Module DC common mode specifications
(in support of comment 49)

Adee Ran, Cisco

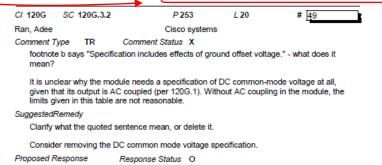# Problem statement

- Module output has DC common-mode voltage (min and max) specifications, with a cryptic footnote

- However, as the footnote states, the CM voltage is generated by the host, so the module's own DC CM is irrelevant and should not be specified

- An apparently missing specification is the range of host DC CM voltages that a module needs to tolerate.

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) Short mode Long mode	120G.5.1	 600 900	 mV mV
Eye height (min)	120G.3.2.2	15	mV
Vertical eye closure, VEC (max)	120G.3.2.2	12	dB
Common-mode to differential return loss (min)	120G.3.1.1	Equation (120G–1)	dB
Effective return loss, ERL (min)	120G.3.2.3	8.5	dB
Differential termination mismatch (max)	120G.3.1.3	10	%
Transition time (min)	120G.3.1.4	8.5	ps
DC common-mode voltage (min)[b]	120G.5.1	−350	mV
DC common-mode voltage (max)[a]	120G.5.1	2850	mV

[a]The signaling rate range is derived from the PMD receiver input.
[b]DC common-mode voltage is generated by the host. Specification includes effects of ground offset voltage.

CI **120G**   SC **120G.3.2**   P **253**   L **20**   # **49**

Ran, Adee   Cisco systems

Comment Type   **TR**   *Comment Status*   **X**

footnote b says "Specification includes effects of ground offset voltage." - what does it mean?

It is unclear why the module needs a specification of DC common-mode voltage at all, given that its output is AC coupled (per 120G.1). Without AC coupling in the module, the limits given in this table are not reasonable.

SuggestedRemedy

Clarify what the quoted sentence mean, or delete it.

Consider removing the DC common mode voltage specification.

Proposed Response   *Response Status*   **O**

What is this specification anyway

- The current host output specification (Table 120G–1) is -0.3 V to +2.8 V

  - This range is consistent with host specifications since 83E (CAUI-4 C2M)

- This suggests that the module's <u>output</u> specification of -350 mV to +2850 mV was intended to be a <u>tolerance</u> specification

  - If so, the parameter name/description needs to be changed to clarify the requirement

  - Module input specification should also be a tolerance specification

Proposed change #1 – parameter naming

- Change module output specification (bottom two rows of Table 120G–3 and footnote b) to

Parameter	Reference	Value	Units
DC common-mode voltage tolerance (range)[b]	120G.5.1	-0.35 – 2.85	V

[b] DC common-mode voltage is generated by the host. A module is required to meet all output specifications with any DC common-mode within the specified range driven at TP4.

- Change module input specification (bottom two rows of Table 120G–9 and footnote) similarly
  - Preferably use consistent units (propose V instead of mV)

Alternatively, create new subclauses with a detailed explanation and refer to them, instead of the footnote