

Return Loss and ERL Limits for C2M and CR

Ali Ghiasi

Ghiasi Quantum LLC

**IEEE 802.3ck Task Force
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Overview

❑ Contribution in support of following C2M comments

- TP1a SCC22 comment
- TP4 SCC22 comment
- TP1a/TP4a SCD11/22 comment
- TP1/TP4 SCD11/SCD22 comment
- TP1a/TP4a ERL comment
- TP1/TP4 ERL comment

❑ Contribution in support of following CR comments

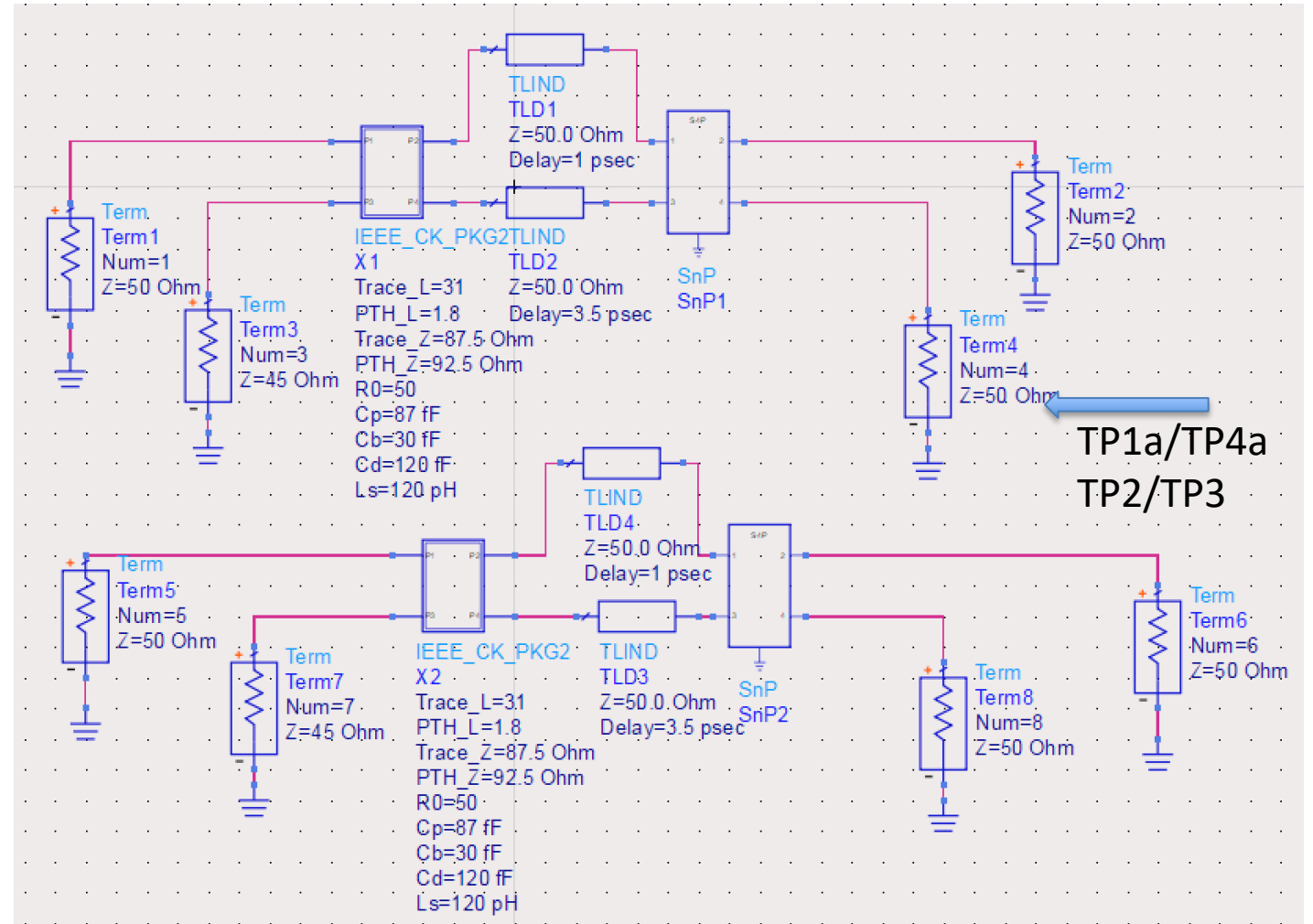
- TP1a SCC22 comment
- TP2/TP3 SCD11/22 comment
- TP2/TP3 ERL comment

❑ Addressing comment **118, 120, 121, 123, 122, 124, 125, 126, 128, 131.**

Host Circuit

Host circuit for SCC, SCD, and ERL analysis include:

- IEEE CK package
- 10% term mismatch
- 2.5 ps delay mismatch
- Yamaichi MCB/HCB.

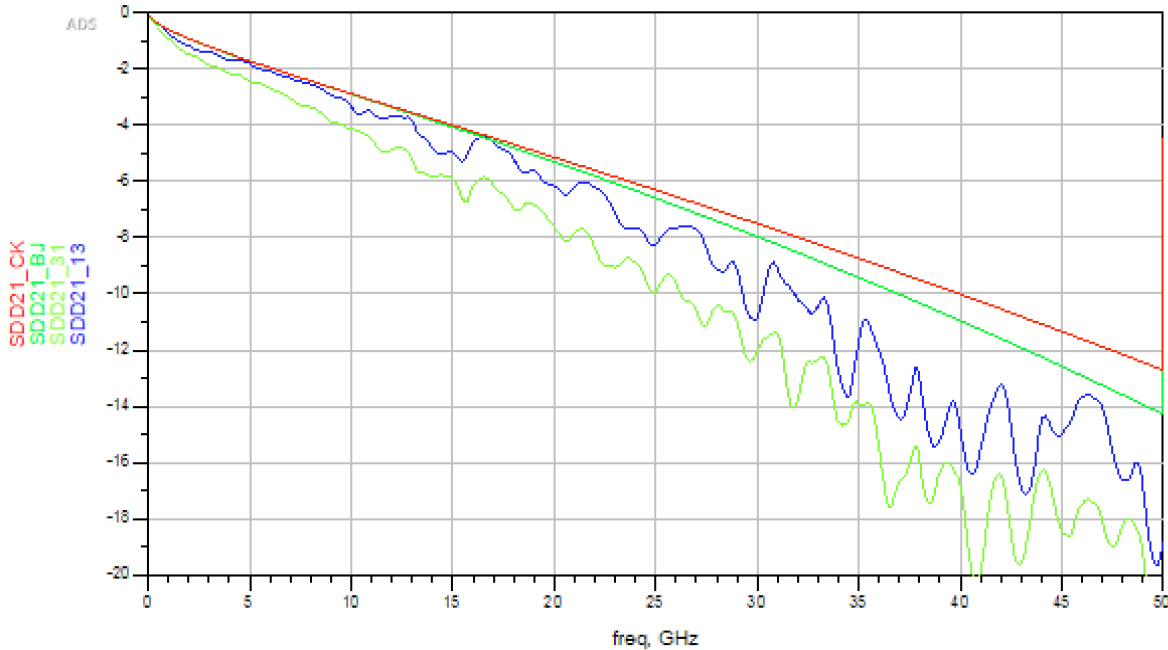


Transfer and Reflectance for Host Circuit (comment 118, 120, 122, 128, 131)

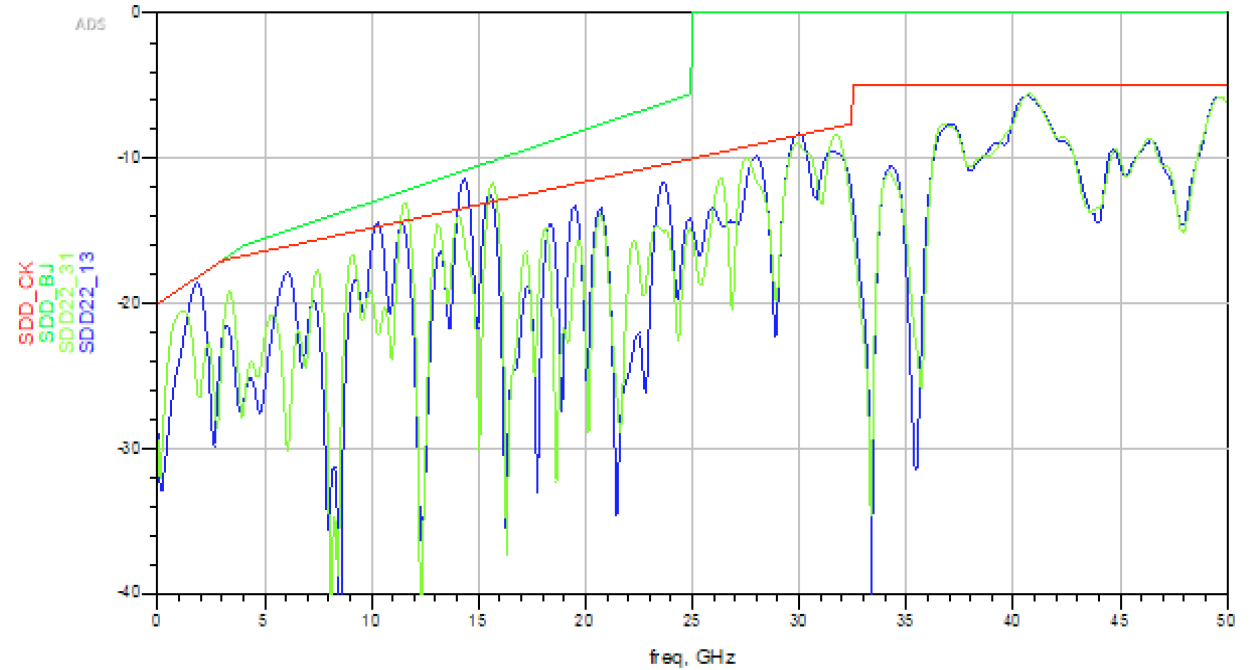
□ SDD11/22 plots are for illustration actual specifications is based on ERL

- C2M TP1a/TP4a ERL=10.5 dB
- CR TP2/TP3 ERL=11.0 dB

```
Eqn SDD21_BJ=if (freq/1e9<50) then -(0.471*sqrt(freq/1e9)+0.1194*freq/1e9+0.002*(freq/1e9)**2) else 0
Eqn SDD21_CK=if (freq/1e9<50) then -0.9503*(0.471*sqrt(freq/1e9)+0.141*freq/1e9+0.0012*(freq/1e9)**2) else 0
```

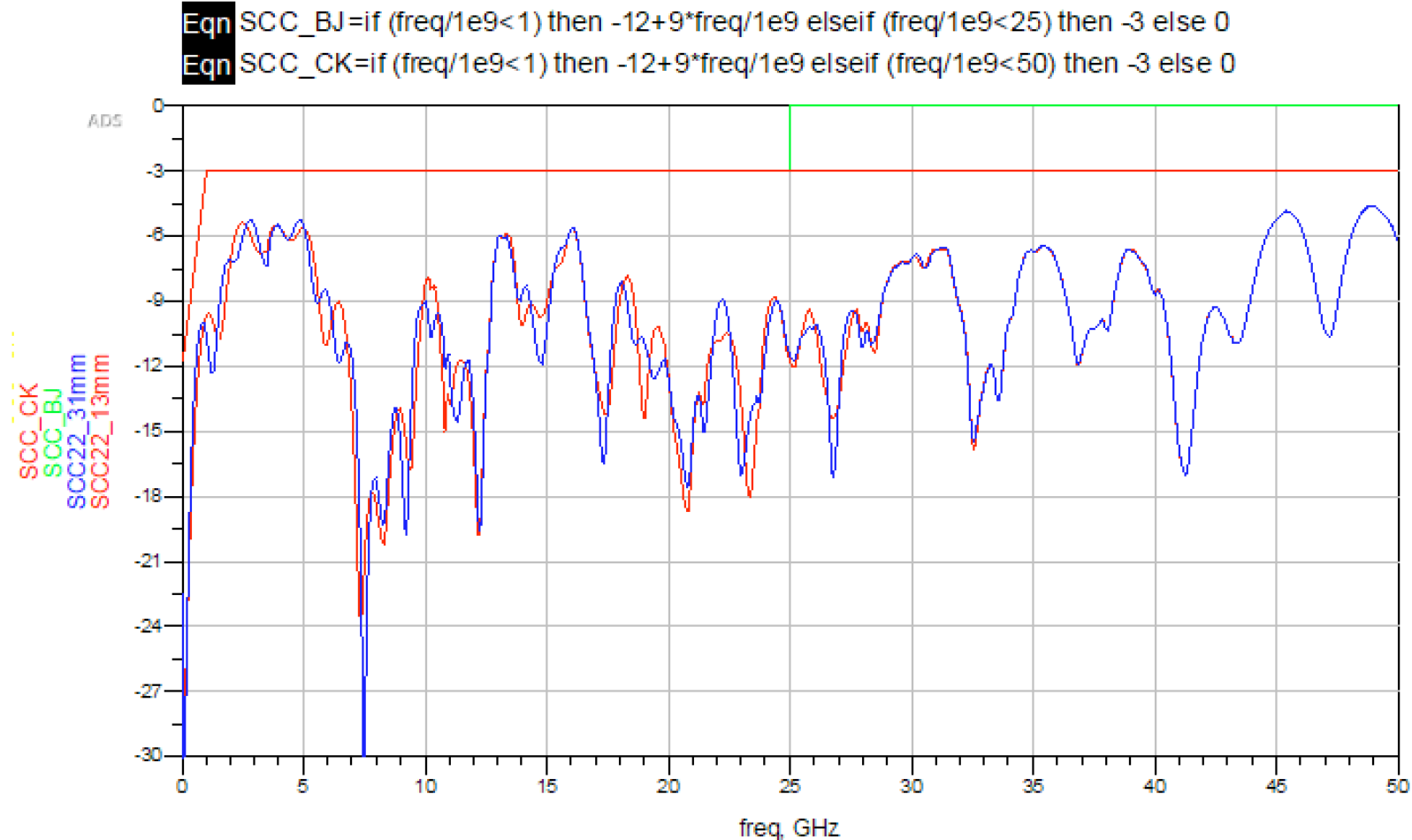


```
Eqn SDD_BJ=if (freq/1e9<4) then -20+freq/1e9 elseif (freq/1e9<25) then -18+0.5*freq/1e9 else 0
Eqn SDD_CK=if (freq/1e9<3.1) then -20+freq/1e9 elseif (freq/1e9<32.5) then -18+0.32*freq/1e9 else -5
```



Host SCC11/22 (comment 118, 126, 127)

- Graph are in reflectance but IEEE 802.3ck specifies return loss.

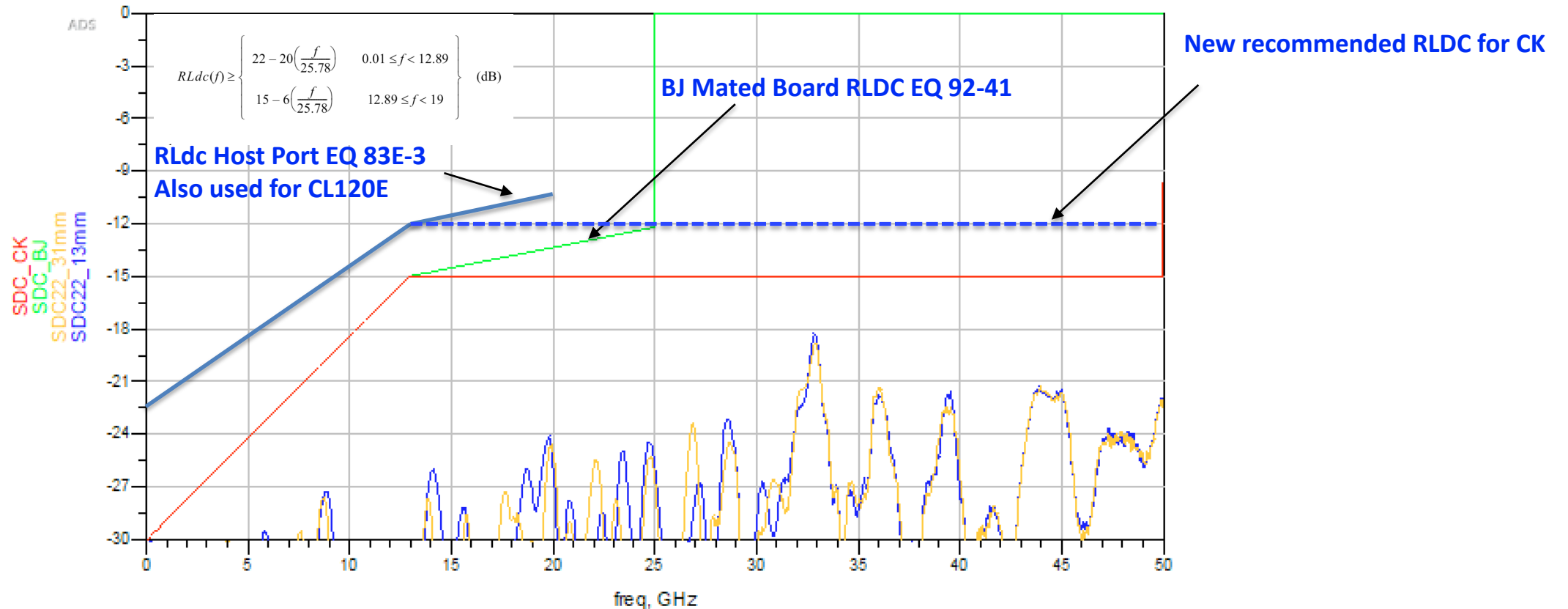


Host SDC11/22 (comment 119, 130)

- Graph are in reflectance but IEEE 802.3ck specifies return loss (BJ EQ 92-41).

Eqn SDC_BJ = if (freq/1e9 < 12.89) then -30 + 30 * freq/1e9 / 25.78 else if (freq/1e9 < 25) then -18 + 6 * freq/25.78 / 1e9 else 0

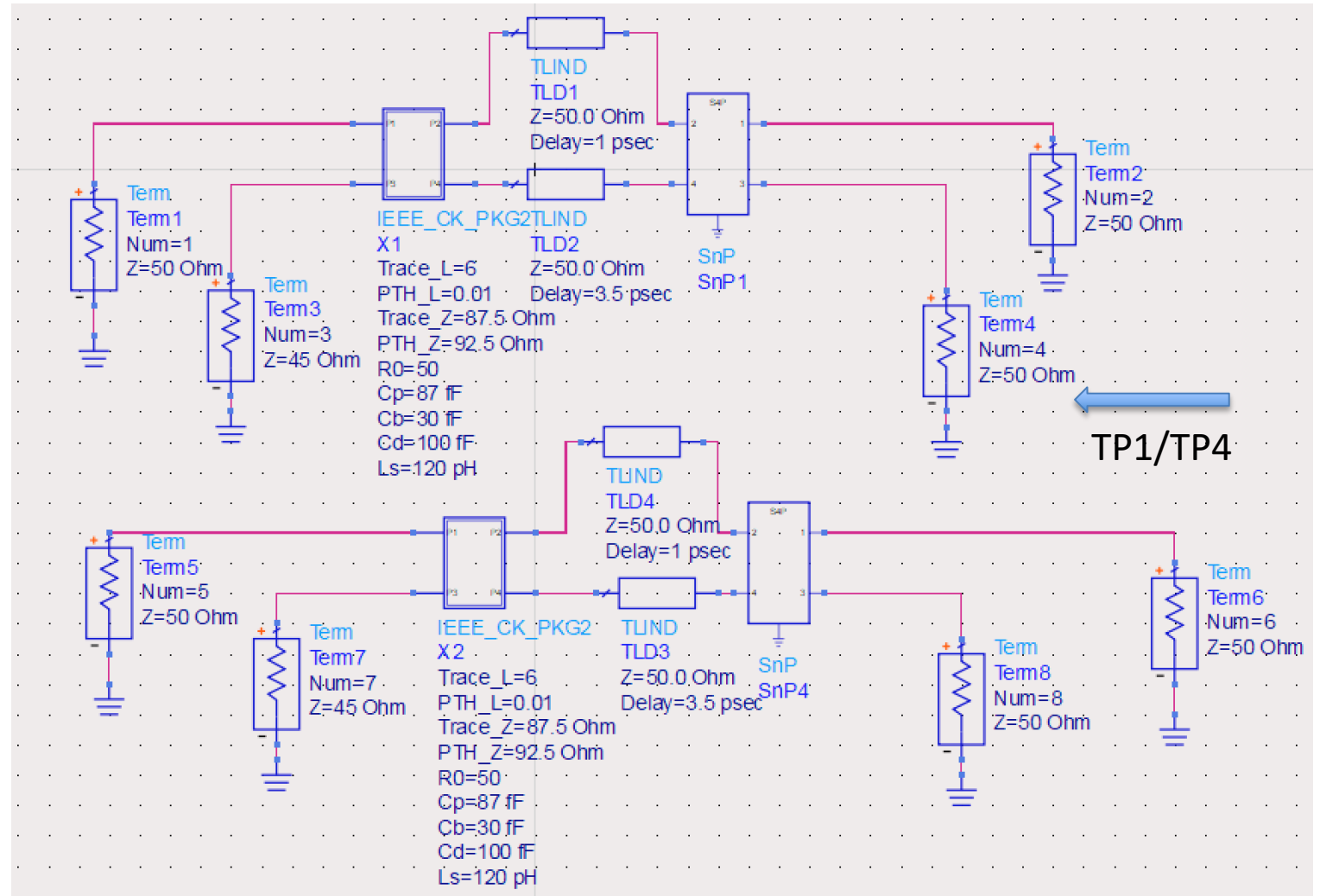
Eqn SDC_CK = if (freq/1e9 < 12.89) then -30 + 30 * freq/1e9 / 25.78 else if (freq/1e9 < 50) then -15 else 0



Module Circuit

Module circuit for SCC, SCD, and ERL analysis:

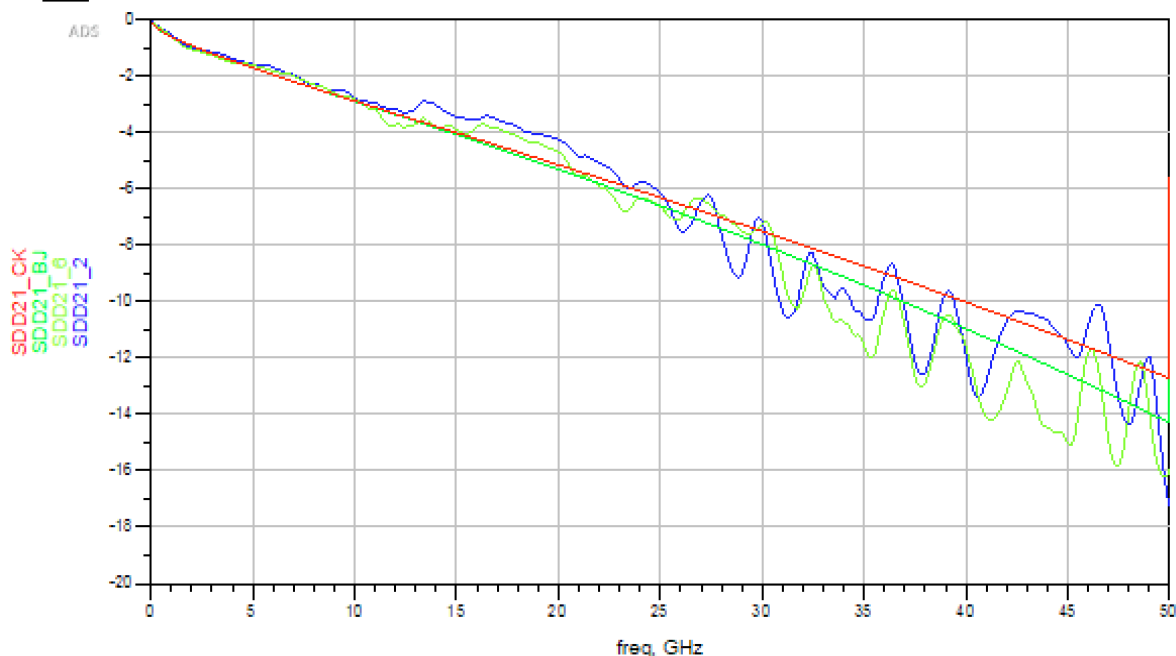
- IEEE CK package
- Yamaichi MCB/HCB
- 10% term mismatch
- 2.5 ps delay mismatch.



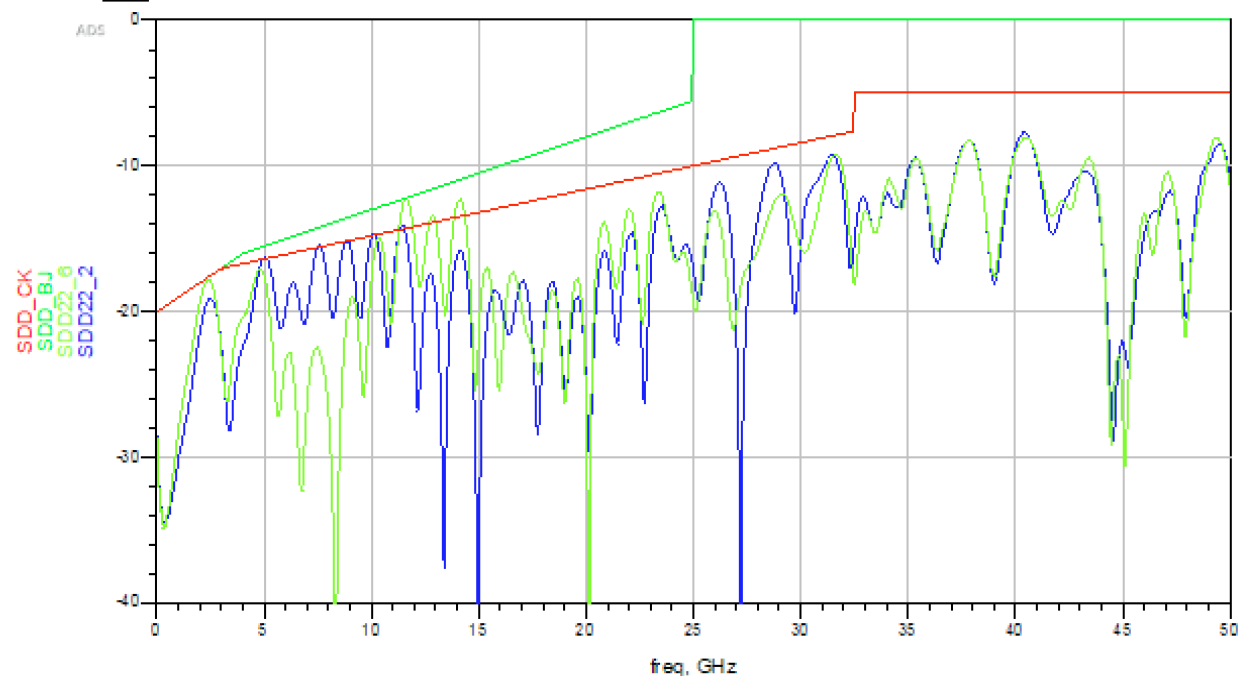
SDD/ERL Analysis (comment 121, 123)

□ C2M TP1/TP4 ERL=11.5 dB

```
Eqn SDD21_BJ=if (freq/1e9<50) then -(0.471*sqrt(freq/1e9)+0.1194*freq/1e9+0.002*(freq/1e9)**2) else 0  
Eqn SDD21_CK=if (freq/1e9<50) then -0.9503*(0.471*sqrt(freq/1e9)+0.141*freq/1e9+0.0012*(freq/1e9)**2) else 0
```

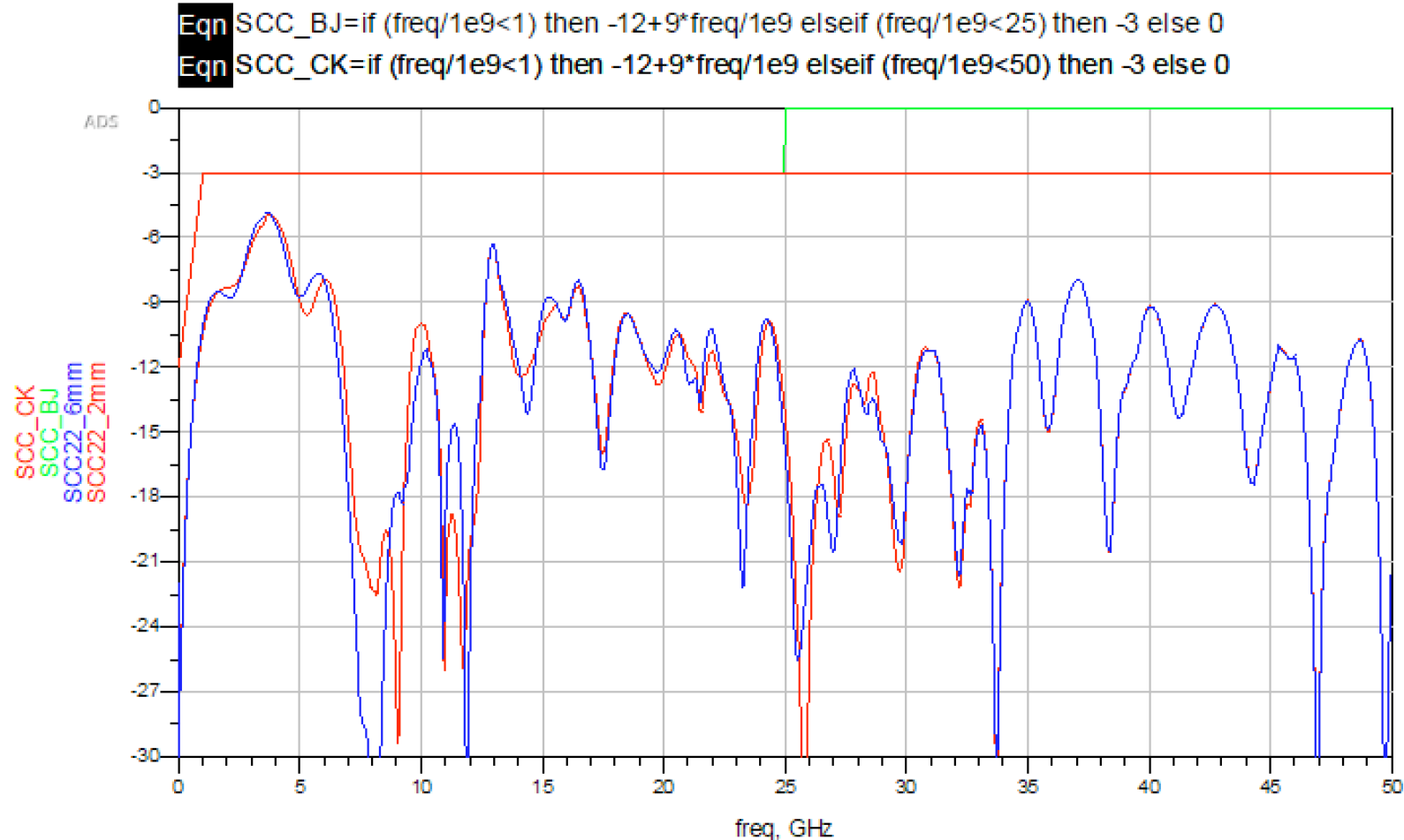


```
Eqn SDD_BJ=if (freq/1e9<4) then -20+freq/1e9 elseif (freq/1e9<25) then -18+0.5*freq/1e9 else 0  
Eqn SDD_CK=if (freq/1e9<3.1) then -20+freq/1e9 elseif (freq/1e9<32.5) then -18+0.32*freq/1e9 else -5
```



Module SCC11/22 (comment 224)

- Graph are in reflectance but IEEE 802.3ck specifies return loss.



Module SDC11/22 (comment 124, 125)

- Graph are in reflectance but IEEE 802.3ck specifies return loss (BJ EQ 92-41).

Eqn SDC_BJ=if (freq/1e9<12.89) then -30+30*freq/1e9/25.78 elseif (freq/1e9<25) then -18+6*freq/25.78/1e9 else 0

Eqn SDC_CK=if (freq/1e9<12.89) then -30+30*freq/1e9/25.78 elseif (freq/1e9<50) then -15 else 0

