

Potential changes for D3.3

Adee Ran, Cisco

Module output common mode

- Comment R1-29 asked to change $V_{\text{CMPP-LF}}$ max from 60 mV to 30 mV (for CR, KR, at 10^{-4}) or 32 mV (for C2C, C2M, at 10^{-5}).
 - Motivation (brief): LF CM is not attenuated by the channel; LF CM noise of 60 mVpp would be a very sloppy design; may cause unexpected non-stationary effects in receivers
 - Comment was accepted after straw polls indicated strong support for reduction, and preference to the proposed values.
- The comment specifically listed where the changed should be applied...
 - As listed in the response: In 162.9.3 and 163.9.2 change $V_{\text{CMPP-LF}}$ (max) to 30 mV; In 120F.3.1 and **120G.3.1** change $V_{\text{CMPP-LF}}$ (max) to 32 mV.
 - The fact that 120G has separate output specs for host (120G.3.1) and module (**120G.3.2**) has been overlooked.

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
Peak-to-peak AC common-mode voltage (max)	120G.5.1		
Low-frequency, $V_{CMPP-LF}$		32	mV
High-frequency, $V_{CMPP-HF}$		80	
Differential peak-to-peak output voltage (max)	120G.5.1		

The reasoning for module output is the same as that for host output.

Proposal: change $V_{CMPP-LF}$ max in 120G.3.2 (Table 120G-3) from 60 mV 32 mV.

Table 120G–3—Module output characteristics at TP4

Parameter	Reference	Value	Units
Signaling rate, each lane (nominal)		53.125 ^a	GBd
Peak-to-peak AC common-mode voltage (max)	120G.5.1		
Low-frequency, $V_{CMPP-LF}$		60	mV
High-frequency, $V_{CMPP-HF}$		80	

Host/module input common mode tolerance

- Table 120G–7—Host input characteristics
 - AC common-mode voltage tolerance is expressed as RMS (25 mV).
 - The intent was to specify that a host has to tolerate what a module may generate.
 - Module output was later redefined to V_{CMPP} (LF and HF).
 - The reference to 120G.3.3.2, which points to 120G.5.1, which defines V_{CMPP-LF} and V_{CMPP-HF}.
- Similarly in Table 120G–9—Module input characteristics, with reference to 120G.3.4.2, which also points to 120G.5.1.

Table 120G–7—Host input characteristics

Parameter	Reference	Test point	Value	Units
Signaling rate, each lane (range)	120G.3.3.1	TP4a	53.125 ± 100 ppm	GBd
Differential peak-to-peak input voltage tolerance (min) for short mode for long mode	120G.5.1	TP4	600 845	mV
AC common-mode RMS voltage tolerance (min)	120G.3.3.2	TP4	25	mV

120G.3.3.2 Host input AC common-mode voltage tolerance

A host input shall meet all other specifications with AC common-mode voltage (see 120G.5.1) up to the limit specified in Table 120G–7.

Table 120G–9—Module input characteristics

Parameter	Reference	Test point	Value	Units
Signaling rate, each lane (range)	120G.3.4.1	TP1	53.125 ± 100 ppm	GBd
Differential pk-pk voltage tolerance (min)	120G.5.1	TP1a	750	mV
AC common-mode RMS voltage tolerance (min)	120G.3.4.2	TP1a	25	mV

120G.3.4.2 Module input AC common-mode voltage tolerance

A module input shall meet all other specifications with AC common-mode voltage (see 120G.5.1) up to the limit specified in Table 120G–9.

Host/module input common mode tolerance

- **Proposal:**

- In both Table 120G–7 and Table 120G–9, split the row "AC common-mode RMS voltage tolerance (min)" into two rows - High-frequency, $V_{\text{CMPP-HF}}$, and Low-frequency, $V_{\text{CMPP-LF}}$; use minimum values identical to corresponding module/host maximum output parameters.
- Change the text in 120G.3.3.2 and 120G.3.4.2 accordingly, with editorial license.