

SCC22 spec consistency and SCC11

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IPtronics

FC-PI-5 comment IPtronics1

Contents

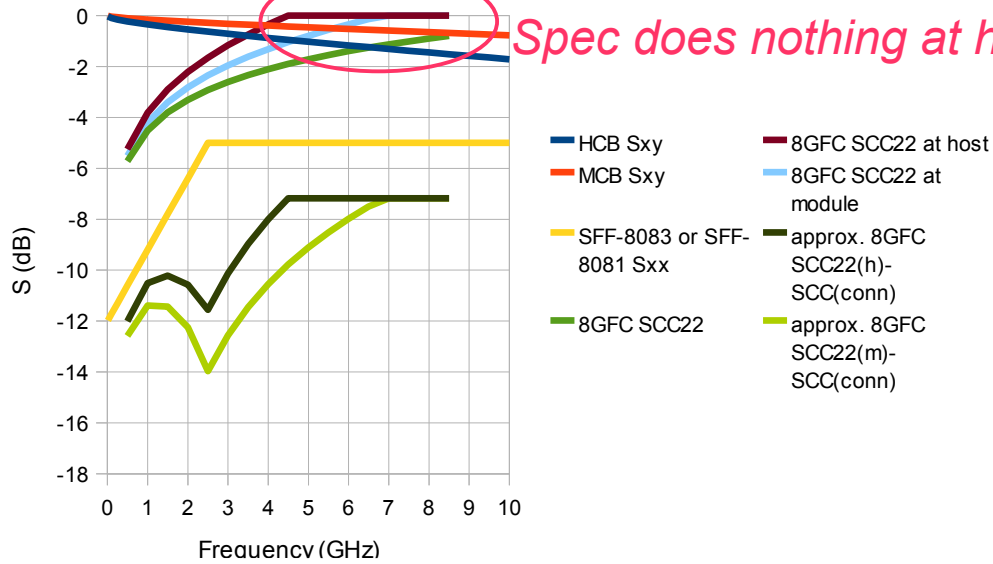
1. Analysing and proposing fix for SCC22 incompatibilities
2. Re-positioning SCC11 specs

Problem statement 1

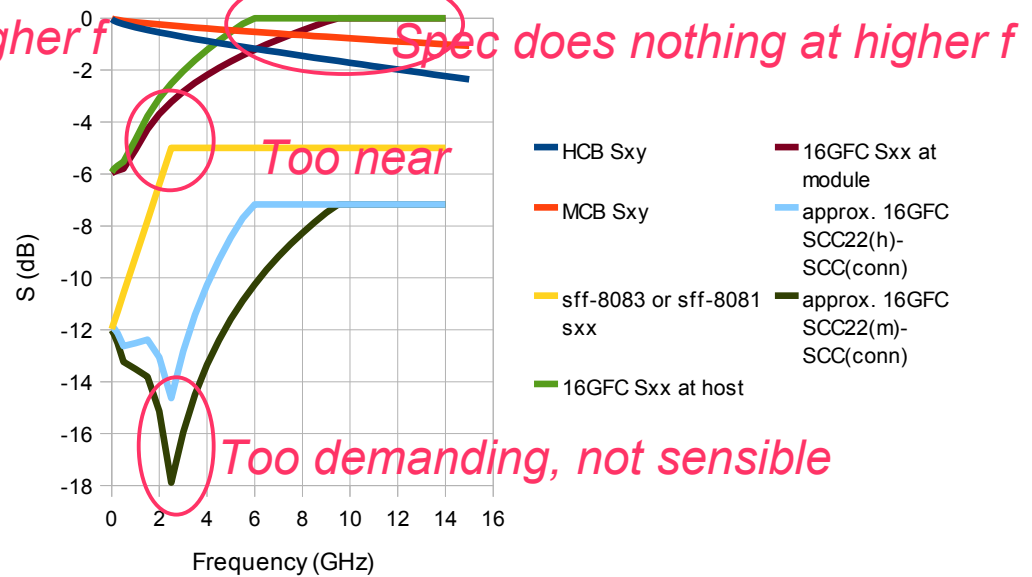
- Following on from D2.0 QLogic 3
- Presentation 10-163v0 shows that in order to achieve good differential return loss in SFP+ connectors it is advantageous to relax the common mode return loss
- The changes made in the last round, surprisingly, leave only a fraction of a dB at 3 GHz between a proposed connector SCCxx spec and the draft FC spec after de-embedding the compliance boards
- So the IC reflection would have to be very good (much better than -20 dB at 3 GHz)!

FC-PI-5 Rev 3.00 with SFF-8083

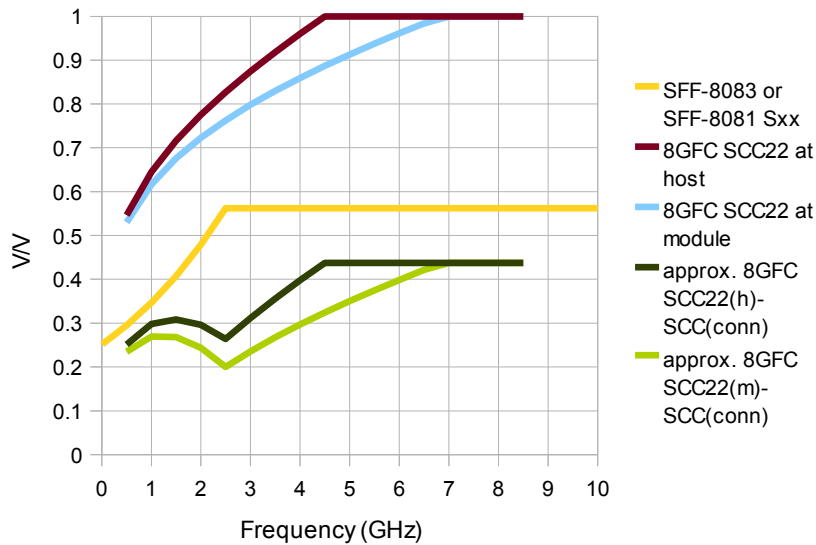
8GFC SCC22 specs (dB)



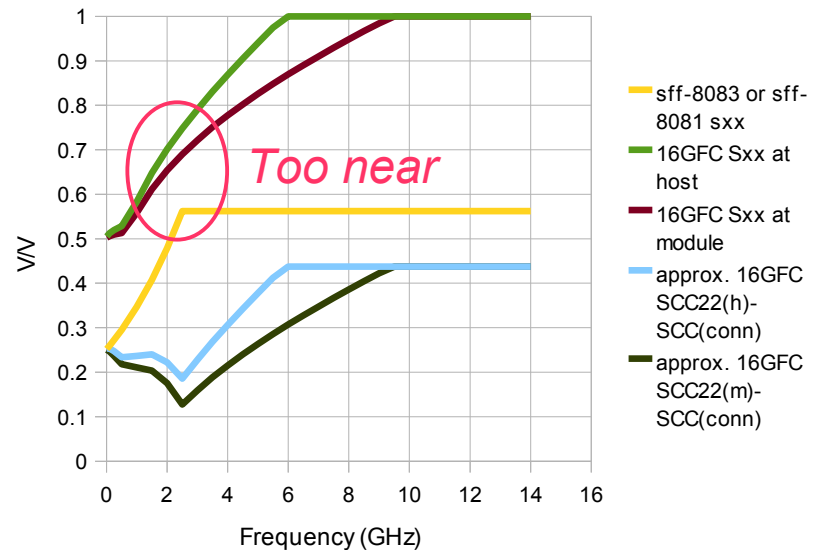
16GFC SCCxx specs (dB)



8GFC SCC22 specs (V/V)

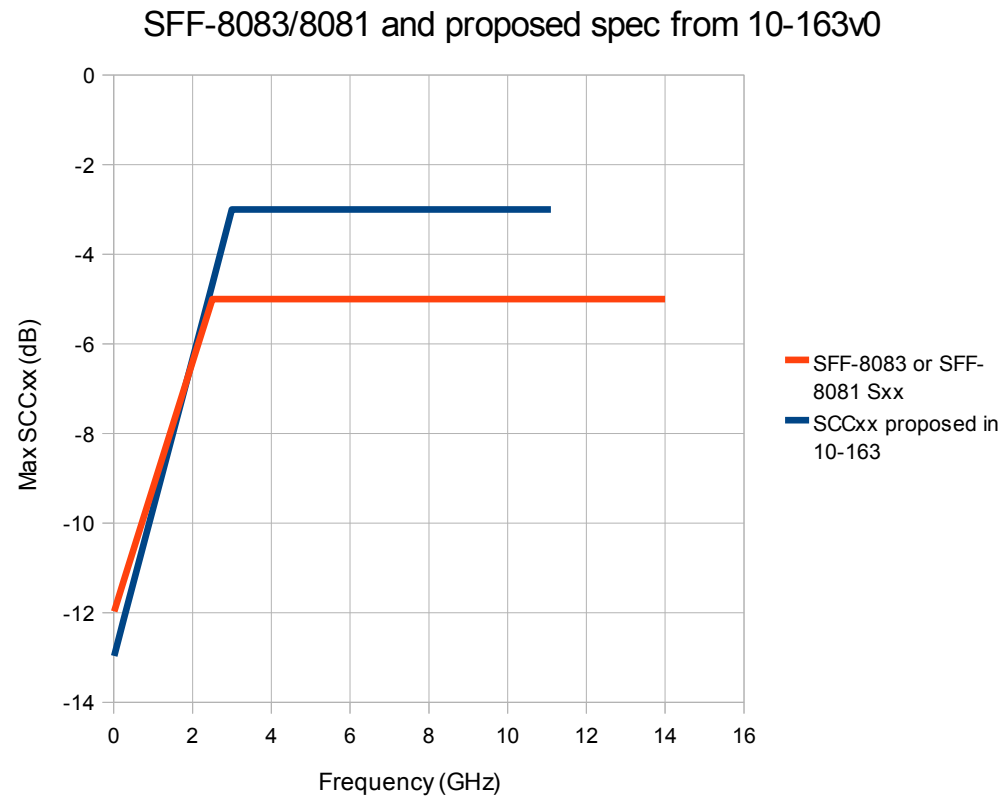


16GFC SCCxx specs (V/V)



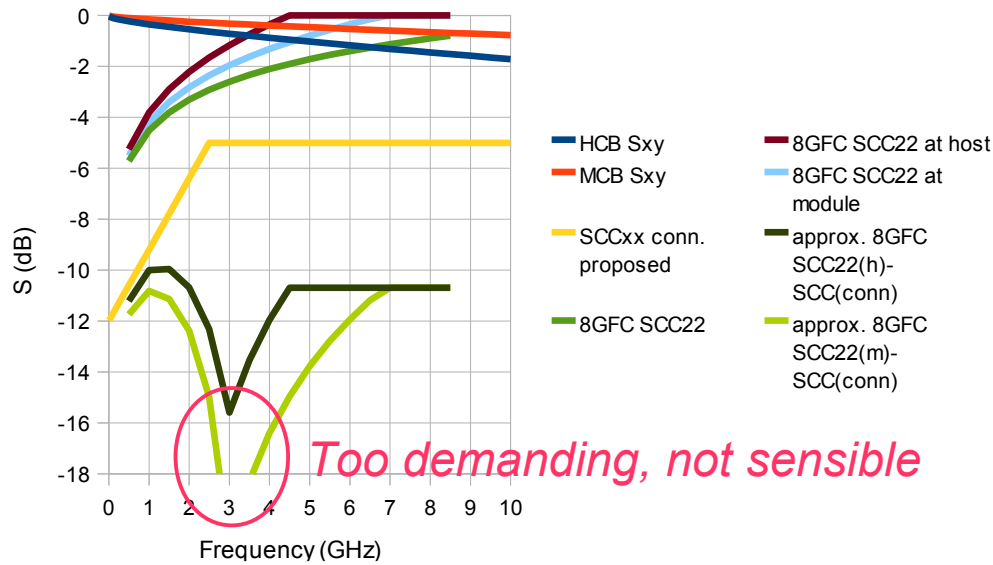
spec c

Expect next generation SFP+ connector will have worse SCCxx

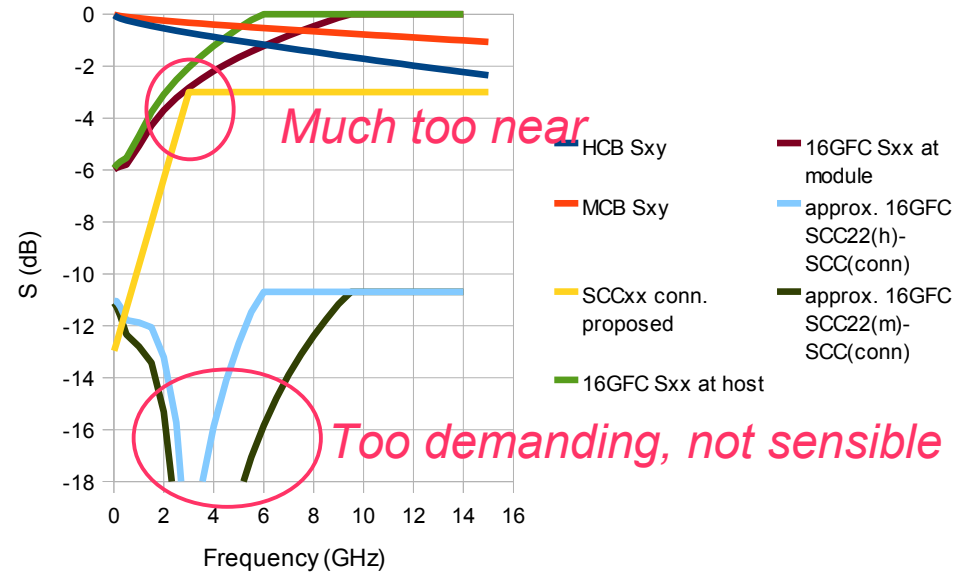


FC-PI-5 Rev 3.00 with proposed SFP+ connector SCCxx

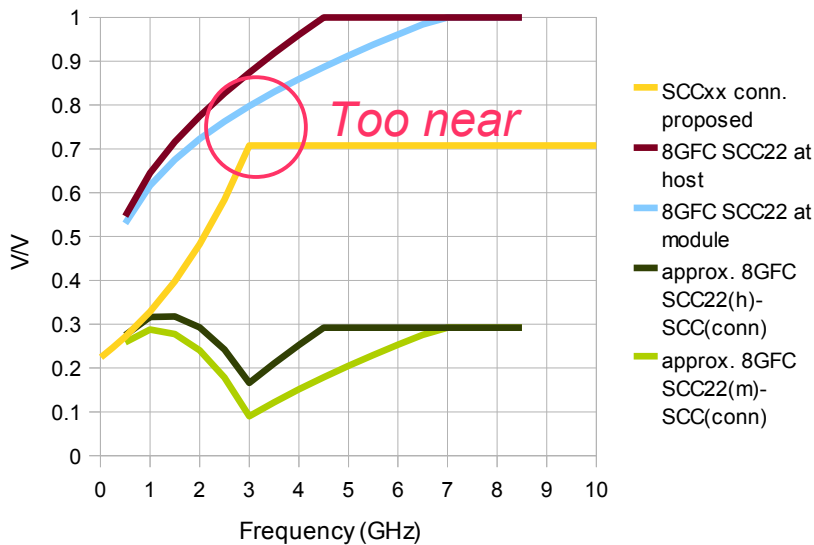
8GFC SCC22 specs (dB)



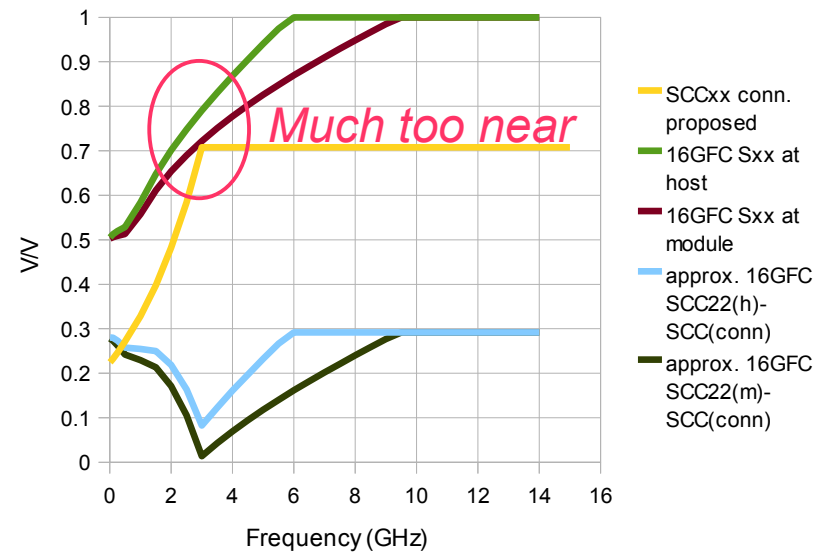
16GFC SCCxx specs (dB)



8GFC SCC22 specs (V/V)



16GFC SCCxx specs (V/V)



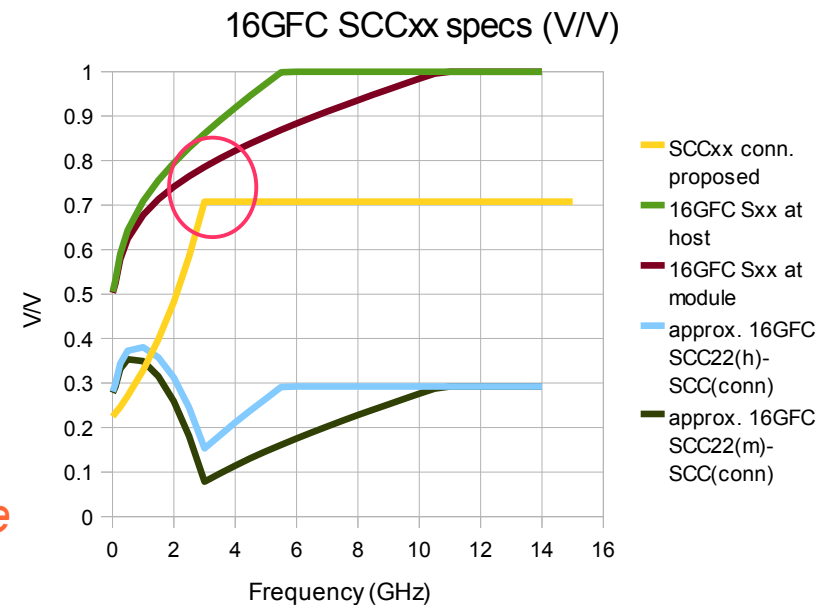
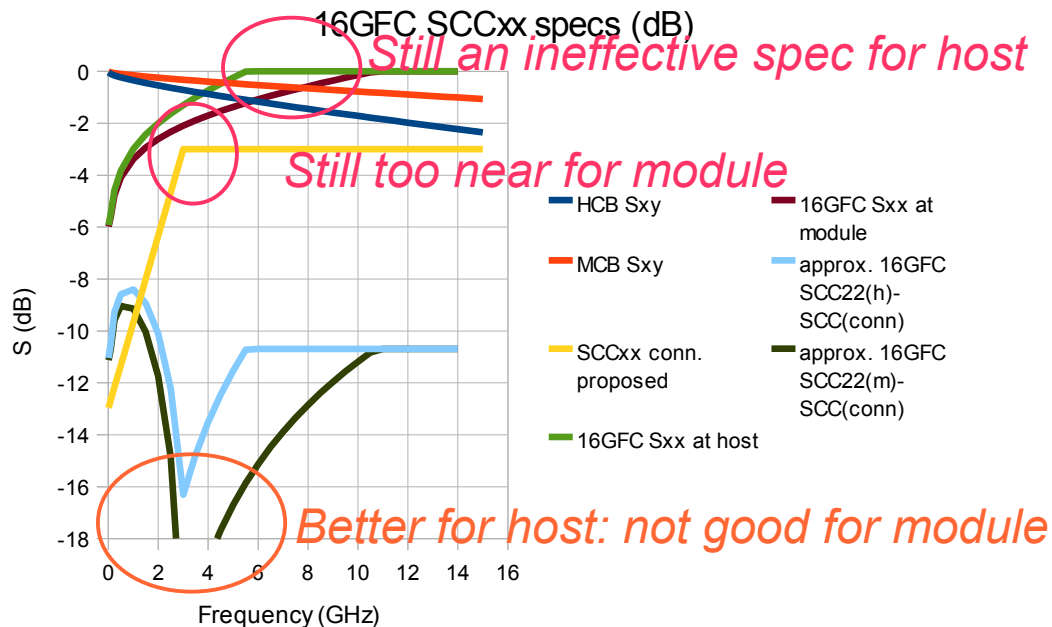
dec consi

Proposal per IPtronics1

Reduce the parameter S (slope, dB/decade) from 4 to 2 for the 16GFC delta points SCC11, SCC22 (transmit and receive)

This will make the spec at 3 GHz more similar for 16GFC and 8GFC (with 16GFC still a little more demanding)

For the connector spec: try to avoid a sharp corner in the 3 GHz region



Improved proposal

Reduce the parameter S (slope, dB/decade) from 4 to 0 and reduce N from -2 to -2.5 for the 16GFC host transmit points SCC22 (common-mode output return loss)

Reduce the parameter S (slope, dB/decade) from 4 to 0 for the 16GFC module receive points SCC22 (common-mode output return loss)

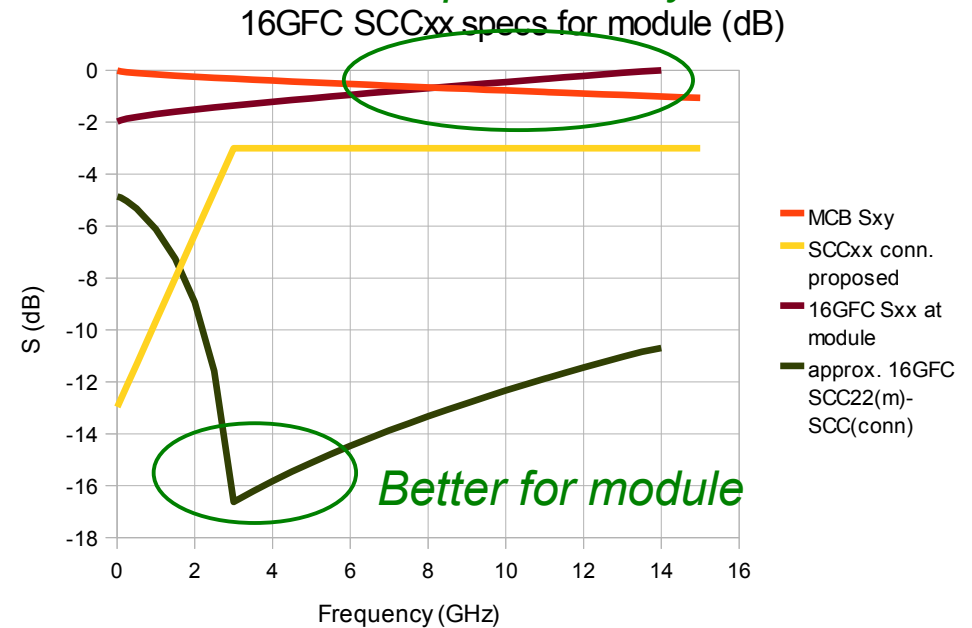
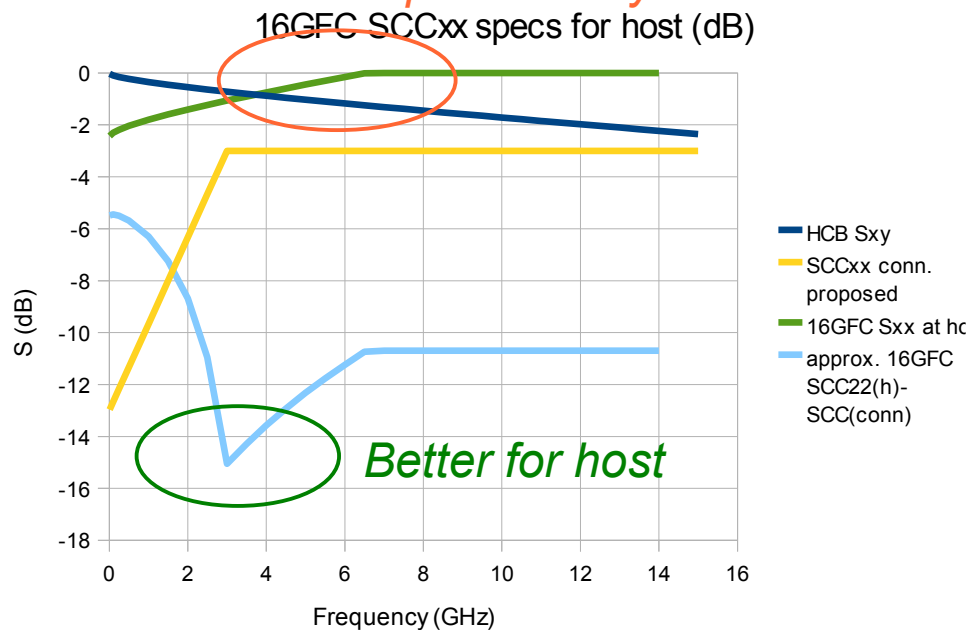
Suggest doing the same for 8GFC (plots in backup, slide 12)

Move SCC11 (common-mode input return loss) to 9.7.3 Electrical channel characteristics – see next slide

For the connector spec: try to avoid a sharp corner in the 3 GHz region

*A bit more effective spec for host
Gradient is provided by HCB*

*More effective spec for module
Gradient is provided by MCB*



Newly discovered SCC11 issue 1/3

- FC-PI-5 has introduced SCC11 (common-mode input return loss) specs for 1600-DF-EL-S and 1600-DF-EA-S
- These are unusual, only partially implemented in the document, and seem to be misplaced: might be intended for 9.7.3 Electrical channel characteristics
- The SCC11 rows may have come from 09-555v0 "Insertion loss deviation and return loss requirements for 1600-DF-EA-S" which showed SCC11 plots for passive cable assemblies and channels, and proposed limits at alpha and delta

Newly discovered SCC11 issue 2/3

- For an optical module or active cable, SCC11 specs are not necessary and are contrary to the usual practice
 - "Usual practice" e.g. SFP+ and 802.3ba: the output is common-mode matched, which controls common-mode echoes, so the input does not need to be, allowing design flexibility e.g. choice of supply voltage
 - For a passive cable or backplane where the far end is well terminated e.g. by test equipment, an SCC11 spec should be achievable
 - But for an FC interface, the SCC11 measured will be that of the downstream input seen through the passive cable or backplane - and that input (ASIC, optical module, whatever...) should not have to be common-mode matched
- SCC11 specs should be removed from table 25 and table 28
- If the committee wants to keep them for passive passive cables or backplanes, they should be placed in 9.7.3 Electrical channel characteristics
- An alternative would be to have SCC11 specs above 1 GHz, so both ends "matched", and below 1 GHz the connector is OK, SCC22 can be better, and one-end matching will be enough

Newly discovered SCC11 issue 3/3: what's in the draft

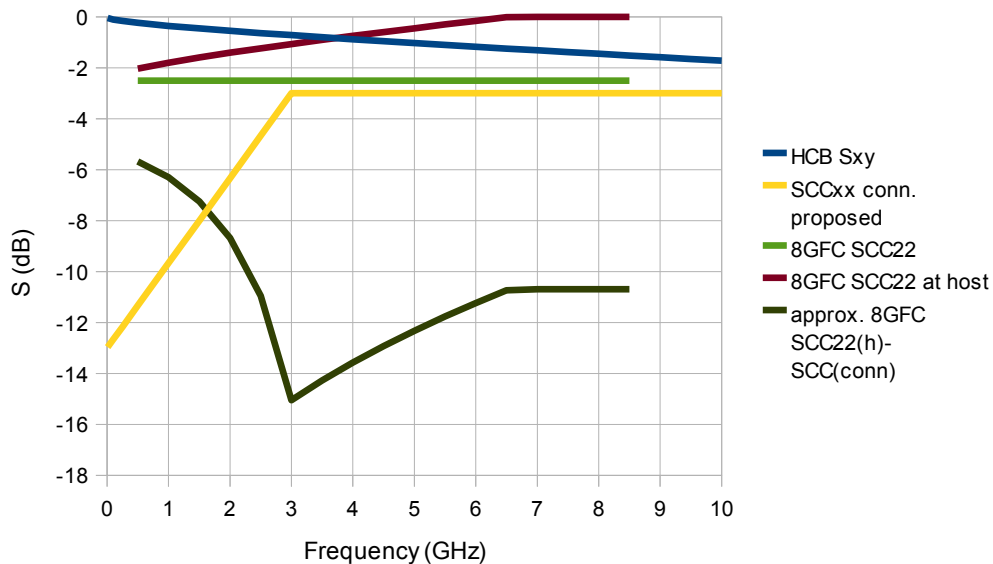
- 9.2.4 Return loss at the transmitter compliance points
 - Table 25 – S parameter at the Transmit Compliance Points
 - 400-DF-EL-S and 800-DF-Ex-S have SCC22 ("common-mode output return loss" in .3ba language) specs but not SCC11 ("common-mode input return loss"). This is like SFP+ and 802.3ba: the output is common-mode matched, which controls common-mode echoes, so the input does not need to be, allowing design flexibility e.g. choice of supply voltage
 - 1600-DF-EL-S and 1600-DF-EA-S have SCC22 AND SCC11 specs:
 - Figure 31 – Sxx at beta T, epsilon T, and gamma T
 - and
 - Figure 32 – Sxx at delta T
 - show SCC22 but not SCC11
 - Text of 9.2.4 mentions SCC22 but not SCC11
- 9.3.3 Return loss at the receive device compliance points
 - Table 28 – S parameter at the receive device compliance points
 - Again, 400-DF-EL-S and 800-DF-Ex-S have SCC22 specs but not SCC11
 - Again, 1600-DF-EL-S and 1600-DF-EA-S have SCC22 AND SCC11 specs
 - Figure 36 – Sxx at the beta R, epsilon R, and gamma R
 - and
 - Figure 37 – Sxx at delta R
 - show SCC22 but not SCC11
 - Text of 9.3.3 mentions SCC11 but not SCC22 in the first paragraph, and SCC22 but not SCC11. Later "Fibre Channel receiver devices shall meet the SCC22..."

Backup: 8GFC SCC22 suggestion

Reduce the parameter S (slope, dB/decade) from 4 to 0 and reduce N from -2 to -2.5 for the 8GFC host transmit points SCC22 (common-mode output return loss)

Reduce the parameter S (slope, dB/decade) from 4 to 0 for the 8GFC module receive points SCC22 (common-mode output return loss)

8GFC SCC22 specs for host (dB)



8GFC SCC22 specs for module (dB)

