

## IEEE P802.3ck D1.1 100/200/400 Gb/s Electrical Interfaces Task Force 2nd Task Force review comments

Cl 120F SC 120F.4.1 P210 L11 # 16

Sun, Junqing Credo Semiconductor

Comment Type TR Comment Status A RR DFE length

Simulations show 5 tap DFE is sufficient to cover contributed channels. Nb=5 will be a good starting point. Simulation results will be provided.

SuggestedRemedy  
set Nb=5.

Response Response Status C  
ACCEPT IN PRINCIPLE.

Based on the result of straw poll #1, set Nb to 6.

Straw Poll #1  
For the C2C AUI, I support the Nb value (Chicago rules):  
4 fixed: 5  
5 fixed: 13  
6 fixed: 29

Cl 120F SC 120F.4.1 P210 L14 # 17

Sun, Junqing Credo Semiconductor

Comment Type TR Comment Status A RR DFE bmax

simulation shows bmax(1)=0.85. bmax(2:5)=0.2 are sufficient to cover contributed channels. Simulation results will be provided.

SuggestedRemedy  
set bmax(1)=0.85 and bmax(2:4)=0.2.

Response Response Status C  
ACCEPT IN PRINCIPLE.

The response to comment #16 changed the Nb value to 6.

Based on straw poll #3, set bmax(1) to 0.85 and bmax(2:6) to 0.2.

Straw poll #2:  
For the C2C AUI, I support:  
A: bmax(1)=0.85, bmax(2:6)=0.2 -- 20  
B: bmax(1)=0.7, bmax(2:6)=0.15 -- 8  
C: no opinion -- 28  
Select 1.

Straw poll #3  
I support closing comment #17, #134, and #159 with bmax(1) = 0.85 and bmax(2:6) = 0.2.  
Yes: 27  
No: 6

Cl 161 SC 161.6 P123 L25 # 21

Slavick, Jeff Broadcom

Comment Type TR Comment Status A

PHY stackup is based upon the given PHY type. When layers within that stackup is optional to implement then the existence of that layer in the stackup maybe there or not. When the layer is mandatory to implement the layer is always there. If a layer is optional to use then a method to bypass it's function is provided for the cases when it's implemented but functionality is being skipped. Cl74 (74.8.2) , Cl108 (108.6.3), Cl73 (73.6.10) all provide methods to "bypass" the functionality of the clause when not in use. Cl91 and Cl161 don't have this bypass function in the draft.

## SuggestedRemedy

In Table 161-1 add mapping to register 1.200.5 as RS\_FEC\_Int\_enable. Add sub-clause describing this bit as "161.6.,14 RS\_FEC\_Int\_enable  
The RS-FEC-Int sublayer shall have the capability to enable or disable the FEC function. An MDIO interface or an equivalent management interface shall be provided to access the variable RS\_FEC\_Int\_Enable for the RS-FEC-Int sublayer. When RS\_FEC\_Int\_Enable variable is set to a one, the RS-FEC-Int sublayer performs the transmit function as specified in 161.5.2 and the receive function as specified in 161.5.3. When the variable is set to zero, the transmit and receive functions are disabled, and the RS-FEC-Int sublayer is bypassed, effectively connecting its service interface to the service interface of its underlying sublayer. This variable is mapped to the bit defined in 45.2.1.110.aa."  
In Table 45-88 assign bit 6 to be RS-FEC Enable with 1-RS-FEC is enabled, 0 - RS-FEC is disabled, R/W

Description for this bit "Bit 1.200.6 enables the Reed-Solomon FEC described in Clause 91 for PHYs that include both Clause 161 and Clause 91.  
Bring in Table 91-2 from 802.3cd-2018 and add a row for RS-FEC Enable, RS\_FEC\_enable, 1.200.6, RS\_FEC\_enable  
Add new sub-clause to describe the FEC\_enable variable as "91.6.2a RS\_FEC\_enable  
For PHYs supporting RS-FEC-Int operation this sublayer shall have the capability to enable or disable its FEC function. An MDIO interface or an equivalent management interface shall be provided to access the variable RS\_FEC\_Enable for the RS-FEC sublayer. When RS\_FEC\_Enable variable is set to zero, the RS-FEC sublayer performs the transmit function as specified in 91.5.2 and the receive function as specified in 91.5.3. When the variable is set to a one, the transmit and receive functions are disabled, and the RS-FEC sublayer is bypassed, effectively connecting its service interface to the service interface of its underlying sublayer. This variable is mapped to the bit defined in 45.2.1.110.xx."

Response Response Status C  
ACCEPT IN PRINCIPLE.

The following presentation was reviewed by the task force:  
[http://www.ieee802.org/3/ck/public/20\\_03/slavick\\_3ck\\_01\\_0320.pdf](http://www.ieee802.org/3/ck/public/20_03/slavick_3ck_01_0320.pdf)

Implement slides 8 to 11 of the presentation referenced above with editorial.

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CI 73 SC 73.6.5.a P69 L31 # 48

Brown, Matt Huawei Technologies Canada

Comment Type T Comment Status A

It is more specifically for PHYs which support RS-FEC-Int in addition to the default Clause 91 FEC. It is not an operating mode, it's a choice of sublayer to invoke. What if neither requests RS-FEC-Int?

SuggestedRemedy

"For 100GBASE-P PHYs which support RS-FEC-Int (see Clause 161) in addition to the default RS-FEC (see Clause 91) the F4 field is used to negotiate which FEC sublayer is to be used. If either PHY requests RS-FEC-Int operation then RS-FEC-Int sublayer is enabled, otherwise RS-FEC sublayer is enabled."

Response Response Status C

ACCEPT IN PRINCIPLE.

Remove "the default" from suggested remedy.

Change text in 73.6.5.a to:

"For 100GBASE-P PHYs which support RS-FEC-Int (see Clause 161) in addition to RS-FEC (see Clause 91) the F4 field is used to negotiate which FEC sublayer is to be used. If either PHY requests RS-FEC-Int operation then RS-FEC-Int sublayer is enabled, otherwise RS-FEC sublayer is enabled."

CI 73 SC 73.6.5 P69 L22 # 56

Brown, Matt Huawei Technologies Canada

Comment Type T Comment Status A

Why is the paragraph being deleted? Instead, further descriptions for the RS-FEC-Int should be provided.

SuggestedRemedy

Show the paragraph without strikethrough and add the following sentence: "F4 is used by 100G PHYs where RS-FEC-Int (See Clause 161) is an alternative to the default RS-FEC (See Clause 91)."

Response Response Status C

ACCEPT IN PRINCIPLE.

Replace struck through text with:

"Bits F0 and F1 are only used for 10 Gb/s per lane operation PHYs. F2 and F3 are used for resolving FEC operation for 25G PHYs. F4 is used by 100G PHYs where RS-FEC-Int (See Clause 161) is an alternative to the default RS-FEC (See Clause 91)."

CI 120F SC 120F.4.1 P209 L52 # 69

Mellitz, Richard Samtec

Comment Type TR Comment Status A

C2C, KR, and CR devices may be the same ports on chips. Align Av, Afe, and Ane with table 163-10

SuggestedRemedy

replace the TBD"s with Av=0.0413,Afe=0.413,Ane=0.608

Response Response Status C

ACCEPT.

CI 120F SC 120F.4.1 P209 L52 # 132

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status A

Transmitter differential peak output is TBD

SuggestedRemedy

Replace Av with 0.413 V  
Replace Afe with 0.413 V  
Replace Ane with 0.608 V

Response Response Status C

ACCEPT.

CI 120F SC 120F.4.1 P210 L11 # 133

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status A

DFE tap length missing

RR DFE length

SuggestedRemedy

Replace TBD with 5 or alternatively with 3 fixed+2 floating taps with span of 12 UI to support full range of channels and packages, for supporting material see ghiasi\_3ck\_02\_0320.pdf

Response Response Status C

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #16.

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CI 120F SC 120F.4.1 P210 L13 # 134  
 Ghiasi, Ali Ghiasi Quantum/Inphi  
 Comment Type TR Comment Status A RR DFE bmax  
 Bmax values are TBDs  
 SuggestedRemedy  
 Replace TBD with B1max=0.5 and B[2-5]max=0.1 ghiasi\_3ck\_02\_0320.pdf  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Resolve using the response to comment #17.

CI 120F SC 120F.4.1 P210 L21 # 135  
 Ghiasi, Ali Ghiasi Quantum/Inphi  
 Comment Type TR Comment Status R  
 To keep C2C power low need to limit max loss including package/filter  
 SuggestedRemedy  
 Add new line to table 120F-5, Total IL\_wpkgs\_wTr (max)=28 dB  
 Response Response Status C  
 REJECT.  
 Note that recommended channel loss is specified as 20 dB at Nyquist along with and insertion loss equation in 120F.4.2.  
 There is no consensus to make the proposed change at this time.

CI 120F SC 120F.4.1 P210 L18 # 146  
 Dawe, Piers Mellanox  
 Comment Type TR Comment Status R RR noise  
 One-sided noise spectral density of  $8.2e-9 V^2/\text{GHz}$  is extremely aggressive and optimistic and was chosen to make 28 dB backplane channels pass COM. It is not appropriate for this 20 dB spec.  
 SuggestedRemedy  
 Change to  $1.64e-8$ , same as 50GBASE-CR but lower than proposed for C2M ( $4.1e-8$ ). (For info, 50G/lane C2C (120C) has  $2.6e-8$ .)  
 Response Response Status C  
 REJECT.  
 Since the noise target is practical for a KR receiver, it should be practical for a C2C receiver. Allowing a higher noise at the receiver would require improvements somewhere else. There is a trade off between transmitter, receiver, and channel complexity to consider.  
 There is no consensus to make the proposed change at this time. Further analysis and consensus building is required.

CI 120F SC 120F.4.1 P210 L11 # 147  
 Dawe, Piers Mellanox  
 Comment Type TR Comment Status A RR DFE length  
 The C2C channel is only a little harder than the C2M one so a similar reference receiver could be used. Low power silicon will be needed if this application is to be viable.  
 SuggestedRemedy  
 4 taps, or 5 as Ali proposed. See my C2M comments for proposed tap weight limits.  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Resolve using the response to comment #16.

IEEE P802.3ck D1.1 100/200/400 Gb/s Electrical Interfaces Task Force 2nd Task Force review comments

Cl 120F SC 120F.4.1 P208 L 40 # 157

Li, Mike Intel  
 Comment Type TR Comment Status A  
 Tr TBD

*SuggestedRemedy*

Change it to Tr =6.5 ps, which is consistent with CEI-112G-PAM4-MR

Response Response Status C  
 ACCEPT IN PRINCIPLE.

Based on the result of straw poll #4 implement the suggested remedy.

Straw poll #4:  
 I support closing comment #157 with the suggested remedy.  
 Yes: 18  
 No: 13  
 Abstain: 21

Cl 120F SC 120F.4.1 P210 L 11 # 158

Li, Mike Intel  
 Comment Type TR Comment Status D RR DFE length  
 Nb TBD

*SuggestedRemedy*

Change it to Nb = 14, which is consistent with CEI-112G-PAM4-MR

Proposed Response Response Status Z  
 REJECT.

This comment was WITHDRAWN by the commenter.

Cl 120F SC 120F.4.1 P210 L 13 # 159

Li, Mike Intel  
 Comment Type TR Comment Status A RR DFE bmax  
 bmax TBD

*SuggestedRemedy*

Change it to bmax = 0.85, which is consistent with CEI-112G-PAM4-MR

Response Response Status C  
 ACCEPT IN PRINCIPLE.

Resolve using the response to comment #17.