s	pecified for the	reference receiver.
	or consistency with nost output	spec.		SuggestedF	Remedy				
SuggestedRemedy				In Table	e 120G-9, add i	parameter "Sing	gle-ended tern	nination resistar	nce", Rd, with value 50
Change TBD mV to	15 mV.			Ω.					
Response	Response Status C			Proposed R	lesponse	Response S	Status Z		
ACCEPT IN PRINCI	PLE.			PROPC	SED REJECT				
Resolve using the re	esponse to #200.			This co	mment was WI	THDRAWN by	the commenter	er.	
C/ 120G SC 120G.4	1.2 P 236	L 15	# 243	CL 120C	SC 120C 5 2	)	P 225	17	# [140
Dawe, Piers	Nvidia				30 1206.5.2	2	F 235		# 118
Comment Type TR	Comment Status A			Hidaka, Yas	SUO		Credo Semic	conductor	
D1.1 comment 142:	"Should account for scope noi	se as TDECQ do	es", "Allow RSSing out	Comment T	ype TR	Comment S	Status R		
the scope noise (as	done in TDECQ) if it's signification	ant." It turns out t	hat it is significant, but	It is not	good to restric	t gDC range by	gDC2.		······································
that the scopes can	nandle this; we should not sec	iona-guess them.		aDC2 v	alue, and resul	that many cas	es nad the bes pecified range	in D1.2.	weakest) regardless of
SuggestedRemedy				This is r	reasonable, be	cause the best	gDC2 may be	low (strong) to	cancel low-frequency
Change step g from:	$r_{\rm ram}$ from $vrv(k)$ including the	effect of Gaussi	an noise with variance	loss due	e to skin effect,	, whereas the b	est gDC may l	be high (weak) t	to suppress
calculated in the pre	vious step.	effect of Gaussia		Hence	ement of high-i we should not	requency hoise	e. nae by aDC2		
to:				Suggested	Pomody		ge », g= e=:		
Compute an eye dia	gram from yrx(k), including the	effect of Gaussia	an noise with variance	Suggesteur Make d	Nerrieuy DC range inder	pendent from a			
measurement instru	ment's noise is already in y2(k	).			DC lange inder	pendent nom g	002.		
(We could say yrx(k)	instead of y2(k), the noise is t	, the same)		Response	-	Response S	Status C		
Response	Response Status C			REJEC	1.				
ACCEPT IN PRINCI	PLE.			Resolve	e using the resp	conse to comm	ent #117.		
Implement suggeste	d remedy with editorial license								

C/ 120G SC 120G.5.2 C/ 120G SC 120G.5.2 P 235 L7 # 117 C/ 120G SC 120G.5.2 P 235 L16 # 201 Hidaka, Yasuo Credo Semiconductor Ghiasi, Ali Ghiasi Quantum/Inphi Comment Status R Comment Type TR Comment Type TR Comment Status A This CTLE will have positive gain if gDC = -2dB. CTLE gain setting for TP4 nearend are TBD To avoid positive gain, upper bound of gDC for TP1a should be limited up to -3dB. SuggestedRemedy SuggestedRemedy see ghiasi\_3ck\_02\_0620 where includes min g\_DC and g\_DC\_HP, min g\_DC=5 dB and Change upper bound of -2 of gDC for TP1a to -3. min g\_DC\_HP=2 dB Response Response Status C Response Response Status C REJECT. ACCEPT IN PRINCIPLE. There is no consensus to make changes to g\_DC and g\_DC2. [Editor's note: change reference from 120G.3.4.1.1.] C/ 120G SC 120G.5.2 P 235 L 10 # 225 The following presentations were reviewed by the task force: http://www.ieee802.org/3/ck/public/20\_07/ghiasi\_3ck\_02a\_0720.pdf Dudek. Mike Marvell. http://www.ieee802.org/3/ck/public/20 07/hidaka 3ck 01d 0720.pdf Comment Type T Comment Status A For TP4 near-end... Some channels appear to want GDC2 of less than -2dB even though GdC is more than -Set qdc2 range = -2 to 0. 8dB Set gdc range = -5 to -2. Same range for all gdc2 settings. SuggestedRemedy C/ 120G SC 120G.5.2 P 235 # 202 Change the 8dB to 6dB for GDC2 less than -2dB. L 23 Ghiasi, Ali Ghiasi Quantum/Inphi Response Response Status C ACCEPT IN PRINCIPLE. Comment Type **TR** Comment Status A CTLE gain setting for TP4 far end are TBD Change -8 dB to -6 dB for g\_DC2 less than -2 dB. SugaestedRemedv see ghiasi\_3ck\_02\_0620 where includes min g\_DC and g\_DC\_HP, min g\_DC=10 dB and min g\_DC\_HP=3 dB Response Response Status C ACCEPT IN PRINCIPLE. [Editor's note: change subclause from 120G.3.4.1.1.] The following presentations were review by the task force: http://www.ieee802.org/3/ck/public/20 07/ghiasi 3ck 02a 0720.pdf http://www.ieee802.org/3/ck/public/20 07/hidaka 3ck 01d 0720.pdf For TP4 far-end... Set adc2 range = -3 to -1. Set gdc range = -9 to -3. Same range for all gdc2 settings.

IEEE P802.3ck D1.2 100/200/400 Gb/s Electrical Interfaces Task Force 3rd Task Force review comments

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 Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

C/ 120G SC 120G.5.2 Page 8 of 13 7/29/2020 1:20:08 PM

C/ 120G	SC 120G.5.2	P <b>235</b>	L <b>41</b>	# 241
Dawe, Piers		Nvidia		

Comment Type TR Comment Status A

A negative first DFE tap means the DFE is taking emphasis out of the signal. In C2M, this should never happen: remember this is a measurement of a signal not a channel, the idea is that a signal with only mild emphasis or shaping is transmitted, there is always some channel loss, and the receiver equalizes a low-pass-filtered signal. Real receivers don't have to cope with over-emphasised signals: in CR and KR they can ask the far transmitter to reduce its emphasis, in C2C the management entity does that on the receiver's behalf. In C2M, the receiver has to tolerate any compliant signal, so the equalizer limits in the eye measurement have to be set more carefully than in COM. The real receiver is not required to be constructed like the COM receiver, and low power receiver designs often can't remove emphasis (because they shouldn't need to).

The first DFE tap minimum and the CTLE gDC maximum must be chosen together to stop people setting up C2M outputs badly.

Further, there should be realistic tap minima for all the taps, as for C2C, KR and CR (see other comments).

See hidaka\_3ck\_adhoc\_01\_021920 slide 8 for example tap weights found. Remember that these weights aren't the only acceptable solutions: for example, b1 gDC and TxFIR setting can be traded.

### SuggestedRemedy

Tap 1 min +0.1 (max is 0.4) Tap 2 min -0.15 (max is 0.15) Taps 3, 4 min -0.05 (max is 0.1) Adjust names of limits and 93A.1 to support separate max and min limits (see other comments).

Response Response Status C

ACCEPT IN PRINCIPLE.

[Editor's note: changed SC from 120G.4.2.]

The referenced presentation is here: http://www.ieee802.org/3/ck/public/adhoc/feb19\_20/hidaka\_3ck\_adhoc\_01\_021920.pdf

Implement the suggested remedy for both TP1a and TP4 NE/FE.

Implement with editorial license.

C/ 120G	SC 120G.5.2	P <b>235</b>	L <b>43</b>	# 242
Dawe, Piers	3	Nvidia		
<u>о</u> , т				

Comment Type TR Comment Status R

It may be that too few scopes can achieve this level of noise (which should warn us that it might be challenging for product receivers too!) As it may be undesirable to attempt to remove or deconvolve noise from a measurement, the solution is to increase the one-sided noise spectral density eta0. Then, this fixed noise makes signals from high loss hosts look relatively worse than from low loss hosts. To avoid that and include something for low-loss ripple effects (see Dudek presentations), we can use a second signal-strength-dependent noise to balance up the reported eye openings across a range of host losses

## SuggestedRemedy

Increase eta0 to what is needed for practical measurements. Use a second noise term proportional to the eye height (after equalization) i.e. K\*sum(AVupp + AVmid + AVlow). Use its variance similarly to eta0's, as in steps f and g.

Response Response Status C

REJECT.

[Editor's note: change SC from 120G.4.2.]

Further details and analysis are required. There is no consensus to implement the proposed methodology at this time.

C/ 120G	SC 120G.5.2	P <b>236</b>	L <b>20</b>	# 246	C/ 120G	SC	2120G.5.2	P <b>236</b>	L <b>21</b>	# 123
Dawe, Pie	rs	Nvidia			Hidaka, Ya	asuo		Credo Sei	niconductor	
Comment	Туре Т	Comment Status A			Comment 7	Туре	т	Comment Status A		
This cr obtain	riterion "The value ed with the combi	es of eye height, eye width, a nation of gDC and gDC2 tha	and vertical eye at produces the i	closure are the values minimum value of	The co confusi	nditio ing. It	n "where ey is not clear	e height also meets the what is "the target value	target value" seem ".	s not necessary and
venica	a eye closure whe	a different Rx setting but faile	s ESMW at the	setting for best VEC	Suggested	Reme	edy			
We lea	arnt in previous C	2M projects that best vertica	and best horizo	ontal opening weren't at	Remov	ve "wh	nere eye hei	ght also meets target va	ue".	
the sa	me setting.			1.	Response			Response Status C		
Editori	al: the idea is not	to meet a target, it is to mee	et or exceed a lu	nit.	ACCE	PT IN	PRINCIPLE	,		
Suggestea	Remedy						-			
Chang The va	ge to: alues of eye heigh mbination of cDC	it, eye width, and vertical eye	e closure are the	e values obtained with	The int the EH	ent of heigh	f the referen ht specificat	ce phrase is to eliminate ion fails.	combinations of g	DC and gDC2 where
where Editori measu	eye height and E al: ESMW isn't re urement?	SMW also comply with the I ally a measurement, it's a m	imits in the appr nask. Maybe de	opriate table. fine ESW as the	Change with the	e "who e speo	ere eye heig cification for	ght also meets target val eye height (min) as spe	ue" to "where eye h cified for the interfa	neight also complies ace".
Response		Response Status C								
ACCE	PT IN PRINCIPLE	Ξ.								
The co EH, E\ that th	ommenter is reque W, and VEC. Firs e clarify the inten	esting to changes to the crite t, that the criteria includes E t of the criteria.	eria for finding th SMW in additior	ne measured values of n to eye height. Second,						
Accord there is ESMW	ding to discussion s constroversy ov / should not be ad	s related to the response to er whether the EW/ESMW p dded to the criteria at this tin	o comment #231 parameters shoune.	, Ild be retained. EW or						

Resolve this comment using the response to comment #123.

C/ 120G SC 120G.5.2 Page 10 of 13 7/29/2020 1:20:08 PM

C/ 162	SC 162.9.3	P 14	18 L 3	0 #	139
Ran, Adee		Intel			
Comment Typ	pe T	Comment Status	Α		Tx electrical

(cross-clause)

Common-mode to common-mode return loss specification is currently TBD.

The specification in all PMD clauses since 802.3bj is 2 dB flat between 0.2-19 GHz.

This specification has been taken from InfiniBand without further discussion in 802.3bj. It may be difficult to justify specific limits. However, it is reasonable from implementation point of view and there is no evidence that requires modifying it.

It is proposed to extend the frequency range proportionally with the increase in signaling rate, to 40 GHz. This should be done in a new subclause that other specifications can refer to. It should also provide some justification to the specification.

#### SuggestedRemedy

Add a new subclause 162.9.3.6 with content:

162.9.3.6 Common-mode to common-mode return loss

Common-mode signal can be generated in the channel by conversion of a differential signal. Any common-mode signal returned into the channel can be converted back to a differential signal and result in differential noise into the receiver. To limit this effect, a minimum common-mode to common-mode return loss is required.

The common-mode to common-mode return loss shall be greater than or equal to 2 dB at all frequencies between 0.2 GHz and 40 GHz.

Refer to the new subclause in the appropriate row of table 162-9. Set the value to 2 dB.

Refer to the new subclause in Table 163-5 with the same value, and change the row name from "Common-mode return loss (min.)" to "Common-mode to common-mode return loss (min.)".

Add a new row for "Common-mode to common-mode return loss (min.)" with same content in table 120F-1.

### Response

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Response Status C

C/ 162	SC 162.9.3.2	P 1	52	L <b>24</b>	# 145
Ran, Adee		Intel			
Comment T	ype <b>T</b>	Comment Status	Α		Tx electrical
Address	ing TBD equation	n 162-5.			

Recommendations of maximum host board IL at the Nyquist frequency would be valuable for board design. Minimum recommendations should also be given, to reduce ISI from reflections.

Unlike previous generations, the assumption in this project is that host board is built of ultra-low-loss material where the loss at a large part of the spectrum is close to the loss at Nyquist. The IL equation has relatively little additional value and will be harder to justify. Therefore we can remove this TBD equation.

Recommended loss should be given at 26.56 GHz, not 25.56 GHz.

Also, since the effect of the test fixture may vary between MDIs and form factors, it would be helpful to recommend the IL from TP0 to the MDI and from the MDI to TP5 in addition. These are given in Figure 162A–1 as 6.875 dB each; this should be considered a maximum value.

Note that host board design should also minimize reflections, which may require a different specification or recommendation, but that is not proposed at this point.

### SuggestedRemedy

Change the text of 162.9.3.2 to the following two paragraph, removing the equation:

The recommended insertion loss at 26.56 GHz from TP0 to TP2 or from TP3 to TP5 (including the test fixture) is between 7.1 dB and 10.975 dB.

The recommended insertion loss at 26.56 GHz from TP0 to the MDI pads (not including the MDI receptacle and test fixture) is between 3 dB and 6.875 dB.

Response Response Status C

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

C/ 162 SC 162.9.3.2

C1 162       SC 162.11.7.1.1       P161       L 51       # [29]       C1 1628       SC 162.B.1.3.1       P250       L 24       # [23]         Dudek, Mike       Marvell.       Molex       Molex       Molex         Comment Type T       Comment Status A       bucket6       Molex       Comment Type T       Comment Status A       bucket6         SY(HOSPT) is defined as the host transmitter PCB signal path in clause 162:11.7.1.1       the following presentation was reviewed at a previous ad hoc meeting: http://www.ieee802.org/3ct/public/adhoc/jun10_20/haser_3dx_adhoc_01c_062420.pdf         Comment Type T       Comment Status A       bucket6         SY(HOSPT) is defined as the host transmitter PCB signal path in clause 162:11.7.1.1. The agreesor transmitter PCB signal path as SY(HOTxSP).       Execute 123         C1 162       SC 162.11.7.1.2       P 163       L 3       # 128         Comment Type T       Comment Status A       Locket6         Hidaka, Yasuo       Credo Semiconductor       Comment Type T       Comment Status A         Comment Type T       Comment Status A       bucket6       Fill in									
Dudek, Mike       Marvell.       Harvell.         Comment Type       T       Comment Status A       bucket6         St(HOSP) is not correct.       Suggested/Remedy       Comment Status A       Fill in TBD value for T_1 (6.16ps)         Suggested/Remedy       Change it to S(HOSPR)       Response       Response Status C       C         ACCEPT.       Credo Semiconductor       T       Comment Status A       bucket6         SY(HOSPT) is defined as the host transmitter PCB signal path in clause 162.11.7.1.1.       The following presentation was reviewed at a previous ad hoc meeting: http://www.ieee802.org/Si/Ak/public/adhoc/junt0_20/haser_3dk_adhoc_01c_062420.pdf         For T_1, replace TBD with 7.5 ps.       C/ 1628       SC 162.11.7.1.2       P 163       L 3       # Too         Suggested/Remedy       Change "S/(HOSPT)" to "S/(HOTXSP)" in Equation (162-13) and on line 29 and line 44.       Molex       Comment Type       T       Comment Status A         Suggested/Remedy       Credo Semiconductor       Credo Semiconductor       Credo Semiconductor       Comment Type       T       Comment Status A         Change "S/(HOSPT)" to "S/(HOTXSP)" in Equation (162-13) and on line 29 and line 44.       See haser_3ck_adhoc_01b_061020 & update Figure 162B-4         Response       Response Status C       ACCEPT IN PRINCIPLE.       Comment Type T       Comment Type T       Comment Type T <t< td=""><td>C/ 162</td><td>SC 162.11.7.1</td><td>.1 <i>P</i> 161</td><td>L 51</td><td># 219</td><td>C/ 162B SC 162B.1.3.1</td><td>P 250</td><td>L <b>24</b></td><td># 83</td></t<>	C/ 162	SC 162.11.7.1	.1 <i>P</i> 161	L 51	# 219	C/ 162B SC 162B.1.3.1	P 250	L <b>24</b>	# 83
Comment Type T       Comment Status A       bucket6         S(HOSP) is not correct.       Suggested/Remedy         Suggested/Remedy       Canament Status C         ACCEPT.       ACCEPT.         C1 162 SC 162.11.7.1.2       P162 L 29 # 127         Hidaka, Yasuo       Creeto Semiconductor         Comment Type T       Comment Status A         Suggested/Remedy       Creeto Semiconductor         Comment Type T       Comment Status A         Suggested/Remedy       Suggested/Remedy         Suggested/Remedy       Creeto Semiconductor         Change "S(HOSPT)' to "S(HOTXSP)' in Equation (162-13) and on line 29 and line 44.         Response       Response Status C         ACCEPT.       P163         C1 162       SC 162.11.7.1.2         P163       L 3         ACCEPT.       P163         Comment Status A       Suggested/Remedy         Contrast Status C       ACCEPT IN PRINCIPLE.         Comment System Transmitter PCB signal path solut on clause 136:11.7.1.1       The following resentation was reviewed at a previous ad hoc meeting:         Hitim TBD for RL Limit       Suggested/Remedy       Suggested/Remedy         Correcto Semiconductor       Correcto Semiconductor       Suggested/Remedy         Correcto Signal path solu	Dudek, Mi	ke	Marvell.			Haser, Alex	Molex		
SuggestedRemedy       SuggestedRemedy         Response       Response Status C         ACCEPT.       C1 162       SC 162.11.7.1.2       P 162       L 29       # 127         Hidaka, Yasuo       Credo Semiconductor       bucket6         SYLHOSPT) is defined as the host transmitter PCB signal path in clause 162.11.7.1.1.       bucket6         SYLHOSPT) is defined as the host transmitter PCB signal path in clause 162.11.7.1.1.       the following presentation was reviewed at a previous ad hoc meeting: http://www.ieee802.org/3/ck/public/adhoc/jun10_20/haser_3ck_adhoc_01c_062420.pdf         SuggestedRemedy       Change 'Sr(HOSPT)' to 'Sr(HOTxSP)' in Equation (162-13) and on line 29 and line 44.       For T_1, replace TBD with 7.5 ps.         C1 162       SC 162.11.7.1.2       P 163       L 3       # 128         ACCEPT.       Credo Semiconductor       SuggestedRemedy       Comment Type       T       Comment Status A         Kesponse       Response Status C       Accept IN PRINCIPLE.       Response Status C       Accept IN PRINCIPLE.         SuggestedRemedy       Credo Semiconductor       SuggestedRemedy       SuggestedRemedy       SuggestedRemedy         Change 'Sv(HOSPT)' to 'Sv(HOTxSP)' in Equation (162-14) in page 162 and on line 3 in page 163.       Response C       Response Status C         SuggestedRemedy       Change 'Sv(HOSPT)' to 'Sv(HOTxSP)' in Equation (162-14) in page 162 and on	Comment S(HOS	<i>Type</i> <b>T</b> SP) is not correct.	Comment Status A		bucket6	Comment Type <b>T</b> C Fill in TBD value for T_t (6.	Comment Status A 16ps)		
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Cl 162       SC 162.11.7.1.2       P 163       L 3       # 128         Hidaka, Yasuo       Credo Semiconductor         Comment Type       T       Comment Status       A       bucket6         S^(HOSPT) is defined as the host transmitter PCB signal path in clause 162.11.7.1.1. The aggressor transmitter PCB signal path should use a different symbol. Clause 136.11.7.1 defined the agressor transmitter PCB signal path as S^(HOTxSP).       SuggestedRemedy       The following presentation was reviewed at a previous ad hoc meeting: http://www.ieee802.org/3/ck/public/adhoc/jun10_20/haser_3ck_adhoc_01c_062420.pdf         SuggestedRemedy       Change "S^(HOSPT)" to "S^(HOTxSP)" in Equation (162-14) in page 162 and on line 3 in page 163.       The following presentation was reviewed at a previous ad hoc meeting: http://www.ieee802.org/3/ck/public/adhoc/jun10_20/haser_3ck_adhoc_01c_062420.pdf         Response       Response Status       C         ACCEPT.       ACCEPT.	Suggested Chang Response ACCE	IRemedy IRemedy Ie "S^(HOSPT)" to PT.	"S^(HOTxSP)" in Equation Response Status C	(162-13) and o	n line 29 and line 44.	Haser, Alex <i>Comment Type</i> <b>T</b> <i>C</i> Fill in TBD for RL limit <i>SuggestedRemedy</i> See haser_3ck_adhoc_01b	Comment Status A	re 162B-4	
Comment Type       T       Comment Status       A       bucket6         S^(HOSPT) is defined as the host transmitter PCB signal path in clause 162.11.7.1.1. The aggressor transmitter PCB signal path as S^(HOTxSP).       The following presentation was reviewed at a previous ad hoc meeting: http://www.ieee802.org/3/ck/public/adhoc/jun10_20/haser_3ck_adhoc_01c_062420.pdf         SuggestedRemedy       Differential Return Loss = 18-0.5*fGHz < 0.01 GHz ≤ fGHz < 25 GHz	C/ <b>162</b> Hidaka, Ya	SC 162.11.7.1	.2 P 163 Credo Semic	L 3 onductor	# 128	Response R ACCEPT IN PRINCIPLE.	esponse Status C		
Change "S^(HOSPT)" to "S^(HOTxSP)" in Equation (162-14) in page 162 and on line 3 in page 163.          Response       Response Status       C         ACCEPT.       C	Comment S^(HO aggres defined Suggested	Type <b>T</b> OSPT) is defined a ssor transmitter P( d the agressor trai IRemedy	Comment Status A s the host transmitter PCB CB signal path should use a nsmitter PCB signal path as	signal path in cla a different symbo s S^(HOTxSP).	<i>bucket6</i> ause 162.11.7.1.1. The bl. Clause 136.11.7.1	The following presentation http://www.ieee802.org/3/cl Differential Return Loss = $18-0.5*fGHz$ ; 0.01 GHz $\leq$ f 5.5 : 25 GHz $\leq$ fGHz $\leq$ 50 C	was reviewed at a previc k/public/adhoc/jun10_20, GHz < 25 GHz GHz	ous ad hoc meetii /haser_3ck_adho	ng: c_01c_062420.pdf
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C/ 162B SC 162B.1.3.2

C/ 162B	SC 162B.1.3.3	P <b>251</b>	L 18	# 88	
Haser, Ale	x	Molex			
Comment 7 Fill in T	Type <b>T</b> Co BD for CMCIL limit	omment Status A			
Suggested	Remedy iser 3ck adhoc 01b	061020 & update Figu	re 162B-5		
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The fol http://w	lowing presentation w ww.ieee802.org/3/ck	/as reviewed by the tas /public/adhoc/jun10_20	k force at a prev /haser_3ck_adh	ious ad hoc meeting: oc_01c_062420.pdf	
Set the 30-(21/ 15 ; 20	e common-mode con∖ ⁄28)*fGHz ; 0.01 TBD GHz ≤ fGHz ≤ 50 GF	ersion loss limits as fol GHz ≤ fGHz < 20 GHz Iz	llows:		
C/ 162B	SC 162B.1.3.6	P <b>254</b>	L 11	# 92	
Haser, Alex	x	Molex			
Comment 7 Fill in T	<i>Type</i> <b>T</b> Co BD for T_nt	omment Status A			
Suggested	<i>Remedy</i> nt to 6.16 ps (see has	ser_3ck_adhoc_01b_06	61020)		
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Adopt t Tnt= 7. Tft= 7. ICNFE ICNNE ICNTot	the following values: 5 ps 5 ps XT = 4.2mV XT = 1.5 mV tal = 4.4 mV				