In Support of Test Fixtures Comments

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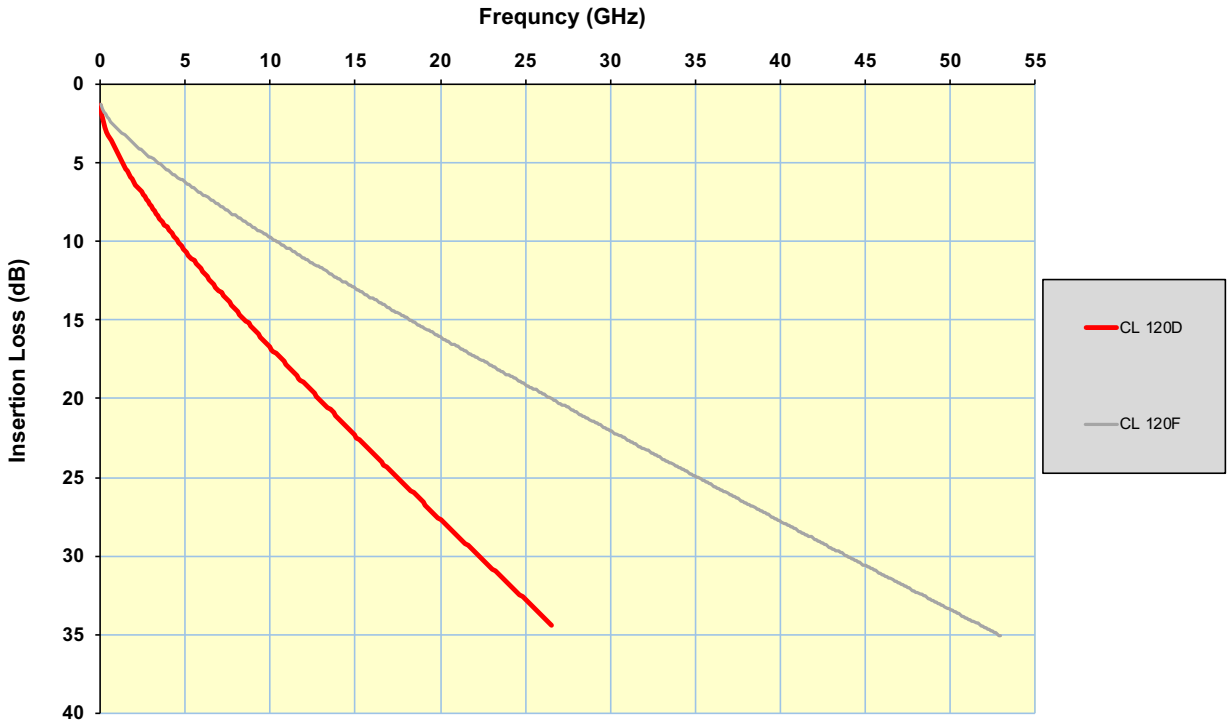
Overview

- **This presentation is supplemental to comments submitted against 802.3ck D1.0, addressing comments related to mated test fixture for C2M/CR and KR/CR test boards**
  - Comment 172
  - Comment 173
  - Comment 177
  - Comment 185
  - Comment 186
  - Comment 187
  - Comment 188.

CL120F Informative Insertion Loss (Comment 177)

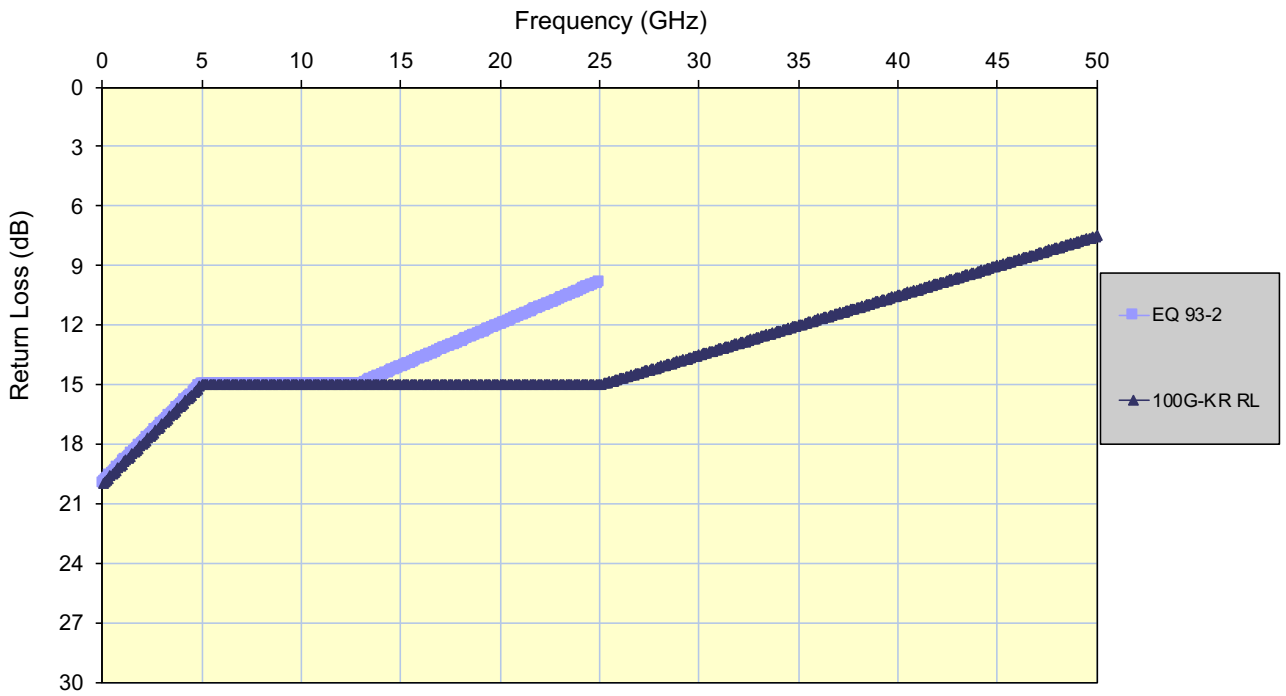
- **CL120F informative insertion loss scaled scaled from CL120D both with 20 dB loss at Nyquist.**

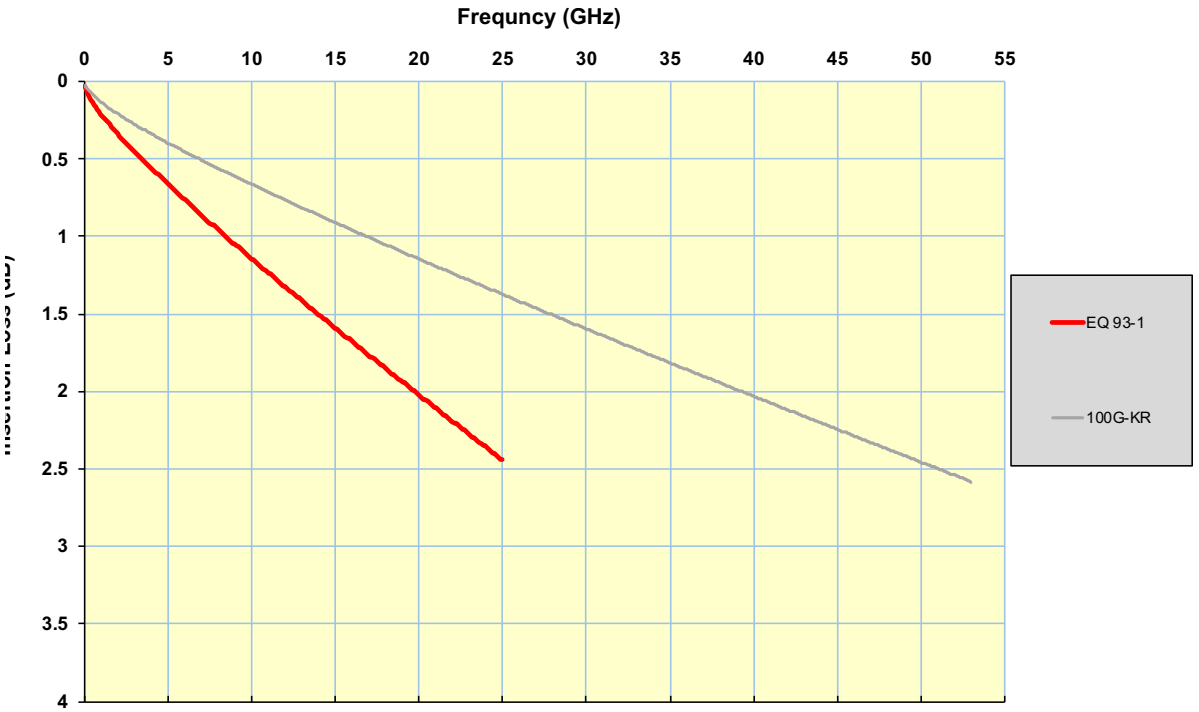


Insertion_Loss(f)=1.083+1.25$\sqrt{f}$ + 0.47f 0.01≤ f ≤ 50 GHz

Update to KR Test Fixture IL and RL (Comment 172, 173)

- **RL scaled but IL max RL at 50 GHz reduced from 9.85 dB to 7.5 dB due to difficulty one would have meeting the RL at 50 GHz.**



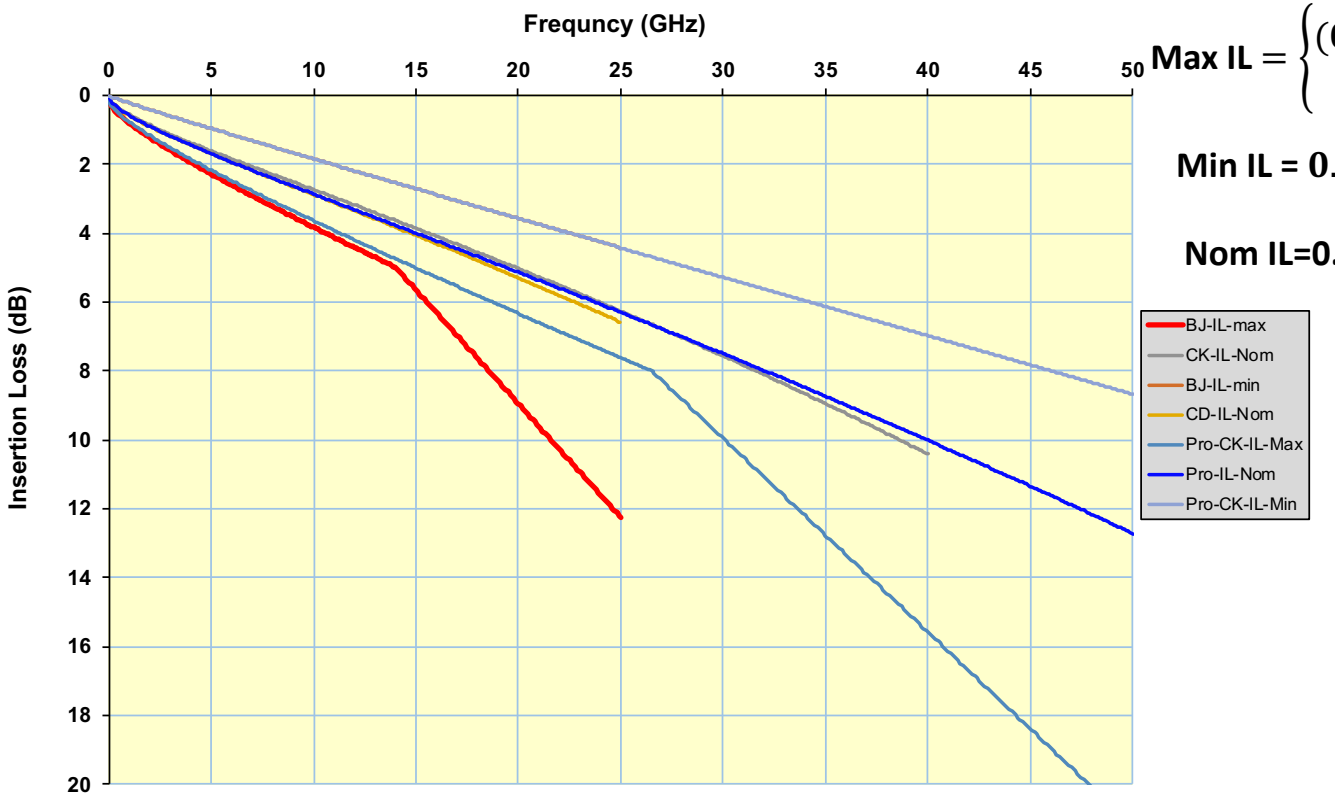


$$\text{RLd(f)} \geq \begin{cases} 20 - f\ dB & 0.05 \leq f \leq 5\ GHz \\ 15\ dB & 5 < f \leq 25\ GHz \\ 22.5 - 0.3f\ dB, & 25 < f \leq 50\ GHz \end{cases}$$

$$\text{Ilref(f)=-0.0015+0.1}\sqrt{f} + 0.035f\ 0.05 \leq f \leq 50\ GHz$$

Mated Board IL (Comment 185)

- **Maintaining the current 6.6 dB loss at 26.55 GHz but adjusting f^2 factor slightly to remove curve past 30 GHz**
  - Also providing min and max loss to replace TBDs
  - FOM ILD (max) <=0.1 dB over range of 0.01-40 GHz.

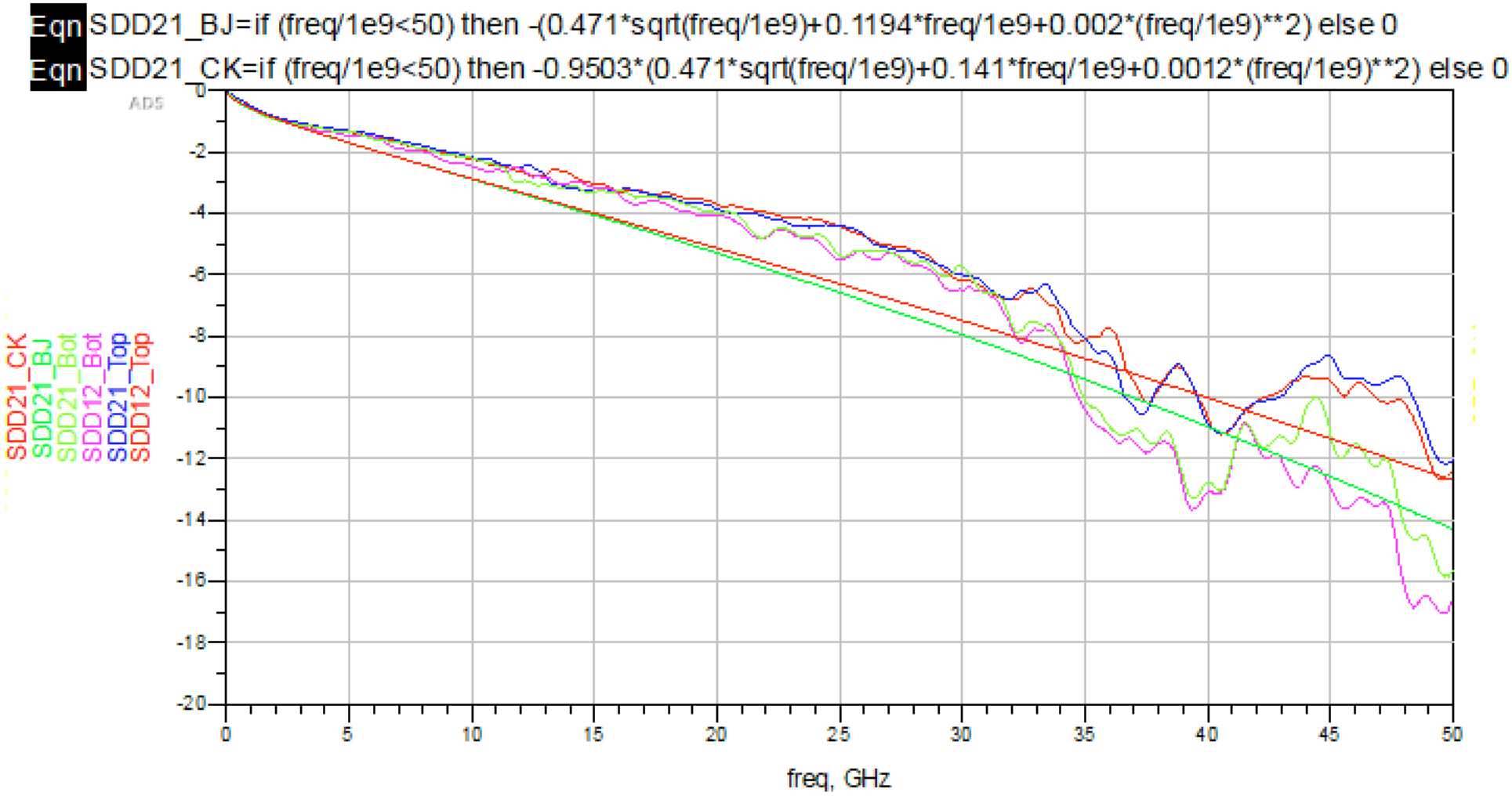


$$\text{Max IL} = \begin{cases} (0.12 + 0.475\times\sqrt{f} + 0.221\times f)\times 0.9503\ dB & 0.01 \le f \le 26.55\ GHz \\ 6.9505 + 0.562\times f & 26.55 < f \le 50\ GHz \end{cases}$$

$$\text{Min IL} = 0.0656\times\sqrt{f} + 0.164\times f$$

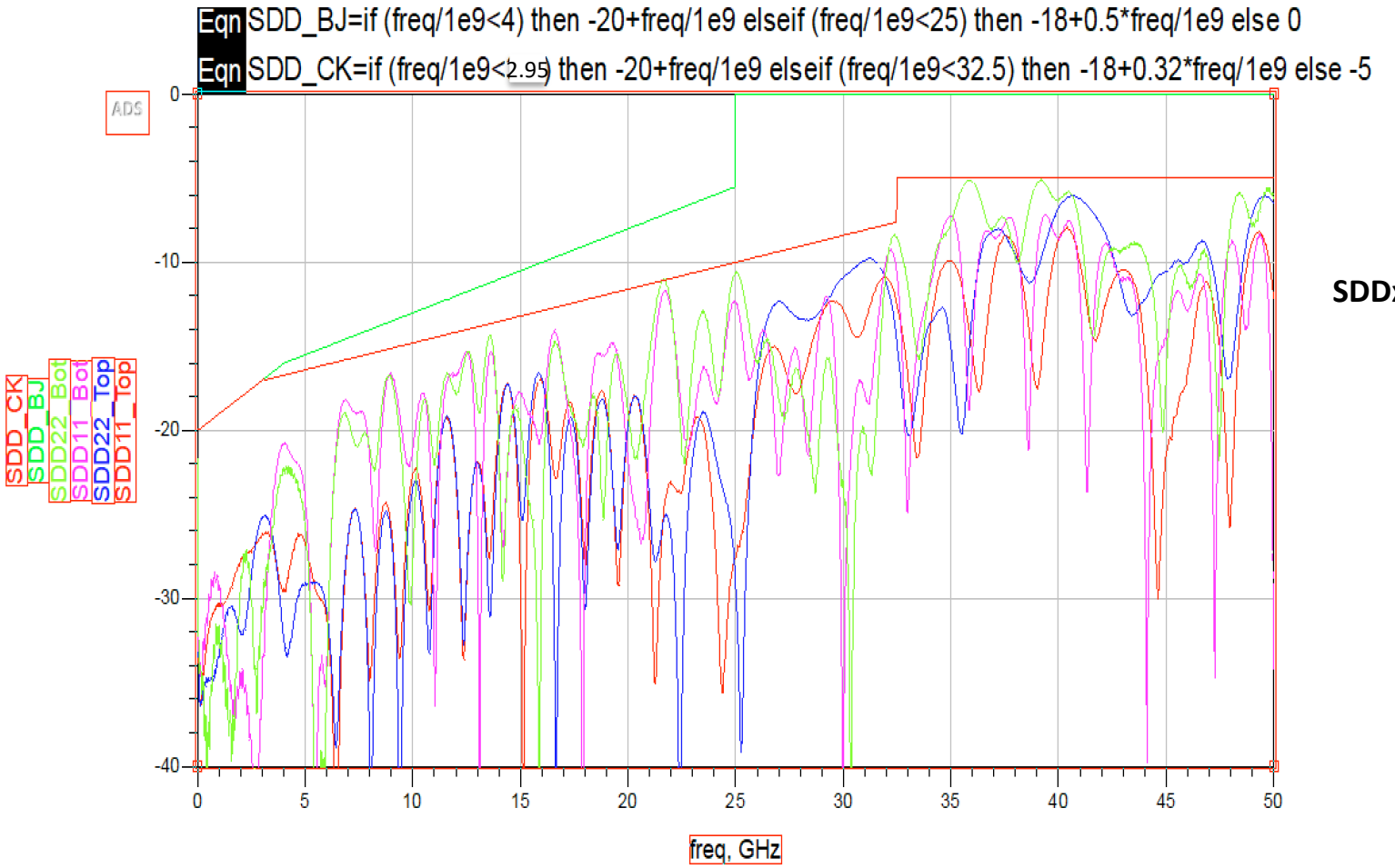
$$\text{Nom IL} = 0.9503\text{x}(0.471\sqrt{f} + 0.141f + 0.0012xf\text{^}2) \quad 0.05 \le f \le 50\ GHz$$

Mated Board IL Compare to Measured QSFP56 MCB/HCB



Mated Board SDD11/22 for Mated QSFP56 Test Board (Comment 188)

- **Proposed SDD extend the BJ SDD11/SDD22 masks**
  - Graph below shows S-parameters for RL invert the sign.



Differential Return Loss Equation

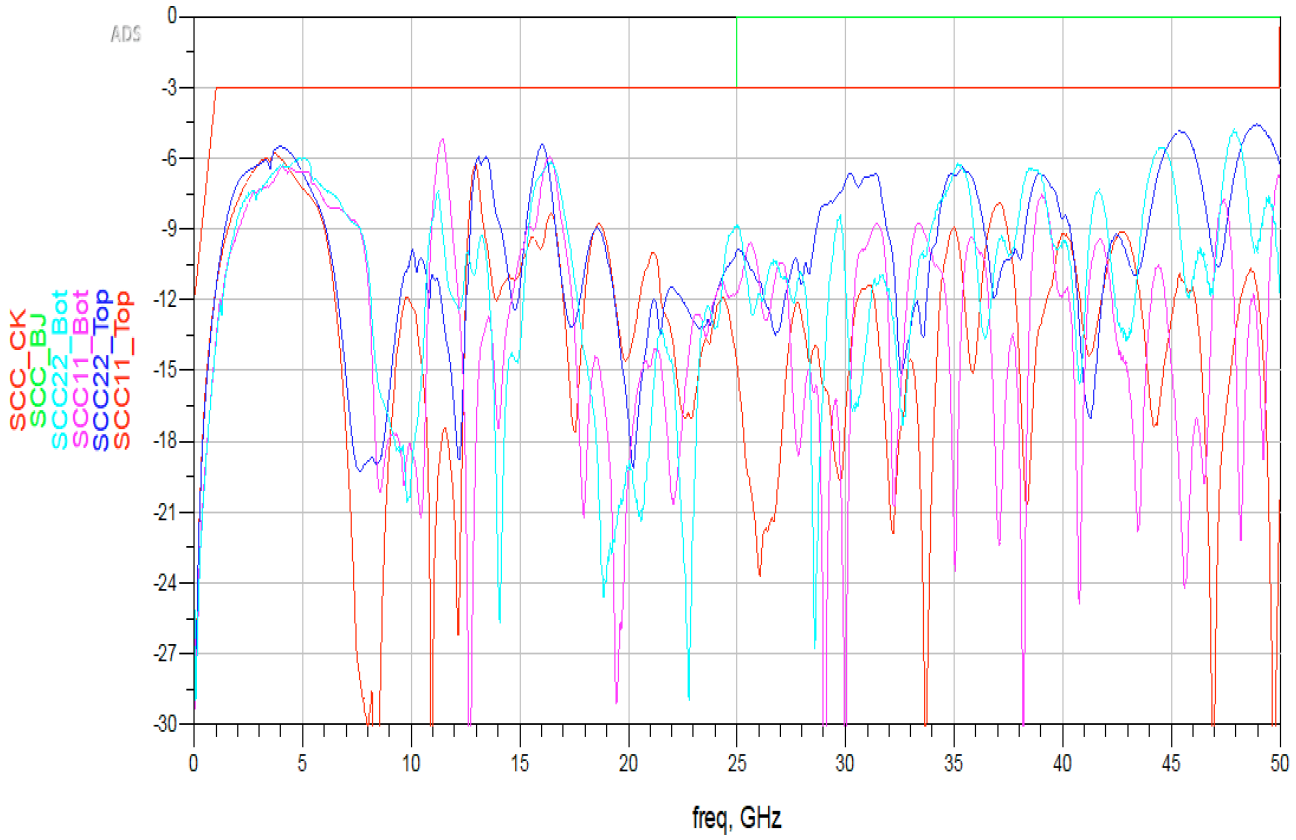
$$\text{SDDxx RL} = \begin{cases} (20 - f) \times 0.9503\ dB & 0.01 \le f \le 2.95\ GHz \\ 18 - 0.32 \times f & 2.95 < f \le 32.5\ GHz \\ 5 & 32.5 < f \le 50\ GHz \end{cases}$$

Mated QSFP56 Test Board SCC11/22

- **Proposed common mode RL extend the BJ SCC11/SCC22 masks**
  - Graph below shows S-parameters for RL invert the sign.

Eqn SCC_BJ=if (freq/1e9<1) then -12+9*freq/1e9 elseif (freq/1e9<25) then -3 else 0

Eqn SCC_CK=if (freq/1e9<1) then -12+9*freq/1e9 elseif (freq/1e9<50) then -3 else 0

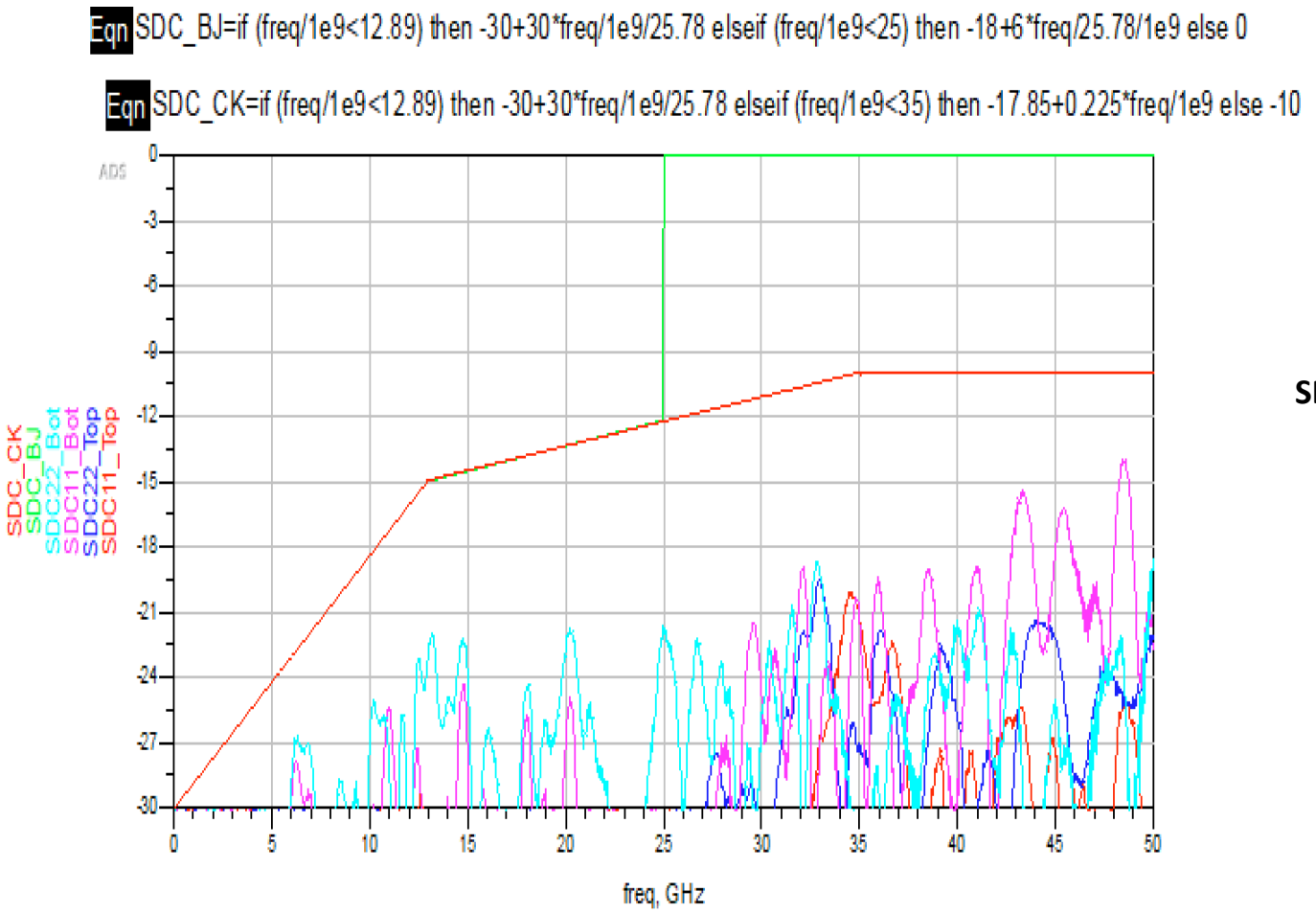


Common Mode Return Loss Equation

$$\text{SCCxx RL} = \begin{cases} (20 - f)\times 0.9503\ dB & 0.01 \le f \le 2.95\ GHz \\ 18 - 0.32\times f & 2.95 < f \le 32.5\ GHz \\ 5 & 32.5 < f \le 50\ GHz \end{cases}$$

Mated QSFP56 Test Board SDC11/22 (Comment 186)

- **Proposed common mode to differential extend the BJ SDC11/22 masks**
  - Graph below shows S-parameters for RL invert the sign.



Differential Return Loss Equation

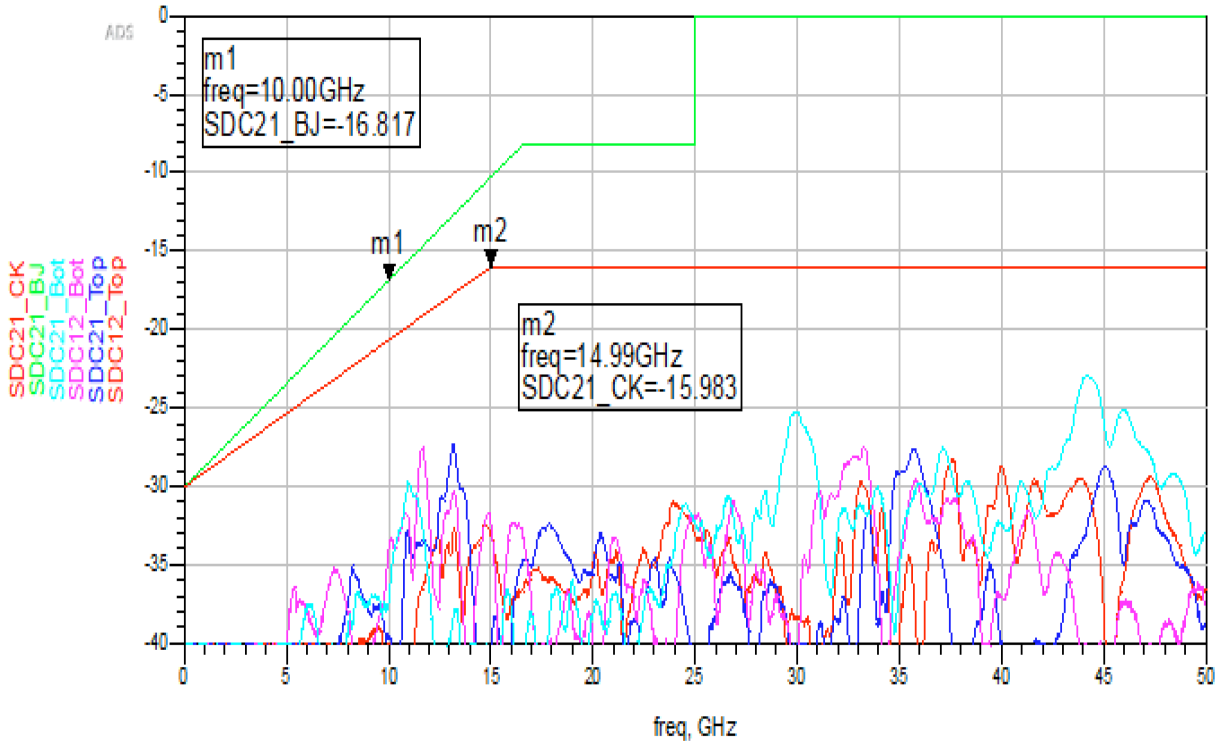
$$\text{SDDxx RL} = \begin{cases} 30 - 30\times\frac{f}{25.78}\,dB & 0.01 \le f \le 12.89\ GHz \\ 17.85 - 0.225\times f & 12.89 < f \le 35\ GHz \\ 10 & 35 < f \le 50\ GHz \end{cases}$$

Mated QSFP-56 Test Board SDC12/21 (Comment 187)

- **Proposed common mode to differential transfer extend the BJ SDC12/21 masks**
  - Graph below shows S-parameters for RL invert the sign
  - The common mode to differential transfer is lower than SDC11/22 not sure why BJ has tighter limit on the SDC11/22 and not on the SDC12/21!

Eqn SDC21_BJ=if (freq/1e9<16.5) then -30+29*freq/1e9/22 elseif (freq/1e9<25) then -8.25 else 0

Eqn SDC21_CK=if (freq/1e9<15) then -30+0.935*freq/1e9 elseif (freq/1e9<50) then -16 else -16



Common Mode to Differential Return Loss Equation

$$\text{SCCxy RL} = \begin{cases} (30 - 0.0.935 \times f)\ dB & 0.01 \le f \le 15\ GHz \\ 16 & 15 < f \le 50\ GHz \end{cases}$$