

P802.3ck D1.4

Annex 120G EH/VEC Values

Matt Brown, Huawei, 802.3ck Editor-in-Chief

Introduction

- In Draft 1.4 the measurement method for EH and VEC was modified such that the specified values of EH and VEC need to be revisited.
- This slide package summarizes the values for EH and VEC as proposed by the following comments:
 - 5, 40, 61, 72, 75, 76, 77, 78, 80, 81, 88, 145
- These comments cover all four test points:
 - TP1a (host output), 120G.3.1, Table 120G-1
 - TP1 (module input), 120G.3.4, Table 120G-10
 - TP4 (module output), 120G.3.2, Table 120G-3
 - TP4a (host input), 120G.3.3, Table 120G-7

Presentations

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

- ❖ https://www.ieee802.org/3/ck/public/adhoc/jan06_21/wu_3ck_adhoc_01_010621.pdf
- ❖ https://www.ieee802.org/3/ck/public/adhoc/jan06_21/mellitz_3ck_adhoc_01_010621.pdf

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

- ❖ https://www.ieee802.org/3/ck/public/21_01/ghiasi_3ck_01_0121.pdf
- ❖ https://www.ieee802.org/3/ck/public/21_01/mellitz_3ck_01_0121.pdf
- ❖ https://www.ieee802.org/3/ck/public/21_01/wu_3ck_01_0121.pdf

CI 120G	SC 120G.3.1	P 231	L 17	# 5
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Mellitz, Richard Samtec

Comment Type TR Comment Status X

EH and VEC need be to computed for the histogram window.

SuggestedRemedy

Change Eye height, differential (min) to 10 mV
 Change Vertical eye closure (max) to 13 dB
 Presentation available

Proposed Response Response Status O

CI 120G	SC 120G.5.2	P 246	L 38	# 40
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Brown, Matt Huawei

Comment Type T Comment Status X

The editor's note indicates that the specified values for EH/VEC value may need to be updated due to measurement method being updated in D1.4.

SuggestedRemedy

Provide updated values for host output, module output, host input, and module input if necessary and remove editor's note.

Proposed Response Response Status O

CI 120G	SC 120G.3.1	P 231	L 17	# 81
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Wu, Mau-Lin MediaTek

Comment Type T Comment Status X

Due to we adopted the new EH & VEC test methods in D1p4, the specifications of EH & VEC for "Table 120G-1 - Host output characteristics at TP1a" and "Table 120G-10 - Module stressed input parameters" shall be updated to reflect the impact by new method.

SuggestedRemedy

Propose to change EH from 15 mV to 8 mV in Table 120G-1 & 120G-10.
 Propose to change VEC from 9.0 dB to 12.0 dB in Table 120G-1.
 Propose to change VEC (max) from 9.5 dB to 12.5 dB in Table 120G-10.
 Propose to change VEC (min) from 9.0 dB to 12.0 dB in Table 120G-10.
 Detailed analysis is included in wu_3ck_01_0121.pdf

Proposed Response Response Status O

CI 120G	SC 120G.3.1	P 231	L 18	# 72
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Healey, Adam Broadcom Inc.

Comment Type T Comment Status X

The eye height and vertical eye closure limits were based on (simulated) measurements of a vertical slice of the eye at the nominal sampling time. The measurement method for eye height and vertical eye closure in 120G.5.2 has been modified to use a vertical slice of the eye spanning -50 to +50 mUI around the nominal sampling time. Comparison of measurement results implies that the change in the measurement method results in up to a 3 dB increase in vertical eye closure and a similar decrease in eye height.

SuggestedRemedy

In Table 120G-1, change "Eye height, differential (min)" to 10 mV and "Vertical eye closure (max)" to 12 dB.
 In Table 120G-3, change "Near-end eye height, differential (min)" and "Far-end eye height, differential (min)" to 17 mV and "Near-end vertical eye closure (max)" and "Far-end vertical eye closure (max)" to 10.5 dB.
 In Table 120G-7, change "Near-end eye height" and "Far-end eye height" to 17 mV and "Near-end vertical eye closure" and "Far-end vertical eye closure" to 10.5 dB.
 In Table 120G-10, change "Eye height" to 10 mV, "VEC (max)" to 12.5 dB, and "VEC (min)" to 12 dB.

Proposed Response Response Status O

CI 120G	SC 120G.3.2	P 234	L 11	# 75
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Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status X

Given that now we have AUI-S/L near end eye would be AUI-S min eye opening

SuggestedRemedy

The eye opening with 50 mUI rectangular window for AUI-S is VEO=20 mV, see ghiasi_3ck_01_0121

Proposed Response Response Status O

CI 120G	SC 120G.3.2	P 234	L 13	# 76
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Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status X

Given that now we have AUI-S/L far end eye would be AUI-S min eye opening

SuggestedRemedy

The eye opening with 50 mUI rectangular window for AUI-L is VEO=11 mV, see ghiasi_3ck_01_0121

Proposed Response Response Status O

Cl 120G SC 120G.3.2 P 234 L 11 # 77

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type ER Comment Status X

Given that now we have AUI-S/L near end VEC need to be defined

SuggestedRemedy

The eye opening with 50 mUI rectangular window for AUI-S is VEC=12.5 dB, see ghiasi_3ck_01_0121

Proposed Response Response Status O

Cl 120G SC 120G.3.2 P 234 L 14 # 78

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status X

Given that now we have AUI-S/L far end VEC need to be defined

SuggestedRemedy

The eye opening with 50 mUI rectangular window for AUI-L is VEC=14.5 dB, see ghiasi_3ck_01_0121

Proposed Response Response Status O

Cl 120G SC 120G.3.1 P 231 L 17 # 80

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status X

Eye height need to be adjusted to account for the 50 mUI rectangular window

SuggestedRemedy

See ghiasi_3ck_01_0121 and reduce eye height window from 15 mV to 9.5 mV

Proposed Response Response Status O

Cl 120G SC 120G.3.1 P 231 L 19 # 81

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status X

VEC need to be adjusted to account for the 50 mUI rectangular window

SuggestedRemedy

See ghiasi_3ck_01_0121 and reduce eye height window from 7.5 dB to 14 dB

Proposed Response Response Status O

Cl 120G SC 120G.3.4.1 P 240 L 46 # 88

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status X

Table 120G-10 needs to be updated now that measurements are with 50 mUI window

SuggestedRemedy

See ghiasi_3ck_01_0121 and reduce eye height window from 15 mV to 9.5 mV

See ghiasi_3ck_01_0121 and reduce eye height window from 7.5 dB to 14+/- 0.5 dB

Proposed Response Response Status O

Cl 120G SC 120G.3.2 P 234 L 10 # 145

Dawe, Piers Nvidia

Comment Type TR Comment Status X

For a reasonably clean module (or test equipment in a host stressed eye test), the driver swing has to be aggressively reduced to deliver only 24 mV at near end, short setting. 120E has 70 mV.

SuggestedRemedy

Eye height limits should be set sensibly for short and long modes, near and far - not all the same.

Change the NEEH from 24 mV to 40 mV.

Proposed Response Response Status O

Values in Draft 1.4

Table 120G-1—Host output characteristics at TP1a

Parameter	Reference	Value	Units
Signaling rate, each lane (range)		53.125 ± 50 ppm ^a	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)	120G.5.1		
Transmitter disabled		35	mV
Transmitter enabled		870	
Eye height, differential (min)	120G.3.1.5	15	mV
Vertical eye closure (max)	120G.3.1.5	9	dB

Table 120G-10—Module stressed input parameters

Parameter	Value
Applied pk-pk sinusoidal jitter	Table 120G-8
Eye height	15 mV
VEC (max)	9.5 dB
VEC (min)	9.0 dB

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

Parameter	Reference	Value	Units
Signaling rate, each lane (nominal)		53.125 ^a	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, FRL (min)	120G.3.2.3	TRN	dB

Table 120G-7—Host stressed input parameters

Parameter	Value
Applied peak-to-peak sinusoidal jitter	Table 120G-8
Near-end eye height	24 mV
Near-end vertical eye closure	7.5 dB
Far-end eye height	24 mV
Far-end vertical eye closure	7.5 dB

EH value comments

Comment #	TP1a	TP1	TP4 NE/FE	TP4a NE/FE
5 (Rich Mellitz)	10	—	—	—
61 (Mau-Lin Wu)	8	8	—	—
72 (Adam Healey)	10	10	17	17
75 (Ali Ghiasi)	—	—	NE=20	—
76 (Ali Ghiasi)	—	—	FE=11	—
77 (Ali Ghiasi)	—	—	—	—
78 (Ali Ghiasi)	—	—	—	—
80 (Ali Ghiasi)	9.5	—	—	—
81 (Ali Ghiasi)	—	—	—	—
88 (Ali Ghiasi)	—	9.5	—	—
145 (Piers Dawe)	—	—	NE=40	—

VEC value comments

Comment #	TP1a	TP1 min	TP1 max	TP4 NE/FE	TP4a NE/FE
5 (Rich Mellitz)	13	—	—	—	—
61 (Mau-Lin Wu)	12	12	12.5	—	—
72 (Adam Healey)	12	12	12.5	10.5	10.5
75 (Ali Ghiasi)	—	—	—	—	—
76 (Ali Ghiasi)	—	—	—	—	—
77 (Ali Ghiasi)	—	—	—	NE=12.5	—
78 (Ali Ghiasi)	—	—	—	FE=14.5	—
80 (Ali Ghiasi)	—	—	—	—	—
81 (Ali Ghiasi)	14	—	—	—	—
88 (Ali Ghiasi)	—	14+/-0.5	—	—	—
145 (Piers Dawe)	—	—	—	—	—

Summarized values

Parameter	D1.4	Proposals	Consensus
EH @ TP1a	15	8, 9.5, 10	?
EH @ TP1	15	same as TP1a	?
EH NE/FE @ TP4	24/24	17/17, 20/11, 40/24	?
EH NE/FE @ TP4a	24/24	same as TP4	?
VEC @ TP1a	9	12, 13, 14	?
VEC min/max @ TP1 min	9/9.5	12/12.5, 13.5/14.5	?
VEC NE/FE @ TP4	7.5/7.5	10.5/10.5, 12.5/14/5	?
VEC NE/FE @ TP4a	7.5/7.5	same as TP4	?

Summary

- There is no clear consensus on any of the values, however the proposed values are similar to each other for each parameter.
- We need to agree upon a new value for each of the parameters.