							-					
C/ 120E	SC 12	DE.3.1.6	P 372	L 41	# <u>r02-1</u>		C/ 119	SC	119.2.6.3	P 170	L 19	# r <u>02-3</u>
Anslow, F	Peter		Ciena Corpora	ation			Gustlin, Ma	ark		Xilinx, Inc.		
Commen	t Type T	Comr	ment Status A			Bucket	Comment	Туре	т	Comment Status A		Bucket
Com	ment r01-43	3 against D3.1 a	added:				l = 139	264 is	incorrect for	or 200GE, it should be 27	8528, same as fo	r 400GE.
"so tr 120E	.3.2.1. 120	E.3.3.2.1 and 1	ne are not correlated 20E.3.4.1.1.	a within the PIVIL)" IN 120E.3.1.6,		Suggested	Remed	dy			
But the Host Modu Host Modu which	he pattern in output eye ile output ey stressed in ile stressed	n question is be width and eye h ye width and eye put test input test input test	eing used for measur height ve height	ement of:			Chang marker 264 for marker marker	e "Eac rs i x 10 r a 200 r lock p rs 278	h alignmen 0-bit Reed- GBASE-R process loo 528 x 10-bi	t marker lock process loc Solomon symbols apart (PCS and i = 278 528 for ks for two valid alignmen t Reed-Solomon symbols	oks for two valid a fon a per PCS lan a 400GBASE-R F t s apart on a per P	lignment e basis, where i = 139 PCS)" to "Each alignment CS lane basis"
Suggost	dPomody		ic i wib sublayer				Response			Response Status C		
In 12	0F31612	20F 3 2 1 120F	= 3 3 2 1 and 120E 3	4 1 1 delete "w	ithin the PMD"		ACCEI		PRINCIPLE			
Respons ACC	e EPT.	Respo	onse Status C				This co and IE Hence Howev	ommer EE P80 it is no rer, the	nt does not 02.3bs/D3. ot within the changes s	apply to the substantive 1 or the unsatisfied nega scope of the recirculation uggested are an improve	changes between tive comments fro n ballot. ement to the draft	IEEE P802.3bs/D3.2 m the previous ballots. that would otherwise
C/ 121	SC 12	1.7	P 221	L 16	# <u>r02-2</u>		need to	o be m	ade in Mair	ntenance.		
King, Jon	athan		Finisar Corpo	ration			Apply s	suaaes	ted remed	۷.		
Commen The o band value	<i>t Type</i> T changes in I width mean which is 0.	R Comr Draft 3.2 to the that transmitte 9 dB higher.	ment Status A TDECQ reference e rs that just passed E	qualizer and ref 03.1 TDECQ wil	erence receiver have a D3.2 TE	DECQ						
Simil	arly for clau	ses 122 and 12	24									
Suggeste	dRemedy											
Subje licens	ect to task fo se	orce review, im	plement the changes	s in king_3bs_0	1_0617, with edi	torial						
Respons ACC Imple http:/ with t In Ta leave In foo SEC	e EPT IN PRI ement the cl /www.ieee8 he following bles 121-7, the Receiv otnote c of e Q of 0.9 dB'	Respo NCIPLE. hanges shown 02.org/3/bs/put 9 exceptions: 122-11, 122-12 er sensitivity (C ach table chan	onse Status C in blic/adhoc/smf/17_0(2, and 124-7: DMAouter), each lan- ige the addition to "a	6_27/anslow_02 e (max) unchan nd is defined for	_0617_smf.pdf ged `a transmitter w	ith						

C/ 119 SC 119.2.5.3 P 164 Koehler, Daniel	L 10	# <u>r</u> 02-4	<i>Cl</i> 119 Koehler, D	SC 119.2.6.2 aniel	2.2	P 167	L 25	# <u>r</u> 02-5
Comment Type E Comment Status A Defines the assertion time for hi_ser as a time variable definition in 119.2.6.2.2 which defines 8192 codewords	from 60ms to 75ms v deassertion when les	which differs from the ss than threshold within	Comment Assert accord	<i>Type</i> E ion and Deasse ling to 119.2.5.3	Comment S rtion of hi_ser is once asserted	tatus A defined as de it should stay	epending on 819 asserted for 60n	2 codewords. However ns to 75ms which is not
Suggested Remedy			Suggested	Remedy				
Undate 119 2 6 2 2 variable definition to includ	e the time		Chang	e wording simila	ar to this hit is	set to one if	exceeds the th	reshold and once
Posponso Desponso Status	o the time.		asserte	ed is set to zero	after 60ms to 7	5ms and no lo	onger exceeding	the threshold.
ACCEPT IN PRINCIPLE.			Response ACCE	PT IN PRINCIPI	Response Si	tatus C		
Update the definition of hi_ser, from:			See th	e response to c	omment #r02-4.			
"When FEC_bypass_indication_enable is set t RS-FEC symbol errors in a window of 8192 co 119.2.5.3) and is set to zero otherwise. When zero, this bit is set to zero. This variable is mapped to the bit defined in 45.2.3.	o one, this bit is set to dewords exceeds the FEC_bypass_indicati 47k (3.801.2)."	o one if the number of threshold (see on_enable is set to	[Editor The re Update	's note added at sponse to comn e the definition c	fter comment re nent r02-4 is: of hi_ser, from:	solution comp	leted.	
to: "When FEC_bypass_indication_enable is set t ms to 75 ms if the number of RS-FEC symbol exceeds the threshold (see 119.2.5.3), and is s FEC_bypass_indication_enable is set to zero, mapped to the bit defined in 45.2.3.47k (3.801)	o one, this bit is set to errors in a window of set to zero otherwise. this bit is set to zero. .2)."	o one for a period of 60 8192 codewords When This variable is	"When RS-FE 119.2. zero, tl variabl to: "When	FEC_bypass_i C symbol errors 5.3) and is set to his bit is set to z e is mapped to FEC_bypass_i	ndication_enabl s in a window of o zero otherwise zero. This the bit defined ir ndication_enabl	e is set to one 8192 codewo e. When FEC_ n 45.2.3.47k (e is set to one	e, this bit is set to rds exceeds the bypass_indication 3.801.2)." e, this bit is set to	o one if the number of threshold (see on_enable is set to o one for a period of 60
			ms to a exceed FEC_b mappe	75 ms if the nun ds the threshold bypass_indication d to the bit defin	nber of RS-FEC (see 119.2.5.3) on_enable is set ned in 45.2.3.47	symbol errors , and is set to to zero, this b k (3.801.2)."	s in a window of zero otherwise. it is set to zero.	8192 codewords When This variable is

1

r02-6

C/ 119	SC 119.2.6.3	P 172	L 2
Koehler. D	Daniel		

Comment Type T Comment Status A

Adding hi ser in the Fig. 119-13 seems unintended. It forces the LOSS OF ALIGNMENT state (LOA) which creates ambiguities for the RSFEC decode process up to the possibility of a dead-lock the link would never recover from. Reasons of doubt: a) When in LOA state restart lock is forced false. If now during hi ber the link is reset by the link partner the statemachine of Fig. 119-12 will enter the 5 BAD state eventually as markers are most likely no longer at expected position. Now we have an ambiguity what state the restart lock variable should become. Fig. 119-13 enforces false, where now Fig. 119-12 enforces true. Which one wins ? (neither is a solution) b) But the main problem is now Fig. 119-13 which does not allow deskew as LOA state enforces pcs enable deskew=false. Hence the deskew process cannot align the lanes in such situation causing the RSFEC decoder receiving data from unaligned lanes causing permanent uncorrectable codewords which by definition in 119.2.5.3 create 16 symbol errors per codeword. This is now a dead-lock, as the hi ser will never deassert as the threshold will be permanently exceeded hence the link will never come up again. It may be argued that the RSFEC decode process is not active when align status is down but then also hi ser measurement stops which then means definition of hi_ser deassertion is incorrect in 119.2.6.2. and e.g. needs to be defined purely based on time deasserting after 60..75ms.

SuggestedRemedy

I think the intention was to enforce CDMII local fault signaling and link status down when hi_ser occurs similar to the reaction to hi_ber done for 100G (Clause 82) while maintaining all RSFEC decode process to continue operating normally while hi_ser is asserted to keep monitoring. Proposed Remedy: remove the the or hi_ser from Fig. 119-13. Instead add it to Fig. 119-15 (Receive state diagram) to enforce RX_INIT state producing local fault to CDMII. In addition change definition of PCS_Status in 119.2.6.2.2 to: A boolean variable that is true when align_status is true and hi_ser is false and is false otherwise.

Response

ACCEPT IN PRINCIPLE.

Adding hi_ser to the state machine in Figure 119-13 was intentional. This only occurs once a high symbol error ratio is observed and FEC_bypass_indication_enable is set to one.

Response Status C

Modify state diagram in Figure 119-12 to remove the restart_lock conflict by removing the 5_BAD state, and have a direct transition from INVALID_AM directly to LOCK_INIT if amp_bad_count = 5.

C/ 116	SC 116.5	P 119	L 33	# <u>r</u> 02-7
Slavick, Je	ff	Broadcom Lin	nited	

Comment Type TR Comment Status A

Table 116-8 lists N/A for SP2 and SP5 which are the PMD interface skew points. For 400G-DR4 that is a 53Gbd interface.

SuggestedRemedy

In Table 116-8 53GBd column, change the SP2 N/A to 21 and the SP5 N/A to 191

Response Response Status C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.

However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance.

In Table 116-8, in the column for "Maximum Skew Variation for 53.125 GBd PMD lane (UI)", change the entry for SP2 from "N/A" to "= 21" and the entry for SP5 from "N/A" to "= 191", where "=" is the curly equals sign used for other entries in the column.

C/ 120 SC 120.5.7 P 196 L 15 # [r02-8] Slavick, Jeff Broadcom Limited Image: State St	Cl 116 SC 116.3.3 P 111 L 42 # [r02-9] Slavick, Jeff Broadcom Limited
Slavick, Jeff Broadcom Limited Comment Type T Comment Status A This section is defining how Gray mapping is done in the transmit and receive directions. The first two paragraphs are related to the transmission and the last to the reception. However, only the last paragraph qualifies the direction of data flow. SuggestedRemedy Combine the first two paragraphs to read as follows: For output lanes encoded as PAM4 (for 200GBASE-R, where the number of output lanes is 4, or for 400GBASE-R, where the number of output lanes is 4 or 8), the PMA transmit process shall map consecutive pairs of bits {A, B}, where A is the bit arriving first, to a Gray-coded symbol as follows: Response Response Status C ACCEPT IN PRINCIPLE. This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots.	Slavick, Jeff Broadcom Limited Comment Type T Comment Status A Bucket The inter-sublayer service interface is applicable to both 200G and 400G SuggestedRemedy Bucket Delete "for the 400GBASE-R sublayers" Response Response Status C ACCEPT IN PRINCIPLE. This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot. However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance. Change: "the inter-sublayer service interface primitives for the 400GBASE-R sublayers" to:
Hence it is not within the scope of the recirculation ballot. However, the changes suggested are an improvement to the draft that would otherwise need to be made during publication. Change the first two paragraphs of 120.5.7 to "For output lanes encoded as PAM4 (for	"the inter-sublayer service interface primitives for the 200GBASE-R and 400GBASE-R sublayers".
200GBASE-R, where the number of output lanes is 4, or for 400GBASE-R, where the number of output lanes is 4 or 8), the PMA transmit process shall map consecutive pairs of bits {A, B}, where A is the bit arriving first, to a Gray-coded symbol as follows:"	
(note that while this is editorially better than the Draft 3.2 text, it introduces a difference as compared to the wording of 94.2.2.5)	

C/ 120D SC 120D.3.2.1 Hidaka, Yasuo	<i>Р</i> 360 Fujitsu Labora	L 27 atories of	# <u>r</u> 02-10	<i>Cl</i> 120D Hidaka, Ya	SC 120D.3 asuo	.2.1	<i>Р</i> 360 Fujitsu Labo	L 38 ratories of	# <u>r</u> 02-11
Comment Type TR Co	omment Status A			Comment	Type TR	Commer	nt Status A		
For Rx ITT of 100GBASE-KR4 in 93.8.2.3, the return loss of the test setup in Figure 93C-4 measured at TP5 replica was specified to meet the requirements of Equation (93-2), but it is missing for 120D. As explained in hidaka_3cd_01a_0517.pdf and hidaka_060717_3cd_adhoc-v2.pdf, missing return loss allows use of a bad test channel for Rx ITT, which will cause interoperability problems between compliant channel and compliant Rx. As explained in hidaka_3cd_02_adhoc-v2.pdf, the return loss of the test channel for Rx ITT is important, because it may improve margin for interoperability. Since we had defined return loss of test channel for Rx ITT of Clause 93 as well as 83D, we should do the same for Annex 120D.					The COM value for Rx ITT should be the max value, not the target value. For instance, even if the requirement for Rx ITT compliance is 3dB, a SerDes vendor may use 2dB to have an extra margin for some reason such as a customer request. If a device passes Rx ITT with a 2dB test channel, it is not required to test it again with a 3dB test channel to claim the compliance. However, if it is defined as the target value, it must be tested again with a 3dB test channel to claim the compliance. A numerical error in the computation of calibration is a minor issue. Although it was defined as the target value in Table 92-8, Table 93-6, Table 94-15. Table 110-6, Table 110-7, Table 110-8, Table 111-7, Table 111				value. For instance, ndor may use 2dB to If a device passes Rx 3dB test channel to t must be tested again in the computation of alue in Table 83D-5, it 92-8, Table 93-6, Table 111-5, and Table 111-6.
SuggestedRemedy				Suggested	dRemedy				
Add the following to the list of	of additional consideration	ons:		Specif Remo	iy "COM includ ve the "Target"	ing effects of b columns from	proadband noise Table 120D-6.	e" as the max val	ue.
i) The return loss of the test requirements of Equation (93	setup in Figure 93C-4 m 3-2).	neasured at TP5	replica meets the	Response ACCE	PT IN PRINCI	Response PLE.	e Status C		
Add a new row of "Return los	ss of test setup at TP5 ro	eplica" to Table	120D-6 with a value of	This c	omment does	not apply to th	e substantive ch	hanges between	IEEE P802.3bs/D3.2

ACCEPT IN PRINCIPLE. See resolution of comment #r02-57

Response

[Editor's note added after comment resolution completed. The response to comment r02-57 is:

"The return loss of the test setup in Figure 93C-4 measured at TP5 replica towards TPt 1

	C/ 120D	SC 120D.3.2.1	P 360	L 38	# <u>r</u> 02-11	
_	Hidaka, Yas	Suo	Fujitsu Labora	atories of		

and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots.

However, the changes suggested are an improvement to the draft that would otherwise

Hence it is not within the scope of the recirculation ballot.

need to be made in Maintenance.

Apply the suggested remedy

"Equation (93-2)" in "Min" columns.

Response Status C

Add an extra bullet to the list: meets the requirements of Equation (93-2)."

C/ 120B	SC 120B.3.2	P 337	L 23	# <u>r</u> 02-12
Hidaka, Yas	SUO	Fujitsu Labora	tories of	

Comment Type T Comment Status A

The COM value for Rx ITT should be the max value, not the target value. For instance, even if the requirement for Rx ITT compliance is 3dB, a SerDes vendor may use 2dB to have an extra margin for some reason such as a customer request. If a device passes Rx ITT with a 2dB test channel, it is not required to test it again with a 3dB test channel to claim the compliance. However, if it is defined as the target value, it must be tested again with a 3dB test channel to claim the compliance. A numerical error in the computation of calibration is a minor issue. Although it was defined as the target value in Table 83D-5, it was wrong unfortunately. It was defined as the max value in Table 92-8, Table 93-6, Table 94-15, Table 110-6, Table 110-7, Table 110-8, Table 111-4, Table 111-5, and Table 111-6.

SuggestedRemedy

Change the third item in the list of exceptions from:

The target values for the parameter "COM including effects of broadband noise" in Table 83D-5 are 3dB.

to:

The parameter "COM including effects of broadband noise" in Table 83D-5 has the max values of 3dB. There is no target values for the parameter "COM including effects of broadband noise".

Response

Response Status C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.

However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance.

Change the third item in the list of exceptions from:

"The target values for the parameter "COM including effects of broadband noise" in Table 83D-5 are 3 dB." to:

"The parameter "COM including effects of broadband noise" in Table 83D-5 has values of 3 dB max in place of 2 dB target."

A straw poll was taken: Do you support changing from Target to Max? Yes: 13 No: 5

C/ 120B SC 120B.3.2	P 337	L 34	# <u>r</u> 02-13
Hidaka, Yasuo	Fujitsu Labora	tories of	

Comment Type T Comment Status R

Specifying "Applied pk-pk sinusoidal jitter" as the target value is wrong. For instance, a SerDes vendor may have additional sinusoidal jitter to have an extra margin for some reason. If a device passes Rx ITT with this additional sinusoidal jitter, it is not required to test it again with the sinusoidal jitter in this standard spec. Although it was defined as the target in Table 83D-5, it was wrong unfortunately.

SuggestedRemedy

Change the seventh item in the list of exceptions from:

The "Applied pk-pk sinusoidal jitter" for Test 1 and Test 2 in Table 83D-5 is according to Table 87-13.

to:

The "Applied pk-pk siunoidal jitter" for Test 1 and Test 2 in Table 83D-5 has max the max values according to Table 87-13. There is no target values for the parameter "Applied pk-pk sinusoidal jitter".

Response Response Status C

REJECT.

This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.

The commenter appears to have proposed max when it should have been min. The jitter tolerance requirements in Clause 92, Clause 93, Clause 94, Clause 110, and Clause 111 are all target values as per this test.

Cl 120D	SC 120D.4	P 363	L 8	# <u>r</u> 02-14
Hidaka, Yası	o	Fujitsu La	aboratories of	

Comment Type TR Comment Status A

As explained in hidaka_061417_3cd_01_adhoc.pdf, the limit of variation of compliant channels will grow, if we use a single reference value for the COM impedance parameters, and the single reference value is different from the nominal value. In order to minimize the variation of compliant channels, we should use the nominal value as the single reference value, or we should use multiple reference values. Reduction of variation helps to improve margin for interoperability, which is not guaranteed in the current specification. When we change the COM impedance parameters, we should also consistently change A_v, A_fe, A_ne to get the same signal amplitude at TP0a from reference Tx in COM, and we should also change the COM value to avoid changing the pass / fail status of existing channels. The consistent changes required to A_v, A_fe, and A_ne were reported in hidaka_060717_3cd_adhoc-v2.pdf slide 9. The consistent change required to COM value was reported in hidaka_061417_3cd_01_adhoc.pdf slide 3-8.

SuggestedRemedy

Change the following COM parameter values in Table 120D-8:

 Z_c from 90 ohm to 95 ohm R_d from 55 ohm to 50 ohm A_v from 0.44 V to 0.418 V A_fe from 0.44 V to 0.418 V A_ne from 0.63 V to 0.604 V

For clarification of the intention of the value, in the parameter column of Table 120D-8, change

"Transmission line characteristic impedance" to

"Transmission line nominal characteristic impedance".

In the first paragraph of 120D.4, P362, L9, change from:

"shall be greater than or equal to 3 dB"

to

"shall be greater than or equal to 3.1 dB".

Response Response Status C ACCEPT IN PRINCIPLE.

See response to #r02-55

[Editor's note added after comment resolution completed. The response to comment r02-55 is:

In Table 120D-8 change: Z_c from 90 ohm to 95 ohm

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 r02-15

Page 7 of 25 26/07/2017 16:55:08

R_d A_v A_fe A_ne]	from 55 ohm to 50 ohm from 0.44 V to 0.418 V from 0.44 V to 0.418 V e from 0.63 V to 0.604 V			
C/ 1	SC 1.4	P 34	L 3	# r02-15
Grow, Ro	bert	RMG Consul	ting	

Comment Status R

Comment Type E

Bucket

Insert locations do not follow 802.3 sort order. Though this could be fixed during the next revision, getting these definitions closer to the correct sort order location will help not overlook this during the revision. Our publication editors have recently stated that subclause numbering is not substantive, so if no additional recirculations are required this comment can be passed to the editors for consideration during publication preparation.

SuggestedRemedy

1.4.72b through 1.4.72i belong after 1.4.64aa 2.5GBASE-T inserted by IEEE Std 802.3bz. 1.4.72j through 1.4.72r belong after

Response Response Status C

REJECT.

This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.

The current draft is written as an amendment to IEEE Std 802.3-2015. The order of definitions in 1.4 of IEEE Std 802.3-2015 is not consistent. The current draft places the new 200G and 400G names after the 40G names. Placing them in the list after 2.5GBASE-T would not make the overall list comply with the newly agreed sorting rules and would not make the new definitions any easier to find. The sort order for 1.4 will not be overlooked during the next revision since maintenance request 1297 has been agreed to be included in the revision. See pages 29 and 30 of:

http://www.ieee802.org/3/maint/public/healey_1_0517.pdf#page=29

C/ 78 SC 78.1.4	P 103	L 16	# r <u>02-16</u>	C/ 124	SC 124.8.9	P 302	L 42	# r <u>0</u> 2-18
Grow, Robert	RMG Consulti	ng		Wertheim,	Oded	Mellanox 7	Technologie	
Comment Type E Misleading editing inst and the inserted rows relevance to the speci	Comment Status R truction table has been modifie in IEEE Std 801.2bv are not a fied insert point.	d by most amo t the bottom of	<i>Bucket</i> endments to 802.3-2015, the table (have no	Comment The jitt freque the jitte	<i>Type</i> T er specification ncy corner as t er mask is defin	Comment Status R n for the 100G per lane 400 he 50G per lane 400GAUI- ned in UIs.	GBASE-DR4 rece 8 but with half the	eiver uses the same peak-to-peak jitter as
SuggestedRemedy Delete the parenthetic Response	cal "(as modified by IEEE Std 8 Response Status C	02.3by-2016)"	from the instruction.	This re require unnec freque require	equires the 400 is to add PLL to essary compley ncy jitter isn't b id in order to ha	GBASE-DR4 transceiver P o handle the low frequency ity, cost and power to the t ounded in host transmitter, andle the low frequency jitte	MA to implements jitter and a large j ransceiver. Morec in theory an unlin er.	s a de-jitterizer, which itter buffer which adds over, since the low nited jitter buffer is
This comment does no and IEEE P802.3bs/D Hence it is not within t While it is true that the IEEE Std 802.3by-201 was the reason for inc	ot apply to the substantive cha 3.1 or the unsatisfied negative the scope of the recirculation b e insertion point in the table is 16, footnote "a" to the table wa cluding it in the editing instruction	nges between comments fro allot. not affected by s modified by t on.	IEEE P802.3bs/D3.2 m the previous ballots. the changes made by hat amendment and that	Suggestea Double Add ar with - The s o f < o 40 o 4 M	Remedy the peak to point of the following exception to $\frac{1}{2}$ the following exinusoidal jitter 40 KHz, Not spoint $\frac{1}{2}$ of $\frac{1}{2}$ A MH $\frac{1}{2}$ of $\frac{1}{2}$ of \frac{1}{2} of $\frac{1}{2}$ of \frac{1}{2} of $\frac{1}{2}$ of $\frac{1}{2}$ of \frac{1}{2} of \frac{1}{2} of $\frac{1}{2}$ of \frac{1}{2} of $\frac{1}{2}$ of \frac{1}{2} of \frac{1}{2} of $\frac{1}{2}$ of \frac{1}{2}	eak jitter value for the 400G 24.8.9 Stressed receiver s xceptions: is used to test receiver jitte ecified z, 4 * 10^5 / f 0.1	BASE-DR4 receiv ensitivity: er tolerance:	ver:
C/ 78 SC 78.2 Grow, Robert	P 103 RMG Consulti	L 38 ng	# <u>r02-17</u>	Conse	quently change	the 400GBASE-DR4 TDE	CQ.	
Comment Type TR There are no specifica SuggestedRemedy Add rows to Table 78-	Comment Status R ations for EEE timing prameter 2 for the various port types an	s Tx, Tq, and ⁻ d interfaces of	Bucket Tr. P802.3bs.	Response REJEC The su transm higher The co	CT. ggested remea itters with a hig level of jitter to mmenter has i	Response Status C dy is proposing to place an gher level of TDECQ which lerance.	extra burden on th may be due to IS extra burden is les	ne receiver by allowing I and also by requiring a as onerous than putting a
Response REJECT. This comment does no and IEEE P802.3bs/D Hence it is not within t Table 78-2 does not c are all related to the d types in the P802.3bs	Response Status C ot apply to the substantive cha 3.1 or the unsatisfied negative the scope of the recirculation b ontain a parameter Tx. The pa eep sleep mode of EEE which draft.	nges between comments fro allot. arameters Ts, is not support	IEEE P802.3bs/D3.2 m the previous ballots. Tq, and Tr in Table 78-2 ed by any of the PHY	buffer	n the PMA.			

C/ 120E SC 120E.3.3.2.1 P 379 L 28 # [r02-19	C/ 120E SC 120E.3.4.1.1 P 381 L 53 # r02-20					
	Commont Tuno T Commont Statue D					
Test equipment cannot achieve the required transition time for the aggressor patterns when measured through the compliance boards with the specified oscilloscope 33 GHz 4th order BT response. This does not represent realistic approximation of the transmitter transition time when measured through the same channel and oscilloscope without equalization. (A presentation will be submitted to the ad hoc call covering this)	Test equipment cannot achieve the required transition time for the aggressor patterns when measured through the compliance boards with the specified oscilloscope 33 GHz 4th order BT response. This does not represent realistic approximation of the transmitter transition time when measured through the same channel and oscilloscope without equalization. (A presentation will be submitted to the ad hoc call covering this)					
SuggestedRemedy	SuggestedRemedy					
Increase the aggressor transition time that a value that better approximates a real transmitter measured through the same channel and oscilloscope response.	Increase the aggressor transition time that a value that better approximates a real transmitter measured through the same channel and oscilloscope response.					
Response Response Status C	Response Response Status C					
ACCEPT IN PRINCIPLE.	REJECT.					
This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot. However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance	This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot. The existing value of 12 ps is representative of the risetime for a module output viewed through the MCB.					
See response to #r02-62	C/ 120E SC 120E.3.3.2 P 378 L 41 # r02-21					
[Editor's note added after comment resolution completed.	Le Cheminant, Greg					
This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2	Comment Type T Comment Status R					
and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot. However, the changes suggested are an improvement to the draft that would otherwise	Test equipment (BERT pattern generators) cannot achieve the specified EW(1E-5) throug the specified compliance board channel when measured with the specified reference receiver. The resulting eye is somewhat narrower, which will overstress the DUT					
need to be made in Maintenance	SuggestedRemedy					
In 120E.3.3.2.1, change 12 ps to 19 ps]	Relax the specification for the EW in the both the Host and Module input tests to a value which can be obtained in the specified test setup (A presentation on this will be offered the ad hoc call)					
	Response Response Status C					
	REJECT.					
	This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.					
	A presentation on this subject was made to the Joint Electrical ad hoc call on the 28th June. There was no consensus that there was a problem with the existing EW specification					
	No additional information has been provided since the ad hoc call, so there is still no consensus for a change to the draft.					

Comment ID r02-21

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C/ 120E	SC 120E.3.4.1	P 380	L 44	# <u>r</u> 02-22	C/ 120E	SC 120E.3.2.	2 P 376	L 49	# <u>r</u> 02-23
Le Cheminar	nt, Greg				Healey, Ad	lam	Broadcom Ltd.		
Comment Tv	vpe T	Comment Status R			Comment	Tvpe T	Comment Status A		

Test equipment cannot achieve the required transition time for the aggressor patterns when measured through the compliance boards with the specified oscilloscope 33 GHz 4th order BT response. This does not represent realistic approximation of the transmitter transition time when measured through the same channel and oscilloscope without equalization. (A presentation will be submitted to the ad hoc call covering this)

SuggestedRemedy

Relax the specification for the EW in the both the Host and Module input tests to a value which can be obtained in the specified test setup (A presentation on this will be offered on the ad hoc call)

Response

Response Status C

REJECT.

This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.

See response to #r02-21

[Editor's note added after comment resolution completed.

The response to comment r02-21 is:

This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.

A presentation on this subject was made to the Joint Electrical ad hoc call on the 28th June. There was no consensus that there was a problem with the existing EW specification.

No additional information has been provided since the ad hoc call, so there is still no consensus for a change to the draft.

Comment Type T Comment Status A

The "Far-end pre-cursor ratio" is the ratio p pre/p max where p pre is a residual intersymbol interference (ISI) term. There is also pre-cursor equalization that may be employed by the transmitter to reduce the measured "far-end pre-cursor ratio". There has been some confusion as to whether this specification refers to the transmitter equalization or the residual ISI. This is clear from the text of 120E.3.2.2 but it may be better to refer to the parameter defined in this subclause as the "far-end pre-cursor ISI ratio".

SugaestedRemedv

Change "far-end pre-cursor ratio" to "far-end pre-cursor ISI ratio" here (2 instances), in Table 120E-3 (1 instance), and in 120E.3.3.2.1 (1 instance, page 379, line 44). On page 377, line 26, change "The pre-cursor p pre..." to the "Theu pre-cursor ISI p pre...".

Response Response Status C

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot. However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance

Change "far-end pre-cursor ratio" to "far-end pre-cursor ISI ratio" here (2 instances), in Table 120E-3 (1 instance), and in 120E.3.3.2.1 (1 instance, page 379, line 44). On page 377, line 26, change "The pre-cursor p pre..." to the "The pre-cursor ISI p pre...". With editorial license.

C/ 45 SC 45.2.3.47k.3 P 75 L 45 # [r02-24] Slavick, Jeff Broadcom Limited Broadcom	C/ 120D SC 120D.3.2 P 360 L 39 # [r02-25] Mellitz, Richard Samtec, Inc. Samtec, I
Comment Type TR Comment Status A Bucke	t Comment Type TR Comment Status D
The definition of this bit in Clause 45 is at odds with the definition in Clause 119. SuggestedRemedy Change 45.2.3.47k.3 to read: When read as a one, bit 3.801.4 indicates that the local PCS has detected a degradation of the received signal. This bit reflects the state of FEC_degraded_SER (see 119.2.5.3).	There is need to limit the variability of the test 1 and test 2 channel. Return loss was suggested as a method to control variability. Additional precision can be improved by measuring the effective pulse refection from a unit interval pulse. SuggestedRemedy Add a row to table 120D-6 which specifies the maximum effective return loss from a UI
Response Response Status C	pulse. Specify this maximum effective return loss at -18 dB. Refer to an added new annex on how to compute the effective pulse return per presentation (name TBD)
ACCEPT IN PRINCIPLE. This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.	Proposed Response Response Status Z REJECT.
	This comment was WITHDRAWN by the commenter.
However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance. There is some information that is removed by the suggested remedy that is not present in 119.2.5.3.	This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.
Change 45.2.3.47k.3 to read: When read as a one, bit 3.801.4 indicates that the local PCS has detected a degradation of	

the received signal. This bit reflects the state of the variable FEC_degraded_SER (see 119.2.5.3). The value of bit 3.801.4 is unspecified if the value of the PCS FEC degraded SER activate threshold (registers 3.806 and 3.807) is less than the value of the PCS FEC degraded SER deactivate threshold (registers 3.808 and 3.809).

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 353 L 14 # [r02-26] Mellitz, Richard Samtec, Inc. Samtec, Inc	Cl 120 SC 120.5.7 P 196 L 13 # [r02-27] Dawe, Piers J G Mellanox Technologie Mellanox Technox Technologie Mellanox Technologie </th
Comment Type TR Comment Status R Package differences between COM computations and those which pass device electrical parameters may increase the risk of interoperability. An additional return loss metric more tightly tied to signaling will help reduce this risk.	Comment Type T Comment Status A According to http://www.atis.org/glossary/definition.aspx?id=5055 and Wikipedia, a Gray code is a binary numeral system and/or cyclic. PAM4 isn't. This subclause defines Gray coding with PAM4 coding.
Sugrested Remedy	SuggestedRemedy
Insert a row in table 120D-1 snff 120D-5 for maximum effective return loss. Specify this maximum effective return loss at -7.5 dB. Specify a new Annex on how to compute the effective pulse return loss per presentation (name TBD)	Change heading from "Gray coding for PAM4 encoded lanes" to "Gray and PAM4 coding". For consistency with the next paragraph, change "Gray-coded symbol" to "Gray-coded PAM4 symbol". Change "four Gray-coded levels" to "four PAM4 levels".
Response Response Status C	In 120.5.11.2.1, 120.5.11.2.2 and 120.5.11.2.3, change "Gray coding" to "Gray and PAM4 coding" (6 changes in all).
REJECT. See response to comment r02-56	Response Response Status C
[Editor's note added after comment resolution completed. The response to comment r02-56 is: This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots.	This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.
Hence it is not within the scope of the recirculation ballot.	However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance.
A straw poll was taken: I support the following option (choose one): A) Change the required value of COM for the channel from 3 dB to 3.1 dB and change the calibration of the interference tolerance test COM from 3 dB to 2.9 dB	For consistency with the title of 94.2.2.5, change the title of 120.5.7 to "Gray mapping for PAM4 encoded lanes"
 B) Change the required value of COM for the channel from 3 dB to 3.2 dB while leaving the calibration of the interference tolerance test COM at 3 dB. C) No change (i.e., both COM for the channel and calibration of the RX ITT remain at 3 dB). A 2 B 0 	Clause 94 uses the term "Gray-coded symbol", and hence the remainder of the proposed remedy is not appropriate as it would introduce inconsistency with Clause 94.
C 24	

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

1

C/ 121	SC 121.7.1	P 221	L 25	# r <u>02-28</u>	C/ 121	SC 121.7.1		P 221	L 32	# r <u>02-29</u>
Dawe, Piers	JG	Mellanox Tech	nnologie		Dawe, Piers	JG	Ν	Mellanox Tech	nologie	
Comment Ty PAM4 o we have feasibilit TDECQ power le	the TR totics is still new seen far too littl y. It looks like th method and with vels can be redu	Comment Status R and raw, we are still debugg e experimental information is PMD can be made to wo n new receiver designs beco uced and the spec as in this	ying the specificatio showing technical a rk but as measurem ome available, we e draft will be unecon	n methodology, and ind economic nents with the new xpect the optical nomic.	Comment Ty After the limits ar change SuggestedR	pe T change in re d make conse the definition emedy	Comment St ference receiver l equent changes in (zero basis) of TE	atus A bandwidth, we ncluding to bu DECQ.	e need to either in dget and unstress	crease the TDECQ sed sensitivity; and/or
SuggestedR	emedy				Changir in the lo	g the zero po na term. See	another commer	ems easy to de nt.	o in the short term	n and less confusing
Bring mo TDECQ Based o dB (with	ore evidence for measurements n evidence, redu other adjustmer	what optical power levels a with SSPRQ, and correlatio uce all the optical power levents for other reasons). Revi	nd TDECQ limits ar n to actual receiver els for 200GBASE-I ew the TDECQ limi	e right; in particular, performance. DR4 by 0.5, 1 or 1.5 t.	Response ACCEP See res	T IN PRINCIP	Response Sta PLE. ment r02-2	atus C		
Response REJEC1 This cor and IEE Hence it The sug	nment does not a E P802.3bs/D3. is not within the gested remedy o	Response Status U apply to the substantive cha 1 or the unsatisfied negative scope of the recirculation b does not propose any chang	anges between IEEI e comments from th pallot. ges to the draft.	E P802.3bs/D3.2 e previous ballots.	[Editor's The resp Implement http://www. with the In Table leave the In Table leave the In footnot SECQ of J C/ 122 Dawe, Piers Comment Ty Table 12 say Exti Suggested R Can the Response ACCEP This corr and IEE Hence it Howeve need to In Table (min)"	note added a conse to comment the change ww.ieee802.or following exce s 121-7, 122- e Receiver se ote c of each t f 0.9 dB" SC 122.7.1 J G <i>ype</i> E 21-6 and 124- Inction ratio (memedy y be made comment to prove the comment s not within the second r, the changes be made in M s 122-9 and 1	after comment res ment r02-2 is: es shown in g/3/bs/public/adh eptions: 11, 122-12, and 1 nsitivity (OMAout table change the s <i>Comment St</i> 6 say Extinction r nin) nsistent? <i>Response Sta</i> PLE. tot apply to the su 3.1 or the unsatis the scope of the r s suggested are a laintenance. 22-10 change "E	solution compl noc/smf/17_06 124-7: her), each lane addition to "ar P 221 Mellanox Tech atus A ratio, each land atus C ubstantive chan sfied negative recirculation bio an improveme xtinction ratio	eted. _27/anslow_02_0 (max) unchange ad is defined for a <i>L</i> 36 nologie e (min) while table comments from t allot. nt to the draft that (min)" to "Extincti	D617_smf.pdf d transmitter with # <u>r02-30</u> <i>Bucket</i> es 122-9 and 122-10 EE P802.3bs/D3.2 he previous ballots. t would otherwise on ratio, each lane
TYPE: TR/te COMMENT SORT ORDI	chnical required STATUS: D/disp ER: Comment ID	ER/editorial required GR/ patched A/accepted R/reject	general required T/ cted RESPONSE	/technical E/editorial G/g STATUS: O/open W/wri	eneral tten C/closed	U/unsatisfied	Z/withdrawn	Comme	nt ID r02-30	Page 13 of 25 26/07/2017 16:55:08

<i>Cl</i> 121 Dawe, Pie	SC 121.8.5.1 ers J G	P 226 Mellanox Tech	L 49 Inologie	# <u>r</u> 02-31	<i>Cl</i> 121 Dawe, Pier	SC 121.8.5.3 rs J G	P 229 Mellanox Tec	L 11 hnologie	# <u>r</u> 02-33
Comment Using Does crosst comm PMA. appro	t Type TR the same pattern of what we gain in contalk outweigh what nent 13 points out, of It should be possil baches.	Comment Status R on the aggressor lanes (corr rrectly handling the spectrur we lose in inconsistency vs. using the conventional unco ble to calculate the relative of	elated crosstal n of the determ UI- and sub-U rrelated crosst measurement a	<i>Bucket</i> k) is very unusual. inistic part of the I phasing? As D3.1 alk can simplify the accuracy of the two	Comment The ba signal penalt Suggested Chang	Type TR andwidth for the r is now 13.28125 y but not the une <i>Remedy</i> ie 19.34 GHz to ²	Comment Status A noise enhancement calculatio GHz. This difference over-e qualizable part, which seems 13.28125 GHz.	on is still 19.34 estimates the e bad.	4 GHz while that for the equalizable part of the
Suggester Work gener Response REJE The s	<i>dRemedy</i> out which is better; rator options in Clau 9 CT. suggested remedy c	change the crosstalk patter ise 120 as appropriate. <i>Response Status</i> U loes not propose any chang	rns here and th es to the draft.	e related pattern	Response ACCE In 121 Also, a "- the n a fourt	PT IN PRINCIPL .8.5.3 (page 229, add another exce normalized noise h-order Bessel-T	Response Status C E. , line 11), change 19.34 GHz ption to 124.8.5: power density spectrum N(f homson response filter with	to 13.28125 () is equivalent a bandwidth o	GHz. to white noise filtered by f 26.5625 GHz."
The c prepa C/ 121	SC 121.8.5.3	d to perform the calculation is esentation with proposed cha P 228 Mellanox Tech	suggested in th anges to the dr <i>L</i> 9	e comment and aft. # <u>r02-32</u>					
Comment "the o withou measuright g	t <i>Type</i> T pscilloscope is set u ut averaging": this in urements seem to l guidance but we sho	Comment Status R p to capture samples from a mplies 65,535, maybe times have around a million samp ould not give bad guidance	all symbols in t a few: is that les or more. M or hint at bad p	Bucket he complete pattern really enough? Actual /e don't need to give ractice.					
Suggestee We sh enoug	<i>dRemedy</i> hould either give go gh that it does not n	od advice, or just say that that the result.	he number of s	amples should be large					
Response REJE This c and IE Hence	e CCT. comment does not a EEE P802.3bs/D3.1 e it is not within the	Response Status C apply to the substantive cha or the unsatisfied negative scope of the recirculation b	nges between comments fro allot.	IEEE P802.3bs/D3.2 m the previous ballots.					
The c	comment is written i	n the form of a question.	and the sharfs						
The s The c the dr	suggested remedy c commenter is invited raft.	loes not propose any chang d to prepare a consensus pr	es to the draft. esentation with	proposed changes to					

			-						
P 229	L 34	# r02-34	C/ 121	SC 121.8.5	.3	P 229	L 42	# r02-35	
Mellanox Tech	hnologie		Dawe, Pier	s J G		Mellanox Tec	hnologie		
mment Status A bandwidth from 19.34 (no emphasis) has a TI vy other numbers includ sure (SECQ)" but doing assume the offset is 0. 891, which is 0.5 dB le CQ of an ideal signal (fa teter, value 0.891, add cQ = 10 log10() - TDE	GHz to 13.2812 DECQ that is fai ding "results in a g so makes the l .5 dB; this shoul ess. Add a NOT ast edges, no no to the "where" li ECQ0 where TDI	5 means that an ideal r from zero. We could at least half of the dB budget hard to d be checked. E to explain that this bise or jitter, no ist. ECQ0 is 0.5	Comment T Updatii It seen use en with ar the cha bandw Suggested Define of the r deviatii 13.281	Type TR ng D3.0 comm is that it is posi- phasis to get i unreasonable anged low-band dth, this issue Remedy TDECQrms = neasured sign on of a fast cle 25 GHz filter rc	Comment ent 140: sible to make a t to pass the TE challenge (up t dwidth TDECQ becomes more 10*log10(A_RM al after the 13.2 an signal with C esponse, accore	Status R bad transmitte DECQ test, yet being used to apparent. MS/(s*3*Qt*R)) 8125 GHz filte DMA=0.5 and v ding to what let	er (e.g. with a no leave a realistic rse than the SRS equalize the refe where A_RMS is r response. s is vithout emphasis vel of dirty-but-er	isy or distorted signal), compliant receiver test?) With some of rence receiver's own the standard deviation close to the standard closerved through the mphasised signal we	
ponse Status U									
2-2			Response REJEC	CT.	Response S	oroblem and th	at the proposed	remedy fixes the	
nment resolution comp 2-2 is: 'n in bublic/adhoc/smf/17_06 -12, and 124-7: (OMAouter), each land ange the addition to "a	bleted. 6_27/anslow_02 e (max) unchang and is defined for	2_0617_smf.pdf ged r a transmitter with	probler The co wavefc implem occurri	n. mmenter is inv rm that passe: entation) and ng.	rited to provide s TDECQ but ca that the propose	a contribution f annot be decoo ed additional re	that demonstrate ded by a reasona equirement preve	es the problem (a able receiver ents this issue from	
	P 229 Mellanox Tec mment Status A bandwidth from 19.34 no emphasis) has a T iy other numbers inclu sure (SECQ)" but doin assume the offset is 0 891, which is 0.5 dB le Q of an ideal signal (fa eter, value 0.891, add Q = 10 log10() - TDE ponse Status U 2-2 nment resolution comp 2-2 is: m in public/adhoc/smf/17_0 -12, and 124-7: (OMAouter), each Ian ange the addition to "a	P 229L 34Mellanox Technologiemment StatusAbandwidth from 19.34 GHz to 13.2812no emphasis) has a TDECQ that is faiy other numbers including "results in asure (SECQ)" but doing so makes theassume the offset is 0.5 dB; this should891, which is 0.5 dB less. Add a NOTCQ of an ideal signal (fast edges, no noeter, value 0.891, add to the "where" liQ = 10 log10() - TDECQ0 where TDponse StatusU2-2nment resolution completed.2-2 is: <i>n</i> inpublic/adhoc/smf/17_06_27/anslow_02-12, and 124-7:(OMAouter), each lane (max) unchanaange the addition to "and is defined for	P29 L34 # [72-34] Mellanox Technologia <i>mment Status</i> A bandwidth from 19.34 GHz to 13.28125 means that an ideal of emphasis) has a TDECQ that is far from zero. We could sup other numbers including "results in at least half of the dB sup other numbers including so makes the budget hard to gasume the offset is 0.5 dB; this should be checked. 81, which is 0.5 dB less. Add a NOTE to explain that this 20 of an ideal signal (fast edges, no noise or jitter, no: eter, value 0.891, add to the "where" list. Q = 10 log10() - TDECQ0 where TDECQ0 is 0.5 by the numbers including the transmitter with the tra	P 229 L 34 # r02-34 Cl 121 Mellanox Technologie Dawe, Pier. nmment Status A Damowidth from 19.34 GHz to 13.28125 means that an ideal no emphasis) has a TDECQ that is far from zero. We could up other numbers including "results in at least half of the dB sure (SECQ)" but doing so makes the budget hard to assume the offset is 0.5 dB; this should be checked. Updatin t see must sure (SECQ)" but doing so makes the budget hard to assume the offset is 0.5 dB; this should be checked. Suggested. 891, which is 0.5 dB less. Add a NOTE to explain that this CQ of an ideal signal (fast edges, no noise or jitter, no eter, value 0.891, add to the "where" list. Q = 10 log10() - TDECQ0 where TDECQ0 is 0.5 ponse Status U Suggested. 2-2 nmment resolution completed. REJECQ 2-2 nin public/adhoc/smf/17_06_27/anslow_02_0617_smf.pdf REJECQ -12, and 124-7: (OMAouter), each lane (max) unchanged ange the addition to "and is defined for a transmitter with ccurrin	P229 L34 # [102-34] Mellanox Technologie mment Status A bandwidth from 19.34 GHz to 13.28125 means that an ideal no emphasis) has a TDECQ that is far from zero. We could y other numbers including "results in at least half of the dB sure (SECQ)" but doing so makes the budget hard to assume the offset is 0.5 dB iess. Add a NOTE to explain that this 20 of an ideal signal (fast edges, no noise or jitter, no eter, value 0.891, add to the "where" list. Cl 121 SC 121.8.5. Q = 10 log10() - TDECQ0 where TDECQ0 is 0.5 ponse Status U Define TDECQrms = of the measured signal deviation of a fast cle 13.28125 GHz filter re decide is acceptable. 2-2 nment resolution completed. The comment resolution completed. 2-2 nin Dublic/adhoc/smf/17_06_27/anslow_02_0617_smf.pdf -12, and 124-7: (OMAouter), each lane (max) unchanged ange the addition to "and is defined for a transmitter with Response	P229 L34 # [102-34] Mellanox Technologie mment Status A bandwidth from 19.34 GHz to 13.28125 means that an ideal no emphasis) has a TDECQ that is far from zero. We could y other numbers including "results in at least half of the dB sure (SECQ)" but doing so makes the budget hard to assume the offset is 0.5 dB; this should be checked. Comment Type TR Comment 140: It seems that it is possible to make a use emphasis to get it to pass the TG with an unreasonable challenge (up for the changed low-bandwidth TDECQ to the changed low-bandwidth TDECQ and with the is issue becomes more solution for item where "list. Q of an ideal signal (fast edges, no noise or jitter, no pense Status U Define TDECQOM where TDECQO is 0.5 ponse Status U 2-2 nment resolution completed. Response CResponse 3 2-2 nin Numert To 2/27/anslow_02_0617_smf.pdf -12, and 124-7: (OMAouter), each lane (max) unchanged ange the addition to "and is defined for a transmitter with The commenter is invited to provide waveform that passes TDECQ but cit in plementation) and that the propose occurring.	P 229L 34# $[02:34]$ Mellanox TechnologieMellanox Technologiement Status Abandwidth from 19.34 GHz to 13.28125 means that an ideal no emphasis) has a TDECQ that is far from zero. We could y other numbers including "results in at least half of the dB sure (SECQ)" but doing so makes the budget hard to assume the offset is 0.5 dB; this should be checked.891, which is 0.5 dB less. Add a NOTE to explain that this 'CQ of an ideal signal (fast edges, no noise or jitter, no eter, value 0.891, add to the "where" list. Q = 10 log10() - TDECQ0 where TDECQ0 is 0.5 ponse Status U2-22-2nment resolution completed. 2-2 is: m in bublic/adhoc/smf/17_06_27/anslow_02_0617_smf.pdf-12, and 124-7: (OMAURT) (OMAURT) achol and is defined for a transmitter with	P229 L34 # 102-34 Mellanox Technologie Mellanox Technologie nment Status A Eandwidth from 19.34 GHz to 13.28125 means that an ideal no emphasis has a TDECQ that is far from zero. We could us other numbers including "results in at least half of the dB sure (SECQ)" but doing so makes the budget hard to assume the offset is 0.5 dB; this should be checked. Mellanox Technologie 801, which is 0.5 dB less. Add a NOTE to explain that this 20 of an ideal signal (fast edges, no noise or jitter, no etr, value 0.891, add to the "where" list. Cl at assume the offset is 0.5 dB less. Add a NOTE to explain that this 20 of an ideal signal (fast edges, no noise or jitter, no etr, value 0.891, add to the "where" list. Cl at assume the offset is 0.5 dB less. Add a NOTE to explain that this 20 of an ideal signal (fast edges, no noise or jitter, no parse Status U 2.2 L34 Define TDECQmms = 10°10g10(A_RMS/(s*3*Qt*R)) where A_RMS is is deviation of a fast clean signal with OMA=0.5 and without emphasis is 32.8125 GHz filter response, according to what level of dirty-but-er decide is acceptable. Require that TDECCmms shall not exceed the Response Status U 2.2 Net Interversion (Interversion (Interver	

IFFF D202 2ha D2 2 200 Ch/a & 400 Ch/a Ethornat 2nd Spannar regiraulation hallot com . . .

C/ 122 SC 122.7.1	P 252	L 14	# r <u>02-36</u>	C/ 124	SC ·	124.8.5	P 302	L 4	# <u>r</u> 02-38
Dawe, Piers J G	Mellanox Tech	nnologie		Dawe, Pier	rs J G		Mellanox Tec	hnologie	
Comment Type TR	Comment Status R			Comment	Туре	Е	Comment Status R		Bucke
PAM4 optics is still new a we have seen far too little	nd raw, we are still debugg experimental information	ging the specification showing technication	ation methodology, and al and economic	Most o (TDEC	of these CQ) and	definition 124.8.9	is identify the pattern to use ((SRS) don't, leaving the asso	by reference to ⁻ ociated rows in th	Table 124-10. 124.8.5 he table without effect.
feasibility. As measureme	nts with the new TDECQ r	nethod and with	new receiver designs	Suggested	Remed	У			
this draft would be uneco	nomic.	s can be reduced	a and the spec as in	For co	nsisten	cy, should	d 124.8.5 and 124.8.9 identif	y the pattern too)?
SuggestedRemedy				Response			Response Status C		
Bring more evidence for v TDECQ measurements w Based on evidence, cons 30 dBm signal detect limi Review the TDECQ limits	what optical power levels ar ith SSPRQ, and correlation der reducing all the optical by 0.5 or 1 dB (with other	nd TDECQ limits n to actual receiv l power levels in adjustments for	are right; in particular, ver performance. this clause except the - other reasons).	REJEC This co and IE Hence	CT. omment EE P80 t it is not	t does no 2.3bs/D3 t within th	t apply to the substantive cha 1 or the unsatisfied negative e scope of the recirculation l	anges between e comments fror pallot.	IEEE P802.3bs/D3.2 n the previous ballots.
Response	Response Status U			As I al alread	ble 124- v clearly	10 conta / defined.	ins specific reference to the	subclause for the	e test the pattern is
REJECT. This comment does not a and IEEE P802.3bs/D3.1 Hence it is not within the The suggested remedy do	EEE P802.3bs/D3.2 the previous ballots.	Cl 121 Dawe, Pier Comment With th	SC [/] rs J G <i>Type</i> he lowel	121.8.7 TR	P 302 Mellanox Tec Comment Status R bandwidth measuring RIN i	L 20 hnologie n approximately	# <u>r02-39</u>		
C/ 124 SC 124.7.1 Dawe, Piers J G	P 298 Mellanox Tech	L 4 nnologie	# r02-37	(twice indepe can be could	as muc endently e obtaine enhance	h) seems adjust fo ed as a b e the RIN	too much; 1/2 to 3/4 would l or good ISI and RIN filtering, y-product of the TDECQ product , it would not choose to do se	be better. A T-s so can an adequ cedure? While a p if RIN were a p	paced equalizer cannot Jate estimate of RIN a T/2-spaced equalizer problem.
PAM4 optics is still new a	nd raw, we are still debug	ning the specifica	ation methodology, and	Suggested	Remed	У			
we have seen too little ex feasibility. As measureme become available, it may	perimental information sho ents with the new TDECQ r be that optical power levels	wing technical a method and with s can be reduce	nd economic new receiver designs d and the spec as in	Review; simplify RIN measurement to a Qsq measurement (see 68.6.7) or eliminate as appropriate. Remove 120.5.11.2.4 Square wave (quaternary) test pattern, and associated registers.					.6.7) or eliminate as battern, and associated
this draft would be unecon	nomic.			Response			Response Status U		
SuggestedRemedy				REJE	CT.				
Bring more evidence for v TDECQ measurements w Based on evidence, reduc (with other adjustments for	hat optical power levels an ith SSPRQ, and correlation and the optical power level of other reasons). Review 1	nd TDECQ limits n to actual receiv els for 400GBAS the TDECQ limit	are right; in particular, ver performance. E-DR4 by 0.5 or 1 dB	The su Chang provide	uggeste jing the e the sa	d remedy RIN mea me safeg	suggests 2 different approa surement to a Qsq measure guards that are expected from	ches to change ment has not be n the RIN requir	the draft. en demonstrated to ement.
Response	Response Status U			Elimin	ating the	e RIN me	asurement was discussed in	the response to	comment #130
REJECT. This comment does not a and IEEE P802.3bs/D3.1 Hence it is not within the s	pply to the substantive cha or the unsatisfied negative scope of the recirculation b	anges between II e comments from pallot.	EEE P802.3bs/D3.2 the previous ballots.	agains potent very a	ally bac ccurate.	on the bas transmit	sis that "The transmitter RIN tters even if the noise correct	xOMA spec is in tion required by	thended to screen out the TDECQ test is not
The suggested remedy do	es not propose any chang	ues to the draft							

r02-40

C/ 124	SC 124.8.9	P 302	L 4
Dawe. Pie	ers J G	Mellanox Tech	nologie

Comment Type TR Comment Status R

Following up on D3.0 comment 153 and D3.1 comment 55: if the jitter corner frequency for 26.5625 GBd (NRZ and PAM4) is 4 MHz, the low frequency ends of the jitter masks must align or be in the right order if expressed in time vs. frequency, i.e. should scale with signalling rate if in UI. If this is not done, the required depth of the LF jitter buffer in the 2:1 muxes in a 400GBASE-DR4 module is unbounded and the low frequency litter generation requirements on the module become unreasonable. Compare 87.8.11.4 and 88.8.10: 4 MHz for 10.3125 GBd, 10 MHz for 25.78125 GBd. History: anslow 3bs 04 0316 does not contain reasoning, refers to ghiasi 3bs 01 0316 which does not address wander and buffering. ghiasi 3bs 01a 0116.pdf#page=15 shows FIFOs but does not establish a workable spec. Slide 14 shows they can be avoided: this is what we have for 400GAUI-8 or 400GAUI-16 with 400GBASE-xR8. I have no evidence that the problems described in the second sentence have been considered or solved by the committee.

L 46

SuggestedRemedy

Add another exception for the SRS procedure, with a table like Table 121-12 replacing second row after the header row: $80 \text{ kHz} < f \le 250 \text{ kHz}$ 4e5/f250 kHz < f <= 500 kHz 1e11/f^2 1 MHz < f <= 4 MHz 2e5/f Or, with the UIs doubled vs. Table 121-12: f < 40 kHz Not specified $40 \text{ kHz} < f <= 4 \text{ MHz} \quad 4e5/f$

4 MHz < f <= 10 LB 0.1

Increase the TDECQ limit to share the burden appropriately between transmitter and receiver.

This option means the 100G/lane receiver has to tolerate no more timing slew rate (in ps/us) than that agreed for 50G/lanes.

Or, increase jitter by 50% and corner frequency by 33%:

f < 40 kHz Not specified

40 kHz < f <= 6 MHz 4e5/f

5.333 MHz < f <= 10 LB 0.075

and add an exception in 124.8.5 that the CRU corner frequency is 5.333 MHz. Increase the TDECQ limit to share the burden between transmitter and receiver.

To do the job properly with the first option, in 124.8.5 we should add another exception to the CRU with a corner frequency of 4 MHz and a slope of 20 dB/decade (in 121.8.5.1): add a pole at 250 kHz and a zero at 500 kHz. I am advised that this can be done in hardware (in software, anything is possible).

Response Response Status U

REJECT.

The suggested remedy is proposing to place an extra burden on the receiver by allowing transmitters with a higher level of TDECQ which may be due to ISI and also by requiring a higher level of itter tolerance.

The commenter has not demonstrated that this extra burden is less onerous than putting a buffer in the PMA.

For the second option in the suggested remedy the commenter is invited to build consensus for an increase of the corner frequency to be above 4 MHz.

C/ 120D	SC 120D.2	P 352	L 31	# r02-41
Dawe, Piers	JG	Mellanox Tech	nologie	

Comment Type **TR** Comment Status A

Now that the return loss spec has been tightened (Eg 120D-2), the allowed return loss of the test fixture (in 93.8.1.1) is too close to the limit and ruins the measurement. Per 93.8.1.1, "The effects of differences between the insertion loss of an actual test fixture and the reference insertion loss are to be accounted for in the measurements"

SuggestedRemedy

Tell the user to de-embed the test fixture return loss, or tighten the TF RL spec? Making the IC implementer responsible for the test fixture seems appropriate, as the test fixture is custom designed for that IC and the IC is soldered onto it.

Response Response Status C

ACCEPT IN PRINCIPLE.

This issue was discussed at the 6th July electrical ad hoc and the consensus was for the following remedy:

Add "The test fixture return loss may be de-embedded from return loss measurements." to the Transmitter differential output return loss sub-clause (120D.3.1.1). With editorial license.

C/ 120D	SC 120D.3.1.1	P 353	L 24	# <u>r</u> 02-42
Dawe, Piers	JG	Mellanox Tech	nnologie	

Comment Type TR Comment Status R

Signal-to-noise-and-distortion ratio (min) 31.5 dB is too high (increased by D3.1 comment 22, so even worse than before) - probably can't measure the IC through the test fixture and cables. I suspect there is double counting of jitter in SNDR and as jitter, in COM.

SuggestedRemedv

Remove the double counting. Reduce the SNDR limit to something that can reasonably be measured, or change the measurement method.

Response Response Status U

REJECT.

The presentation:

http://www.ieee802.org/3/bs/public/17_07/dawe_3bs_04_0717.pdf was reviewed. Changing the SNDR limit to 28.5 dB is considered to be placing too great a burden on the receiver and it has not been demonstrated that implementations cannot meet the current specification.

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 353	L 26	# <u>r02-43</u>	C/ 120D	SC 120D.4		P 363	L 28	# r02-45
Dawe, Piers J G	Mellanox Technolo	ogie		Dawe, Piers	s J G		Mellanox Te	chnologie	
Comment Type TR Comm Following D3.1 comments 22 a dB is still too high - probably ca test equipment fails this limit. T doesn't solve it.	ment Status R nd 36: transmitter Output n't measure the IC throug The warning NOTE in 120	residual ISI SNR_I gh the test fixture ar ID.3.1.7 shows the i	ISI (min) 34.8 nd cables, even issue, but	Comment 7 Becaus high Z normat recomm	<i>Type</i> TR se COM accour (low Z), C2C n ive channel RL nendations.)	Comment S nts for channel re eeds a channel spec already, 1	<i>tatus</i> A eturn loss on RL spec. (Cl 00GBASE-K	ly erratically (de ause 137, 200G R4 and C2C XL/	pends on frequency and BASE-KR4, has a AUI/CAUI-10 have
SuggestedRemedy				Suggested	Remedy				
It may be necessary to move a	way from the SNR_ISI me	ethod.		Add a d	channel return l	oss spec, e.g. c	opy the one	from Clause 137	7. This should be
Response Res	onse Status U			Response ACCEF	PT IN PRINCIP	Response Si LE.	tatus C	immended for ot	ner channels.
Cl 120D SC 120D.3.1.1 Dawe, Piers J G Comment Type TR Comm Following D3.1 comment 41: th integrity compared with the 8.7 low (and high) frequency (althou	<i>P</i> 354 Mellanox Technolo <i>ment Status</i> R e low frequency RL at 14. dB at 6 GHz. This RL is ugh apparently looser bet	L 36 pgie .25 dB is insignifica much tighter than (ween 4 and 9 GHz)	# <u>r02-44</u> ant for signal CEI-56G-MR at).	This co and IEE Hence Howev need to Apply s	mment does n EE P802.3bs/D it is not within t er, the change be made in M suggested reme	ot apply to the s 3.1 or the unsat he scope of the s suggested are aintenance edy with editorial	ubstantive ch isfied negativ recirculation an improver license.	nanges between /e comments fro ballot. nent to the draft	IEEE P802.3bs/D3.2 m the previous ballots. that would otherwise
SuggestedRemedy				C/ 120E	SC 120E.3.1		P 371	L 20	# r02-46
Change 14.25 - f to 12 -0.625f				Dawe, Piers	s J G		Mellanox Te	chnologie	2
Response Response Response Response REJECT. Re-statement of comment r01-4 No consensus to make a change [Editor's note added after comment further investigation of the effect no change to the equation can be while additional work has been change.	onse Status U 41 which was rejected wit ge at this time, but further nent resolution completed at of Return Loss at low fro be justified at this time.] done on this topic, there	th the response: investigation is end d. The consensus vi equencies should ta is still no consensu	couraged. iew was that ake place, but us to make a	Comment 7 Building peak ar the refe eye will Suggested/ We nee eye clo Response REJEC No pres While a consen	Type TR g on D3.0 comm mplitude but on erence receiver collapse. Remedy ed some other sure spec will p TT. sentation provid a vertical eye cl sus was reach	Comment S ment 119: The h ly 32 mV eye he , that would work spec to protect t probably work. I <i>Response Si</i> ding a suggested osure specificati ed to make a ch	tatus R ost is allowe- eight - a very k, but with a he module fr 'll try to bring tatus U d remedy for ion was cons ange to the c	d to output a sig bad signal. If the good but slightly om such unexpe a presenttaion. this comment w sidered worth fur draft.	nal with 900 mV peak-to- e module is exactly like different receiver the ected signals. A vertical as submitted. ther investigation, no

C/ 120E SC 120E.3.2 P 376 L 7 # r02-47	C/ 120E SC 120	0E.4.1	P 383	L3	# <u>r02-48</u>	
	Dawe, Piers J G			nologie		
It turns out that meeting the five module output specs simultaneously with good tolerances is not feasible (near and far end eye height and width, far-end pre-cursor ratio). And, according to my understanding of healey_3bs_01a_0317, a far-end pre-cursor ratio of 1%, 2% or 9% provides a healthy COM for a C2C receiver but a C2M receiver after a COM package with a now obsolete Cd has a problem with 9%, so the 2.5% limit in the draft seems arbitrary. This is a follow-up to D3.1 comment 42.	This refers to 92 compliance boar sensitive to refle that is feasible. SuggestedRemedy If feasible, add F	Comment Sta .11.3 where 92.11.3.1 h rds. OIF CEI-56G-VSR- ctions (ILD), it would be This comment is a revis	as a FOM_IL PAM4 has a advisable to sion of D3.1 c dB.	D spec of 0.13 limit of 0.1 dB. follow OIF CE comment 44 (no	dB for the mated As PAM4 is so I-56G-VSR-PAM4 if consensus then).	
SuggestedRemedy	Response	Response Stat	tus C			
Widen the pre-cursor ratio limit from +/-2.5% to +/-3.5%. Consider increasing the loss in the software channel (moving the "far end" to after a reasonable package loss), and making a small adjustment to the far-end eye height and width to compensate. If the loss is not increased, consider if an asymmetrical pre-cursor ratio limit would be more effective. Review the way this works for a reasonable variety of channels. Review what range of CTLE peaking is consistent with the insertion loss budget.	A straw poll was I support: A) Add an additi B) leave the FOI A 7 B 6	taken: onal exception that the F M_ILD limit as it is	FOM_ILD lim	it is 0.1 dB		
Pesponse Response Status U	Add an additiona	al exception that the FO	M_ILD limit is	s 0.1 dB		
ACCEPT IN PRINCIPLE. This issue of changing the near end eye height and pre-cursor ratio was discussed at the 6th July electrical ad hoc, but no consenus was reached on how to address it.	Change Equation IL(f) = 0.471 sqrt to IL(f) = 0.471 sqrt	n 120E-3 from: :(f) + 0.1194f + 0.01f^2 :(f) + 0.1194f + 0.002f^2	: (dB)			
A Straw poll was taken:	C/ 120E SC 12	0E.5.4.2	P 388	L 20	# r02-49	
A) Change the near end eye height from 70 mV to 60 mV B) Make no change to the draft	Dawe, Piers J G	M	ellanox Tech	nologie		
A 9	Comment Type E	Comment Sta	tus A		Bucket	
B 16	The PICS entries Table 120E-3, th	s should be in the order ien others.	the requirem	ients appear, w	hich is the order in	
Change " The setting of the reference CTLE is the same used to measure eve width and height."	SuggestedRemedy					
Το	Order the PICS	entries as in Table 120E	-3, then the	items which are	en't in the table.	
" Any setting of the reference CTLE for which the eye width and height satisfy the limits in Table 120F-3, may be used."	Response	Response Stat	tus C			
	ACCEPT IN PRINCIPLE.					
	This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot. However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance					
	Apply suggested	I remedy.				
TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/v	/general vritten C/closed U/unsati	sfied Z/withdrawn	Commei	nt ID r02-49	Page 19 of 25 26/07/2017 16:5	

vaccep R/rejected SORT ORDER: Comment ID

C/ 120E SC 120E.5.4.2 P 388 L 24 # r02-50	C/ 122 SC 122.8.4 P 258 L 6 # [r02-51]
Comment Type E Comment Status A Missing PICS item	Comment Type E Comment Status A Bucket This is a very long "run on" sentence.
SuggestedRemedy Add PICS item for far-end pre-cursor ratio Response Response Status C ACCEPT IN PRINCIPLE. This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots.	SuggestedRemedy Break the sentence into three. "The OMAouter is measured using a test pattern specified for OMAouter in Table 122-15. It is the difference between the average optical launch power level P3, measured over the central 2 UI of a run of 7 threes, and the average optical launch power level P0, measured over the central 2 UI of a run of 6 zeros, as shown in Figure 122-3. For the test the sum of the optical power from all of the lanes not under test is below -30 dBm, or if other lanes are operating, a suitable optical filter may be used to separate the lane under test.
Hence it is not within the scope of the recirculation ballot. However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance Apply suggested remedy. Note: comment r02-23 has changed the name of this parameter.	Response Response Status C ACCEPT IN PRINCIPLE. This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.
[Editor's note added after comment resolution completed. The response to comment r02-2 is:	However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance.
This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot. However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance Change "far-end pre-cursor ratio" to "far-end pre-cursor ISI ratio" here (2 instances), in Table 120E-3 (1 instance) and in 120E 3 3 2 1 (1 instance name 379 line 44). On page	Change to "The OMAouter is measured using a test pattern specified for OMAouter in Table 122-15. It is the difference between the average optical launch power level P3, measured over the central 2 UI of a run of 7 threes, and the average optical launch power level P0, measured over the central 2 UI of a run of 6 zeros, as shown in Figure 122-3. For this measurement the sum of the optical power from all of the lanes not under test is below -30 dBm, or if other lanes are operating, a suitable optical filter may be used to separate the lane under test."

377, line 26, change "The pre-cursor p_pre..." to the "The pre-cursor ISI p_pre...".

With editorial license.

1

	P 393	1.28	# 102 52	CI 120E	SC 120E 2	2 2 1	P 270	/ 53	# -02.54
Dudek, Michael	Cavium	20	# <u>102-32</u>	Dudek, Mic	chael	5.2.1	Cavium	2 33	# 102-34
Comment Type T Com	ment Status A		Bucket	Comment	Туре Т	Comm	nent Status A		Bucket
Wrong reference. The error co	unters aren't descrit	oed in 119.2.5.3.		Wrong using t	reference. W he PRBS31Q	e shouldn't pattern	be referring to the	PRBS31 test pat	tern section when
Change the reference to 119.3.	1 (as was done in s	ection 120E.3.3.2	21 in draft 3.1)	Suggested Chang	<i>Remedy</i> the referenc	e from 120.	5.11.1.1 to 120.5.1	1.2.2. Also on j	bage 382 line 23
ACCEPT IN PRINCIPLE.				Response ACCE	PT IN PRINCI	Respor PLE.	nse Status C		
This comment does not apply to and IEEE P802.3bs/D3.1 or the Hence it is not within the scope However, the changes suggest need to be made in Maintenanc Apply suggested remedy.	 the substantive ch unsatisfied negativ of the recirculation ed are an improven e 	anges between I e comments fron ballot. nent to the draft t	EEE P802.3bs/D3.2 n the previous ballots. hat would otherwise	This co and IE Hence Howe need to	DEMENT does EE P802.3bs// it is not within ver, the chang o be made in f	not apply to D3.1 or the the scope of es suggeste Maintenance	the substantive ch unsatisfied negativ of the recirculation ed are an improven	anges between I e comments fron ballot. nent to the draft t	EEE P802.3bs/D3.2 n the previous ballots. hat would otherwise
C/ 120D SC 120D.3.2.1	P 360	L 26	# r02-53	Арріу	suggested rem	edy.			
Dudek, Michael	Cavium			C/ 120D	SC 120D.4		P 362	L 28	# r <u>02-55</u>
Comment Type T Com	nent Status A			Dudek, Mid	chael		Cavium		
It would be advantageous to all	ow the use of the Pl	RBS31Q pattern	for the interference	Comment	Type TR	Comm	nent Status A	ar tha dia impada	and nonlinear
tolerance test just as it is allowed for the jitter tolerance test. SuggestedRemedy Add an additional bullet (new bullet h) and renumber h)) (modified version of the jitter tolerance bullet.) "As an alternative to using the scrambled idle test pattern and measuring FEC symbol error ratio it is permissible to use the PRBS31Q pattern as described in 120.5.11.2.2 and bit error ratio testing. In this case the required bit error ratio					a single set of ance has been daka_3cd_01a tends to favor for Rd and Zc al values shou	supposed v shown to n _0317, Duo certain cha reduces the d be used u	tot result in worst ca dek_3bs_02_0517) innels while penaliz e amount of "favori unless multiple sets	ase COM for vari . Using these su ting other channe ng" and "penalizi s of different valu	ous channels. (See pposed worst case els. Using nominal ng" and therefore the es are used.
is equal to the required FEC syn can be somewhat more stringer FEC symbol error ratio, and the	nbol error ratio divid at than using the sc refore failing this te	ded by 10. Note t rambled idle test st requirement wi	hat this requirement pattern and measuring th the PRBS31Q	In table dudek	e 120D-8 Char _3bs_01a_051	ige Zc to 95 7 for the ch	5 Ohm, Zd to 50 C ange to Av).)hm and change	Av to 0.416. (See
pattern does not necessarily im	ply a failure of the ir	nterference tolera	ince test.	Response		Respor	nse Status C		
Response Respo	nse Status C			ACCE	PT IN PRINCI	PLE.			
ACCEPT IN PRINCIPLE.				In Tab	le 120D-8 cha	nge: 05 ohm			
This comment does not apply to and IEEE P802.3bs/D3.1 or the Hence it is not within the scope	Z_c fro R_d fro A_v fro A fe fr	om 55 ohm to om 0.44 V to 0 om 0.44 V to 0	50 ohm 418 V 0.418 V						

A_ne from 0.63 V to 0.604 V

Hence it is not within the scope of the recirculation ballot. However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance.

Apply suggested remedy.

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

P 362	L 9	# <u>r</u> 02-56	C/ 120D	SC 120D.3	.2.1	P 360	L 17	# <u>r</u> 02-57
Cavium			Dudek, Mich	ael		Cavium		
Comment Status R			Comment Ty	pe TR	Comm	nent Status A		
npedance and die impedance return loss) cause worse C the COM test for the channe D1a_0317, Dudek_3bs_02_(ce while still mee OM for some cha el resulting in a "h 0517). This hole	ting the Tx and Rx annels than is obtained nole" in the budget. is around 0.5dB.	Variatior of the DI reduced equipme	is in the test JT to create (as was dor nt.	equipment non-reprodu e for Clause	output impedance ucibility in the Interi e 93) by imposing a	will interact with t ference tolerance a return loss spec	the Rx input impedance test. This should be dification on the test
			SuggestedR	emedy				
Change the required value of COM for the channel from 3.0dB to 3.5dB while leaving the calibration of the interference tolerance test at 3.0dB COM. As an alternative the burden to close the budget could be shifted from the channel to the Rx by using 3.0dB as the				e same retui extra bullet to eplica meets	n loss spec the list. " the require	ification for the test The return loss of t ments of Equation	equipment as w he test setup in F (93-2)."	as used in Clause 93. Figure 93C-4 measured
B COM for the interference t is 0.5dB difference betweer	olerance test cal n them Chang	ibration or could be e PICS CC1 to this	Response ACCEP ⁻	IN PRINCI	Respor PLE.	nse Status C		
Response Status U				extra bullet to urn loss of th e requireme	o the list: e test setup nts of Equa	o in Figure 93C-4 m tion (93-2)."	easured at TP5	replica towards TPt
This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.			<i>Cl</i> 120D Dudek, Mich	SC 120D.3 ael	.1.1	<i>P</i> 353 Cavium	L 36	# <u>r02-58</u>
A straw poll was taken: I support the following option (choose one): A) Change the required value of COM for the channel from 3 dB to 3.1 dB and change the calibration of the interference tolerance test COM from 3 dB to 2.9 dB. B) Change the required value of COM for the channel from 3 dB to 3.2 dB while leaving the calibration of the interference tolerance test COM at 3 dB. C) No change (i.e., both COM for the channel and calibration of the RX ITT remain at 3 dB).		Comment Ty The retu with the presenta SuggestedR Change	pe TR m loss spec allowance fo tion will be r emedy the second	Comm fication is to r the test fix nade either nalf of equat	tion 120D-2 to "10	uencies for the p articularly for the he Berlin meeting 65 -0.4f	ackage used in COM short package) A g (or both)	
A 2 B 0 C 24		Proposed Response Response Status Z REJECT.						
			This con	nment was V	ITHDRAW	N by the comment	er.	
	<i>P</i> 362 Cavium <i>Comment Status</i> R npedance and die impedance greturn loss) cause worse C the COM test for the channel of a 0317, Dudek_3bs_02_(lue of COM for the channel rence tolerance test at 3.0d Id be shifted from the channel B COM for the interference to is 0.5dB difference between <i>Response Status</i> U t apply to the substantive ch .1 or the unsatisfied negative e scope of the recirculation to potion (choose one): value of COM for the channel rence tolerance test COM for the channel and c	P 362 L 9 Cavium Comment Status R npedance and die impedance while still mee g return loss) cause worse COM for some cha the COM test for the channel resulting in a "h D1a_0317, Dudek_3bs_02_0517). This hole Ilue of COM for the channel from 3.0dB to 3.6 rence tolerance test at 3.0dB COM. As an a ld be shifted from the channel to the Rx by us B COM for the interference tolerance test cal is 0.5dB difference between them Change Response Status U t apply to the substantive changes between II .1 or the unsatisfied negative comments from e scope of the recirculation ballot. option (choose one): value of COM for the channel from 3 dB to 3 erence tolerance test COM from 3 dB to 2.9 d value of COM for the channel from 3 dB to 3 erence tolerance test COM at 3 dB. h COM for the channel and calibration of the l	P362 L9 # 102-56 Cavium Comment Status R npedance and die impedance while still meeting the Tx and Rx greturn loss) cause worse COM for some channels than is obtained the COM test for the channel resulting in a "hole" in the budget. D1a_0317, Dudek_3bs_02_0517). This hole is around 0.5dB. Ilue of COM for the channel from 3.0dB to 3.5dB while leaving the rence tolerance test at 3.0dB COM. As an alternative the burden Id be shifted from the channel to the Rx by using 3.0dB as the B COM for the interference tolerance test calibration or could be is 0.5dB difference between them Change PICS CC1 to this Response Status U t apply to the substantive changes between IEEE P802.3bs/D3.2. 1 or the unsatisfied negative comments from the previous ballots. e scope of the recirculation ballot. potion (choose one): I value of COM for the channel from 3 dB to 3.1 dB and change the sence tolerance test COM from 3 dB to 3.2 dB while leaving the sence tolerance test COM at 3 dB. n dCOM for the channel from 3 dB to 3.2 dB while leaving the sence tolerance test COM at 3 dB. n dCOM for the channel from 3 dB to 3.2 dB while leaving the sence tolerance test COM at 3 dB. n cOM for the channel and calibration of the RX ITT remain at 3 dB).	P362 L9 # [102-56] Cl 1200 Cavium Comment Status R Dudek, Michi repedance and die impedance while still meeting the Tx and Rx pretrun loss) cause worse COM for some channels than is obtained the COM test for the channel resulting in a "hole" in the budget. Variation of the DU reduced equipme J1a_0317, Dudek_3bs_02_0517). This hole is around 0.5dB. SuggestedRe Apply the rence tolerance test at 3.0dB COM. As an alternative the burden ld be shifted from the channel to the Rx by using 3.0dB as the B COM for the interference tolerance test calibration or could be is 0.5dB difference between them Change PICS CC1 to this SuggestedRe Response Status U Add an e The returneets the recirculation ballot. 1 or the unsatisfied negative comments from the previous ballots. Add an e "The returneets the recirculation ballot. value of COM for the channel from 3 dB to 3.1 dB and change the rence tolerance test COM rom 3 dB to 2.9 dB. Dudek, Michi value of COM for the channel from 3 dB to 3.2 dB while leaving the rence tolerance test COM at 3 dB. SuggestedRe h COM for the channel and calibration of the RX ITT remain at 3 dB). SuggestedRe	P 362 L 9 # [r02-56] Cavium Cl 120D SC 120D.3 Comment Status R Npedance while still meeting the Tx and Rx preturn loss) cause worse COM for some channels than is obtained the COM test for the channel resulting in a "hole" in the budget. Comment Type TR Variations in the test of the channel resulting in a "hole" in the budget. Comment Status R Ilue of COM for the channel from 3.0dB to 3.5dB while leaving the rence tolerance test at 3.0dB COM. As an alternative the burden Id be shifted from the channel to the Rx by using 3.0dB as the B COM for the interference tolerance test calibration or could be is 0.5dB difference between them Change PICS CC1 to this SuggestedRemedy Response Status U Add an extra bullet to "The return loss of the meets the requiremeet" 1 or the unsatisfied negative comments from the previous ballots. CI 120D SC 120D.3 ption (choose one): Value of COM for the channel from 3 dB to 3.1 dB and change the rence tolerance test COM from 3 dB to 3.2 dB while leaving the rence tolerance test COM from 3 dB to 3.2 dB while leaving the rence tolerance test COM at 3 dB. Nodek, Michael Comment Type TR Value of COM for the channel from 3 dB to 3.2 dB while leaving the rence tolerance test COM at 3 dB. SuggestedRemedy Value of COM for the channel from 3 dB to 3.2 dB while leaving the rence tolerance test COM at 3 dB. SuggestedRemedy Nother the channel and calibration of the RX ITT remain	P 362L9# [r02-56]CaviumComment Status Rnpedance and die impedance while still meeting the Tx and Rxy return loss) cause worse COM for some channels than is obtainedthe COM test for the channel resulting in a "hole" in the budget.Ja_0317, Dudek_3bs_02_0517). This hole is around 0.5dB.lue of COM for the channel from 3.0dB to 3.5dB while leaving therence tolerance test at 3.0dB COM. As an alternative the burdenb b shifted from the channel to the Rx by using 3.0dB as theB COM for the interference tolerance test calibration or could bei is 0.5dB difference between them Change PICS CC1 to thisResponse Status Uat apply to the substantive changes between IEEE P802.3bs/D3.2.1 or the unsatisfied negative comments from the previous ballots.e scope of the recirculation ballot.value of COM for the channel from 3 dB to 3.1 dB and change thevalue of COM for the channel from 3 dB to 3.2 dB while leaving then COM for the channel and calibration of the RX ITT remain at 3 dB).n COM for the channel and calibration of the RX ITT remain at 3 dB).	P362 L9 # [n2-56] Cavium Cl 120D SC 120D.3.2.1 P360 Comment Status R The second of the impedance while still meeting the Tx and Rx in the COM test for the channel resulting in a "hole" in the budget. Comment Type TR Comment Status A Use of COM for the channel resulting in a "hole" in the budget. Dudek, Michael Cavium Comment Type TR Comment Status A Use of COM for the channel to the Rx by using 3.0dB as the SOM for the interference tolerance test calibration or could be is 0.5dB difference between them Change PICS CC1 to this SuggestedRemedy Apply the same return loss of the test setup in Figure 93C-4 m meets the requirements of Equation (93-2)." Accept IN PRINCIPLE. Add an extra bullet to the list: "The return loss of the test setup in Figure 93C-4 m meets the requirements of Equation (93-2)." I to the unsatisfied negative comments from the previous ballots. P360 Comment Type TR Comment Status D I value of COM for the channel from 3 dB to 3.1 dB and change the rence tolerance test COM from 3 dB to 3.2 dB while leaving the rence tolerance test COM at 3 dB. Comment Type TR Comment Status D I value of COM for the channel from 3 dB to 3.2 dB while leaving the rence tolerance test COM from 3 dB to 3.2 dB while leaving the rence tolerance test COM at 3 dB. Comment Type TR Comment Status D	P362 L9 # 102-56 Carnium Comment Status R mpedance and die impedance while still meeting the Tx and Rx if etum loss) cause worse COM for some channels than is obtained. Comment Type TR Comment Status A Variations in the test equipment output impedance will interact with if the COM test for the channel from 3.0dB to 3.5dB while leaving the rene tolerance test at 3.0dB COM. As an alternative the burden to be shifted from the channel to the RX by using 3.0dB as the B COM for the interference tolerance test calibration or could be is its offer the test equipment to the RX by using 3.0dB as the B COM for the interference tolerance test calibration or could be is 0.5dB difference between them Change PICS CC1 to this Response Status U t apply to the substantive changes between IEEE P802.3bs/D3.2 1 or the unsatisfied negative comments from the previous ballots. e cope of the recirculation ballot. point (choose one): value of COM for the channel from 3 dB to 3.1 dB and change the renere tolerance test COM for the channel from 3 dB to 3.2 dB while leaving the alow and to fequation is too tight at high frequencies for the presentation will be made either in an ad hoc or at the Berlin meetin suggested/Remedy h cOM for the channel from 3 dB to 3.2 dB while leaving the alow and the alow and the alow and the form a 3 dB. h cOM for the channel from 3 dB to 3.2 dB while leaving the alow and the al

C/ 120D SC 120D.3.1.7	P 357 Cavium	L 38	# <u>r</u> 02-59	C/ 120D SC 120 Dudek Michael	D.5.4.1	P 365 Cavium	L 39	# <u>r</u> 02-61
Comment Type E (There are a lot of "where"	Comment Status A	lit into two parag	Bucket raphs which don't read	Comment Type T Wrong equation	Comn	nent Status A		Bucket
well. SuggestedRemedy Combine the paragraphs	and create a list of the w	nere's. It would	l look like.	SuggestedRemedy Change equation	93-3 to equation	on 120D-2.		
120D.3.1.3, using Equation (120D-8), where: to is the index of the linear	om the linear tit pulse rea	sponse, p(k) in a als pmax.	ccordance with	ACCEPT IN PRIN	ICIPLE.	the substantive ch	anges between I	EEE P802.3bs/D3.2
M is the oversampling ratio 85.8.3.3.4 Np is the linear fit pulse ler Nb is given in Table 120D-	o of the measured wavefor ngth given in 120D.3.1.3. 8.	orm and linear fit	pulse as defined in	and IEEE P802.3 Hence it is not wi However, the cha need to be made	bs/D3.1 or the hin the scope inges suggest in Maintenance	unsatisfied negative of the recirculation l ed are an improvem e	e comments fron ballot. nent to the draft t	hat would otherwise
Response R ACCEPT.	esponse Status C			Apply suggested	remedy.			
C/ 120D SC 120D.3.2	P 359	L 33	# <u>r</u> 02-60	C/ 120E SC 120 Dudek, Michael	5.3.3.2.1	<i>P</i> 379 Cavium	L 28	# <u>r</u> 02-62
Dudek, Michael	Cavium			Comment Type TI	comn	nent Status A		
Comment Type TR (The Differential input return differential return loss of th	Comment Status A h loss for the receiver sho e transmitter to reduce th	ould have stayed	I the same as the ween the system	The module output 880mV amplitude the same counter	it is tested with (see 120E.3.2 propaging sig	n counter-propagatin 2.1). The Host stress nals. The amplitude	ng signals with a ssed input test sh e is the same bu	19ps transition time hould be calibrated with t the risetime is 12ps.
performance of a channel i and the result with a real re (better) return loss.	neasured by COM with a eceiver which is measure	a single package d with a test sys	and die impedance tem with a different	SuggestedRemedy Align these risetir	nes. I recomm	end that both are s	et to 19ps, as it i	s likely that the stress
SuggestedRemedy				Response	Boopo	noo Statua	nii nave slower o	ulput fisetimes.
Change the Differential inp and refering to 120D.3.1.1.	ut return loss (min) in tak Also change the PICs	ble 120D-5 to us reference in RC	e equation 120D-2. 1.	ACCEPT IN PRIN	ICIPLE.			
Response R ACCEPT IN PRINCIPLE. Change the Differential inp and refering to 120D.3.1.1. Note: Comment r02-41 has return loss measurements. Also change the PICs refer With editorial license.	esponse Status C ut return loss (min) in Ta s added "The test fixture " to 120D.3.1.1. rence in RC1.	ble 120D-5 to u return loss may	se Equation 120D-2. be de-embedded from	This comment do and IEEE P802.3 Hence it is not wi However, the cha need to be made In 120E.3.3.2.1, c	es not apply to os/D3.1 or the hin the scope inges suggest in Maintenance hange 12 ps to	the substantive ch unsatisfied negative of the recirculation l ed are an improvem e o 19 ps	anges between I e comments fron ballot. hent to the draft t	EEE P802.3bs/D3.2 n the previous ballots. hat would otherwise

C/ 120E SC 120E.3.4.1.1 Dudek, Michael	<i>P</i> 381 Cavium	L 53	# <u>r</u> 02-63	<i>Cl</i> 120C Maki, Jeffer	SC 120C.5.3	J	P 346 uniper Netwo	L1 orks, Inc.	# <u>r</u> 02-64	
Comment Type T Co	mment Status A			Comment T	vpe TR	Comment Sta	atus A			Bucket
The host output is tested with slew time of 12ps between +	n counter-propagating s /-0.27V (see 120E.3.1.	signals with a 90 .6). The Module	00mV amplitude and a stressed input test	No whe Furterm	ere in 120C.5.3 nore, what FEC	Major capabilities code is mandato	s/options is it ory is not liste	listed that FEC	is mandatory.	
however a 20-80% transition	time of 12ps is used in	nstead of the sle	w time. 20 to 80%	SuggestedF	Remedy					
would be equivalent to the sl metric for both.	ew time from +/-0.27V	but it would be	better to use the same	List the FEC200	mandatory FE 0; Feature: 200	C code to make a GBASE-R RS-FE	a compliant c EC; Subclaus	hip-to-module in e: 119; Value/C	nterface. Item: Comment: Device	
SuggestedRemedy				FEC40	0: Feature: 400	GBASE-R RS-FE	EC: Subclaus	se: 119: Value/C	Comment: Device	
Change "target amplitude of	900 mV peak-to-peak	differential and 2	20% to 80% target	implem	ents Clause 11	9 RS-FEC for 40	0GBASE-R;	Status: M; Supp	oort: Yes []	
transition time of 12 ps as m at TP4. " to ""target amplite	easured ude of 900 mV peak-to	-peak differential	l and slew time of 12	Response		Response Sta	tus C			
ps between +/- 0.27 V. at TP	4			ACCEP	PT IN PRINCIPI	.E.	hatantina aha			
Response Res ACCEPT IN PRINCIPLE.	sponse Status C			and IEE Hence i	EE P802.3bs/D it is not within th	B.1 or the unsatis	fied negative fied negative ecirculation b	comments fror allot.	n the previous ba	3.2 llots.
This comment does not appl and IEEE P802.3bs/D3.1 or Hence it is not within the scc	y to the substantive ch the unsatisfied negative pe of the recirculation	anges between l e comments fror ballot.	IEEE P802.3bs/D3.2 n the previous ballots.	Howeve need to	er, the changes be made in Ma	suggested are a iintenance.	n improveme	ent to the draft th	hat would otherwi	se
However, the changes suggeneration need to be made in Mainteneration	ested are an improvem ance	ent to the draft th	hat would otherwise	With ful - The F are sun corresp	Il editorial licens EC and other s nmarized in Tab oonding PMD C	e, in 120C.1 add ublayers for each bles 116-3 and 11 ause.	I text that exp PHY that m 16-4, respect	blains the follow ay use a 200GA ively, and norm	ing: \UI-8 or 400GAU atively specified i	I-16 n the

- The positioning of the 200GAUI-8 or 400GAUI-16 relative to other sublayers is specified in 120.1 with further examples in Annex 120A.

A straw poll was taken:

B) make no change to the draft

A) making the change in the suggested remedy

Change "target amplitude of 900 mV peak-to-peak differential and 20% to 80% target transition time of 12 ps as measured at TP4." to "target amplitude of 900 mV peak-to-peak differential and target slew time between +/- 270 mV of 12 ps as measured at TP4."

I support:

A 8 B 4

Cl 120E Maki, Jeffery	SC 120E.5.3	P 3 Junipe	87 er Networ	L 1 ks, Inc.	# r <u>02-65</u>
Comment Ty No when Furterm	<i>ype</i> TR re in 120E.5.3 M ore, what FEC c	Comment Status ajor capabilities/opti ode is mandatory is	A ions is it l not listed	isted that FE	Bucket C is mandatory.
SuggestedR List the FEC200 impleme FEC400 impleme	Remedy mandatory FEC 0; Feature: 200G ents Clause 119 0; Feature: 400G ents Clause 119	code to make a cor BASE-R RS-FEC; S RS-FEC for 200GB BASE-R RS-FEC; S RS-FEC for 400GB	npliant ch Subclause ASE-R; S Subclause ASE-R; S	nip-to-module 2: 119; Value, Status: M; Su 2: 119; Value, Status: M; Su	interface. Item: /Comment: Device pport: Yes [] Item: /Comment: Device pport: Yes []
Response ACCEP	T IN PRINCIPLE	Response Status	С		

This comment does not apply to the substantive changes between IEEE P802.3bs/D3.2 and IEEE P802.3bs/D3.1 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot.

However, the changes suggested are an improvement to the draft that would otherwise need to be made in Maintenance.

With full editorial license, in 120E.1 add text that explains the following: - The FEC and other sublayers for each PHY that may use a 200GAUI-4 or 400GAUI-8 are summarized in Tables 116-3 and 116-4, respectively, and normatively specified in the corresponding PMD Clause.

- The positioning of the 200GAUI-4 or 400GAUI-8 relative to other sublayers is specified in 120.1 with further examples in Annex 120A