

# **P802.3ck D1.4**

## **Annex 120G transition time and XTALK parameter values (V2)**

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# Introduction

- In Draft 1.4, the parameters for XTALK calibration for host/module output EH/VEC measurements and host/module input stressed eye calibration are TBD.
- This slide package summarizes the parameter values as proposed by the following comments:
  - TP1a (host output, 120G.3.1): 14, 33, 62, 68, 84, 124
  - TP4 (module output, 120G.3.2): 17, 36, 63, 69, 86, 127
  - TP4a (host input, 120G.3.3): 19, 37, 64, 70, 87, 128
  - TP1 (module input, 120G.3.4): 20, 39, 65, 71, 89, 129
- Before resolving these we need to consider two comments that propose to modify the transition time specification at TP1a and TP4.
  - 83 (TP1a, Table 120G-1)
  - 85 (TP4, Table 120G-3)

# Presentations

The following related presentations were viewed the ad hocs prior to the comment resolution meetings:

- ❖ [https://www.ieee802.org/3/ck/public/adhoc/jan20\\_21/wu\\_3ck\\_adhoc\\_01\\_012021.pdf](https://www.ieee802.org/3/ck/public/adhoc/jan20_21/wu_3ck_adhoc_01_012021.pdf)

The following related presentations were submitted (so far) for the upcoming comment resolution meetings:

- ❖ ?

# Comments 83 and 85, transition time

CI 120G SC 120G.3.1 P 231 L 25 # 83

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status X

At TP1a it is no possible to get 7.5 ps, please put something reasonable

SuggestedRemedy

A fast ASIC with 7.6 ps output rise time when passes through a mated board with just 5 dB loss produces 12 ps 20-80% rise time. I suggest 12 ps but no less than 10 ps.

Proposed Response Response Status O

Table 120G-1—Host output characteristics at TP1a

Parameter	Reference	Value	Units
Signaling rate, each lane (range)		53.125 ± 50 ppm <sup>a</sup>	GBd
DC common-mode output voltage (max)	120G.5.1	2.8	V
DC common-mode output voltage (min)	120G.5.1	-0.3	V
Single-ended output voltage (max)	120G.5.1	3.3	V
Single-ended output voltage (min)	120G.5.1	-0.4	V
AC common-mode RMS output voltage (max)	120G.5.1	17.5	mV
Differential peak-to-peak output voltage (max) Transmitter disabled Transmitter enabled	120G.5.1	35 870	mV
Eye height, differential (min)	120G.3.1.5	15	mV
Vertical eye closure (max)	120G.3.1.5	9	dB
Common-mode to differential return loss (min)	120G.3.1.1	Equation (120G-1)	dB
Effective return loss, ERL (min)	120G.3.1.2	7.3	dB
Differential termination mismatch (max)	120G.3.1.3	10	%
Transition time (min, 20% to 80%)	120G.3.1.4	7.5	ps

<sup>a</sup>For a PMA in the same package as the PCS sublayer. In other cases, the signaling rate is derived from the signaling rate presented to the PMA input lanes (see Figure 135-3 and Figure 120-3) by the adjacent PMA or FEC sublayers.

CI 120G SC 120G.3.1 P 231 L 25 # 85

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type T Comment Status X

At TP4 it is no possible to get 7.5 ps, please put something reasonable

SuggestedRemedy

A fast ASIC with 7.6 ps output rise time when passes through a mated board with just 5 dB loss produces 12 ps 20-80% rise time, given that real module may have less than min HCB loss then 10 ps would be reasonable rise time.

Proposed Response Response Status O

Table 120G-3—Module output characteristics (at TP4)

Parameter	Reference	Value	Units
Signaling rate, each lane (nominal)		53.125 <sup>a</sup>	GBd
AC common-mode output voltage (max, RMS)	120G.5.1	17.5	mV
Differential peak-to-peak output voltage (max)	120G.5.1	900	mV
Near-end eye height, differential (min)	120G.3.1.5	24	mV
Near-end vertical eye closure (max)	120G.3.1.5	7.5	dB
Far-end eye height, differential (min)	120G.3.1.5	24	mV
Far-end vertical eye closure (max)	120G.3.1.5	7.5	dB
Common-mode to differential return loss (min)	120G.3.1.2	Equation (120G-1)	dB
Effective return loss, ERL (min)	120G.3.2.3	TBD	dB
Differential termination mismatch (max)	120G.3.1.3	10	%
Transition time (min, 20% to 80%)	120G.3.1.4	7.5	ps
DC common-mode voltage (min) <sup>b</sup>	120G.5.1	-350	mV
DC common-mode voltage (max) <sup>a</sup>	120G.5.1	2850	mV

<sup>a</sup>The signaling rate range is derived from the PMD receiver input.

<sup>b</sup>DC common-mode voltage is generated by the host. Specification includes effects of ground offset voltage.

# TP1a XTALK comments, part 1

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Cl 120G SC 120G.3.1.5 P 233 L 17 # 14

Dudek, Mike Marvell

Comment Type TR Comment Status X

The host output signal should be measured with a crosstalk signal equivalent to the largest and fastest signal that a module is allowed to create and the crosstalk signal risetime should be measured from 20% to 80%.

#### SuggestedRemedy

Change to a target differential peak-to-peak amplitude of 900mV and the slew time to be 7.5ps measured between -270mV and +270mV

Proposed Response Response Status O

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Cl 120G SC 120G.3.1.5 P 233 L 17 # 33

Brown, Matt Huawei

Comment Type T Comment Status X

The specified values for the host output EH/VEC crosstalk parameters (4x) are TBD.

#### SuggestedRemedy

Provide values.

Proposed Response Response Status O

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Cl 120G SC 120G.3.1.5 P 233 L 17 # 62

Wu, Mau-Lin MediaTek

Comment Type T Comment Status X

There are some TBDs for crosstalk calibration specs for Host Output test. According to the analysis explored in wu\_3ck\_adhoc\_02\_010621.pdf, the target swing at TP4 shall be aligned with that of Module output spec, which is 900 mV. Similarly, the output voltage swing at TP1a, which is 870 mV now, shall be aligned among Host output, Module output, Host input, & Module input specs.

#### SuggestedRemedy

Propose the following paragraph to replace the original one  
Host output: 120G.3.1.4 (Page 233, L17)  
"... with target differential peak-to-peak amplitude of 900 mV and slew time of 12 ps between -2.7 V and +2.7 V."

Proposed Response Response Status O

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# TP1a XTALK comments, part 2

CI 120G SC 120G.3.1.5 P 233 L 17 # 68

Healey, Adam Broadcom Inc.

Comment Type T Comment Status X

The target differential peak-to-peak amplitude and slew time of the crosstalk generator, as observed at TP4, are TBD.

### SuggestedRemedy

Since the crosstalk generator is used to represent near-end aggression from the the module transmitter outputs, the largest amplitude and smallest transition time allowed for a module output (as observed at TP4) should be used to represent worst-case aggression.

Change:

"The crosstalk generator is calibrated at TP4 (without the use of a reference receiver) with target differential peak-to-peak amplitude of TBD mV and slew time of TBD ps between -TBD V and +TBD V."

To:

"The crosstalk generator is calibrated so that the differential peak-to-peak output voltage and transition time, as measured at TP4, are as close to the limits in Table 120G-3 as practical."

Proposed Response Response Status O

CI 120G SC 120G.3.1.5 P 233 L 17 # 84

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status X

Addressing the TBD in the paragraph

### SuggestedRemedy

A fast ASIC with 7.6 ps output rise time when passes through a mated board with just 5 dB loss produces 12 ps 20-80% rise time. I suggest 24 ps for the slew from -400 mV to + 400 mV and with amplitude of 800 mV, the reason amplitude is reduced is due assumption that signal will have pre-emphasis on for this measurement otherwise one could go with 900 mV amplitude I don't believe that is reasonable.

Proposed Response Response Status O

CI 120G SC 120G.3.1.5 P 233 L 17 # 124

Ran, Adeel Intel

Comment Type TR Comment Status X

"The crosstalk generator is calibrated at TP4 (without the use of a reference receiver) with target differential peak-to-peak amplitude of TBD mV and slew time of TBD ps between -TBD V and +TBD V"

This is the host output test; the crosstalk generator represents the module output. We specify the PtP amplitude and transition time for modules at TP4 in Table 120G-3. The calibration should use the maximum amplitude and minimum transition time values from that table.

### SuggestedRemedy

Change the quoted sentence to:

"The crosstalk generator is calibrated at TP4 (without the use of a reference receiver) with targets equal to the Differential peak-to-peak output voltage (max) and Transition time (min, 20% to 80%) in Table 120G-3".

Proposed Response Response Status O

# TP1a parameter proposed values/text

Comment #	TBD #1 (mV)	TBD #2 (ps)	TBD #3 (mV)	TBD #4 (mV)
14 (M Dudek)	900	7.5	-270	270
62 (M Wu)	900	12	-2700	2700
68 (A Healey)	“The crosstalk generator is calibrated so that the differential peak-to-peak output voltage and transition time, as measured at TP4, are as close to the limits in Table 120G-3 as practical.” [PPV = 900 mV, TT = 7.5 ps]			
84 (A Ghiasi)	800	24	-400	400
124 (A Ran)	“The crosstalk generator is calibrated at TP4 (without the use of a reference receiver) with targets equal to the Differential peak-to-peak output voltage (max) and Transition time (min, 20% to 80%) in Table 120G-3". [PPV = 900 mV, TT = 7.5 ps]			
Consensus	900?	?	?	?

All counter-propagating signals are asynchronous to the co-propagating signals using the PRBS13Q (see 120.5.11.2.1) or PRBS31Q (see 120.5.11.2.2) pattern, or a valid 100GBASE-R, 200GBASE-R, or 400GBASE-R signal. For the case where PRBS13Q or PRBS31Q are used with a common clock, there is at least 31 UI delay between the patterns on one lane and any other lane, so that the symbols on each lane are not correlated. The crosstalk generator is calibrated at TP4 (without the use of a reference receiver) with target differential peak-to-peak amplitude of TBD mV and slew time of TBD ps between -TBD V and +TBD V.

# TP4 XTALK comments, part 1

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CI 120G SC 120G.3.2.2 P 235 L 34 # 17

Dudek, Mike Marvell

Comment Type TR Comment Status X

The module near-end output signal should be measured with a crosstalk signal equivalent to the largest and fastest signal that the host can supply. The risetime for the far-end signal can be slower.

#### SuggestedRemedy

Change "The crosstalk generator is calibrated at TP1a (without the use of a reference receiver) with target differential peak-to-peak amplitude of TBD mV and target transition time of TBD ps." to "The crosstalk generator is calibrated at TP1a (without the use of a reference receiver) with target differential peak-to-peak amplitude of 870 mV and target transition time of 7.5 ps for the near end measurement and target transition time of 15 ps for the far-end measurement."

Proposed Response Response Status O

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CI 120G SC 120G.3.2.2 P 235 L 33 # 36

Brown, Matt Huawei

Comment Type T Comment Status X

The specified values for the module output EH/VEC crosstalk parameters (2x) are TBD.

#### SuggestedRemedy

Provide values.

Proposed Response Response Status O

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CI 120G SC 120G.3.2.2 P 235 L 33 # 63

Wu, Mau-Lin MediaTek

Comment Type T Comment Status X

There are some TBDs for crosstalk calibration specs for Host Output test. According to the analysis explored in wu\_3ck\_adhoc\_02\_010621.pdf, the target swing at TP4 shall be aligned with that of Module output spec, which is 900 mV. Similarly, the output voltage swing at TP1a, which is 870 mV now, shall be aligned among Host output, Module output, Host input, & Module input specs.

#### SuggestedRemedy

Propose the following paragraph to replace the original one  
Module output: 120G.3.2.2 (Page 235, L33)  
"... with target differential peak-to-peak amplitude of 870 mV and target transition time of 19 ps."

Proposed Response Response Status O

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CI 120G SC 120G.3.2.2 P 235 L 33 # 69

Healey, Adam Broadcom Inc.

Comment Type T Comment Status X

The target differential peak-to-peak amplitude and transition time, as observed at TP1a, are TBD.

#### SuggestedRemedy

Since the crosstalk generator is used to represent near-end aggression from the the host transmitter outputs, the largest amplitude and smallest transition time allowed for a host output (as observed at TP1a) should be used to represent worst-case aggression.

Change:

"The crosstalk generator is calibrated at TP1a (without the use of a reference receiver) with target differential peak-to-peak amplitude of TBD mV and target transition time of TBD ps."  
To:

"The crosstalk generator is calibrated so that the differential peak-to-peak output voltage and transition time, as measured at TP1a, are a close to the limits in Table 120G-1 as practical."

Proposed Response Response Status O

# TP4 XTALK comments, part 2

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CI 120G SC 120G.3.2.2 P 235 L 34 # 86

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status X

Addressing the TBD in the paragraph

### SuggestedRemedy

A fast ASIC with 7.6 ps output rise time when passes through a mated board with just 5 dB loss produces 12 ps 20-80% rise time, the full swing is about 2x. But given that module PCB may have lower than HCB loss, then I suggest 20 ps for the slew from -350 mV to +350 mV and with amplitude of 700 mV, the reason amplitude is reduced is due assumption that signal will have pre-emphasis on for this measurement otherwise one could go with 900 mV amplitude I don't believe that is reasonable.

Proposed Response Response Status O

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CI 120G SC 120G.3.2.2 P 235 L 34 # 127

Ran, Adeel Intel

Comment Type TR Comment Status X

(addressing TBD)

"The crosstalk generator is calibrated at TP1a (without the use of a reference receiver) with target differential peak-to-peak amplitude of TBD mV and target transition time of TBD ps"

This is the module output test; the crosstalk generator represents the host output. We specify the PtP amplitude and transition time for hosts at TP1a in Table 120G-1. The calibration should use the maximum amplitude and minimum transition time values from that table.

### SuggestedRemedy

Change the quoted sentence to:

"The crosstalk generator is calibrated at TP1a (without the use of a reference receiver) with targets equal to the Differential peak-to-peak output voltage (max) and Transition time (min, 20% to 80%) in Table 120G-1".

Proposed Response Response Status O

# TP4 parameter proposed values/text

Comment #	TBD #1, PP voltage (mV)	TBD #2 (ps), transition time (ps)
17 (M Dudek)	870	7.5 NE, 15 FE (new text required)
63 (M Wu)	870	19
69 (A Healey)	reference Table 120G-1 (870 in D1.4) next text required	reference Table 120G-1 (7.5 in D1.4) new text required
86 (A Ghiasi)	"20 ps for the slew from -350 mV to +350 mV and with amplitude of 700 mV"	
127 (A Ran)	reference Table 120G-1 (870 in D1.4)	reference Table 120G-1 (7.5 in D1.4)
Consensus	?	?

All counter-propagating signals are asynchronous to the co-propagating signals using the PRBS13Q (see 120.5.11.2.1) or PRBS31Q (120.5.11.2.2) pattern, or a valid 100GBASE-R, 200GBASE-R, or 400GBASE-R signal. For the case where PRBS13Q or PRBS31Q are used with a common clock, there is at least 31 UI delay between the patterns on one lane and any other lane, so that the symbols on each lane are not correlated. The crosstalk generator is calibrated at TP1a (without the use of a reference receiver) with target differential peak-to-peak amplitude of TBD mV and target transition time of TBD ps.

# TP4a XTALK comments, part 1

Cl 120G SC 120G.3.3.2.1 P 238 L 54 # 19

Dudek, Mike Marvell

Comment Type TR Comment Status X

The crosstalk used in the calibration of the host stressed signal should match the crosstalk used for the test for the module output

## Suggested Remedy

Change "The counter propagating crosstalk signals during calibration of the stressed signal are asynchronous with target amplitude of TBD mV peak-to-peak differential and 20% to 80% target transition time of TBD ps." to "The counter propagating crosstalk signals during calibration of the stressed signal are asynchronous with target differential peak-to-peak amplitude of 870 mV and target transition time of 7.5 ps for the near end calibration and target transition time of 15 ps for the far-end calibration"

Proposed Response Response Status O

Cl 120G SC 120G.3.3.2.1 P 238 L 54 # 70

Healey, Adam Broadcom Inc.

Comment Type T Comment Status X

The target differential peak-to-peak amplitude and transition time, as observed at TP1a, are TBD.

## Suggested Remedy

Since the crosstalk generator is used as a proxy for the host transmitter(s) during stressed input signal calibration, the amplitude and transition times should be set to agree with the values measured at the output of the host under test (TP1a).

Change:

"The counter propagating crosstalk signals during calibration of the stressed signal are asynchronous with target amplitude of TBD mV peak-to-peak differential and 20% to 80% target transition time of TBD ps as measured at TP1a (without the use of a reference receiver)."

To:

"The counter propagating crosstalk signals are asynchronous during calibration of the stressed signal. The crosstalk generator is calibrated so that the differential peak-to-peak output voltage and transition time, as measured at TP1a, are as close as practical to the values measured at the output of the host under test (at TP1a) without the use of a reference receiver."

Proposed Response Response Status O

# TP4a XTALK comments, part 2

Cl 120G SC 120G.3.3.2.1 P 238 L 54 # 64

Wu, Mau-Lin MediaTek

Comment Type T Comment Status X

There are some TBDs for crosstalk calibration specs for Host Output test. According to the analysis explored in wu\_3ck\_adhoc\_02\_010621.pdf, the target swing at TP4 shall be aligned with that of Module output spec, which is 900 mV. Similarly, the output voltage swing at TP1a, which is 870 mV now, shall be aligned among Host output, Module output, Host input, & Module input specs.

#### SuggestedRemedy

Propose the following paragraph to replace the original one  
Host input: 120G.3.3.2.1 (Page 238, L54)  
"... with target amplitude of 870 mV peak-to-peak differential and 20% to 80% target transition time of 19 ps as measured at TP1a ..."

Proposed Response Response Status O

Cl 120G SC 120G.3.3.2.1 P 238 L 54 # 37

Brown, Matt Huawei

Comment Type T Comment Status X

The specified values for the host stressed input crosstalk parameters (2x) are TBD.

#### SuggestedRemedy

Provide values.

Proposed Response Response Status O

Cl 120G SC 120G.3.3.2.1 P 238 L 54 # 87

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status X

Addressing the TBD in the paragraph

#### SuggestedRemedy

A fast ASIC with 7.6 ps output rise time when passes through a mated board with just 5 dB loss produces 12 ps 20-80% rise time. I suggest 12 ps rise time and possibly as fast as 10 ps but would be difficult to generate such fast rise time through mated board. Given that the signal will have pre-emphasis enabled getting more than 800 mV could be difficult. I suggest to go with 800 mV

Proposed Response Response Status O

Cl 120G SC 120G.3.3.2.1 P 238 L 54 # 128

Ran, Adeo Intel

Comment Type TR Comment Status X

(addressing TBD)

"The counter propagating crosstalk signals during calibration of the stressed signal are asynchronous with target amplitude of TBD mV peak-to-peak differential and 20% to 80% target transition time of TBD ps"

This is the host stressed input test; the actual counter-propagating signals are from the host's own transmitter. For calibration purposes we can assume that the host uses the maximum amplitude and minimum transition time. If the host does not reach the limits, then it may benefit from less crosstalk during the actual test - but as long as it meets the host output specifications, it is acceptable.

We specify the PtP amplitude and transition time for hosts at TP1a in Table 120G-1. The calibration should use the maximum amplitude and minimum transition time values from that table.

#### SuggestedRemedy

Change the quoted sentence to:

"The counter-propagating crosstalk signals are asynchronous with respect to the input signal and are calibrated at TP1a (without the use of a reference receiver) with targets equal to the Differential peak-to-peak output voltage (max) and Transition time (min, 20% to 80%) in Table 120G-1".

Proposed Response Response Status O

# TP4a parameter proposed values/text

Comment #	TBD #1 (mV)	TBD #2 (mV)
19 (M Dudek)	870	NE=7.5, FE=15
64 (M Wu)	870	19
70 (A Healey)	as close as practical to values measured at TP1a of host under test	
87 (A Ghiasi)	800	12 or 10
128 (A Ran)	per Table 120G-1, new text required [D1.4: VPP=870, TT=7.5]	
Consensus	?	?

The counter propagating crosstalk signals during calibration of the stressed signal are asynchronous with target amplitude of TBD mV peak-to-peak differential and 20% to 80% target transition time of TBD ps as measured at TP1a (without the use of a reference receiver). The crosstalk signal transition time is calibrated with PRBS13Q. The pattern may be changed to a valid 100GBASE-R, 200GBASE-R, or 400GBASE-R signal for amplitude calibration and the stressed input test. For the case where the PRBS13Q pattern is used with a common clock, there is at least 31 UI delay between the PRBS13Q patterns on one lane and any other lane, so that the symbols on each lane are not correlated. Any one of these patterns is sufficient as a crosstalk aggressor with all lanes active during the stressed input test.

# TP1 XTALK comments, part 1

CI 120G SC 120G.3.4.1.1 P 242 L 2 # 20

Dudek, Mike Marvell

Comment Type TR Comment Status X

The crosstalk used in the calibration of the module stressed signal should match the crosstalk used for the test for the host output

*SuggestedRemedy*

Change to "a target amplitude of 900mV differential peak-to-peak and target slew time between -270mV and +270mV of 7.5ps"

Proposed Response Response Status O

CI 120G SC 120G.3.4.1.1 P 242 L 2 # 39

Brown, Matt Huawei

Comment Type T Comment Status X

The specified values for the module stressed input crosstalk parameters (4x) are TBD.

*SuggestedRemedy*

Provide values.

Proposed Response Response Status O

CI 120G SC 120G.3.4.1.1 P 242 L 2 # 65

Wu, Mau-Lin MediaTek

Comment Type T Comment Status X

There are some TBDs for crosstalk calibration specs for Host Output test. According to the analysis explored in wu\_3ck\_adhoc\_02\_010621.pdf, the target swing at TP4 shall be aligned with that of Module output spec, which is 900 mV. Similarly, the output voltage swing at TP1a, which is 870 mV now, shall be aligned among Host output, Module output, Host input, & Module input specs.

*SuggestedRemedy*

Propose the following paragraph to replace the original one

Module input: 120G.3.4.1.1 (Page 242, L2)

"... with target amplitude of 900 mV peak-to-peak differential and target slew time between -2.7 V and +2.7 V of 12 ps as measured at TP4 ..."

Proposed Response Response Status O

# TP1 XTALK comments, part 2

CI 120G SC 120G.3.4.1.1 P 242 L 2 # 71

Healey, Adam Broadcom Inc.

Comment Type T Comment Status X

The target differential peak-to-peak amplitude and slew time of the crosstalk generator, as observed at TP4, are TBD.

## SuggestedRemedy

Since the crosstalk generator is used as a proxy for the module transmitter(s) during stressed input signal calibration, the amplitude and transition times should be set to agree with the values measured at the output of the module under test (TP4).

Change:

"The counter propagating crosstalk signals during calibration of the stressed signal are asynchronous with target amplitude of TBD mV peak-to-peak differential and target slew time between -TBD mV and TBD mV of TBD ps as measured at TP4 (without the use of a reference equalizer)."

To:

"The counter propagating crosstalk signals are asynchronous during calibration of the stressed signal. The crosstalk generator is calibrated so that the differential peak-to-peak output voltage and transition time, as measured at TP4, are as close as practical to the values measured at the output of the module under test (at TP4) without the use of a reference receiver."

Proposed Response Response Status O

CI 120G SC 120G.3.4.1.1 P 242 L 3 # 89

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status X

Addressing the TBD in the paragraph

## SuggestedRemedy

A fast ASIC with 7.6 ps output rise time when passes through a mated board with just 5 dB loss produces 12 ps 20-80% rise time, the full swing is about 2x. But given that module PCB may have lower than HCB loss, then I suggest 20 ps for the slew from -350 mV to +350 mV and with amplitude of 700 mV, the reason amplitude is reduced is due assumption that signal will have pre-emphasis on for this measurement otherwise one could go with 900 mV amplitude I don't believe that is reasonable.

Proposed Response Response Status O

CI 120G SC 120G.3.4.1.1 P 242 L 2 # 129

Ran, Adee Intel

Comment Type TR Comment Status X

(addressing TBD)

"The counter propagating crosstalk signals during calibration of the stressed signal are asynchronous with target amplitude of TBD mV peak-to-peak differential and target slew time between -TBD mV and TBD mV of TBD ps as measured at TP4"

This is the module stressed input test; the actual counter-propagating signals are from the module's own transmitter. For calibration purposes we can assume that the module uses the maximum amplitude and minimum transition time. If the module does not reach the limits, then it may benefit from less crosstalk during the actual test - but as long as it meets the module output specifications, it is acceptable.

We specify the PtP amplitude and transition time for modules at TP4 in Table 120G-3. The calibration should use the maximum amplitude and minimum transition time values from that table.

## SuggestedRemedy

Change the quoted sentence to:

"The counter-propagating crosstalk signals are asynchronous with respect to the input signal and are calibrated at TP4 (without the use of a reference receiver) with targets equal to the Differential peak-to-peak output voltage (max) and Transition time (min, 20% to 80%) in Table 120G-3".

Proposed Response Response Status O

# TP1 parameter proposed values/text

Comment #	TBD #1 (mV)	TBD #2 (mV)	TBD #3 (mV)	TBD #4 (ps)
20 (M Dudek)	900	-270	270	7.5
65 (M Wu)	900	-2700	2700	12
71 (A Healey)	"The counter propagating crosstalk signals are asynchronous during calibration of the stressed signal. The crosstalk generator is calibrated so that the differential peak-to-peak output voltage and transition time, as measured at TP4, are as close as practical to the values measured at the output of the module under test (at TP4) without the use of a reference receiver." [PPV = 900 mV, TT = 7.5 ps]			
89 (A Ghiasi)	700	-350	350	20
129 (A Ran)	"The counter-propagating crosstalk signals are asynchronous with respect to the input signal and are calibrated at TP4 (without the use of a reference receiver) with targets equal to the Differential peak-to-peak output voltage (max) and Transition time (min, 20% to 80%) in Table 120G-3". [PPV = 900 mV, TT = 7.5 ps]			
Consensus	?	?	?	?

The counter propagating crosstalk signals during calibration of the stressed signal are asynchronous with target amplitude of TBD mV peak-to-peak differential and target slew time between -TBD mV and TBD mV of TBD ps as measured at TP4 (without the use of a reference equalizer). The crosstalk signal transition time is calibrated with a PRBS13Q pattern (see 120.5.11.2.1). The pattern may be changed to a valid 100GBASE-R, 200GBASE-R, or 400GBASE-R signal for amplitude calibration and the stressed input test. For the case where the PRBS13Q pattern is used with a common clock, there is at least 31 UI delay between the PRBS13Q patterns on one lane and any other lane, so that the symbols on each lane are not correlated. Any one of these patterns is sufficient as a crosstalk aggressor with all lanes being active during the stressed input test.

# Summary

We need to make a number of decisions...

- ❖ Whether host output and module output transition times need to change or whether they stay at D1.4 values (7.5 ps).
- ❖ For some test ports whether to use slew rate or transition time.
- ❖ For some test ports whether to use specified or measured values.
- ❖ For each test port the XTALK parameter values, specified locally versus reference to a table.