C/ 121 Ran, Adee	SC 121.5.8		P 218 Intel	L <b>48</b>	# 1	C/ <b>121</b> Ran, Adee	SC	121.5.4	P <b>217</b> Intel	L <b>40</b>	# 2		
Comment	Type E	Comment S	tatus D			Comment	Type	Е	Comment Status D				
(This c	comment is aga	inst an unchang	ed portion of	the draft)		(This c	omme	ent is agair	nst an unchanged portion of	of the draft)			
The we with ot	ording of the "P ther similar subo	MD lane-by-lane clauses:	e transmit dis	able function" sub	clause is inconsistent	Several functional specifications subclauses lack MDIO mapping (121.5.4 PMD global signal detect function, 121.5.5 PMD lane-by-lane signal detect function, 121.5.7 PMD global transmit disable function (optional)) unlike other functional specification subclauses.							
1. Unli 2. The	ke other option	al function, it is r	not stated as	optional in the su	bclause heading	This comment also applies to the corresponding subclauses in clauses 122, 123 and 124.							
3. "If th	he optional PMI	D_transmit_disal	ble_i function	is not implement	ed in MDIO, an								
alterna	alternative method may be provided to independently disable each transmit lane for testing						Add MDIO manning information as in 121.5.9 to 121.5.11						
(an alt	ernative method	d may always be	provided).	subciause, and is		Proposed Response Poeponse Statue							
ابت مطط	ition to this is a			alaan if lama huulau	a tuananit dia abla ia	rioposedi	lespo	1130	Response Status U				
require	ed for testing pu	urposes. Is it rea	omewnat une	clear if lane-by-lar	ne transmit disable is								
					<b>6</b> (1) <b>1 1 1</b>	C/ <b>120D</b>	SC	120D.3.1	P <b>350</b>	L <b>42</b>	# 3		
in clau	omment also ap	24. For clause 12	ID lane-by-lai 23. the comm	ne transmit disabl ent applies partia	e function" subclauses	Ran, Adee			Intel				
option	al in the subclau	use heading).				Comment	Туре	т	Comment Status D				
Suggested	Remedy					(This c	omme	ent is agair	nst an unchanged portion of	of the draft)			
If it is a	an optional feat	ure, apply the fo	llowing			"A 200	GAUI	4 or a 400	GAUI-8 chip-to-chip trans	mitter shall meet	the specifications given		
1 add	"(ontional)" to t	the subclause he	adina (avcar	t in clause 123 w	hich has it already)	in Table 120D–1 if measured at TP0a."							
2. Rep interfa disable	ce is implement ce is is specifie	aragraph with a p ted, PMD_transi ed in 45.2.1.8".	aragraph sta mit_disable_i (in clause 123	ting the MDIO ma shall be mapped add the extension	apping: "If the MDIO to the PMD transmit on register in	"if measured" can be read as a condition, but the transmitter characteristics are normative whether or not they are actually measured.							
45.2.1	.14g).					The specifications are already defined at TP0a in Table 120D–1, so there is no need to add							
If this	feature is requir	red for testing pu	irposes, then	remove its marki	ng as optional.	"if mea	sured	at TP0a"					
Proposed	Response	Response S	tatus <b>O</b>			Also applies to 120D.3.2 (TP5), 120E.3.1 (TP1a), 120E.3.2 (TP4), 120E.3.3 ("appropriate test point"), and 120E.3.4 ("appropriate test point"). In all these cases, the referenced table defines the test point.							
						Suggested	Reme	dy					
						Delete	the "if	measured	d at x" part of the sentence	e in all occurences	S.		
						Proposed I	Respo	nse	Response Status O				
	//				<b>T</b> # 1 · 1 <b>E</b> / 19 · 1 <b>O</b>				2				

						-	-			
C/ 120D Ran Adee	SC 120D.3.1	P <b>351</b> Intel	L 19	# 4	Cl <b>120E</b> Ran Adee	SC	120E.3.2	P <b>370</b> Intel	L 16	# 6
Comment Type       TR       Comment Status       D         The steady state voltage and linear fit pulse peak parameters have a refererence to 94.3.12.5.3. These parameters have a new measurement procedure in 120D.3.1.4.         SuggestedRemedy         Change the references to point to 120D.3.1.4 for the parameters: Steady state voltage vf (max), Steady state voltage vf (min), and Linear fit pulse peak (min).         Proposed Response       Response Status       0					Comment Module definiti compa Host ir	<i>Type</i> e differe on in th rison, t put tole	TR ential outpu he reference he Host ou erance (Tab	Comment Status <b>D</b> t voltage (max) is specified e (120E.3.1.2) means that th tput is specified 880 mV pea ole 120E–4) is also specified	in Table 120E- ne peak-to-pea ak-to-peak (Ta d as 900 mV, t	–3 as 900 mV. Using the ik is 1800 mV. In ble 120E–1). out that is peak-to-peak.
Proposed Response Response Status O					l assur same	I assume the intent is that host output, host input tolerance, and module output use the same definition and at least the latter two use the exact same value.				
					Suggested	Remea	ly			
C/ 00 Ran, Adee	SC 0	<i>P</i> 185 Intel	L <b>30</b>	# 5	In Tab output	e 120E voltage	–3, change e (max)", as	e "Differential output voltage in Table 120E–1.	(max)" to "Diff	ferential peak-to-peak
The PN zero, o instant mappe Compa each s to tx_s	MA service interf one, two, three or iations of this int of to electrical signare to e.g.121.5.2 ignal stream sha ymbol = zero."	ace uses the enumerated tx_s zero and one (116.3.3.1.1 and erface (annexes 120B to 120E gnals. 2 which includes the statement all correspond to tx_symbol = th	ym and rx_syr d 116.3.3.2.1). i) do not define t "The highest nree and the lo	n which take values But the physical how these values are optical power level in owest shall correspond	Proposed i	hos ou Resport	tput. ise	Response Status <b>O</b>	u luerance va	
Suggested	Remedy									
Define Add to to the t tx_sym	the required ma item b) 2): 'In Ni tx_symbol or rx_ abol or rx_symbol	pping in 120.1.4 (which discus RZ modulation, the highest diff symbol value "one" and the lov l value "zero".'	ses the physic rerential voltag west level shal	al instantiations) e level shall correspond l correspond to the						
Add to corresp corresp	item b) 3): 'In Pr pond to the tx_sy pond to the tx_sy	AM4 modulation, the highest d mbol or rx_symbol value "thre mbol or rx_symbol value "zero	ifferential volta e" and the low ".'	age level shall rest level shall						
Additio	onally (or alternat	ively) add similar statements i	n every AUI ar	nex as appropriate.						

Proposed Response Response Status **O** 

C/ 116 SC 116.1.2 P 107 L 3 # 7	C/         120B         SC         120B.1         P 332         L 7         # 9           Ran, Adee         Intel					
Comment Type       TR       Comment Status       D         This list specify the interfaces for which the width cannot be chosen "for implementation convenience".       All items except item a refer to physically instantiated interfaces; for these, it makes sense to specify the width. But item a refers to 200GMII and 400GMII and "logical interconnection points" and sets their widths as 64 bits.	Comment TypeTComment StatusD(This comment is against an unchanged portion of the draft)It is better to use different names for different things. The version of 200GAUI-8 defined here is different from the one defined in 120C, but but are labeled (200GAUI-8). Same goes for 400GAUI-16, 200GAUI-4 and 400GAUI-8.In 802.3by the abbreviations C2C and C2M were defined for chip-to-chip and chip-to- module. They can be used to differentiate the labels.This can also be applied to abbreviate text in the annex, e.g. "200GAUI-8 chip-to-chip" in figure 120B-1, if desired.In addition, in some places "200GAUI-4" appears unqualified (e.g. P333 L34) while in other places a qualifier such as "chip-to-chip" is appended (e.g. P333 L44). Although the type can be implied from the clause, using the qualifiers "C2C" or "C2M" in all places can improve readability and consistency.SuggestedRemedy In the title of annex 120B, change "(200GAUI-8)" to "(200GAUI-8 C2C)" and "(400GAUI- 16)" to "(400GAUI-16 C2C)".Similarly in 120C add "C2M", in 120D add "C2C", and in 120E add "C2M".					
The high-speed nGMIIs are assumed to be logical interfaces and not expected to be implemented physically (at least not in an obsevable way). Furthermore, even internal to an implementation, 200G with 64-bit bus width requires more than 2.5 Gtransfers/second and 400G requires more than 5 GT/s. This is not really feasible with today's technology and it is much more likely that implementations will use much larger bus widths such as 256 or 512 bits. 200GMII and 400GMII are interfaces for which "implementations may choose other data-path widths for implementation convenience", therfore they are not exceptions and should not be listed.						
SuggestedRemedy Delete item a from the list.						
Alternatively, reword it to clarify that multiple-word implementations of 200GMII and 400GMII are possible.						
Proposed Response Response Status <b>O</b>	Consider using the abbreviations to qualify the AUIs across the text of the annexes too.Proposed ResponseResponse StatusO					
Cl 120A SC 120A.2 P 328 L 8 # 8 Ran, Adee Intel Comment Type TR Comment Status D (This comment is against an unchanged portion of the draft)						
The PMA on the top left should be 8:8 if it connects to 200GAUI-8 and the one on the right should be 16:16 if it connects to 400GAUI-16. SuggestedRemedy Change top PMAs from PMA(8:4) to PMA(8:8) and from PMA(16:8) to PMA(16:16)						

Proposed Response Response Status **O** 

## 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: Comment ID

C/ 120B	SC 120B.1	P	333	L <b>34</b>	# <u>1</u> 0
Ran, Adee		Intel			

Comment Type E Comment Status D

(This comment is against an unchanged portion of the draft)

The paragraphs starting in lines 34 and 41 contain a lot of information about loosely related topics (definition of link, loss budget, NRZ modulation, AC coupling, recommendation about -3 dB point) and have lots of common text. This is complete, but difficult to read. It would be easier to read if they are edited to "factor out" the common text.

Also, the first sentence of the third paragraph (L48) seems to fit better into the previous paragraphs.

Suggest reordering for clarity.

Also applies to similar text in 120D.1.

### SuggestedRemedy

Replace the three paragraphs in this page with the following text:

"The 200GAUI-8 bidirectional link is described in terms of a 200GAUI-8 transmitter, a 200GAUI-8 channel, and a 200GAUI-8 receiver. The 400GAUI-16 bidirectional link is described in terms of a 400GAUI-16 transmitter, a 400GAUI-16 channel, and a 400GAUI-16 receiver.

Figure 120B–3 depicts a typical 200GAUI-8 application. Figure 120B–4 depicts a typical 400GAUI-16 application.

Equation (83D–1) (illustrated in Figure 83D–3) summarizes the informative differential insertion loss budget associated with the chip-to-chip application.

The 200GAUI-8 chip-to-chip interface comprises independent data paths in each direction, with each data path containing eight differential lanes. The 400GAUI-16 chip-to-chip interface comprises independent data paths in each direction, with each data path containing sixteen differential lanes.

The lanes on each data path are AC-coupled. The low-frequency 3 dB cutoff of the AC-coupling should be less than 100 kHz.

The 200GAUI-8 or 400GAUI-16 transmitter and receiver communicate using NRZ signaling on each lane with a nominal signaling rate of 26.5625 GBd.

The 200GAUI-8 or 400GAUI-16 transmitter on each end of the link is adjusted to an appropriate setting based on channel knowledge. If implemented, the transmitter equalization feedback mechanism described in 83D.3.3.2 may be used to identify an appropriate setting. The adaptive or adjustable receiver perform the remainder of the equalization."

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: Comment ID

Comment ID 10

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Apply corresponding change in 120D.1 replacing "NRZ" with "PAM4".

Consider changing 120C and 120E in a similar way.

Proposed Response Response Status **O** 

					-							
Cl <b>120B</b> Ran Adee	SC 120B.3.1	P 335	L <b>4</b>	# 11	Cl <b>120C</b> Ran Adee	SC 120C.5.4	.3 P 346	L <b>8</b>	# 12			
					Commont	T						
Comment (This c	<i>Type</i> IR	Comment Status D	the dreft)		Comment	rype I	Comment Status D		ont			
(This c	comment is agains	at an unchanged portion of	the drait)		HUSLI	put does not inc			ent.			
In 802	.3by we identified	a "hole" in the loss budget	due to the fact t	hat transmitter that	Compa	are to Module inp	out, item RM2.					
barely for in (	meets the existing	g specs represents a long t the specification for the tra	ransition time wi	hich was not accounted	SuggestedRemedy							
peak"	in the PMD was cl	hanged from 0.71*v_f to 0.7	75*v_f (see 111.	8.2). It was claimed that	Add item RH2: "Host stressed input test BER requirement"; 120C.3.3; "Meet BER requirement of 120C.1.1"; M							
there is	s margin in existin	g transmitters to meet this	specification. In	addition, an exception								
the tra	nsmitter (list item	c in 111.8.3.1).	for the measure	ed transimition time of	Proposed I	Proposed Response Response Status O						
Unfort	unately, probably	due to lack of attention, the	se changes wer	e not applied to 25GAUI	C/ 120D	SC 120D 3.2	1 P 355	/ 21	# 13			
the old	I value, and there	is no exception in the recei	ver tolerance tes	st). This enables a loss	Ran, Adee		Intel					
deficit	in annex 109A.				Comment	Type F	Comment Status D					
lt woul 120D.	d be preferable no	ot to have this hole in 120B	. It seems that it	was already fixed in	J4 and as in th	JRMS appear a e equation.	s equation parameters, so	should be in itali	c font in the text as well			
Cor the	tronomittor this i	is a simple matter of adding		untion Doood on	Suggested	Remedy						
111.8.	2, it is expected th	at transmitters can meet th	is specification.	puon. Based on	Set J4	and JRMS in ita	lics in the text.					
For the	e receiver, the exc	eption in 120D.3.2.1 item c	can be added v	vith minor modifications.	Proposed I	Response	Response Status O					
Suggestea	Remedy											
In 120	B.3.1, add to the li	ist of exceptions:										
- The v	alue of linear fit p	ulse peak (min) in Table 83	3D-1 is 0.75 × v_	_f.								
In 120	B.3.2, add to the li	ist of exceptions:										
- The t	ransmitter device	package model S(tp) is or	nitted from Equa	tion (93A–3) in the								
Calcula COM.	The filtered voltag	e transfer function H(k)(f) o	alculated in Equ	ation (93A–19) uses								
the filte	er											
Ht(f) d 4.32 p measu	efined by Equatior s, and Trm is the r rred using the met	n (93A–46), where \beta is measured 20% to 80% tran hod in 86A.5.3.3, with the e	2, Tr is calculate sition time of the exception that th	ed as Tr = 1.09 × Trm – e signal at TP0a. Trm is e observation filter								
bandw 12 GH Local	idth is 33 GHz ins z. Trm is measure eq_c1 both equal	tead of ed with the transmit equaliz to 0, see 83D.3.1.1).	er turned off (i.e	., Local_eq_cm1 and								
Proposed	Response	Response Status 0										
		•										

C/         120D         SC         120D.3.2.1         P 355         L 22         # 14           Ran, Adee         Intel         Int	Cl         120D         SC         120D.3.2.2         P 356         L 33         # 15           Ran, Adee         Intel         Int						
Comment Type TR Comment Status D	Comment Type TR Comment Status D						
Q4 is not defined anywhere; the "note" is not a definition. It is not clear to the reader where this number comes from.	"jitter amplitude" is confusing, since amplitude of a sinusoidal is half of the peak-to-peak. The values here should be the peak-to-peak.						
Q(3.8906) is 5e-5; is this intended to represent probability of 1e-4?	Compare to Table 111–7.						
Way back in 48B.3.1.3.1 I found:	SuggestedRemedy Change ""Jitter amplitude" to "Peak-to-peak jitter amplitude".						
"For each BER_n, determine the associated Qn from the inverse normal cumulative probability distribution, adjusted for transition density, e.g., $Q = 3.94$ for BER = 1e-5, and Q = 5.77 for BER = 1e-9, where transition density is assumed to be 0.5"	Proposed Response Response Status <b>O</b>						
These Q values correspond to 4e-5 and 4e-9 respectively; the BER is divided by half of the transition density, or 0.25. But in 120D.3.2.1 the "BER" is divided by 2. I'm confused	CI         120D         SC         120D.3.2.2         P 356         L 15         # 16           Ran, Adee         Intel						
It would be preferable to define Q4 using the inverse complementary error function (already defined in clause 92) with the appropriate argument, either in the text or in another equation, and explain the argument's relation to the 1e-4 probability measured.	Comment Type TR Comment Status D What does "be at least 3 dB" mean? Should it be "should be", "shall be"?						
SuggestedRemedy Assuming the value is correct, add an equation: $Q4=sqrt(2)^{serfc^{-1}(2*10^{-4}/(transition density factor))}$ Where erfc^-1 is the inverse of the complementary error function erfc(x) defined by	What happens if the COM is below 3 dB? This may happen since the added jitter is higher than A_DD even at high frequencies which are not filtered in measurement (if the transmitter and channels are minimally compliant then even with no noise added COM will be 3 dB).						
Equation (92–14). And explain why the "transntion density factor" in the argument is taken as 2 instead of 0.25 as in 48B. (If the number is incorrect, modify accordingly)	Is there a reason for testing tolerance to a sinusoidal with PtP of 0.05 UI when in COM A_DD is 0.02 (corresponding to PtP of 0.04)?						
	SuggestedRemedy						
Alternatively use erfcinv instead of Q^-1	Preferably change the maximum peak-to-peak amplitude to 0.04 UI.						
Move the note after the equation.	If jitter is kept higher than 2*A_DD, remove the requirement for COM, since it might not be						
Proposed Response Response Status O	possible to meet it. And if possible explain in the text why the test is defined with this high amplitude.						
	Fix the "be".						
	Proposed Response Response Status <b>O</b>						

C/ <b>120D</b> Ran. Adee	SC 120D.	4 P 3 Intel	57 L 30	# [17	C/ <b>120E</b> Ran. Adee	SC	120E.3.2	In	P <b>370</b> tel	L 16	# 19	
Comment T	ype E	Comment Status	D		Comment T	Туре	т	Comment Sta	tus <b>D</b>			
Mixed for	ont size in th	ne "value" column.			Module	e differe	ential output	t voltage (max)	is specified	as 900 mV. Th	is value seems	
SuggestedF Set all o	Re <i>medy</i> cells to 9 poi	nt font.			extremely and unnecessarily high for PAM4 signaling, and using it may be waste of electrical power in the module transmitter. Nevertheless the specified host input tolerance is also 900 mV.						nay be waste of ed host input tolerance	
Proposed R	Response	Response Status	0		Since there is no de-emphasis in the module output, long runs will reach the launch voltag at the host input. The reference CTLE attenuates up to 9 dB at DC, which would still leave over 300 mV peak voltage with the maximum module output. Such high voltages may							
C/ 120D	SC 120D.	4 <i>P</i> 3	57 L 34	# 18	cause	saturat	tion of the he	ost receiver wh	ich is detrim	iental for PAM4	detection.	
Ran, Adee		Intel			To avo	id satu	ration with t	he maximum m	nodule outpu	ut the host woul	d likely have to apply	
Comment T	<i>ype</i> E should use	<i>Comment Status</i> the capital Omega sign	D (per style manual)		additior noise ir	additional flat attenuation to the signal; this causes adds complexity and possibly increasing in the receiver.						
SuggestedF Change	Re <i>medy</i> e to Ohm sig	n (Hexadecimal 2126) o	r capital Omega (Hexac	lecimal 03A9).	On the specifie and the	other l ed as c e differ	hand, the m only 30 mV. ential output	inimum far-end Currently there t voltage, so a r	l eye height is no conne module with	(after reference ection between a 30 mV far-en	e equalization) is the minimum eye height id eye height and a high	
Proposed R	Response	Response Status	0		differential output voltage (that requires attenuation in the host ) would be host that attenuates the signal to maintain linearity will have a smaller that height.					ould be compliant. A ler than expected eye		
					Assum being d also ha transmi don't ne differen receive	ing the defined ave to c itter ec eed att nce of er desig	e host receiv I in 802.3cd) detect PAM4 qualization to tenuation at expected an gn.	ver may also fur ) which operate 4 with much low o de-emphasize the receiver (in nplitudes betwe	nction as a F e over more I ver incoming e the low-fre n fact they us een these tw	PAM4 electrical lossy channels, g amplitudes. Th quency content sually need pos to cases adds c	PMD (such as the ones the host receiver will nese PMDs typically use of the signal and thus itive gain). The large omplexity to the	
					Since a module	a modu e outpu	ule is plugga it voltage.	ble we cannot a	assume pro	prietary soltutio	ns to reduce the	
					A possi the diffe with a l	ible rei erentia large p	medy is to s al output volt eak voltage	tate the near-e tage, in order to	nd and far-e o prevent ha	nd eye height p ving a combina	parameters relative to tion of small eye height	
					This protect the model	oblem dule do	may also ap oes not have	pply in the othe e to double as a	er direction, c a CR receive	dhost output to er).	module input (although	
					Suggestedl	Remed	dy					
					Add a s than 5 t times th	specific times t he eye	cation fot ma the far-end e height - equ	aximum far-enc eye height (so t uivalent to ~30 <sup>0</sup>	d module out hat the peak % eye openi	tput differential <-to-peak of the ing).	voltage to be no more host input is up to 10	
					In addit	tion it v	will be good	to reduce the r	maximum me	odule output dif	ferential voltage to 450	
TYPE: TR/te	echnical req	uired ER/editorial requi	red GR/general require	d T/technical E/editorial G/gene	eral				Comme	ent ID 19	Page 7 of 40	

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mV (900 mV differantial PtP).

Change the host receiver tolerance (Table 120E–4) and crosstalk generator in host stressed input test (120E.3.3.2.1) parameters accordingly.

Optionally add a way to control the module output voltage with an MDIO register.

If desired, change the host output and module input specifications accordingly.

Proposed Response Response Status O

C/ 120E	SC 120E.3.4	P 374	L 13	# 20
Ran, Adee		Intel		

Comment Type T Comment Status D

In Table 120E–7, "Differential pk-pk input voltage tolerance" value is minimum 900 mV, while the host output is specified in Table 120E–1 with a maximum of only 880 mV.

In previous similar clauses these specs were aligned.

### SuggestedRemedy

Change input tolerance minimum value to 880 mV.

Proposed Response Response Status O

C/ 121	SC 121.1.1	P 213	L <b>48</b>	# 21
Ran, Adee		Intel		

### Comment Type T Comment Status D

"The bit error ratio (BER) when processed according to Clause 120 shall be less than 2.4  $\times$  1e–4..."

This sentence does not define the conditions under which the BER is measured. For this requirement to hold, it makes sense to assume that the transmitter and the receiver (both including PMA and PMD) are compliant, and the optical channel is compliant (e.g. according to the fiber types and lengths listed in 121.7). But none of that is listed here.

There is a PICS item associated with this "shall". BER is typically associated with the receiver, so a supplier of a PMD has to commit that the receiver meets the specified BER. It doesn't make senst to commit to meeting it under unspecified conditions.

In electrical PMD clauses, this is solved by having the BER requirement is stated as "link BER". A link is described as including compliant transmitter, channel, and receiver. This way the conditions are specified and every supplier should be able to commit.

### SuggestedRemedy

Define the performance in terms of a compliant link. Add a definition of "link" in a separate paragraph following the current paragraph.

### Suggested wording:

The bit error ratio (BER) of a link shall be less than  $2.4 \times 1e-4$  (... conclude the existing paragraph).

In this context, a link consists of a compliant transmitter (PMA and PMD), a fiber optic channel meeting the specifications of Table 121–13, and a compliant receiver (PMD and PMA).

Proposed Response Response Status **O** 

-									
Cl <b>122</b> Ran Adee	SC 122.1.1	P <b>242</b> Intel	L <b>43</b>	# 22	C/ 123 Ran Adee	SC 123.1.1	P <b>271</b> Intel	L <b>52</b>	# 23
Comment "The b	<i>Type</i> <b>T</b> bit error ratio (BEF	Comment Status D R) when processed accordir	ng to Clause 120	shall be less than 2.4 ×	Comment "The b	<i>Type</i> <b>T</b> it error ratio (B	Comment Status D ER) when processed accordin	ng to Clause 120	) shall be less than 2.4 ×
1e-4 This s requir includ accord There receiv It doe: In elec BER"	entence does not ement to hold, it r ing PMA and PMI ding to the fiber ty is a PICS item at er, so a supplier of sn't make senst to ctrical PMD claus. A link is describe	t define the conditions unde nakes sense to assume tha D) are compliant, and the op pes and lengths listed in 12 ssociated with this "shall". E of a PMD has to commit tha o commit to meeting it unde es, this is solved by having ed as including compliant tra	r which the BER at the transmitter otical channel is o (2.7). But none o BER is typically a the receiver me r unspecified cor the BER requirer ansmitter, channe	is measured. For this and the receiver (both compliant (e.g. f that is listed here. ssociated with the sets the specified BER. nditions. ment is stated as "link el, and receiver. This to commit	1e-4 This so require includi accord There receive It does In elec BER".	entence does r ment to hold, i ng PMA and P ling to the fiber is a PICS item er, so a supplie n't make sensi trical PMD clau A link is descri	not define the conditions under t makes sense to assume tha MD) are compliant, and the op types and lengths listed in 12 associated with this "shall". B of a PMD has to commit tha t to commit to meeting it under uses, this is solved by having bed as including compliant tra	r which the BER t the transmitter otical channel is (3.7). But none of ER is typically a t the receiver m r unspecified co the BER require ansmitter, chann	is measured. For this and the receiver (both compliant (e.g. of that is listed here. Associated with the eets the specified BER. Inditions. ment is stated as "link el, and receiver. This to commit
Sugaested	dRemedv				Sugaesteg	Remedv			
Define	e the performance raph following the	e in terms of a compliant link current paragraph.	Add a definition	n of "link" in a separate	Define paragr	the performan aph following t	ce in terms of a compliant link he current paragraph.	Add a definition	n of "link" in a separate
Sugge	ested wording:				Sugge	sted wording:			
The b parag	it error ratio (BER raph).	t) of a link shall be less than	2.4 × 1e-4 ( c	onclude the existing	The bi paragr	t error ratio (BE aph).	ER) of a link shall be less than	2.4 × 1e-4 ( c	conclude the existing
In this chann PMA)	context, a link co lel meeting the sp	ponsists of a compliant transm pecifications of Table 122–1	nitter (PMA and I 7, and a complia	PMD), a fiber optic nt receiver (PMD and	In this chann PMA).	context, a link el meeting the	consists of a compliant transn specifications of Table 123–6,	nitter (PMA and , and a complian	PMD), a fiber optic It receiver (PMD and
Proposed	Response	Response Status O			Proposed	Response	Response Status <b>O</b>		

C/ 124	SC 124.1.1	P 289	L <b>45</b>	# 24	C/ 120E	SC 120E	.4.2	P 378	L <b>20</b>	# 26
Ran, Adee		Intel			Rabinovich	, Rick		IXIA		
Comment T	Туре Т	Comment Status D			Comment T	Гуре Т		Comment Status D		
"The bi 1e–4	it error ratio (BEI "	R) when processed accordin	g to Clause 120	shall be less than 2.4 ×	Figure and ey the sub	120E-13 do e-height in ject figure	es not r subclau: did not t	eflect the text describing t se 120E.4.2. The procedur rack the terminology include	he methodolog re has gone thr ded in the text.	y to measure eye-width ough multiple edits but
This se	entence does no	t define the conditions under	which the BER	is measured. For this	Suggested	Remedy				
includir accord	ng PMA and PM ing to the fiber ty	D) are compliant, and the op ypes and lengths listed in 12-	tical channel is 4.7). But none o	compliant (e.g. f that is listed here.	Edit Fig http://w Plan to	gure 120E- ww.ieee80 update pre	3 appro 2.org/3/I sentatio	ppriately. Please refer to pr os/public/adhoc/elect/17Oo on to be given at Plenary M	resentation give ct_16/rabinovicl /leeting.	en at electric adhoc: h_01_101716_elect.pdf.
There i receive It does	is a PICS item a er, so a supplier n't make senst t	ssociated with this "shall". Bl of a PMD has to commit that o commit to meeting it under	ER is typically a the receiver me unspecified cor	ssociated with the eets the specified BER. nditions.	Proposed F	Response	ŀ	Response Status O		
In elect BER".	trical PMD claus A link is describe	es, this is solved by having t ed as including compliant tra	he BER require nsmitter, chann	ment is stated as "link el, and receiver. This	C/ 122	SC 122.	7.3	P <b>254</b>	L 8	# 27
way the	e conditions are	specified and every supplier	should be able	to commit.	Swanson, S	Steve		Corning Incorp	oorated	
Suggested	Remedy				Comment 7	Type TR		Comment Status D		
Define paragra	Define the performance in terms of a compliant link. Add a definition of "link" in a separate paragraph following the current paragraph.				In Table 122-13, the channel insertion loss for 200GBASE-LR4 and 400GBASE-LR8 is specified at 6.3 dB. However 10km x 0.46 dB/km plusthe 2.0 dB allocation for connectors = 6.6 dB.					
Sugge	sted wording:				Sugaested	Remedv				
The bit paragra	t error ratio (BEF aph).	R) of a link shall be less than	2.4 × 1e-4 ( c	onclude the existing	Add a footnote tied to Channel Insertion Loss: bUsing the 0.46 dB/km at 1272.55 nm attenuation for optical fiber cables derived from Appendix I of ITU-T G.695 may not support operation at 10 km for 400GBASE-LR8 at worst case conditions.					
In this channe	context, a link co el meeting the sp	onsists of a compliant transm pecifications of Table 124–11	itter (PMA and , and a complia	PMD), a fiber optic nt receiver (PMD and						ables derived from 400GBASE-LR8 at
Proposed F	Response	Response Status 0			Proposed F	Response	F	Response Status O		
<u> </u>	SC 110 3 1	P 175	/ 1	# 25						
Lapierre, D	ominic	EXFO	<i>L</i> 1	π 25						
Comment 7 MDIO 9 3.801.2	<i>Type</i> <b>E</b> status variable F 2) is missing fror	Comment Status D PCS FEC High SER (clause 4 n table 119-5.	15.2.3.47k.4, reç	gister/bit number						
Suggested Add the defines	<i>Remedy</i> e PCS FEC High s it in clause 134	n SER status variable to table .6.5.	e 119-5, in a sin	nilar way that 802.3cd						

Proposed Response Response Status **O** 

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: Comment ID

Comment ID 27

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C/ 123	SC 123.7	P <b>278</b>	L
Swanson,	Steve	Corning Incorpo	orated

# 28

L4

C/ 118 P130 SC 118.1.2 L 15 Hidaka, Yasuo Fujitsu Lab of America

Comment Type TR Comment Status D

The decision to add wide band multiple mode fiber to the 400GBASE-SR16 PMD is a mistake that will lead at minimum to confusion in the market and is IMHO misleading the reader of the standard to believe that deploying a fiber designed for operation in SWDM systems in a parallel application, will lead to enhanced performance or a viable upgrade path when in fact it will not. It is not clear that 400GBASE-SR16 will reach broad market potential given the fact that the work in 802.3cd will likely obsolete 400GBASE-SR16 in favor of 400GBASE-SR8. In addition, there is no good rationale for deploying 32 wideband fibers in a parallel fiber solution as an upgrade path.

### SuggestedRemedy

The suggestion is to reverse our decision in Fort Worth and remove wide band multimode fiber from 400GBASE-SR16 rather than mislead the reader of the standard. A user is always free to use a fiber that meets/exceeds the OM4 specification but if it provides no benefit at higher cost, it should not be recommended.

If this comment is not selected, several changes still must be made:

1. Replace "...type A1a.3 (OM4), or fiber compliant to TIA-492AAAE, according to the specifications defined in Table 123.6" with "...type A1a.4 (OM5)"

2. Replace "The fiber type and operating range shown in Table 123..5 are the same as 100GBASE-SR4 (See Clause 95)." with "The operating range shown in Table 123.5 is the same as 100GBASE-SR4 (See Clause 95).

3. 2. Consistent with Table 122-8 for single-mode fiber, there is no need to add a new row for WBMMF in Table 123-5 since the supportable link length is the same as OM4 and the fiber should only be used as an OM4 equivalent fiber, i.e., a single wavelength solution in this parallel application. Replace Table 123-5 with the following: Table 123-5 - 400GBASE-SR16 operating range

PMD type Required operating range

400GBASE-SR16 0.5 m to 70 m for OM3

0.5 m to 100 m for OM4 or OM5 operating as OM4 fiber at 850nm

Proposed Response Response Status 0 Comment Type TR Comment Status D

Comment #255 to D2.0 said that 200GXS and 400GXS are different from 200GBASE-R PCS and 400GBASE-R PCS regarding to IS SIGNAL indication. The response to the comment was accept in principle, but suitable text to describe the precise difference is requested. Here is revised changes.

### SuggestedRemedy

Change the paragraph of 118.1.2 to:

The 200GXS is identical in function to the 200GBASE-R PCS in Clause 119 excepting the functions described in 118.2 and 118.2a and the 400GXS is identical in function to the 400GBASE-R PCS in Clause 119 excepting the functions described in 118.2 and 118.2a.

Add the following sub clause 118.2a before 118.3:

118.2a IS SIGNAL indication

A PHY 200GXS or PHY 400GXS sublayer generates the IS SIGNAL indication primitive to the next higher sublaver always with a value of OK.

A DTE 200GXS or DTE 400GXS sublayer monitors the IS SIGNAL indication primitive presented by the lower sublayer and behaves in the same way as the 200GBASE-R PCS or 400GBASE-R PCS in Clause 119.

Add a diagram to illustrate the direction of IS SIGNAL indication that is an output from PHY XS and an input to DTE XS or 200/400GBASE-R PCS.

Proposed Response Response Status **O** 

C/ 118	SC	118.2.2	P 131	L <b>50</b>	# 30
Hidaka, Yas	uo		Fujitsu Lab of A	merica	
Comment Ty	/pe	Е	Comment Status D		
There is	unne	cessary i	new line and extra line space.		

SuggestedRemedy

Remove the new line and extra line space.

Proposed Response Response Status 0 # 29

		IEEE FOUZ.JL	5 D2. 1 200 GL		LISLVVUKI	ig Group rec			115	
C/ 1	SC 1.4.72h	P 34	L 33	# 31	C/ 118	SC 118.5.7		P 141	L 51	# 33
Hidaka	, Yasuo	Fujitsu Lab	of America		Hidaka, Ya	asuo		Fujitsu Lab of	America	
Comme 200 tha pre bey fut def	ent Type <b>TR</b> D/400GMII Extender t utilize a PCS subli- pare for future exter yond such preparati ure PHY/PCS for mure compatibility iss ine IEEE standard d define the future PI	Comment Status <b>D</b> is defined as a mechanism ayer other than that defined nsion in some aspect, this of on. It is very strange to excl any reasons. (1) It cannot b ues until we define the futur that nobody can rely on it. (3 XVPCS, we can define it in	a for communication in Clause 119. Al definition of 200/40 lude current use b e technically comp re PHY/PCS. (2) T 3) There is no nee	on with future PHYs though it is important to DOGMII Extender is far y restricting it only for blete for unknown here is no point to d to do it now. When populying all the	Comment M3 is Suggested Add "I Proposed	<i>Type</i> <b>E</b> mandatory only <i>IRemedy</i> N/A []" in the su <i>Response</i>	Commen when the op oport column Respons	nt Status <b>D</b> and DTI of M3. e Status <b>O</b>	EXS are supporte	əd.
unl futi	known compatibility ure, when we define	issues. (4) The definition que the future PHY/PCS. It is n	uoting future must not good to change	be changed in the the definition from the	<i>Cl</i> <b>120</b> Hidaka, Ya	SC <b>120.5.1</b> <sup>4</sup> asuo	1.1.1	P <b>196</b> Fujitsu Lab of	L <b>22</b> America	# 34
CO	isistency.				Comment	Type TR	Comme	nt Status D		
On any cur	the other hand, alth / serious technical p rent PHYs and Clau	nough I have carefully review problems to use 200/400GN use 119 PCS.	wed the whole spe III Extender in Cla	ecification, I do not see use 118 with the	The d Also, was ir	escription of the we should revise troduced in the	error counte e non-exact e past when th	er is not clear for b error counting by t ne target BER was	ourst errors. he sliding 1000-b s rather low such	bit window, because it $a \le 1E-12$ and a
Sugges	stedRemedy				DFE v	vas not commo	nly used.			
Ch The cor Cla	ange the definition of e 200 Gb/s Media Ir nsists of two 200GX nuse 118.)	of 200 GMII Extender to: Independent Interface Extend S sublayers with a 200GAU	der extends the re II-n between them	ach of the 200GMII and . (See IEEE Std 802.3,	Now, Also, propa Hardw and c	the target BER use of the slidin gation of DFE th are to measure onsumes less th	before RS-FE g window wil nat is now co the exact er nan 1mW.	EC is rather high s I miss significant of mmonly used in e ror count without a	such as < 2.4E-4 degradation of Bl lectrical interface a sliding window	ER due to error es. is a few hundred cells
Ch The cor	ange the definition of e 400 Gb/s Media Ir nsists of two 400GX	of 400GMII Extender to: Independent Interface Extend S sublayers with a 400GAU	der extends the re II-n between them	ach of the 400GMII and . (See IEEE Std 802.3,	This is	s related to com	ment #430 to	D2.0. This comn	nent is a revised	change to the text.
Cla	iuse 118.)				Suggester	aRemeay	abaakar aba	Il incromont the te	at pattorp arror a	ountor by one for
Oth Propos	nerwise, remove Cla ed Response	ause 118 and postpone it fo <i>Response Status</i> <b>O</b>	r a future project t	hat will be used.	each i Implei errors	ncoming bit error nentations shou occur in a slidir	or in the PRB and be capabling 1000-bit w	S31 pattern for is counting at le ndow." to either o	olated single bit east one error wh of the following of	errors. lenever one or more ptions:
<i>Cl</i> <b>118</b> Hidaka	SC <b>118.5.7</b> , Yasuo	P <b>141</b> Fujitsu Lab	L 48 of America	# 32	Optior The cl PRBS	n A: hecker shall ind 31 pattern. A bi	rement the t urst error is e	est-pattern error c exactly counted as	counter by one fo multiple errors.	r each bit error in the
Comme M2 Sugges	ent Type E is mandatory only steedRemedy	Comment Status D when the options MD and P	HYXS are suppor	ted.	Option The cl PRBS	n B: hecker shall inc 31 pattern. If a	rement the te DFE is not u	est-pattern error co sed, a burst error	ounter by one for that is multiple e	each error in the rrors within 100 bits
Ad	d "N/A []" in the sup	port column of M2.			may b	e counted as or	ne error.			
Propos	ed Response	Response Status <b>O</b>			Proposed	response	Respons	e Status O		

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: Comment ID

C/ 120	SC 120.5.	11.2.4	P 199	L 35	# 35		C/ 120D	SC 12	0D.3.1.6	5	P 354	L 20	# 36
Hidaka, Ya	asuo		Fujitsu Lab of	America			Hidaka, Yas	suo			Fujitsu Lab o	f America	
Comment	Type TR	Comme	ent Status D				Comment T	vpe 1	ΓR	Comme	ent Status D		
The de Also, v was in DFE v	escription of the we should revi atroduced in the vas not comm	ne error count se non-exact e past when t only used.	er is not clear for b error counting by t he target BER was	ourst errors. he sliding 1000 s rather low suc	-bit window, because h as < 1E-12 and a	it	When t in claus 120D.3 it is not	he wavef e 85.8.3 .1.3 that recomm	form is o .3.4 that is referre ended to	aptured, a is referre ed from 12 o use aver	averaging multiple d from clause 94. 20D.3.1.6. Since raging when capte	e waveform capti 3.12.5.2 that is r averaging remov uring waveform f	ures was recommended eferred from ed uncorrelated noise, or SNDR measurement.
Now, t Also, u propa Hardw	the target BEF use of the slid gation of DFE vare to measu	R before RS-F ing window wi that is now co re the exact e	EC is rather high s Ill miss significant of ommonly used in e rror count without a	such as < 2.4E-4 degradation of E electrical interfact a sliding window	4. BER due to error ces. v is a few hundred cel	s	Howeve and exc Alternat	er, such r clude an tively, we	estrictio option to may pe	n of not to use a sa ermit to us	o use averaging w mpling scope. e averaging, if we	ould mandate us	se of a realtime scope
and co	onsumes less	than 1mW.		-			test.	-					
This is which	s related to co was accepted	mment #301 t in principle. <sup>-</sup>	o D2.0. Although <del>/</del> This comment is a	#301 was rejecto revised change	ed, #301 refers to #43 to the text.	0	PRBS1 Howeve	3Q on di er, PRBS	fferent la 13Q on	anes shou different l	ld be uncorrelate anes are synchro	d as much as po nous because th	ssible. e pattern length is
Suggested	dRemedy						Therefo	ore, avera	ating will	not remo	ve their effect of	crosstalk.	
Chang each i	ge the text "Th ncoming bit e	e checker sha ror in the PRI	all increment the te 3S31 pattern for is	est-pattern error olated single bit	counter by one for		Suggested	Remedy					
Impler errors	nentations sh occur in a slic	ould be capat ling 1000-bit v	ble of counting at le window." to either of	east one error w	henever one or more options:		Change	the first	and sec	cond parag	graphs of 120D.3	.1.6 to:	
Optior The cl PRBS	n A: hecker shall in 31 pattern. A	ncrement the burst error is	test-pattern error c exactly counted as	counter by one f	or each bit error in the	9	Signal-I followin settings	o-noise a g methoo s.	and disto d, with tr	ortion ratio ansmitter	o (SNDR) is meas s on all lanes ena	sured at the trans bled, with idention	smitter output using the cal transmit equalizer
Optior The cl PRBS	n B: hecker shall in 31 pattern. If a	crement the t a DFE is not u	est-pattern error co used, a burst error	ounter by one fo that is multiple	or each error in the errors within 100 bits		Capture per 85.8 If avera under te	e at least 3.3.3.4 e ging is u est.	one cor xcepting sed, alth	nplete cyc that aver nough it is	cle of the PRBS13 aging multiple wa not recommende	3Q test pattern ( veform captures d, send PRBS1	120.5.11.2.3) at TP0a is not recommended. 3Q on the lanes not
may b	e counted as	one error.	a Ctatura O				Otherw not und	ise, send er test.	PRBS3	1Q or a v	alid 200GBASE-F	R or 400GBASE-	R signal on the lanes
rioposeu	Response	Respons	se status 0				Compu error, e	te the lin (k), acco	ear fit to rding to	the captu 120D.3.1.	red waveform an 3. Denote the sta	d the linear fit pu Indard deviation	llse response, p(k), and of e(k) as σe.
							Also sp lane an	ecify the d any oth	minimu ner lanes	m offset o s in Claus	f 940 symbols be e 120.5.11.2.3.	tween PRBS130	) patterns between any
							Proposed F	esponse	)	Respons	se Status <b>O</b>		

C/ 120 SC 120.5.11.2.3 P 198 L 40 # 37	C/ 120D SC 120D.3.1.1	P 351	L <b>42</b> # <u>3</u> 9
Hidaka, Yasuo Fujitsu Lab of America	Hidaka, Yasuo	Fujitsu Lab of Ar	merica
Comment Type <b>TR</b> Comment Status <b>D</b> Unlike PRBS31Q, PRBS13Q does not specify the seed for each lane or the minimum offset between PRBS13Q on different lanes. The Autocorrelation function of PRBS13Q has a strong peak at an offset of 452 symbols with correlation coefficient of 0.4. Lack of specification of seed for each lane or the minimum offset between lanes may result in strong correlation between test patterns on different lanes that is not desired for measurement accurately. It is also discouraged to reuse 4 seeds in Table 94-11 by adding 4 more seeds, because they will make the offset between Lane 1 and 2 only 827 symbols that is not sufficient to separate the strong peak between lanes. Autocorrelation function of PRBS13Q is almost flat for an offset between 470 symbols and 7720 symbols.	Cl 120D SC 120D.3.1.1	provide Labor An omment Status D 5 in D2.1. Then, we can re- bo "at least 10^5 hits". Sponse Status O P 351	educe the number of samples in the
Add the following statement to the second paragraph in 120.5.11.2.3:	HIdaka, Yasuo	Fujitsu Lab of Ar	merica
To avoid correlated crosstalk, it is highly recommended that the PRBS13Q pattern is generated from different seeds for each lane so that the PRBS13Q pattern has a minimum offset of 940 symbols between any lane and any other lane. Proposed Response Response Status <b>O</b>	Test pattern for EOJ has bee to JP03B due to some proble There has been still discussi #565 to D2.0 by Piers. This is my recommendation to	en once changed from JP( em. on to use PRBS13Q for E to measure EOJ using PR	03B to PRBS13Q, but changed back EOJ measurement such as comment RBS13Q.
Cl 120D       SC 120D.3.1.1       P 350       L 51       # 38         Hidaka, Yasuo       Fujitsu Lab of America       Fujitsu Lab of America         Comment Type       TR       Comment Status       D         There has been discussion on jitter measurement using PRBS13Q such as comment #131 to D2.0 by Piers.       This is my recommendation to measure jitter using PRBS13Q.         SuggestedRemedy       Measure jitter on each of 12 specific transitions in PRBS13Q in order to exclude DDJ       Get a horizontal histogram for each of specific transitions.         - Each specific transition may be replaced with a similar specific transition.       Each histogram should include at least 10^5 hits.         - Derive JRMS and J4 from the histogram using the method in 120D.3.1.1       JRMS and J4 should meet the specification at each specific transition.         Proposed Response       Response Status       O	For each of 12 specific transi - Measure 2 cycles of PRBS - Get a first horizontal histog - Let T1 be the mean time of - Get a second horizontal his - Let T2 be the mean time of - Calculate EOJ as abs(T2 - - Each histogram should inc - EOJ should meet the spec - Each specific transition ma transition in PRBS13Q is me Proposed Response Res	itions in PRBS13Q. 13Q test pattern fram for the specific transi f the first histogram stogram for the specific tra- f the second histogram T1 - 8191 UI) lude at least 10^5 hits. ification at each specific tra- transition at each specific tra- sponse Status O	ition in the first PRBS13Q ansition in the second PRBS13Q ransition. lar transition as long as the same

C/ 120D SC 120D.3.1	P 351	L 21	# 41	C/ 120D	SC 120D.3.	1 P	351	L 19	# 43
Hidaka, Yasuo	Fujitsu Lab o	America		Hidaka, Ya	suo	Fujit	su Lab of	America	
Comment Type TR Co	mment Status D			Comment	Туре Е	Comment Status	s D		
The Value of Np, 13 in D2.0 A larger Np value increases to capture more long-term ISI. On the other hand, peak of the As a result, the ratio of the ling	was changed to 200 in the steady-state voltag ne fitted pulse does no near fit pulse peak to th	D2.1. e vf, because a : change. ie steady-state v	longer fitted pulse will voltage vf is reduced.	In Tabl 94.3.12 that do 120D.3 120D.3	e 120D-1, the i 2.5.3. However es not include 3.1.4 which refe 3.1.3).	reference for the stea , clause 94.3.12.5.3 exceptions described eres to the linear fit p	idy state v efers to th in 120D. <sup>2</sup> rocedure ii	voltage vf (max) ne linear fit proc 1.3. The referer n 120D.3.1.2 (it	and (min) is redure in 94.3.12.5.2 ince should be made to a must be corrected to
In order to avoid changing th adjust the values of vf and th According to my simulation, v	e requirement for Tx do e ratio of the linear fit p of was increased by 4.3	ue to the Np valu oulse peak to the 3279% for 30mn	ue change, we should e steady voltage vf. n package and by	Suggested Chang 94.3.12	<i>Remedy</i> e the reference 2.5.3 to 120D.3	e for the steady state 1.4.	voltage vf	(max) and (mir	n) in Table 120D-1 from
1.7706% for 12mm package The ratio of the linear fit puls for 30mm package and by 1.	when I changed Np fro e peak to the steady-st 7393% for 12mm pack	om 13 to 200. ate voltage vf w age when I char	as reduced by 4.1471% nged Np from 13 to 200	Proposed I	Response	Response Status	Ο		
SuggestedRemedy				C/ 120D	SC 120D.3.	1 P	351	L <b>21</b>	# 44
Change the Steady state volt from 0.6 to 0.611	age vf (max)			Hidaka, Ya	suo	Fujit	su Lab of	America	
Change the Steady state volt from 0.4 to 0.417 Change the value of Linear fi from "0.736 x vf" to "0.705 x	tage vf (min) t pulse peak (min) vf″.			Comment In Tab clause contrac 120D.3 120D.3	<i>Type</i> <b>E</b> 94.3.12.5.3 ref dictory descript 3.1.4 which refe 3.1.3).	Comment Status reference for the line fers to the linear fit pr ion for the linear fit pro- ers to the linear fit pro-	<b>D</b> ar fit pulse ocedure ir ulse peak. ocedure in	e peak (min) is 9 n 94.3.12.5.2 ar The reference 120D.3.1.2 (tha	94.3.12.5.3. However, nd includes a should be made to at must be corrected to
Proposed Response Res	sponse Status O			Suggested Chang 120D.3	<i>Remedy</i> e the reference 3.1.4.	for the linear fit puls	e peak (m	in) in Table 120	DD-1 from 94.3.12.5.3 to
C/ 120D SC 120D.3.1.4 Hidaka, Yasuo	Р <b>352</b> Fujitsu Lab o	L <b>46</b> America	# 42	Alterna point to	tively, the refer 0 120D.3.1.2 (th	rence may be directly nat must be corrected	/ to 120D.3 d to 120D.	3.1.3, because 3.1.3).	120D.3.1.4 merely
Comment Type E Co It is written as the linear fit pr linear fit procedure. 120D.3.1 described in 120D.3.1.3.	omment Status D ocedure in 120D.3.1.2 .2 describes Transmitt	but 120D.3.1.2 er linearity. The	does not describe the linear fit procedure is	Proposed I	Response	Response Status	F <b>O</b>		
SuggestedRemedy									
Change the reference to 120	D.3.1.2 with a reference	e to 120D.3.1.3							

Proposed Response Response Status **0** 

C/ 121	SC 121.8.5.3	P 226	L <b>24</b>	# 45	C/ 121	SC 121.8.5.1	P <b>224</b>	L 10	# 48
King, Jona	than	Finisar			Le Chemir	nant, Greg	keysight Tech	inologies	
Comment	Туре Т	Comment Status D			Comment	Type E	Comment Status D		
Equati	on 121-4 is inten	ded to direct the reader to cre	eate a cummula	tive distribution for	Figure	e 121-4 is incomple	te. Text was lost in the righ	nt side.	
values written	of y>Pth1 and y	Pth1, a few reviewers have	commented tha	t it's a bit ambiguous as	Suggester	dRemedy			
Suggested	IRemedy				Figure	e 121-4 should be i	dentical to 122-4 on page 2	57	
Equati expres See ex	on 121-4 could b sions, one for yi ample in presen	e expressed more clearly by >Pth1, and one for yi <pth1. tation king_3bs_01_1016_sm</pth1. 	describing the v	/alue of Cf1(yi) as two	Proposed	Response	Response Status <b>O</b>		
Proposed I	Response	Response Status <b>O</b>			C/ 121	SC 121.8.1	P 222	L <b>41</b>	# 49
·					Le Chemir	nant, Greg	keysight Tech	inologies	
					Comment	Туре Т	Comment Status D		
C/ 124	SC 124.8.1	P 298	L <b>40</b>	# 46	Optica	al modulation ampl	itude should allow use of SS	SPRQ (pattern 6	6) as a valid test pattern
Le Chemin	ant, Greg	keysight lech	nologies		in add	lition to PRBSQ13	(pattern 4). Currently OMA	is measured or	ly with pattern 4.
Comment	Туре <b>т</b>	Comment Status D			patter	ns to be used The	e data acquired for the TDE	CQ measureme	ent using the SSPRO
As per	earlier commen	ts, allow SSPQRQ pattern 6 a	as a valid patter	n for OMA and	patter	n can effectively be	e reused for the OMA measure	urement if the S	SPRQ pattern is
extinct	ion ratio				docm	ented as a valid pa	ttern. This will reduce test t	times as well as	not require the test
Suggested	Remedy				proces		witch test patterns.		
add pa	attern 6 to lines 4	0 and 45 page 298			Suggested	dRemedy			
Proposed I	Response	Response Status W			Allow line 37	SSPRQ as a valide 7	e pattern for OMA measurer	ments. Add pat	tern 6 to Table 121-10,
[Editor	's note: Type set	t to T]			Proposed	Response	Response Status O		
C/ 124	SC 124.8.6	P <b>299</b>	L <b>50</b>	# 47					
Le Chemin	ant, Greg	keysight Tech	nologies		C/ 121	SC 121.8.1	P 222	L <b>41</b>	# 50
Comment	Туре Т	Comment Status D			Le Chemir	nant, Greg	keysight Tech	inologies	
As per	earlier commen	ts, SSPRQ should be a valid	pattern for extin	iction ratio	Comment	Туре Т	Comment Status D		
measu	irements				Allow	SSPRQ pattern 6 a	as a valid pattern for extinct	ion ratio test. T	his will allow the
Suggested	Remedy				extinc	tion ratio measurer	nent to be derived from the	same data acq	uired for the TDECQ
change	e line 50 to read	"pattern as defined in	120.5.11.2.3 o	r SSPRQ pattern as			Thou requiring the test proce		SWILCH
defined	a in 120.5.11.2.5	with the sum			Suggester	arkemedy	4 40 line 44		
Proposed I	Response	Response Status W			Add p	attern 6 to table 12	1-10 line 41		
[Editor	's note: Type set	t to T]			Proposed	Response	Response Status <b>O</b>		

				-				
C/ 121 SC 122.8.	6 P 227	L <b>35</b>	# <u>5</u> 1	C/ 122	SC 122.8.6	P <b>258</b>	L 17	# 54
Le Cheminant, Greg	keysight Tec	hnologies		Le Chemir	nant, Greg	keysight Tech	nologies	
Comment Type T	Comment Status D			Comment	Туре Т	Comment Status D		
Assuming pattern 6 document this	is allowed for extinction ratio te	st, the text in 12	1.8.6 needs to	As per measu	r earlier commer urements	nts, SSPRQ should be a valid	pattern for exti	nction ratio
SuggestedRemedy				Suggested	dRemedy			
change the text at li defined in 120.5.11.	ne 35 to read "as defined in 2.5."	120.5.11.2.3 or	the SSPRQ pattern as	chang define	e line 18 to read d in 120.5.11.2.	l "pattern as defined ir 5 with the sum	n 120.5.11.2.3 c	or SSPRQ pattern as
Proposed Response	Response Status O			Proposed	Response	Response Status O		
C/ 122 SC 122.8.	1 <i>P</i> 255	L <b>29</b>	# 52	C/ 120E	SC 120E.4.2	2 P 379	L <b>46</b>	# 55
Le Cheminant, Greg	keysight Tec	hnologies		Szczepane	ek, Andre	Inphi		
Comment Type <b>T</b> As per earlier commextinction ratio	Comment Status <b>D</b> nents, allow SSPQRQ pattern 6	as a valid patte	n for OMA and	<i>Comment</i> The de remov	<i>Type</i> <b>E</b> efinitions of AVu /ed.	Comment Status D Ipp, Vupp, AVmid, Vmid, AVIc	ow, & Vlow are r	redundant and should be
SuggestedRemedy				Suggested	dRemedy			
Add pattern 6 to tab	le 122-15 line 29 and line 33			Remo	ve the definition	s of AVupp, Vupp, AVmid, Vn	nid, AVlow, & V	low.
Proposed Response	Response Status 0			Proposed	Response	Response Status O		
<i>Cl</i> <b>122</b> SC <b>122.8</b> . Le Cheminant, Greg	4 P 255 kevsight Tec	L <b>54</b> hnologies	# 53	<i>Cl</i> <b>119A</b> Dillard, Jo	SC 119A	P <b>318</b> Microsemi	L 6	# 56
	Commont Status D			Commont		Commont Status D		
As per previous con	nments, SSPRQ should be doc	umented as a va	lid pattern for OMA test	Since	the alignment m	narkers changed for 200g, tab	les 119A-1 and	119A-3 require
SuggestedRemedy				Suggostor	dBomody			
change line 54 page as defined in 120.5.	e 255 to read "pattern as de 11.2.5 with the sum".	fined in 120.5.1	1.2.3 or SSPRQ pattern	I will p	an to provide si	upporting material		
Note that 121.8.4 m that is the preferred specific PRBSQ13	akes no reference to patterns f text, then 122.8.4 should be sin pattern	or making an OM milar and just dro	IA measurement. If op the reference to the	Proposed	Response	Response Status <b>O</b>		
Proposed Response	Response Status 0							

C/ 121	SC 121.3.2	P <b>215</b>	L <b>40</b>	# 57	C/ 121	SC 121.3.2	P <b>215</b>	L <b>47</b>	# 58
Ran, Adee		Intel			Ran, Adee		Intel		
Comment 7	Гуре Т	Comment Status D			Comment 7	<i>ур</i> е <b>т</b>	Comment Status D		
(Comm	ient is against an	unchanged portion of the draft	)		(Comm	ent is against a	an unchanged portion of the draft)		

"The Skew at SP4 (the receiver MDI) shall be less than 134 ns and the Skew Variation at

If the PMD service interface is physically instantiated so that the Skew at SP5 can be measured, then the Skew at SP5 shall be less than 145 ns and the Skew Variation at SP5 shall be less than 3.6 ns '

Which provider is responsible for meeting the requirements at SP4? Most of the skew and variation at SP4 is caused by the medium. The PMD provider cannot control them.

Having a PICS item for a parameter that is not controllable does not make sense. Such items would probably be checked blindly.

It makes more sense that the skew and variation created by the PMD between SP4 and SP5 should be limited: this is the difference between the values at SP4 and the values at SP5. The skew at SP4 can be provided informatively.

Comment similarly applies to 122.3.2, 123.3.2, 124.3.2.

### SuggestedRemedy

Change the quoted paragraphs (L40 to L44) to read

"The Skew at SP4 (the receiver MDI) can be assumed to be less than 134 ns and the Skew Variation at SP4 can be assumed to be less than 3.4 ns

If the PMD service interface is physically instantiated so that the Skew at SP5 can be measured, then the Skew at SP5 shall be less than the Skew at SP4 plus 11 ns, and the Skew Variation at SP5 shall be less than the Skew Variation at SP4 plus 0.2 ns."

Change PICS accordingly.

SP4 shall be less than 3.4 ns.

Change similarly in the other clauses.

Proposed Response Response Status 0

mment Type	Т	Comment Status D	
(Comment is	against	an unchanged portion of the draft)	

The measurement method defined in 86.8.3.1 cannot be applied directly to the PMDs in this project: for the signal at the PMD input or output, the alignment markers are bit-muxed and PAM4 modulated, and identifying the alignment markers must be done after at least an equivalent of a PMA sublayer that recovers and de-muxes two serial bit stream.

The measurement of skew parameters at the PMD may be done in several ways, and can be left to the test implementer, outside the scope of the standard, without affecting interoperability.

Comment similarly applies to 122.3.2, 123.3.2, 124.3.2.

### SuggestedRemedy

Delete the sentence "The measurements of Skew and Skew Variation are defined in 86.8.3.1." here and in the other PMD clauses.

Proposed Response Response Status 0

C/ 120C	SC 120C.5.3	P 344	L 13	# 59
Ran, Adee		Intel		

Comment Type T Comment Status D

"Adaptive equalizer" is not relevant for a host. A host vendor should not mark this item. This feature is characteristic of a module, specifically the module input. Therefore it should be part of the "module input" table.

#### Also applies to 120E.5.3.

SuggestedRemedy

Move item ADE from 120C.5.3 to 120C.5.4.4 (Module input). Move item ADE from 120E.5.3 to 120E.5.4.4 (Module input).

Proposed Response Response Status **O** 

$\begin{array}{cccccccccccccccccccccccccccccccccccc$											
Ran, Ade       Intel         Comment Type E       Comment Status D         Comment Status D       Comment Status D         Comment Status D       Comment Status D         Several numbers in the 'value' column seem to have a larger font than the rest.       Comment Status D         SuggestedRemedy       Comment Status D         Use consistent font for numbers:       Comment Status D         Proposed Response       Response Status D         C/ 120D SC 120D.4       P 357       L 33       # [s1]         Comment Status D       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D         Comment Status D	C/ 120D SC 120D.4	P <b>357</b>	L <b>31</b>	# <u>6</u> 0	C/ 120E	SC 120E.3.1	1.5	P 367	L <b>8</b>	# 63	
Comment Type E       Comment Status D         Comment Type E       Comment Status D         Several numbers in the 'value' column seem to have a larger font than the rest.       SuggestedRemedy         Use consistent font for numbers.       Proposed Response       Response Status O         C1 120D SC 120D.4       P 357       L 33       # [61]         Canneent Type T       Comment Status D       Comment Status D         Canneent Type T       Comment Status D       Comment Status D         Canneent Type T       Comment Status D       Comment Status D         Canneent Type T       Comment Status D       Comment Status D         Canneent Type T       Comment Status D       Comment Status D         Canneent Type T       Comment Status D       Comment Status D         Canneent Type T       Comment Status D       Comment Status D         Comment Type T       Comment Status D       Comment Status D         Comment Type T       Comment Status D       Comment Status D         Comment Type T       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D         Comment Status D       Comment Status D       Comment Status D <td>Ran, Adee</td> <td>Intel</td> <td></td> <td></td> <td>Ran, Adee</td> <td></td> <td></td> <td>Intel</td> <td></td> <td></td> <td></td>	Ran, Adee	Intel			Ran, Adee			Intel			
(Comment is against an unchanged portion of the draft)       (Comment is against an unchanged portion of the draft)         Suggested/Remedy       Use consistent font for numbers:       (Comment is against an unchanged portion of the draft)         C1 200 SC 1200.4       P357       L33       # [s]         Canneent Type TR       Comment is against an unchanged portion of the draft)       Segseted/Remedy         Canneent Type TR       Comment is against an unchanged portion of the draft)         The parameter with symbol C, bin Table 120D-7 seem to correspond to "Single-ended package capacitance at package-to-board interface".       Single-ended package capacitance at package-to-board interface".         Suggested/Remedy       Comment is against an unchanged portion of the draft).       It is annew, transition times are specified for transitions between three consecutive "the "symbol, or vice versa. The specified times are to feel the draft.         Suggested/Remedy       Comment is against an unchanged portion of the draft).       It should have the same the same are as in Table 93A-1.         Suggested/Remedy       Comment is against an unchanged portion of the draft).       It should have the same the same and the single setting the corresponding name to "Single-ended package capacitance at package-to-board interface".         Proposed Response       Response Status D       Comment Stage capacitance at package-to-board interface".         Suggested/Remedy       It table 93A-1.       Single-ended package capacitance at package-to-board interface". </td <td>Comment Type E</td> <td>Comment Status D</td> <td></td> <td></td> <td>Comment Ty</td> <td>ype T</td> <td>Commer</td> <td>t Status D</td> <td></td> <td></td> <td></td>	Comment Type E	Comment Status D			Comment Ty	ype T	Commer	t Status D			
Several numbers in the "value" column seem to have a larger font than the rest.         SuggestedRenedy         Use consistent font for numbers.         Proposed Respons       Response Status 0         Clinton SC 1200.4       P 37       L 3       # 0         Comment Type TR       Comment Status 0	(Comment is against a	an unchanged portion of the d	raft)		(Comme	ent is against a	an unchange	d portion of the o	draft)		
SuggestedRemedy Use consistent for for numbers.       Proposed Response       Response Status       0         C1 120D       SC 120D.4       P 357       L 33       # [51]         Cannent Type       TR       Comment Status       0         Cannent Type       TR       Comment Status       0         Comment Type       TR       Comment Status       0         Comment Type       E       Comment S	Several numbers in the	e "value" column seem to hav	/e a larger font th	nan the rest.	The ave	rage reader sl	hould be fam	iliar with the con	cept of transition	time, but here it is	
Use consistent font for numbers. Proposed Response Response Status <b>0</b> Cl 1200 SC 1200.4 P 357 L 33 # $\boxed{1}$ Cl 1200 SC 1200.4 P 357 L 33 # $\boxed{1}$ Cl mment Type <b>T</b> Comment Status <b>D</b> (Comment sequences and unchanged portion of the draft) The parameter with symbol $\subseteq$ b in Table 1200–7 seems to correspond to "Single-ended package capacitance at package-to-board interface" in Table 93A-1, which has the symbol Change parameter symbol from C_b to C_b and change the corresponding name to "Single-ended package capacitance at package-to-board interface". Proposed Response Response Status <b>D</b> (Comment is against an unchanged portion of the draft) Change parameter symbol from C_b to C_b and change the corresponding name to "Single-ended package capacitance at package-to-board interface". Proposed Response Response Status <b>D</b> (Comment is against an unchanged portion of the draft) What does the "A" in "eye height A" stand for? Suggested/Remedy Clarify or delete the "A". Proposed Response Response Status <b>D</b> (Comment is against an unchanged portion of the draft) What does the "A" in "eye height A" stand for? Suggested/Remedy Clarify or delete the "A". Proposed Response Response Status <b>D</b> (Comment is against an unchanged portion of the draft) What does the "A" in "eye height A" stand for? Suggested/Remedy Clarify or delete the "A". Proposed Response Response Status <b>D</b> (Comment is against an unchanged portion of the draft) What does the "A" in "eye height A" stand for? Suggested/Remedy Clarify or delete the "A". Proposed Response Response Status <b>D</b> (Comment is against an unchanged portion of the draft) Proposed Response Response Status <b>D</b> (Comment is against an unchanged portion of the draft) What does the "A" in "eye height A" stand for? Suggested/Remedy Clarify or delete the "A". Proposed Response Response Status <b>D</b> (Comment is against an unchanged portion of the draft) Proposed Response Response Status <b>D</b> (Comment is against an unchanged portion of the draft) (Comment i	SuggestedRemedy		-		redefine	d in a confusir	ng way. The f	ransition times a	are defined to ap	ply to only specific	
Paroposed Response       Response Status       0         C1 1200       SC 120D.4       P357       L33       # [61]         C2 moment Type       T       Comment Status       D       Suggested/Remedy         Comment is against an unchanged portion of the draft)       The parameter definition (which I can't find), it should have the same symbol and three consecutive "three" symbols, or vice versa. The specified times are between the crossings of 20% and 80% levels of the signal."       In this annex, transition times are specified for transitions between three consecutive "three" symbols, or vice versa. The specified times are between the crossings of 20% and 80% levels of the signal."         Suggested/Remedy       In this annex, transition times are specified for transitions between three consecutive "three" symbols, or vice versa. The specified times are between the crossings of 20% and 80% levels of the signal."         Suggested/Remedy       In this annex, transition times are specified for transitions between three consecutive "three" symbols, or vice versa. The specified times are between the crossings of 20% and 80% levels of the signal."         Suggested/Remedy       In this annex, transition times are specified package capacitance at package-to-board interface".         Proposed Response       Response Status         C1 120E       SC 120E.3.1       P 365       L 50       # 62         Ran, Adee       Intel       Comment Type       TR       Comment Status D         (comment is against an unchanged portion of	Use consistent font for	r numbers.			signal. a	as in the next of	ges is unclea paragraph): a	nd "isolated edg	ie" is not defined	at all. Punctuation of	
Cl 120D       SC 120L,       P357       L 33       # [6]         Canneent Type       TR       Comment Status       D         Comment is against an unchanged portion of the draft)       The parameter with symbol C_ b in Table 120D-7 seems to correspond to "Single-ended package capacitance at package-to-board interface" in Table 93A-1, which has the symbol C_ D, unchanged portion of the draft)       The parameter with symbol C_ b in Table 93A-1, which has the symbol C_ D, unchanged portion of the draft)       The bescend paragraph, change "In this case, the 0% level are defined as".         SuggestedRemedy       Change the first paragraph to read:       "In this annex. transition times are sponse Status O       O         Cl 120E       SC 120E.3.1       P 365       L 50       # [6]         Ran, Adee       Intel       Comment Status D       Intel         Comment Type       E       Comment Status D       [Comment is against an unchanged portion of the draft]         Ran, Adee       Intel       Ran, Adee       Intel         Comment Type       E       Comment Status D       [Comment is against an unchanged portion of the draft]         What does the "A" in "eye height A" stand for?       StagestedRemedy       Canney the package capacitance at package.       Comment Status D       [Comment is against an unchanged portion of the draft]         Comment Type       E       Comment Status D       [Comment is against an u	Proposed Response	Response Status <b>O</b>			the sent	ence is also u	nclear.				
Cl 1200       SC 120D.4       P 357       L 33       # (a)         Can, Adee       Intel         Comment Type       TR       Comment Status       D         Comment is against an unchanged portion of the draft)       The parameter with symbol C_b in Table 120D-7 seems to correspond to "Single-ended package-to-board interface".       This annex, transition times are specified for transitions between three consecutive "twee" symbols on vice versa. The specified times are between the crossings of 20% and 80% levels of the signal.*         SuggestedRemedy       Change parameter symbol from C_b to C_p and change the corresponding name to "Single-ended package capacitance at package to-board interface".       Note the same name as in Table 93A-1.         SuggestedRemedy       Change parameter symbol from C_b to C_p and change the corresponding name to "Single-ended package capacitance at package-to-board interface".       Note the first paragraph. change "In this case, the 0% level and the 100% level are defined as".         Proposed Response       Response Status       O       C/       120E       SC 120E.3.1       P 365       L 50       # (a)         Comment Type       E       Comment Status       D       (comment is against an unchanged portion of the draft)       Reference to the procedure in 83E.3.3.2.1 is obsolete - there is a specific procedure for this annex in Table 93A-1.         Cl 120E       SC 120E.3.1       P 365       L 50       # (a)         Comment Type					Also, 0%	% and 100% a	re not well de	fined (only "may	y be estimated", a	and "in this case").	
Charge the first paragraph to read:         Comment Type       TR       Comment Status D         (Comment is against an unchanged portion of the draft)         The parameter with symbol C_b in Table 120D-7 seems to correspond to "Single-ended package capacitance at package-to-board interface" in Table 93A-1.       The parameter with symbol C_b in Table 120D-7 seems to correspond to "Single-ended package capacitance at package-to-board interface".       The parameter with symbol C_b in Table 120D-7 seems to correspond to "Single-ended package capacitance at package-to-board interface".       The parameter symbol from C_b to C_p and change the corresponding name to "Single-ended package capacitance at package-to-board interface".       The parameter symbol from C_b to C_p and change the corresponding name to "Single-ended package capacitance at package-to-board interface".       The parameter symbol from C_b to C_p and change the corresponding name to "Single-ended package capacitance at package-to-board interface".       The parameter symbol from C_b to C_p and change the corresponding name to "Single-ended package capacitance at package-to-board interface".       The parameter symbol from C_b to C_p and change the corresponding name to "Single-ended package capacitance at package-to-board interface".       The parameter symbol from C_b to C_p and change the corresponding name to "Single-ended package capacitance at package-to-board interface".       The parameter symbol from C_b to C_p and change the corresponding name to "Single-ended package capacitance at package-to-board interface".       The second paragraph change The to% level and the 100% le		P 357	1 33	# 61	SuggestedR	Remedy					
Comment Type       TR       Comment Status       D         (Comment is against an unchanged portion of the draft)       The parameter with symbol C_b in Table 120D-7 seems to correspond to "Single-ended package-to-board interface" in Table 93A-1, which has the symbol C_b b in Table 132D-7 seems to corresponding name to symbol and the same name as in Table 93A-1.       "In this annex, transition times are specified for transitions between three consecutive "three" symbols, or vice versa. The specified times are between the crossings of 20% and 80% levels of the signal."         SuggestedRemedy       Change parameter symbol from C_b to C_p and change the corresponding name to "Single-ended package capacitance at package-to-board interface".       In the second paragraph, change "In this case, the 0% level and the 100% level may be estimated as" to "The 0% level and the 100% level are defined as".         C/1 120E       SC 120E.3.1       P 365       L 50       # 62         Comment Type       E       Comment Status       D         Comment Type       E       Comment Status       D         Comment Type       E       Comment Status       D         Comment Type       E       Comment for draft)       Reference to the procedure in 83E 3.3.2.1 is obsolete - there is a specific procedure for this annex in 120E.3.3.2.1.         Comment is against an unchanged portion of the draft)       SuggestedRemedy       Change reference to 120E.3.3.2.1.         Clarity, or delete the "A".       Proposed Response       Response Status <td>Ran, Adee</td> <td>Intel</td> <td>L 33</td> <td># 01</td> <td>Change</td> <td>the first parag</td> <td>raph to read</td> <td></td> <td></td> <td></td> <td></td>	Ran, Adee	Intel	L 33	# 01	Change	the first parag	raph to read				
(Comment is against an unchanged portion of the draft)         The parameter with symbol C_b in Table 120D-7 seems to correspond to "Single-ended package-to-board interface" in Table 93A-1, which has the symbol C_b. Unless this is a new parameter definition (which I can't find), it should have the same symbol and the same name as in Table 93A-1.         SuggestedRemedy         Change parameter symbol from C_b to C_p and change the corresponding name to "Single-ended package capacitance at package-to-board interface".         Proposed Response       Response Status       O         C1 120E       SC 120E.3.1       P 365       L 50       # 62         Cannent Type       E       Comment Status       D         (Comment is against an unchanged portion of the draft)       Reference to the procedure in 83E.3.3.2.1 is obsolete - there is a specific procedure for this annex in 120E.3.3.2.1.       SuggestedRemedy         Clarify, or delete the "A".       Proposed Response       Response Status       O         SuggestedRemedy       Clarify, or delete the "A".       O       Note the "A".	Comment Type TR	Comment Status D			"In this a	annex, transitio	on times are	specified for trar	nsitions between	three consecutive	
The parameter with symbol C b in Table 120D-7 seems to correspond to "Single-ended package capacitance at package-to-board interface" in Table 93A-1, which has the symbol C b up to C b up the parameter definition (which I can't find), it should have the same symbol and the same name as in Table 93A-1.         SuggestedRemedy       Change parameter symbol from C b to C b and change the corresponding name to "Single-ended package capacitance at package-to-board interface".       In the second paragraph, change "In this case, the 0% level and the 100% level and	(Comment is against a	an unchanged portion of the d	raft)		"zero" s are betw	ymbols and the veen the cross	ree consecut	ive "three" symb and 80% levels	ools, or vice versa of the signal."	a. The specified times	
SuggestedRemedy         Change parameter symbol from C_b to C_p and change the corresponding name to         "Single-ended package capacitance at package-to-board interface".         Proposed Response       Response Status         O       CI 120E       SC 120E.3.1       P 365       L 50       # 62         CI 120E       SC 120E.3.1       P 365       L 50       # 62         Ran, Adee       Intel       Comment Status       D         Comment Type       E       Comment Status       D         (Comment is against an unchanged portion of the draft)       Reference to the procedure in 83E.3.3.2.1 is obsolete - there is a specific procedure for this annex in 120E.3.3.2.1.         SuggestedRemedy       Clarify, or delete the "A".       Proposed Response       Response Status       O	The parameter with sy package capacitance a C_p. Unless this is a r symbol and the same	mbol C_b in Table 120D–7 so at package-to-board interface new parameter definition (whic name as in Table 93A–1.	eems to corresp " in Table 93A–1 ch I can't find), it	ond to "Single-ended I, which has the symbol should have the same	In the se estimate Proposed Re	econd paragra ed as" to "The <i>esponse</i>	ph, change " 0% level and <i>Response</i>	In this case, the the 100% level Status <b>0</b>	0% level and the are defined as".	e 100% level may be	
Change parameter symbol from C_b to C_p and change the corresponding name to   "Single-ended package capacitance at package-to-board interface".   Proposed Response Response Status O   CI 120E SC 120E.3.1 P 365 L 50 # 62 Ran, Adee Intel Comment Type E Comment Status D (Comment is against an unchanged portion of the draft) What does the "A" in "eye height A" stand for? SuggestedRemedy Clarify, or delete the "A". Proposed Response Response Status O Clarify, or delete the "A". Proposed Response Response Status O Clarify, or delete the "A". Proposed Response Response Status O Clarify. or delete the "A". Proposed Response Response Status O Clarify. or delete the "A". Proposed Response Response Status O Clarify. or delete the "A".	SuggestedRemedy										
Proposed Response Response Status O     Ran, Adee Intel     C1 120E SC 120E.3.1   P 365 L 50   Ran, Adee Intel   Comment Type E Comment Status    Comment Type E Comment Status    Comment is against an unchanged portion of the draft)   What does the "A" in "eye height A" stand for?   SuggestedRemedy   Clarify, or delete the "A".   Proposed Response Response Status O	Change parameter syr "Single-ended packag	mbol from C_b to C_p and ch e capacitance at package-to-l	ange the corresp board interface".	oonding name to	C/ 120E	SC 120E.3.3	3.2	P 371	L <b>47</b>	# 64	_
Cl 120E       SC 120E.3.1       P 365       L 50       # 62         Ran, Adee       Intel       for       for       Reference to the procedure in 83E.3.3.2.1 is obsolete - there is a specific procedure for this annex in 120E.3.3.2.1.         Comment Type       E       Comment Status       D       Reference to the procedure in 83E.3.3.2.1 is obsolete - there is a specific procedure for this annex in 120E.3.3.2.1.         What does the "A" in "eye height A" stand for?       SuggestedRemedy       Change reference to 120E.3.3.2.1.         SuggestedRemedy       Clarify, or delete the "A".       Proposed Response       Response Status       O	Proposed Response	Response Status 0			Ran, Adee			Intel			
Cl 120E       SC 120E.3.1       P 365       L 50       # 62         Ran, Adee       Intel       Intel       Reference to the procedure in 83E.3.3.2.1 is obsolete - there is a specific procedure for this annex in 120E.3.3.2.1.         Comment Type       E       Comment Status       D         (Comment is against an unchanged portion of the draft)       Suggested Remedy       Change reference to 120E.3.3.2.1.         What does the "A" in "eye height A" stand for?       Proposed Response       Response Status       O					Comment Ty	vpe TR	Commer	t Status D			
Ran, Adee       Intel         Comment Type       E       Comment Status       D         (Comment is against an unchanged portion of the draft)       Keference to the procedure in 83E.3.3.2.1 is obsolete - there is a specific procedure for this annex in 120E.3.3.2.1.         What does the "A" in "eye height A" stand for?       SuggestedRemedy         Clarify, or delete the "A".       Proposed Response       Response Status       O	C/ 120E SC 120E.3.1	P 365	L 50	# 62	(Comme	ent is against a	an unchange	d portion of the c	draft)		
Comment Type       E       Comment Status       D         (Comment is against an unchanged portion of the draft)       SuggestedRemedy         What does the "A" in "eye height A" stand for?       Proposed Response       Response Status       O	Ran, Adee	Intel	- •••		Referen this ann	ce to the proce	edure in 83E. 8.2.1.	3.3.2.1 is obsole	ete - there is a sp	pecific procedure for	
(Comment is against an unchanged portion of the draft)       Change reference to 120E.3.3.2.1.         What does the "A" in "eye height A" stand for?       Proposed Response       Response Status       O         SuggestedRemedy       Clarify, or delete the "A".       Proposed Response       Response Status       O	Comment Type E	Comment Status D			Suggested	emedv					
What does the "A" in "eye height A" stand for?       Proposed Response       Response Status       O         SuggestedRemedy       Clarify, or delete the "A".       Proposed Response       Response Status       O	(Comment is against a	an unchanged portion of the d	raft)		Change	reference to 1	20E.3.3.2.1.				
SuggestedRemedy Clarify, or delete the "A". Proposed Response Response Status O	What does the "A" in "	'eye height A" stand for?			Proposed R	esponse	Response	Status O			
Clarify, or delete the "A". Proposed Response Response Status O	SuggestedRemedy					1 · · · · ·					
Proposed Response Response Status O	Clarify, or delete the "/	A".									
	Proposed Response	Response Status <b>O</b>									

C/ 120E	SC 120E.3.3.2.1	P 373	L <b>51</b>	# 65	C/ 120E	SC 120E.3.	l.1.1	P 376	L 1	# 66
Ran, Adee	9	Intel			Ran, Adee			Intel		
Comment	Type TR Col	mment Status D			Comment	Туре Е	Comme	ent Status D		
(Comr	ment is against an unch	anged portion of the d	raft)		(Comm	nent is against	an unchange	ed portion of the d	raft)	
This s see wl "shall"	ubclause describes the here any requirement fo ' statement, and also a	host stressed input te or the BER or SER of t corresponding PICS it	st procedure in the host under te em (this is addre	great detail, but I don't est. There should be a essed in another	The first stating for eas	st paragraph (s the required p e of reading.	arting on P3 erformance,	375) describes the without a break. I	e procedure at le t seems too long	ength, and ends by g and should be broken
comm	ent).				Suggested	Remedy				
If the t way to	test is conducted using o check the BER before	pattern 5 or any valid unscrambling; Theref	PCS output patt	ern, then there is no nt can reasonably be	Break t paragra	the last senten aph.	e ("The mo	dule receiver un	der test shall	") to a separate
Alterna	a in terms of symbol en atively, if the test is con	ducted using pattern 3	(PRBS31Q) the	en the pattern is not a	Prefera P376 L high-lo	ably, change th .9 ("as describe ss case and ar	e text startin d for the hig other descri	g at P375 L54 ("F h loss case") to a bing the low-loss	or the high loss list of two items	case") and ending at s, one describing the level-5 subclauses
PMA p	battern checker.	requirement can rease			Proposed I	Response	Respons	se Status <b>O</b>		
The su	uggested remedy handl	es both options.								
Suggested	dRemedy									
Appen	nd the following paragra	phs at the end of this	subclause:							
"If the	test is performed with p	pattern 3, the host bit e	errors are counte	ed using the host's PMA						

test pattern checker (see 120.5.11.1.1). If the test is performed with pattern 5 or a valid 200GBASE-R/400GBASE-R signal, the host bit errors are counted using the host's PCS Reed-Solomon decoder error counters (see 119.2.5.3), with every symbol error considered as a single bit error. The number of received bits may be estimated based on the test time.

The host BER under the stressed input test conditions shall meet the requirements of 120E.1.1."

Proposed Response Response Status O

C/ 120E	SC 120E.3.4.1.1	P 376	L 11	# 67	C/ 120E	SC 120E.4.2	P 377	L <b>25</b>	# 68
Ran, Adee		Intel			Ran, Adee		Intel		

Comment Type TR Comment Status D

(Comment is against an unchanged portion of the draft)

It is not clear how errors should be detected and counted in this test. The module is not required to count errors internally (and is unlikely to have this capability for anything but test pattern 3), and the test setup does not include a BER checker at the optical output of the module or elsewhere. If such BER checker is assumed, there should be a definition of what it is expected to do - which is not trivial. In addition, there should be some guidance on where this BER checker can be placed.

Specifically, the BER checker should use a bit sequence which depends on the test pattern:

If the test is conducted using pattern 5 or any valid PCS output pattern, then there is no way to check the BER before unscrambling; Therefore a requirement can reasonably be defined in terms of symbol error ratio (after processing by the PCS FEC).

Alternatively, if the test is conducted using pattern 3 (PRBS31Q) then the pattern is not a valid PCS sequence and the requirement can reasonaly be defined in terms of BER at a PMA pattern checker. This may be done inside the module, if implemented, or somewhere else.

The suggested remedy handles both options.

SuggestedRemedy

Add the following text before the last sentence of 120E.3.4.1.1 (i.e. before BER requirements are discussed):

"If the test is performed with pattern 3, the module bit errors may be counted using a PMA test pattern checker (see 120.5.11.1.1) if this option is implemented in the module.

If the test is performed with pattern 5 or a valid 200GBASE-R/400GBASE-R signal, the module bit errors may be counted by placing the module under test into local loopback (see 120.5.9) and feeding the module output into a compliant host or its equivalent, and then using the host's PCS Reed-Solomon decoder error counters (see 119.2.5.3), with every symbol error considered as a single bit error.

Methods of extracting the received bit pattern and counting errors other than the ones described above may be used if they generate equivalent results.

The number of received bits may be estimated based on the test time."

Proposed Response Response Status **O** 

# Comment Type TR Comment Status D

The procedure in this subclause is referenced in host/module stressed input tests as a method of measuring "eye height" and "eye width". But procedure in this list generates three eye heights (Vupp, Vmid, and Vlow) and three eye widths (Hupp, Hmid, and Hlow). It is not clear which height/width should be used.

Note that for the "eye height" parameters Table 120E–1 and Table 120E–3, which also reference this subclause, there are footnotes stating "All 3 PAM4 eyes at 10<sup>^</sup>–5 probability". It may be understood that the "3 PAM4 eyes" refers to the measured Vupp, Vmid and Vlow, but it is not stated explicitly.

When calibrating a stressed eye test, I assume the minimum width/height of all 3 eyes should be specified (if the maximum is specified, the other eyes may be completely closed). If that's the case, the procedure should define the "eye height" and "eye width" as the minimum across the three measurements.

Assuming this is done, this definition can replace the table footnotes too.

### SuggestedRemedy

Add an item after current item 6 with text: "The eye height is defined as the minimum of Vmid, Vupp, and Vlow".

Add an item after current item 9 with text: "The eye width is defined as the minimum of Hmid, Hupp, and Hlow".

Delete footnote a in Table 120E-1 and Table 120E-3.

Proposed Response Response Status **O** 

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: Comment ID

C/         120E         SC         120E.4.2         P 379         L 3         # 69           Ran, Adee         Intel         Intel<	C/ 120E SC 120E.5.4.3 P 383 L 54 # 70 Ran, Adee Intel				
Comment Type TR Comment Status D (Comment is against an unchanged portion of the draft)	Comment Type <b>TR</b> Comment Status <b>D</b> (Comment is against an unchanged portion of the draft)				
According to the style guide, the word "must" should not be used in this place, since it does not indicate an unavoidable situation. In addition, this is a procedure for measurement of EH/EW parameters. It should always yield values. What are the EH and EW if any of the conditions are not met? If they are they undefined, stressed eve calibration is not well defined.	There is no PICS item for host receiver performance. RH1, "Host input characteristics", mostly deals with the host input (electrical parameters which should always comply), but does not state the host receiver performance (BER or SER) with stressed input. The BER item in 120E.5.3 is too generic, and does not address the stressed input test conditions either.				
This eye mask seems to be a minimum requirement for the "symmetrical eye width" (where	Compliance of receiver performance under stressed input test should be separate from input signal compliance.				
the latter is twice the minimum of left and right openings relative to TCmid). If that's the	SuggestedRemedy				
symmetrical eye width, and the tables can specify the minimum for that _result	Add a PICS item in 120E.5.4.3: RH2   Host stressed input test   120E.3.3.2.1   Host under test meets the BER requirements   M   Yes [ ]				
specified with the same value, or ESMW alone is specified; this means that the important parameter is the symmetrical eve width, and there is no need to calculate the "total" eve	Proposed Response Response Status <b>O</b>				

### SuggestedRemedy

Change item 7 to read:

"Calculate the middle eye symmetrical width (Hmid) as the minimum of Tcmid-TL(1e-5) and TR(1e-5)-Tcmid, where TR(1e-5) and TL(1e-5) are the times where MIDCDFR and MIDCDFL, respectively, have a value of 1e-5."

Delete item 10.

Change the text and labels in Figure 120E-14 accordingly (especially, eliminate "must").

Change ESMW in Table 120E-1 and Table 120E-3 to "eye width".

Delete ESMW rows in Table 120E–5, Table 120E–8.

Proposed Response Response Status **0** 

widths as currently done in steps 7, 8, and 9.

C/ 120E	SC 120E.5.4.4	P 384	L <b>7</b>	# 71
Ran, Adee		Intel		

Comment Type **TR** Comment Status **D** 

(Comment is against an unchanged portion of the draft)

There is no PICS item for module receiver performance. The BER item in 120E.5.3 is too generic, and does not address the stressed input test conditions.

Compliance of receiver performance under stressed input test should be separate from input signal compliance.

SuggestedRemedy

Add a PICS item to 120E.5.4.4: RM2 | Module stressed input test | 120E.3.4.1.1 | Module under test meets the BER requirements | M | Yes [ ]

Proposed Response Response Status **O** 

				-					
Cl <b>121</b> SC <b>121.8.5</b> . Le Cheminant. Grea	.3 P 225 kevsiaht Tec	L <b>6</b> hnologies	# 72	C/ 121 Le Chemir	SC <b>121.8.5.</b> nant, Grea	3 /	2 <b>26</b> Sight Tech	L <b>31</b> nnologies	# 75
Comment Type T	Comment Status D			Comment		Comment Stat	IS D		
Specify that OMAoute	er is measured on the equaliz	ed signal.		we sh for est	ould call out the	actual Gaussian d	stribution of	of equation 121-	5 and provide a method
Allow the TDECQ me equalizer, the measur This also allows the e	asurement to be more portab rement, as proposed, can be equalizer used for this measur	le. Given the two made entirely on rement to be impl	gain terms of the the resulting waveform. emented in hardware	Suggested Modify 6)"	d <i>Remedy</i> / line 31 to read	"Gth1(yi) is given b	y Equatior	n (121-5) and car	be estimated by (121-
SuggestedRemedy				0).					
Update the text of line equalized signal	e 6 to read: OMAouter is mea	sured according	to 121.8.4 on the	Add n	ew equation 12 <sup>-</sup>	1-5 (too complex fo	comment	tool, provided in	seperate contribution)
Proposed Response	Response Status O			Origin	al equation 121	-5 becomes equation	n 121-6		
				Proposed	Response	Response State	is W		
Cl         121         SC         121.8.5.           Le Cheminant, Greg	3 P 225 keysight Tec	L <b>21</b> hnologies	# 73	[Edito http://	r's note: Attachr www.ieee802.or	ment is lecheminan g/3/bs/comments/F	_3bs_01_ 802d3bs_l	1116.pdf in D2p1_attachmer	nts.zip]
Comment Type <b>T</b> Specifically document eye diagram	Comment Status <b>D</b> t which signal average power	is derived from,	which is the equalized	<i>Cl</i> <b>121</b> Le Chemir	SC 121.8.5. nant, Greg	3 ke	<b>227</b> /sight Tech	L 16 nnologies	# 76
SuggestedRemedy				Comment	Туре Т	Comment Stat	us D		
Modify line 21 to read determined"	"The average optical power (	(Pave) of the equ	alized eye diagram is	Equat	ion 121-8 needs	a term to compens	sate for the	e equalizer DC g	ain
Proposed Response	Response Status 0			Suggested Modifi tool)	<i>Remedy</i> cation of the equ	uation provided in a	separate	contribution (too	complex for comment
C/ 121 SC 121.8.5.	3 P 226	L <b>25</b>	# 74	Proposed	Response	Response State	is W		
Le Cheminant, Greg	keysight Tec	hnologies		[Edito	r's note: Attachr	ment is lecheminan	_3bs_01_	1116.pdf in	
Comment Type T Equation 121-4 requir tool)	Comment Status D res some modifications (too c	omplex to be ent	ered in the comment	http://v	www.ieee802.or	g/3/bs/comments/F	802d3bs_1	D2p1_attachmer	nts.zip]
SuggestedRemedy									
Modifications to the e comments	quation will be provided in a s	eparate docume	nt e-mailed with the						
Proposed Response	Response Status W								
[Editor's note: Attachr http://www.ieee802.or	ment is lecheminant_3bs_01_ rg/3/bs/comments/P802d3bs_	_1116.pdf in _D2p1_attachme	nts.zip]						

C/ 121 SC 121.8.5.3 P 227 L 24 # 77	C/ 121 SC 121.8.5.3 P 225 L 11 # 79
Le Cheminant, Greg keysight Technologies	Le Cheminant, Greg keysight Technologies
Comment Type T Comment Status D Document the equalizer DC gain coefficient (as provided in earlier comment on equation 121-8 SuggestedRemedy Add text at line 24:	For cosnsistent results across various implementations, the TDECQ optimizations requires some constraints. MMSE optimization is a standard technique that can be implemented by software algorithms or by actual receiver equalizers. By specifying the optimization criteria, it avoids multiple T&M vendors implementing different optimization techniques, or T&M vendors using optimization techniques that an actual receiver could not achieve
Cdc is a coefficient which compensatesd for the reference equlaizer DC gain when the equalizer has been optimized for minimum TDECQ The value Cdc can be calculated from the equalizer tap coefficients Ai as shown in equation (new #)	SuggestedRemedy Section 121.8.5.3 currently has this statement: The reference equalizer (specified in 121.8.5.4) is used to minimize the value of TDECQ derived from the captured waveform. Modify to read: The reference equalizer (specified in 121.8.5.4) is applied to the waveform.
Proposed Response Response Status W	levels (Pave - OMA/2), (Pave - OMA/6), (Pave+OMA/6), and (Pave+OMA/2), where the mean square error is calculated over the center 0.1 UI of the eve diagram
[Editor's note: Attachment is lecheminant_3bs_01_1116.pdf in http://www.ieee802.org/3/bs/comments/P802d3bs_D2p1_attachments.zip]	Proposed Response Response Status O
C/         121         SC         121.8.5.4         P         227         L         27         #         78           Le Cheminant, Greg         keysight Technologies         Keysigh	C/         45         SC         45.2.3.47h         P 73         L 41         # 80           Anslow, Pete         Ciena         Cie
Comment Type       T       Comment Status       D         T/2 spacing allows the equalizer to reduce the noise, which a T spaced equalizer cannot do. This creates strange behaviors where the TDECQ value can go down as OMA drops relative to the intrinsic noise because the equalizer starts optimizing to reduce noise instead of ISI.         SuggestedRemedy       Change: is a 5 tap. T/2 spaced, feed-forward equalizer (FEE), where T is the symbol	Comment TypeEComment StatusD"PCS FEC lane 0" should be "PCS lane 0""SuggestedRemedy Change "PCS FEC lane 0" to "PCS lane 0""Proposed ResponseResponse StatusO
Proposed Response Response Status <b>O</b>	Cl 121       SC 121.12.4.6       P 240       L 1       # 81         Anslow, Pete       Ciena         Comment Type       E       Comment Status       D         In the headings for 121.12.4.6, 122.12.4.9, and 124.12.4.6 "MD" should be "MDI"         SuggestedRemedy         In the headings for 121.12.4.6, 122.12.4.9, and 124.12.4.6 change "MD" to "MDI"         Proposed Response       Response Status       O

C/ 119A SC 119A	P 318	L6	# 82	C/ 119	SC 119 2 4	4	P 154	L 18	# 85
Anslow, Pete	Ciena	-•		Anslow, Pe	ete		Ciena		<i>"</i> <u>0</u> 0
Comment Type T	Comment Status D			Comment	Туре Т	Commen	t Status D		
The example codewore The 200G AMs were c been updated to reflec	ds in Annex 119A include the hanged in D2.1, but Tables 11 t the changes.	AMs. 19A-1, 119A-3 :	and 119A-4 have not	The sp http://v 119-1	preadsheet that www.ieee802.o had an error th	was used to o rg/3/bs/public/ at resulted in l	calculate the hex 16_05/anslow_3 UP2, UM3, UM4,	values in bs_03_0516.pd UM5 not being	f for inclusion in Table the inverse of UP1,
SuggestedRemedy				UMO, U The ne	JM1, UM2 as t arformance of t	hey are for the	e 400GbE marke	rs. hanged to corre	act this error is expected
Update Tables 119A-1 Note, another commer	, 119A-3 and 119A-4 to reflect the proposes to further change a	ct the latest AN AM0 for 200G.	ls.	to be r http://v	eviewed in www.ieee802.o	rg/3/bs/public/	adhoc/logic/oct2	7_16/anslow_0	1_1016_logic.pdf
Proposed Response	Response Status O			Suggestea	Remedy				
C/ 45 SC 45.2.1.4	P <b>45</b>	L <b>25</b>	# 83	Chang 0x9A, 0x73	e AM0 for 200 0x4A, 0x26, 0x	Gb/s Ethernel 05, 0x65, 0xB	t to be: 5, 0xD9, 0xD6, 0	xB3, 0xC0, 0x8	C, 0x29, 0x4C, 0x3F,
Anslow, Pete	Ciena			Proposed	Response	Response	Status O		
Comment Type E	Comment Status D								
In Table 45-6, "operati Also, "operating as 200	ng as 400 Gb/s" should be "op 0 Gb/s" should be "operating a	perating at 400 at 200 Gb/s"	Gb/s"	C/ 120	SC 120.5.1	1.2.5	P 200	L <b>45</b>	# 86
SuggestedRemedy				Anslow, Pe	ete		Ciena		
In Table 45-6, change	"operating as 400 Gb/s" to "operating as 200 Gb/s" to "operating as 200 Gb/s" to "operating at the second s	perating at 400	Gb/s"	Comment	Туре <b>Т</b>	Commen	t Status D		
Proposed Response	Response Status <b>O</b>	at 200 GD/S		http://v an diffe Unlike	RBS31 general www.ieee802.o erent to that us the generator	or that was us rg/3/bs/public/ ed by the PRE used for anslo	adhoc/logic/apr2 3S31 generator n w_01_0416_logi	ne sequence in 8_16/anslow_0 eferenced from c the generator	1_0416_logic.pdf was 120.5.11.2.5. shown in Figure 49-9
C/ <b>120C</b> SC <b>120C.3.2</b> Anslow, Pete	e P <b>341</b> Ciena	L <b>29</b>	# 84	output The ch	naracteristics o	f the SSPRQ t	est sequence cre	equence and it	hanges in the
Comment Type T	Comment Status D			Sugge http://v	sted remedy a vww.ieee802.o	re expected to ra/3/bs/public/	be reviewed in adhoc/logic/oct2	7 16/anslow 02	2 1016 logic.pdf
Comment #48 against	D2.0 changed (in 120C.3.2 ar	nd 120C.4) "as	specified in 109B.3.2.1	Suggested	Remedy	5			
for a PHY that includes an RS-FEC sublayer" to "as specified in 109B.3.2.1". But 109B.3.2.1 defines two different test methods. One "For a PHY that includes an RS- FEC sublayer" and the other "For a PHY that does not include an RS-FEC sublayer". Since the PHYs in the P802.3bs draft do not include an RS-FEC sublayer (the FEC is in the PCS layer), the effect of the change made by comment #48 is to select the method appropriate to a PHY without FEC.					In the heading of Table 120-2, change "Start" to "Seed". Change the paragraph below the table from: "The start value is a 31 bit hexadecimal value sent MSB first that represents the first 31 bits of each section, continuing the PRBS31 sequence for the indicated length of bits as if produced by the shift register implementation shown in Figure 49-9." to:				
SuggestedRemedy		"⊨ach shown	in Figure 49-9	and the seed	is a 31-bit hexad	ecimal value us	egister implementation sed to preset S30		
Change this text in 120 109B.3.2.1 for a PHY t	DC.3.2 and 120C.4 back to how that includes an RS-FEC suble	w it was in D2.0 ayer"	0 "as specified in	throug PRBS	h S0 (S30 is se 31 sequence fo	et to the MSB and the indicated	and S0 is set to t d length of bits."	he LSB) prior to	the generation of the
Proposed Response	Response Status 0			Proposed	Response	Response	Status O		

C/ 00 SC 0 Welch, Brian	P <b>218</b> Luxtera Inc.	L <b>6</b>	# 87	C/ 119 SC 119 Trowbridge, Steve	.2.4.1	<i>P</i> <b>149</b> Nokia	L <b>1</b>	# 90
Comment Type <b>T</b> SIGNAL_DETECT F	Comment Status D ail level set to <= -30 dBm, high	er than the -20	dBm for 400G-DR4.	<i>Comment Type</i> <b>T</b> The OTN mappin FEC degrade Sl	<i>Con</i> g reference p ER and rx loo	nment Status <b>D</b> point needs to include cal degrade informat	e both the strean	n of 66B blocks and the
SuggestedRemedy	<= - 20 dBm			SuggestedRemedy				
Proposed Response	Response Status <b>O</b>			Change "The stressignal for mappin together with the for mapping to O	am of 66-bit g to OTN." to FEC_degrad ſN."	blocks generated by "The stream of 66-b e_SER and rx_local_	this process is u it blocks genera degrade is used	used as the reference ted by this process, I as the reference signal
C/ 00 SC 0 Welch, Brian	P <b>220</b> Luxtera Inc.	L <b>34</b>	# 88	Proposed Response	Resp	oonse Status <b>O</b>		
Comment Type <b>T</b> Average launch pow 400GBase-DR4	Comment Status D er of OFF transmitter, each lane	e (max) set to -	30 dBm, vs20 dBm for	C/ <b>120D</b> SC <b>120</b> Mellitz, Richard	D.4	<i>P</i> <b>358</b> Samtec	L <b>9</b>	# 91
SuggestedRemedy Suggest revising to -	-20 dBm.			Comment Type The is no equation	R Con	nment Status <b>D</b> or fz1,fz2,fp1,fp2. It is	s closely related	to eq. 93A–22. One
Proposed Response	Response Status O			SuggestedRemedy	meaing. Hov	vever we should be h	nore expercit.	
C/ 123 SC 123.7	P 278	L <b>5</b>	# 89	Add equation pro Healey_02_0115	posed for CC pdf Resr	0M in mellitz_3bs_01	_0815_elect.pdf	or explicity specified in
					Noop			
Although the new wir minimum EMB at 85 to VCSEL based trai WBMME results in a	de band multimode fiber definec i0 nm as OM4, these two fibers ( nsceivers. The modification ma combined modal and chromatic	I in TIA-492-AA do not perform de to the refrac bandwidth wh	AE has the same the same when coupled tive index profile for ich is different from	C/ 120E SC 120 Mellitz, Richard	E.4.1	P 376 Samtec	L <b>25</b>	# 92
OM4 and consequer how it relates to OM4 collaborative effort to equivalent and must	the second secon	this time and c each, these two ving in an IEEE	I reach of WBMMF, and currently, there is no o fibers are not = application standard.	Comment Type T The frequnecy do for up to 1 dB diff result in 5mV of V	R Con main electric erence in CC /EO undcertia	nment Status <b>D</b> al specfication for the M as decribed in hea anly.	e mated fixture( aley_3bs_01_09	HDB/MCB) could allow 16. The difference may
Furthermore, at leas WBMMF process. Th confusion, particular WBMMF compared	SuggestedRemedy Add a requreime specified in heale will be requested	nt that the ma y_3bs_01_09 This will use	ated fixture must hav 916 on page 8 of 5.18	e a COM within 8 dB. A presenta e example COM	0.15 dB of that ation demostrated this implementation which			
SuggestedRemedy				includes features	suggested in	healey_3bs_01_091	16.	
I strongly suggest we the Fort Worth meet	e reverse the decision to include ing and blindsided several active	WBMMF, whi	ch was proposed during	Proposed Response	Resp	oonse Status O		
Proposed Response	Response Status W							
[Editor's note: Subcla	ause set to 123.7, Page set to 2	78, line set to !	5]					

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: Comment ID

C/ 120D SC 120D.3.1.1 P 351 L 24 # 93	C/ 121 SC 121.7.1 P 220 L 37 # 96				
Mellitz, Richard Samtec	Dawe, Piers Mellanox				
Comment Type TR Comment Status D	Comment Type TR Comment Status D				
Since Np has been set to 200, there is no way of limiting the ISI of transmitter/package.	The purpose of the RIN spec has changed from something to ensure a good transmitter to				
SuggestedRemedy	something to ensure a good TDECQ measurement. The limit should be adjusted for the intended purpose.				
Add a table entry, ISI_SNR max, of 32.3 dB as suggested in mellitz_3bs_01_0916_adhoc.	SuggestedRemedy				
Proposed Response Response Status <b>O</b>	Correct the RIN limits according to what is necessary for to enable a good TDECQ, all clauses that use TDECQ.				
	Proposed Response Response Status O				
C/ 120 SC 120.5.11.2.5 P 200 L 47 # 94					
Dawe, Piers Mellanox					
Comment Type TR Comment Status D	Dawe Piers Mellanox				
This SSPRQ is not suitable for use in TDECQ or stressed receiver calibration because					
measurements with this pattern do not give the correct penalty.	In this draft, aquare ways is prepaged for PIN measurement. But we can't use aquare				
SuggestedRemedy	wave because it isn't PAM4. CDRs, CRUs and any linearity control circuits may fail				
Either adjust SSPRQ to a pattern that gives the correct penalty, e.g. by changing the first start sequence in Table 120-2, or remove SSPRQ (using PRBS13Q for TDECQ and stressed receiver calibration).	because two of the expected PAM4 levels are missing, CRUs with the special low PAM4 bandwidth (3 MHz nominal) won't hold lock properly because square wave has an unusually low transition density.				
Proposed Response Response Status <b>O</b>	SuggestedRemedy				
	When the RIN spec has been adjusted, remove this section and associated MDIO registers.				
C/         121         SC         121.8.5.3         P         225         L         8         #         95           Dawe, Piers         Mellanox         Me	Proposed Response Response Status <b>O</b>				
Comment Type TR Comment Status D					
The draft says Pattern 6 (SSPRQ) should be used for TDECQ. But SSPRQ is a short,	C/ 121 SC 121.8.1 P 222 L 19 # [98				
deliberately stressful pattern and therefore a TDECQ measurement does not give anything like the correct penalty for a range of reasonable transmitters	Dawe, Piers Melianox				
Suggested Bemedy	Comment Type TR Comment Status D				
Either adjust SSPRQ to a pattern that gives the correct penalty (e.g. by changing the first start sequence in Table 120-2); or use PRBS13Q for TDECQ (and stressed receiver calibration) with a separate requirement for low frequency performance as appropriate, similar to how the 200GAUI-4 etc. specifications handle this, choosing any limit according to the circumstances of the optical link. Apply to clauses 121–122	In this draft, square wave is proposed for RIN measurement. But we can't use square wave because it isn't PAM4. CDRs, CRUs and any linearity control circuits may fail because two of the expected PAM4 levels are missing, CRUs with the special low PAM4 bandwidth (3 MHz nominal) won't hold lock properly because square wave has an unusually low transition density.				
Proposed Pasnonse Doppono Status	SuggestedRemedy				
	If a RIN spec is needed, define it based on PRS13Q. All PAM4 optical clauses. Remove square wave from the draft.				

Proposed Response Response Status **O** 

Cl         120         SC         120.5.11.2.1         P 197         L 43         # 99           Dawe, Piers         Mellanox	C/         121         SC         121.7.1         P         220         L         36         #         102           Dawe, Piers         Mellanox         Me				
Comment Type TR Comment Status D	Comment Type TR Comment Status D				
Should not use such unrepresentative patterns when more normal ones we use anyway will do the job.	Requiring an extinction ratio of 4.5 dB restricts the range of transmitter technologies but does not appear to benefit the link or the receiver significantly (they are protected by the TDECQ spec). Its effect is to push up cost.				
N/hen the litter measurement methods have been improved, removed, ID02A and ID02P	SuagestedRemedy				
test pattern generator and registers.	Reduce the extinction ratio limit to a defensible amount, such as 3 dB.				
Proposed Response Response Status <b>O</b>	Proposed Response Response Status <b>O</b>				
Cl         120D         SC         120D.3.1.1         P 350         L 51         # 100           Dawe, Piers         Mellanox	C/ <b>122</b> SC <b>122.7.1</b> P <b>250</b> L <b>35</b> # 103 Dawe, Piers Mellanox				
Comment Type       TR       Comment Status       D         Should not use such an unrepresentative pattern for just one spec measurement.         SuggestedRemedy         Measure J4 Jitter and Jrms with PRBS13Q as discussed on the electrical ad hoc.         Remove the JP03A test pattern generator and registers.         Proposed Response       Response Status       O	Comment Type       TR       Comment Status       D         Requiring an extinction ratio of 4.5 dB restricts the range of transmitter technologies but does not appear to benefit the link or the receiver significantly (they are protected by the TDECQ spec). Its effect is to push up cost.         SuggestedRemedy       Reduce the extinction ratio limit to a defensible amount, such as 3 dB (all 4 PMDs in this clause).         Proposed Response       Response Status       Q				
C/         120D         SC         120D.3.1.1         P 351         L 28         # 101           Dawe, Piers         Mellanox					
Comment Type TR Comment Status D Should not use such an upropresentative pattern for just one specificm	C/         124         SC         124.7.1         P         296         L         31         #         104           Dawe, Piers         Mellanox         Me				
Should not rely on Clause 94.	Comment Type TR Comment Status D				
SuggestedRemedy Measure EOJ with PRBS13Q as discussed on the electrical ad hoc. Remove the JP03A test pattern generator and registers.	Requiring an extinction ratio of 5 dB restricts the range of transmitter technologies but doe not appear to benefit the link or the receiver significantly (they are protected by the TDEC spec). Its effect is to push up cost. Curious that the limit for 400GBASE-DR4 is higher than for 200GBASE-DR4 anyway.				
Proposed Response Response Status <b>O</b>	SuggestedRemedy Reduce the extinction ratio limit to a defensible amount, such as 3 dB.				
	Proposed Response Response Status <b>O</b>				

Comment Type TR       Comment Status D         Thimit for "Average launch power of OFF transmitter, each lane (max)" is not suitable for transmitters that share a laser and may be used in breakout scenarios.         SuggestedRemedy         Change the limit from 30 dBm to -20dBm, same as in 400GBASE-DR4. Note this is still way lower than the average receive power in 20GBASE-LR.         Proposed Response       Response Status O         C1 120D SC 120D.3.1       P 351       L 19       # 106         Comment Type T       Comment Status D       SuggestedRemedy         Update the references per the comment.       Proposed Response       Response Status D         C1 120D SC 120D.3.1       P 351       L 19       # 106         C1 120D SC 120D.3.1       P 351       L 24       # 107         In Table 120D-1, the references for steady state voltage vf (max), steady state voltag	C/ 121 SC 121.7.1 Dawe, Piers	P <b>220</b> Mellanox	L <b>34</b>	# 105	<i>Cl</i> <b>120D</b> SC <b>120D.3</b> Healey, Adam	.1 <i>P</i> 351 Broadcom L	L <b>31</b> td.	# 108	
Thint for "Average launch power of OFF transmitter, each lane (max)" is not suitable for transmitters that share a laser and may be used in breakout scenarios. SuggestedRemedy: Change the limit from -30 dBm to -20dBm, same as in 400GBASE-DR4. Note this is still welve on the intervence of the scenario in 20GBASE-DR4 and 6.7 dB below the average receive power in 25GBASE-LR. Proposed Response Response Status O Comment Type T Comment Status D In Table 120D-1, the references per the comment. Proposed Response Response Status O Comment Type T Comment Status D In Table 120D-1, the reference for steady state voltage vf (max), steady state voltage vf (	Comment Type TR	Comment Status D			Comment Type T	Comment Status D			
SuggestedRemedy       Change the limit from -30 dBm to -20dBm, same as in 400GBASE-DR4. Note this is still way lower than the average receive power in 20GBASE-LR.       In a contrast status of the parameters of interest) includes the statement that "the 200GAUL-4 or average receive power in 25GBASE-LR.         Proposed Response       Response Status o       Image the limit from -30 dBm to -20dBm, same as in 400GBASE-DR4 and 6.7 dB below the average receive power in 25GBASE-LR.       Image the limit from -30 dBm to -20dBm, same as in 400GBASE-DR4 and 6.7 dB below the average receive power in 25GBASE-LR.         Proposed Response       Response Status o       Image the limit from -30 dBm to -20dBm, same as in 400GBASE-DR4 and 6.7 dB below the average receive power in 25GBASE-LR.       Image the limit from -30 dBm to -20dBm, same as in 400GBASE-DR4 and 6.7 dB below the average receive power in 25GBASE-LR.         Proposed Response       Response Status o       Image the limit from -30 dBm to -20dBASE-DR4 and 6.7 dB below the average receive power in 25GBASE-LR.       Image the limit from -30 dBm to -20dBASE-LR PMAs where the number of physical lanes is 4 or to -100 dBASE-RP MAs where the number of physical lanes is 4 or to -100 dBASE-R PMAs where the number of physical lanes is 4 or to -100 dBASE-R PMAs where the number of physical lanes is 4, and for 400GBASE-R PMAs where the number of physical lanes is 4 or to -100 dBASE-R PMAs where the number of physical lanes is 4 or to -100 dBASE-R PMAs where the number of physical lanes is 4 or to -100 dBASE-R PMAs where the number of physical lanes is 4 or to -100 dBASE-R PMAs where the number of physical lanes is 4 or to -100 dBASE-R PMAs where the number of physical lanes is 4 or to -100 dBASE-R PMAs where the number of physical lanes is 4 or to -200 dBASE-R PMAs whe	Th limit for "Average la transmitters that share	aunch power of OFF transmitte e a laser and may be used in b	er, each lane (m preakout scenari	ax)" is not suitable for os.	Footnote (b) in Table management interfa	e 120D-1 states that "the state ce." It is unclear what the purp	of the transmit e lose of this note is	qualizer is controlled by s. 120D.3.1.5 (which is	
Change the limit from -30 dBm to -20dBm, same as in 400GBASE-DR4. Note this is still waverage receive power in 25GBASE-LR.       Proposed Response       Response Status O         Cl 120D SC 120D.3.1       P 351       L 19       # 106         Cl 120D SC 120D.3.1       P 351       L 19       # 106         Healey, Adam       Broadcom Ltd.       Comment Type T       Comment Status D         In Table 120D-1, the references for steady state voltage vf (min) should be the newly created subclause 120D.3.1.4.       StagestedRemedy         Vupdate the references per the comment.       Proposed Response       Response Status O         Cl 120D SC 120D.3.1       P 351       L 24       # 107         Healey, Adam       Broadcom Ltd.       SuggestedRemedy       Since the definintion of the 200GBASE-R PMAs are unique compared to PMAs at other rates in that they are defined to support both PAM4 and NRZ based         Vupdate the references per the comment.       Proposed Response       Response Status O         Plate 120D-1, the reference for signal-to-noise-and-distortion ratio (min) should be the newly created subclause 120D.3.1.6.       SuggestedRemedy         Update the reference per the comment.       D       In Table 120D-1, the reference for signal-to-noise-and-distortion ratio (min) should be the newly created subclause 120D.3.1.6.       SuggestedRemedy         Update the reference per the comment.       Prom PAM4 encooding and decoding for 200GBASE-R PMAs where the number	SuggestedRemedy				referenced by the pa	rameters of interest) includes	the statement that	at "the 200GAUI-4 or	
Proposed Response       Response Status       O         Cl 120D SC 120D.3.1       P 351       L 19       # 106         Comment Type T       Comment Status D       Image: Comment Status D       Comment Status D         In Table 120D-1, the references for stady state voltage vf (max), steady state voltage vf (min) should be the newly created subclause 120D.3.1.4.       SuggestedRemedy       Update the references per the comment.         Proposed Response       Response Status       O       Since the definition of the 200GBASE-R PMAs where the number of physical lanes is 4 or and for 400GBASE-R PMAs where the number of physical lanes is 4 or and for 400GBASE-R PMAs where the number of physical lanes is 4 or and for 400GBASE-R PMAs where the number of physical lanes is 4 or a comment Type T         Comment Type T       Comment Status D       Since the definition of the 200GBASE-R PMAs where the number of physical lanes is 4 or a for 400GBASE-R PMAs where the number of physical lanes is 4 or a s.         Cl 120D SC 120D.3.1       P 351       L 24       # 107         In Table 120D-1, the reference for signal-to-noise-and-distortion ratio (min) should be the newly created subclause 120D.3.1.6.       to         SuggestedRemedy       Update the reference per the comment.       Proposed Response         No Since the definition of the 200GBASE-R PMAs where the number of physical lanes is 4 or a s.       to         In Table 120D-1, the reference for signal-to-noise-and-distortion ratio (min) should be the newly created subclause 120D.3.1.6. <td>Change the limit from way lower than the av average receive powe</td> <td>-30 dBm to -20dBm, same as erage receive power in 200GB er in 25GBASE-LR.</td> <td>in 400GBASE-I ASE-DR4 and 6</td> <td>DR4. Note this is still 3.7 dB below the</td> <td>SuggestedRemedy Remove the note.</td> <td></td> <td></td> <td></td>	Change the limit from way lower than the av average receive powe	-30 dBm to -20dBm, same as erage receive power in 200GB er in 25GBASE-LR.	in 400GBASE-I ASE-DR4 and 6	DR4. Note this is still 3.7 dB below the	SuggestedRemedy Remove the note.				
Cl 120D       SC 120D.3.1       P 351       L 19       # 106         Cl 120       SC 120D.3.1       P 183       L 46       # 109         Healey, Adam       Broadcom Ltd.       Gisco       Cisco         Comment Type T       Comment Status D       Sc 120D.1, the references for steady state voltage vf (max), steady state voltage vf (	Proposed Response	Response Status O			Proposed Response	Response Status O			
Comment Type T       Comment Status D         In Table 120D-1, the references for steady state voltage vf (max), steady state voltage vf (min), and linear fit pulse peak (min) should be the newly created subclause 120D.3.1.4.       Comment Type T       Comment Status D         SuggestedRemedy       Update the references per the comment.       Proposed Response       Response Status O       SuggestedRemedy         C/ 120D       SC 120D.3.1       P 351       L 24       # 107         Healey, Adam       Broadcom Ltd.       D       In Table 120D-1, the reference for signal-to-noise-and-distortion ratio (min) should be the newly created subclause 120D.3.1.6.       SuggestedRemedy         SuggestedRemedy       Update the reference per the comment.       Proposed Response       Response Status D         In Table 120D-1, the reference for signal-to-noise-and-distortion ratio (min) should be the newly created subclause 120D.3.1.6.       SuggestedRemedy       Modify from:         SuggestedRemedy       Update the reference per the comment.       Proposed Response       Response Status D       In rable 120D-1, the reference for signal-to-noise-and-distortion ratio (min) should be the newly created subclause 120D.3.1.6.       SuggestedRemedy       SuggestedRemedy       In Table 120D-1, the reference per the comment.         Proposed Response       Response Status O       O       O       SuggestedRemedy       In rable 120D-3.1.6.	C/ <b>120D</b> SC <b>120D.3</b> . Healey, Adam	1 P 351 Broadcom Ltd	L 19	# 106	C/ <b>120</b> SC <b>120.1.</b> Nowell Mark	P 183	L <b>46</b>	# 109	
Update the references per the comment.         Proposed Response       Response Status       0         Cl       120D       SC       120D.3.1       P 351       L 24       # 107         Healey, Adam       Broadcom Ltd.       Broadcom Ltd.       ) Perform PAM4 encoding and decoding for 200GBASE-R PMAs where the number of physical lanes is 4, and for 400GBASE-R PMAs where the number of physical lanes is 4 or 8.         Comment Type       T       Comment Status       D         In Table 120D-1, the reference for signal-to-noise-and-distortion ratio (min) should be the newly created subclause 120D.3.1.6.       SuggestedRemedy       or similar         SuggestedRemedy       Update the reference per the comment.       O       or similar         Proposed Response       Response Status       O	Comment Type <b>T</b> In Table 120D-1, the r (min), and linear fit pu SuggestedRemedy	Comment Status <b>D</b> references for steady state volt lse peak (min) should be the n	tage vf (max), st newly created su	eady state voltage vf bclause 120D.3.1.4.	Comment Type <b>T</b> Since the definintion to PMAs at other rate PMDs, be clear in th	Comment Status <b>D</b> of the 200GBASE-R and 400 es in that they are defined to s e summary list of this fact.	G-BASE-R PMAs support both PAM	are unique compared 4 and NRZ based	
Proposed Response       Response Status       O         Modify from:       )) Perform PAM4 encoding and decoding for 200GBASE-R PMAs where the number of physical lanes is 4, and for 400GBASE-R PMAs where the number of physical lanes is 4 or 8.         Cl 120D SC 120D.3.1       P 351       L 24       # 107         Healey, Adam       Broadcom Ltd.       )) Perform PAM4 encoding and decoding for 200GBASE-R PMAs where the number of physical lanes is 4, and for 400GBASE-R PMAs where the number of physical lanes is 4 or 8.         Comment Type       T       Comment Status       D         In Table 120D-1, the reference for signal-to-noise-and-distortion ratio (min) should be the newly created subclause 120D.3.1.6.       SuggestedRemedy         Update the reference per the comment.       Proposed Response       Response Status       O         Proposed Response       Response Status       O	Update the references	s per the comment.			SuggestedRemedy				
Cl 120D       SC 120D.3.1       P 351       L 24       # 107         Healey, Adam       Broadcom Ltd.       Image: Comment Status D	Proposed Response	Response Status O			Modify from: j) Perform PAM4 end physical lanes is 4, a 8	coding and decoding for 200G nd for 400GBASE-R PMAs w	BASE-R PMAs w here the number	here the number of of physical lanes is 4 or	
Comment Type       T       Comment Status       D         In Table 120D-1, the reference for signal-to-noise-and-distortion ratio (min) should be the newly created subclause 120D.3.1.6.       b)       physical lanes is 4, and for 400GBASE-R PMAs where the number of physical lanes is 16, no PAM4 encoding or decoding is required.         SuggestedRemedy       or similar         Update the reference per the comment.       Proposed Response       Response Status       O	Cl <b>120D</b> SC <b>120D.3.</b> Healey, Adam	1 P 351 Broadcom Ltd	L <b>24</b> I.	# 107	to: i) Perform PAM4 end	coding and decoding for 200G	BASE-R PMAs w	here the number of	
SuggestedRemedy     or similar       Update the reference per the comment.     Proposed Response     Response Status     O       Proposed Response     Response Status     O	Comment Type <b>T</b> In Table 120D-1, the r newly created subclau	Comment Status <b>D</b> reference for signal-to-noise-ar use 120D.3.1.6.	nd-distortion rati	o (min) should be the	physical lanes is 4, and for 400GBASE-R PMAs where the number of physical lanes is 4 c 8. For 400GBASE-R PMAs where the number of physical lanes is 16, no PAM4 encoding or decoding is required.				
Update the reference per the comment.     Proposed Response     Response Status     O       Proposed Response     Response Status     O	SuggestedRemedy				or similar				
Proposed Response Response Status O	Update the reference	per the comment.			Proposed Response	Response Status 0			
	Proposed Response	Response Status O							

C/ <b>121</b> SC <b>121.7.1</b> Lewis, David	P 239 L 37 Lumentum	# <u>1</u> 10	C/         120E         SC         120E.3.3.2         P 373           Dudek, Mike         Cavium	L 11 # 113
Comment Type <b>T</b> Table 121-6. The valu GBd PAM-4 PMDs, su RINxxOMA values of requirements than 200 can tolerate RIN of -13 SuggestedRemedy	Comment Status <b>D</b> ue of RIN21.4OMA appears unecessarily low uch as 200GBASE-FR4/-LR4 and 400GBASE -136 dB/Hz. Those PMDs have lower receive DGBASE-DR4, considering that they have op 36 dB/Hz.	at -142. Other 26.6 -FR8/-LR8 have · sensitivity ical demuxes, and yet	Comment TypeTComment StatusDThe Eye height is ambiguous.SuggestedRemedy Change to "Far-end Eye height.Proposed ResponseResponse StatusO	
Change the value of R Proposed Response	RN21.4OMA from -142 to -136 dB/Hz. Response Status <b>O</b>		C/         120         SC 120.5.11.2         P 197           Dudek, Mike         Cavium	L 37 # 114
Cl 120A SC 120A.2 Dudek, Mike Comment Type T There is a problem with wrong ratios. SuggestedRemedy Change the ratio for th 16:16 Proposed Response	P 328 L 12 Cavium Comment Status D th figure 120A-4. The PMA's immediately be ne top PMA for 200G to 8:8 and that for the to Response Status O	# 111 ow the PCS have the p PMA for 400G to	Comment Type       TR       Comment Status       D         JP03B is used for the measurement of EOJ. With the same time crosstalk will affect the measured valulanes have a non-synchronous pattern then crosstalk value of EOJ will be obtained.       Suggested Remedy         Add JP03B to the list of patterns that can be enabled registers to clause 45 (separate comment submitted) 120.5.11.2.2 that were made to 120.5.11.2.1 (for JPC Proposed Response       Response Status       O	e pattern enabled on all the lanes at le degrading the result. If the other will be averaged and the correct l on a lane-by-lane basis. Add control Make similar changes to D3A) in this draft.
C/ <b>120D</b> SC <b>120D.3.</b> Dudek, Mike	1.3 <i>P</i> 351 <i>L</i> 50 Cavium	# 112		
Comment Type <b>T</b> If there is assymetry n values.	<i>Comment Status</i> <b>D</b> normalization may not be enough to align the	evels to the specified		
SuggestedRemedy change "normalized" t	o "normalized and offset adjusted".			
Proposed Response	Response Status <b>O</b>			

C/ 120C	SC 120C.3.2	P 341	L 29	# <u>1</u> 15
Dudek, Mike		Cavium		

### Comment Type TR Comment Status D

Clause 109B.3.2.1 contains two specifications one for a PHY that includes an Clause 109B.3.2.1 RS-FEC sublayer (clause 108) and one for a PHY that does not Clause 109B.3.2.1 provides two different methods to measure the module eye opening. One when the Phy includes an RS-FEC sublayer (Clause 108) and another for a Phy that does not include an RS-FEC sublayer. Technically 200G and 400G do not include an RS-FEC sublayer. The change to delete the words "for a PHY that includes an RS-FEC sublayer" will cause the wrong specification to be used. I also had trouble finding the justification for the change in the D2.0 comment data base.

### SuggestedRemedy

Revert back to the wording in draft 2.0 or better add "using the method described in 109B.3.2.1.2" Make the same change in 120C.4 on page 342 line 16.

Proposed Response	Response Status	0	
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C/ 120D	SC 120D.3.1	P 351	L 32	# 116
Dudek, Mik	е	Cavium		

### Comment Type TR Comment Status D

Crosstalk from other lanes in a real system does not affect Even-odd jitter, however with the use of the JP03B pattern on all lanes as implied by 94.3.12.6.2 the measured Even-odd jitter will be affected by crosstalk which could either increase it or decrease it. An asynchromous pattern should be used on the other lanes. I have made other comments to add the controls to clauses 120 and 45 to provide per lane enablement of the JP03B pattern.

### SuggestedRemedy

change footnote c from "As an exception to 94.3.12.6.2, the clock recovery unit (CRU) used in the jitter measurement has a corner frequency of 4 MHz and a slope of 20 dB/decade." to "As exceptions to 94.3.12.6.2, the clock recovery unit (CRU) used in the jitter measurement has a corner frequency of 4 MHz and a slope of 20 dB/decade, and transmitters on lanes not under test transmit PRBS13Q, PRBS31Q or a valid 200GBASE-R or 400GBASE-R signal."

Proposed Response Response Status O

C/ 120D	SC 120D.3.1.4	P 352	L 41	# 117
Dudek, Mike		Cavium		

### Comment Type **TR** Comment Status **D**

The change in the Np value from 13 to 200 removes almost all reflections or other linear distortions from the measurement of sigma e. Package reflections (or other transmitter degradations) that occur in time after the end of the DFE assumed in the Rx will degrade system performance but will no longer be measured. Some method of ensuring that transmitters do not have larger imperfections than those in the COM reference transmitter is required to ensure inter-operability.

### SuggestedRemedy

Revert Np back to 13 and make TxSNR in COM larger than TxSNDR to account for the sigma e created by the COM package, or create an additional control method and specifications for these effects.

Proposed Response Response Status **O** 

C/ 120D	SC 120D.3.2.1	P 355	L 19	# 118
Dudek, Mike		Cavium		

Comment Type TR Comment Status D

With the change of Np from 13 to 200 in draft 2.1 the effect of reflections in the test system will not be captured and any reflections in the test system will over-stress the receiver.

### SuggestedRemedy

Change "the measured value of SNDR" to "the measured value of SNDR with Np=13 in the waveform fit".

Proposed Response Response Status **O** 

C/ <b>120E</b> SC <b>120E.3.3</b> Dudek Mike	<b>.2.1</b> <i>P</i> <b>373</b> Cavium	L <b>46</b>	# <u>1</u> 19	C/ <b>120D</b> SC <b>120D</b> . Dudek Mike	<b>3.2.1</b> <i>P</i> <b>355</b> Cavium	L <b>21</b>	# <u>1</u> 21
Comment Type <b>TR</b> It is unlikely that it will I height and eye width o the individual levels of amplitude it should be middle eye width will be	Comment Status <b>D</b> be possible to create an inpu n all three eyes, but the test the pattern generator output possible to achieve the same e larger than the outer two.	t signal that has procedure implie are adjusted rath e eye height, but	exactly equal eye s this is required. If her than the overall it is very likely that the	Comment Type E It would read better were in order. SuggestedRemedy swap the order. Proposed Response	Comment Status D if the order of sigma RJ and Al	DD were reversed	d so that the equations
Change "Random jitter adjusted (without excer- shown in Table 120E using the reference rec height and eye width." adjusted (without excer- shown in Table 120E smallest eye given in T CTLE that maximizes t	and the pattern generator ou eding the differential pk-pk in 4) to result in the eye height a everwith the setting of the C to ""Random jitter and the pa eding the differential pk-pk in 4) to result in the eye height f able 120E–5 using the reference he product of eye height and mange to the Module input test	atput amplitude a put voltage tolera and eye width giv TLE that maximi ttern generator c put voltage tolera or all three eyes ence receiver wit eye width."	are ance specification as ven in Table 120E–5 zes the product of eye output levels are ance specification as and eye width for the h the setting of the	Cl 45 SC 45.2.1 Dudek, Mike Comment Type T A comment is being basis. SuggestedRemedy Assuming that com	P 43 Cavium Comment Status D g made to clause 120 to make s ment is accepted additional ap	L 44 JP03B also contro propriate registers	# 122 Dable on a per lane s for JP03B should be
Proposed Response	Response Status <b>O</b>			Proposed Response	Response Status 0		
C/ 118 SC 118.2.2 Dudek, Mike Comment Type E two returns that should SuggestedRemedy remove them Proposed Response	P 131 Cavium Comment Status D n't be there. Response Status O	L 50	# 120	Cl 122 SC 122.8 Dudek, Mike Comment Type T The definition of wh least 31 UI delay be SuggestedRemedy Copy the appropria Proposed Response	.5.1 P 256 Cavium Comment Status D hat pattern is on the other lanes etween lanes). te sentences from 121.8.5.1 Response Status O	L 44 should be include	# <u>123</u> ed. (SSPRQ with at

Sector sect								
C/ 121 SC 121.11.3.	2 P 234	L <b>46</b>	# 124	C/ <b>121</b>	SC 121.11.3	1 P 234	L <b>47</b>	# 127
Dudek, Mike	Cavium			Ghiasi, Ali		Ghiasi Quantu	IM LLC	
Comment Type T	Comment Status D			Comment T	/pe TR	Comment Status D		
The optical lane assign those for 400GBASE-E	ments for 200GBASE-DR4 s DR4 shown in figure 124-5. T	shown in figure 1 hey are also diff	21-9 are different from ferent from what was	MDI def the oute	inition of Fig 12 r 4 fiber are us	21-9 is not consistant with defi ed	inition in CL 95	or PSM4 MSA where
shown in draft 2.0 and change bars against it	I can't find a comment that e	xplained the cha	inge and there are no	SuggestedF	emedy			
SuggestedRemedy				Please	define left most	4 fibers for TX and right mos	t fibers as RX, j	please also align the
Change the figure back	to what was in draft 2.0			text wth MDI Fig	124-5 looks fir	ne so you could just borrow it		
Proposed Response	Boononoo Statua			Proposed R	esnonse	Response Status 0		
r roposeu Nesponse				ropoodari	ooponoo			
C/FM SC FM	P <b>2</b>	L <b>7</b>	# 125	C/ 122	SC 122.11.1	P 263	L <b>24</b>	# 128
Ghiasi, Ali	Ghiasi Quant	um LLC		Ghiasi, Ali		Ghiasi Quantu	IM LLC	
Comment Type ER	Comment Status D			Comment T	/pe TR	Comment Status D		
Missing keywords				The 200	Gbase-FR4/LF	R4 having CL88 LAN-WDM gr	id could also su	pport 0.44 dB/km fiber
SuggestedRemedy				SuggestedF	emedy			
Suggest adding 200GE	BASE-R, 400GBASE-R, and	PAM4		Suggest FR4/LR	keeping curre per definition	nt 0.47/0.5 dB for 400G-FR8/I in CL88	LR8 but use 0.4	4/0.5 dB for 200G-
Proposed Response	Response Status W			Proposed R	esponse	Response Status <b>O</b>		
[Editor's note: Clause a	and Subclause changed from	Abstract to FM]						
C/ 121 SC 121.11	P 233	L 15	# 126	C/ 122	SC 122.10	P 262	L <b>44</b>	# 129
Ghiasi, Ali	Ghiasi Quant	um LLC		Ghiasi, Ali		Ghiasi Quantu	IM LLC	
Comment Type TR	Comment Status D			Comment T	/pe TR	Comment Status D		
Table 121-13 uses opti discrete reflectances	ical return loss is hanging in	the air and shou	ld be tight to # of	Table 12 discrete	21-13 uses opt reflectances	ical return loss is hanging in t	the air and shou	ld be tight to # of
SuggestedRemedy				SuggestedR	emedy			
Add note maximum nu	mber of discreate reflectace	is given by Table	e 121-15.	Add not	e maximum nu	mber of discreate reflectace is	s given by Table	e 122-19.
Proposed Response	Response Status 0			Proposed R	esponse	Response Status W		
				[Editor's	note: Clause of	changed from 120 to 122, Sub	clause change	d from 120.1 to 122.10

C/         124         SC         124.10         P 302         L 45         # 130           Ghiasi, Ali         Ghiasi Quantum LLC         Ghiasi Quantum LLC <th>C/         120E         SC         120E.4.2         P 376         L 31         # [133]           Ghiasi, Ali         Ghiasi Quantum LLC         Ghiasi Quantum LL</th>	C/         120E         SC         120E.4.2         P 376         L 31         # [133]           Ghiasi, Ali         Ghiasi Quantum LLC         Ghiasi Quantum LL
Comment Type <b>TR</b> Comment Status <b>D</b> Table 124-11 optical return loss is hanging in the air and should be tight to # of discrete reflectances	Comment Type TR Comment Status D This section is out of sync with the OIF-56G-VSR liason to the IEEE.
SuggestedRemedy         Add note maximum number of discreate reflectace is given by Table 122-19.         Proposed Response       Response Status         W         IEditor's note: Subclause changed from 124.1 to 124.101	The new OIF document has new figure to show the CDF high and low, Fig 16-6. We need Fig like OIF 16-6. To stay consistant with OIF terminology we could use Fig 16-6 instead of defining UPCDF1 and UPCDF0, just remove all these definition and instead you can say adjust the CDF-High and CDF-Low from middle eye to upper eye and lower. This will make the procedure more clear and shorter.
C/ 120E SC 120E.3.4.1.1 P 375 L 45 # 131	Proposed Response Response Status <b>O</b>
Comment Type TR Comment Status D Loss budget is specified at 12.89 GHz not consistent with Fig 120E-3 loss budget definition at 13.28 GHz which is PAM4 signal Nyquist	Cl 121SC 121.7.3P 219L 47# 134Ghiasi, AliGhiasi Quantum LLCComment TypeTRComment StatusD
SuggestedRemedy Change 12.89 GHz to 13.28 GHz	Current -45 dB RL require APC connector and may not support installed based.
Proposed Response Response Status O Cl 120E SC 120E.3.4.1.1 P 376 L 1 # 132 Ghiasi, Ali Ghiasi Quantum LLC	Standard should allow reducing the number of connectors from 4 as defiend for operation with -45 dB RL to -35 dB with 2 connectors. Adhoc contribution http://www.ieee802.org/3/bs/public/adhoc/smf/16_08_16/anslow_01_0816_smf.pdf inducate to support 2 connector the RL for each connector must be -39 dB. This is close enough to either the MPI budget or trade connector loss as few are used with MPI.
Comment Type TR Comment Status D	Proposed Response Response Status O
The pattern generator device has a package but it would be internal to the generator and in many cases I have seen pattern generator having slower rise time due to internal losses than actual SerDes. Please don't suggest to use a broken methology!	C/         120E         SC         120E.3.1         P 365         L 21         # 135           Ghiasi, Ali         Ghiasi Quantum LLC         Ghiasi Quantum LLC<
Change TP1a loss to 10.2 dB. Please define the nominal generator output risetime to account for any package loss, suggested TP0 20-80% risetime is 12.5 ps. If the generator output is faster than 12.5 ps add the required 4th order Bessel Thomson fitler to slow down the output to 12.5 ps.	Comment Type TR Comment Status D Based simulation to show feasibility 200GAUI-4/400GAUI-8 C2M were base on hypotitical connector haivng ~1/3 the connector crosstalk specified in 120E.4.1 http://www.ieee802.org/3/bs/public/adhoc/elect/24Aug_15/dallaire_01_082415_elect.pdf
Proposed Response Response Status O	SuggestedRemedy Need to verify if current eye width and eye height are feasible with QSFP28 like connector having ~3x the crosstalk. Attach presentation provide background http://www.ieee802.org/3/bs/public/16_09/ghiasi_3bs_01_0916.pdf
	Proposed Response Response Status O

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: Comment ID

Comment ID 135

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C/ 30         SC 30         P 41         L 21         # 136           Slavick, Jeff         Broadcom Limited         Image: Slavick state	C/         118         SC         118.2.2         P 131         L 53         # 139           Slavick, Jeff         Broadcom Limited         Image: Comparison of the second sec
Comment Type TR Comment Status D aRSFECIndicationEnable and aRSFECIndicationAbility are missing references to clause	Comment Type TR Comment Status D Only the DTE XS has the variable rx_local_degraded
SuggestedRemedy Add references to clause 119 to the definitions of those two management objects	SuggestedRemedy Remove "or rx_local_degraded" from the definition of adjacent_pcs_local_degraded
Proposed Response Response Status O	Proposed Response Response Status <b>O</b>
C/ 45 SC 45.2.1.124 P 63 L 41 # 137	C/         119         SC         119.2.4.4         P 151         L 50         # 140           Slavick, Jeff         Broadcom Limited         Image: Comparison of the second s
Slavick, Jeff       Broadcom Limited         Comment Type       TR       Comment Status       D         To support test operation of "Lane under test shall transmit pattern X, while other lanes are sending PRBS13Q, PRBS31Q or mission data" the definition for 1.1501 bit 3 (tx_gen) needs to be amended. Since to transmit the test pattern it has to be set, but the only way to send mission would be to not enable any pattern on the other lanes. Additionally the tx_gen enable allows for more then just PRBS to be sent.	Comment Type       TR       Comment Status       D         The Clause 119 PCS does not forward a XS degraded signal. Clause 118 PHY XS also does not send a degrade indication across the AUI to the DTE XS.         SuggestedRemedy         Presentation to be provided with changes
SuggestedRemedy Change: "Register 1.1501, bit 3 enables PRBS generation in the transmit direction. Register 1.1501, bit 2 enables PRBS checking in the transmit direction. Register 1.1501, bit 1 enables PRBS generation in the receive direction. Register 1.1501, bit 0 enables PRBS checking in the receive direction. If neither of the bits 7 and 6 are asserted then bits 3:0 have no effect." to: "Register 1.1501, bit 3 allows for pattern generation to be sent in the transmit direction. Register 1.1501, bit 2 enables PRBS checking in the transmit direction. Register 1.1501, bit 2 enables PRBS checking in the receive direction. Register 1.1501, bit 0 enables PRBS checking in the receive direction."	Cl 119       SC 119.2.6.2.4       P 168       L 42       # 141         Slavick, Jeff       Broadcom Limited         Comment Type       T       Comment Status       D         The amps_counter is counting the interval of AM insertions. So "separate the ends of", is that inclusive or exclusive of the codeword containing the AM block?         SuggestedRemedy
Proposed Response       Response Status       O         Cl 45       SC 45.2.1.124       P 63       L 1       # 138         Slavick, Jeff       Broadcom Limited         Comment Type       T       Comment Status       D         Control register 1.1501 has more then just PRBS patterns.	Change: "amp_counter This counter counts the i FEC codewords that separate the ends of two consecutive normal alignment marker payload sequences (where i is 4096 for the 200GBASE-R PCS, and 8192 for the 400GBASE-R PCS)." to "amp_counter This counter counts the interval of i FEC codewords containing normal alignment marker payload sequences (where i is 4096 for the 200GBASE-R PCS, and 8192 for the 400GBASE-R PCS)."
SuggestedRemedy Remove the word PRBS from the name of the register and the title of Table 45-93	Proposed Response Response Status <b>O</b>
Proposed Response Response Status <b>O</b>	

C/         119         SC         119.2.6.3         P         169         L         13         #         142           Slavick, Jeff         Broadcom Limited         Broadcom Limited <t< th=""><th>C/ 120D SC 120D.3.1.1 P 351 L 40 # 145</th></t<>	C/ 120D SC 120D.3.1.1 P 351 L 40 # 145
Comment Type E Comment Status D	Comment Type T Comment Status D
The opening paragraph talks about how AM lock is achieved, then how things lose lock, and then the last sentence says, on by the way when you got lock, also do this. So the	All but 1e-4 of the jitter distribution can be confusing and ambiguous.
flow of the paragraph could be improved.	SuggestedRemedy
SuggestedRemedy	Change it to "jitter distribution with its probability density function (pdf) at and above 1e-4"
Move the last sentence to precede the sentence starting with "Once in lock".	Proposed Response Response Status <b>O</b>
Proposed Response Response Status O	
	C/ 120D SC 120D.3.2.1 P 352 L 1 # 146
C/ 119 SC 119.2.6.3 P 170 L 3 # 143	Li, Mike Intel
Slavick, Jeff Broadcom Limited	Comment Type T Comment Status D
Comment Type <b>T</b> Comment Status <b>D</b> Should me make all the FSMs look the same? The maintence request version has the A	Vmid definition only uses V0 and V3, yet is used as the reference for calculating level separation mismatch involving V1 and V2, therefore is a biased Vimd and can cause inaccurate and biased estimation.
transition going to the GOOD_AM state rather then the COUNT_2 state?	SuggestedRemedy
Suggesteakemedy	Change Vmid to Vmid = $(1/4)^*$ (V0+V1+V2+V3)
Move the A transition to go from 2_GOOD -> GOOD_AM	Proposed Response Response Status O
Proposed Response Response Status O	
	C/ 120D SC 120D.3.1.3 P 352 L 38 # 147
C/120 SC 120 5 11 1 1 $P$ 196 $/22$ $#$ 144	Li, Mike Intel
Slavick, Jeff Broadcom Limited	Comment Type T Comment Status D
Comment Type T Comment Status D	"ES is defined to be (ES1 + ES2)/2" is wrong
Do we really want to restrict (and I doubt implmentations do this) error counting to "isolated single bit errors". I believe the current implmentations are able to count all bits, and don't always greats single bit errors.	SuggestedRemedy Change it to "ES is defined to be ( ES1  + ES2)/2"
with the ability to reduce a burst error to be a single increment.	Proposed Response Response Status O
SuggestedRemedy	
In 120.5.11.1.1, 120.5.11.2.4 Change: "The checker shall increment the test-pattern error counter by one for each incoming bit error in the PRBS31 pattern for isolated single bit errors. Implementations should be capable of counting at least one error whenever one or more errors occur in a sliding 1000-bit window." To: "The checker shall increment the test-pattern error counter by one for each incoming error in the PRBS31 pattern. Implementations should be capabable of counting at least one error whenever one or more errors occur in a sliding 100-bit window"	

Proposed Response Response Status **O** 

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: Comment ID

	# [110]	01 4005	00 4005 0	A.4. B074	1 40	# 454
Li, Mike Intel	# [148	Li, Mike	3C 120E.3.4	Intel	L 40	# 151
Comment TypeTComment StatusD900 mv is not consistent with that in Table 120E-1		Comment 7 Table 1	<i>ype</i> <b>T</b> 20E-8 inconsis	Comment Status D stent with Table 120E-1		
SuggestedRemedy         Change it to be 880 mv to be consistent with Table 120E-1         Proposed Response       Response Status       O		Suggested/ Change width) = Change Change	Remedy e "ESMW (Eye = 0.22 UI" e "Eye width= 0 e "Eye height =	symmetry mask width) = ( 0.25 UI " to "Eye width = 0. 50 mV" to "Eye height = 3	).25 UI" to "ESMW 22 UI" 2 mV"	(Eye symmetry mask
C/         120E         SC         120E.3.1.5         P 367         L 16           Li, Mike         Intel         Int	# 149	Proposed F	Response s note: Line ch	Response Status W anged from "40-45" to "40"	']	
Comment Type <b>T</b> Comment Status <b>D</b> Filter definition unclear and inconsistent		C/ <b>120</b> Wertheim (	SC <b>120.5.1</b> 1	1.2.5 P 200	L 43	# 152
SuggestedRemedy Change "The waveform is observed through a 33 GHz low-pass filte Bessel-Thomson response)." To "The waveform is observed through a low-pass filter response with a GHz (such as a Bessel-Thomson response)." to be clear and compl	r response (such as a a 3 dB bandwidth of 33 ete and consistent	Comment 7 The cur receive	<i>Type</i> <b>TR</b> rrent SSPRQ to r testing.	Comment Status D est pattern is too stressful	for transmitter (TDE	ECQ) or stressed
(e.g., with Line 14, page 366) Proposed Response Response Status <b>O</b>		The sho implem the righ	ortened test pa entation persp it penalty.	attern structure of sections ective, we may modify the	of PRBS31 is conv start values of the	enient from segments to produce
C/ 120E SC 120E.3.1.7 P 369 L 49	# 150	Proposed F	Response	Response Status O		
Comment Type <b>T</b> Comment Status <b>D</b> Figure caption for Figure 120E-9 inconsistent with section tile and ta	ble 120E-2	C/ 120 Wertheim, 0	SC <b>120.5.1</b> 1 Oded	1.2.6 P 201 Mellanox	L <b>28</b> Technologie	# 153
SuggestedRemedy Change "Selectable continuous time linear equalizer (CTLE) charac "Reference continuous time linear equalizer (CTLE) characteristic"	teristic" to	Comment 7 A squa the PAI	<i>Type</i> <b>TR</b> re test pattern M4 symbols / tr	Comment Status <b>D</b> is not suitable test pattern ransitions that a CDR or tu	for a PAM4 receive ning implementatio	er. It doesn't include all n may assume.
Proposed Response Response Status <b>O</b>		Suggestedl Remov	Re <i>medy</i> e the square te	est pattern from clause 120	).	
		Proposed F	Response	Response Status O		

C/ 1 SC 1.472r	P 35 L 2	0 # 154	C/ 1 SC 1.4	472r	P 35	L 20	# 156
D'Ambrosia, John	Futurewei, Subsidiary		D'Ambrosia, John		Futurewei, Su	ubsidiary	
Comment Type E C	omment Status D		Comment Type	E Comment	Status D		
Definition of 400GXS Text e functionality to the 400GBA communicate the true intent the 400GXS or the 400GBA	essentially says that the functiona SE-R PCS and IT may be config t. It should communication that it SE-R PCS	lity of the 400GXS is similar in ured as itself, which doesn't can be configured as either	The body of the throughout the r SuggestedRemedy	standard introduces rest of the standard),	DTE 400GXS but neither of t	and PHY 400GX hese terms are d	S (and used lefined.
1.4.72r 400GXS: The 400 G Extender. In functionality, it in Clause 119, but it may be management registers. (See	b/s Extender Sublayer (400GXS is almost identical to the 400GB/ configured as a 400GXS throug e IEEE Std 802.3, Clause 118.)	) is part of the 400GMII ASE-R PCS Sublayer defined h different optional	1. Modify the de their location in 2. Create new d Option 1 makes	efinition of 400GXS to the stack. lefinitions in 1.4 for e	o include the de ach term. he commenter i	finition of these t	wo terms, based on
SuggestedRemedy			Information toge	ether, but i recognize	that this doesn	it allow easy loca	ation of these terms.
Change definition to - The 400 Gb/s Extender Sub functionality, it is almost ide 119. It may be configured a	layer (400GXS) is part of the 400 ntical to the 400GBASE-R PCS is either a 400GXS or the 400GB	DGMII Extender. In Sublayer defined in Clause IASE-R PCS through different	Cl 120b SC 12	e Response	P 332	L <b>26</b>	# [157
optional management regist	optional management registers. (See IEEE Std 802.3, Clause 118.)				Futurewei, Su	ubsidiary	
C/ 1 SC 1.472i D'Ambrosia, John	P 34 L 3 Futurewei, Subsidiary	8 # 155	Comment Type Fig 120B-1 and respectively. He diagrams, layers	E Comment 120B-2 include term owever, these terms s are defined that are	Status <b>D</b> as 200GBASE-F are not defined e not general, a	R PCS and 400G I below. It is note nd rate specific.	BASE-R PCS, ed that in both of these
Comment Type E C The body of the standard in throughout the rest of the st	comment Status <b>D</b> troduces DTE 200GXS and PHY andard), but neither of these terr	200GXS (and used ns are defined.	Include terms 2 diagram. 200GBASE-R F 400GBASE-R F	00GBASE-R PCS ar PCS - 200 Gb/s BAS PCS - 400 Gb/s BAS	nd 400GBASE-I E-R PCS E-R PCS	R PCS in termino	ology below respective
There are two options - 1. Modify the definition of 20 their location in the stack. 2. Create new definitions in Option 1 makes the most se information together, but i re	DOGXS to include the definition of 1.4 for each term. ense to the commenter in terms of ecognize that this doesn't allow e	f these two terms, based on of gathering relevant asy location of these terms.	Proposed Response	e Response	Status <b>O</b>		
Proposed Response Re	esponse Status <b>O</b>	,					

C/ 120c SC 120c.1 P 339 L 26 # 158	Cl         1         SC 1.472i         P 34         L 36         # [161]           Difference         Extremute         Subscription			
D'Ambrosia, John Futurewei, Subsidiary	D'Ambrosia, John Futurewei, Subsidiary			
Fig 120C-1 include terms 200GBASE-R PCS and 400GBASE-R PCS, respectively. However, these terms are not defined below diagram. It is noted that in both of these diagrams, layers are defined that are not general, and rate specific.	Definition of 200GXS Text essentially says that the functionality of the 200GXS is similar in functionality to the 200GBASE-R PCS and IT may be configured as itself, which doesn't communicate the true intent. It should communication that it can be configured as either			
SuggestedRemedy	the 200GXS or the 200GBASE-R PCS			
Include terms 200GBASE-R PCS and 400GBASE-R PCS in terminology below diagram. 200GBASE-R PCS - 200 Gb/s BASE-R PCS 400GBASE-R PCS - 400 Gb/s BASE-R PCS	The 200 Gb/s Extender Sublayer (200GXS) is part of the 200GMII Extender. Infunctionality, it is almost identical to the 200GBASE-R PCS Sublayer defined in Clause 119, but it may be configured as a 200GXS through different optional management registers. (See IEEE State 2.3, Clause 118.)			
Proposed Response Response Status <b>O</b>	Stu 602.3, Clause 116.)			
	Change definition to -			
C/ 120d         SC 120d.1         P 348         L 26         # 159           D'Ambrosia, John         Futurewei, Subsidiary	The 200 Gb/s Extender Sublayer (200GXS) is part of the 200GMII Extender. Infunctionality, it is almost identical to the 200GBASE-R PCS Sublayer defined in Clause 119. It may be configured as either a 200GXS or the 200GBASE-R PCS through different optional			
Comment Type         E         Comment Status         D           Fig 120D-1 and 120D-2 include terms 200GBASE-R PCS and 400GBASE-R PCS, respectively. However, these terms are not defined below. It is noted that in both of these diagrams, layers are defined that are not general, and rate specific.	management registers. (See IEEE Std 802.3, Clause 118.) Proposed Response Response Status <b>O</b>			
SuggestedRemedy Include terms 200GBASE-R PCS and 400GBASE-R PCS in terminology below respective diagram.	Cl         121         SC         121.8.5.3         P 226         L 25         # 162           Hanan, Leizerovich         MultiPhy			
200GBASE-R PCS - 200 Gb/s BASE-R PCS	Comment Type T Comment Status D			
Proposed Response Response Status <b>O</b>	Equation 121-4 is intended to direct the reader to create a cummulative distribution of yi. Because the value of C1F in Equation 121-4 is used in calculation BER, it should be complete for all values of yi. Specifically, for the value yi <pth1, yi="">Pth1 and yi=Pth1.</pth1,>			
C/ 120e SC 120e.1 P 362 L 26 # 160	SuggestedRemedy			
D'Ambrosia, John Futurewei, Subsidiary	Use Either -			
Comment Type E Comment Status D Fig 120E-1 include terms 200GBASE-R PCS and 400GBASE-R PCS, respectively. However, these terms are not defined below diagram. It is noted that in both of these diagrams, layers are defined that are not general, and rate specific.	CF1(yi) =   sigma{f(y), from y=Pth1+Dy to yi} for yi>Pth1   sigma{f(y), from y=yi to Pth1-Dy} for yi <pth1   O for yi=Pth1 **Dy is delta y</pth1 			
SuggestedRemedy Include terms 200GBASE-R PCS and 400GBASE-R PCS in terminology below diagram.	Or more elegent manner is - CF1(yi) = sigma{f(y), from y=min(Pth1,yi) to max(Pth1,yi)} - f(Pth1)			
200GBASE-R PCS - 200 Gb/s BASE-R PCS 400GBASE-R PCS - 400 Gb/s BASE-R PCS	Proposed Response Response Status W			
Proposed Response Response Status O	[Editor's note: This comment was sent after the close of the comment period]			

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: Comment ID

Comment ID 162

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C/ 119 Brown, Mat	SC <b>119.2.6.3</b> t	P 17 Applie	70 L ed Micro	. 10	# 163		
Comment 7 In Figu	Гуре <b>Т</b> re 119-12, condi	Comment Status tions for some transi	<b>D</b> tions are missi	ng.			
SuggestedRemedy For the transition COUNT_NEXT to COMP_2ND use "amp_counter_done * amp_valid". For the transition COMP_2ND to 2_GOOD use "amp_match". For the transition from SLIP to GET_BLOCK use "UCT".							
Proposed Response Response Status W							
[Editor's note: This comment was sent after the close of the comment period]							
C/ 120	SC 120.5.11.	2.6 <i>P</i> 20	<b>D1</b> L	. 20	# 164		
Brown, Mat	t	Applie	ed Micro				
Comment 7	Гуре Т	Comment Status	D				
The SS pattern As suc is ampl	PRQ pattern is segments follow h, there is ample le opportunity to	a complex pattern co ved by conversion to poportunity for the c misinterpret the spec	mprised of a s PAM4 symbols lescription to b cification and ir	et of independen s, gray coding, a le incorrectly inte mplement an inco	tly generated bit nd precoding. rpreted. There prrect pattern.		
Suggestedl	Remedy						
Provide IEEE w	a copy of the e veb site in a loca	ntire PAM4 either wit tion that is perpetual	hin the P802.3 y accessible.	bs document or	in a file on the		
Proposed F	Response	Response Status	w				
[Editor	s note: This corr	ment was sent after	the close of th	e comment peric	od]		