Cl **92** *SC* **92.8.3** *P* **194** *L* **41** # 130

Dawe, Piers IPtronics

Comment Type **TR** *Comment Status* **R**

Following up on D2.0 comment 240: inconsistency between S-parameter frequency range and waveform measurement frequency range. Response says "The capability of an instrument to measure higher frequencies is not a justification to specify them." Adding to that, the cost and increased noise of measuring them is a justification to NOT specify them. Notice that in 92.10.11 Cable assembly integrated crosstalk noise (ICN), the 3 dB reference receiver bandwidth is set to 18.75 GHz.

SuggestedRemedy

In clauses 92 and 93, Reduce the observation bandwidth for waveforms, jitter and similar from 33 GHz to between 18.75 GHz and 25 GHz TBD (e.g. 19.34).
Make an exception for transition time.
Alternatively, increase the S-parameter frequency range to the signalling rate, as OIF does.

Response *Response Status* **U**

REJECT.

The comment does not apply to the substantive changes made between Draft 2.0 and Draft 2.1 and hence is not within the scope of the recirculation ballot.

The bandwidth was chosen to be sufficiently high to minimize the influence of the test equipment on the measured results.

The D2.0 comment 240 was rejected.

Cl **93** *SC* **93.8.1.1** *P* *L* # 133

Dawe, Piers IPtronics

Comment Type **TR** *Comment Status* **R**

The compliance boards in SFP+, Annex 86A (nPPI), InfiniBand FDR and Clause 92 each have a defined reference insertion loss curve. A user has an actual compliance board with a similar but not identical loss. For S-parameter measurements, he can de-embed his actual loss and re-embed the reference loss and get an accurate result. The documents also give a loss range, defining what is a good-enough pair of compliance boards. The ideal (reference) compliance board does not have intentional reflections.

Clause 93's test fixtures are defined differently. There is a range of losses, and only at one frequency. Some ILD and reflections are allowed.
A user with an actual compliance board can de-embed his actual loss, but has to re-embed a loosely specified loss, an ILD, and the reflections of Eq 93-1. Depending what he is measuring, he needs to re-embed the least or the most loss, ILD and/or reflections. He has to do the work at least twice over, possibly more times depending how many corners are relevant. Both in design/simulation and in measurement. The allowed test fixture variability leaks into measurement results unless everyone agrees which corners are relevant for which measurements (e.g. least insertion loss, most return loss of the test fixture for measuring product return loss, most loss for linear fit pulse peak, and so on).

SuggestedRemedy

Use the range of losses, ILD and return loss as guidance for an adequate test fixture. But define the REFERENCE (ideal) test fixture with a specific insertion loss (preferably with an equation) and without deliberate ILD or return loss, as the other specs that use compliance boards do.

Response *Response Status* **U**

REJECT.

The comment does not apply to the substantive changes made between Draft 2.0 and Draft 2.1 and hence is not within the scope of the recirculation ballot.

The Clause 93 test fixtures are defined differently from SFP+, nPPI, 100GBASE-CR4, etc. but this doesn't necessarily render the definition invalid.

The permitted range of insertion loss at 12.89 GHz is 1.2 to 1.6 dB with an ILD allowance of 0.1 dB. This implies the nominal loss target, allowing for ILD, must be in the range of 1.3 to 1.5 dB. Assuming a reference insertion loss would split this difference e.g. 1.4 dB, the difference between the in situ test fixture and the embedded reference would not exceed 0.1 dB. It seems the de-embedding and embedding process could introduce errors of this degree.

Regarding the use of an equation to define the reference insertion loss over frequency, no equation is provided in the suggested remedy for implementation in the draft.