# PPI MCB-HCB Detail Specifications and Connector Pinout

IEEE P802.3ba

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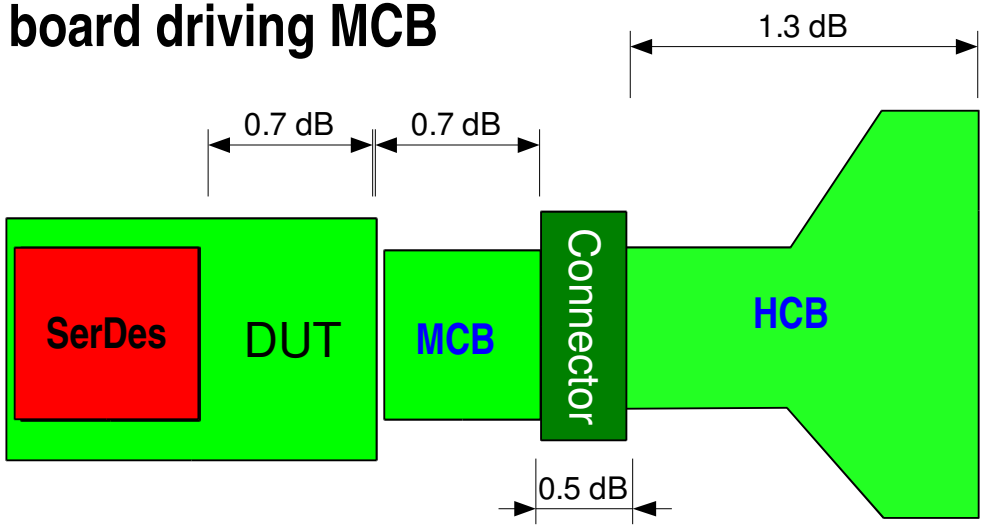
# Key Items Require Further Work

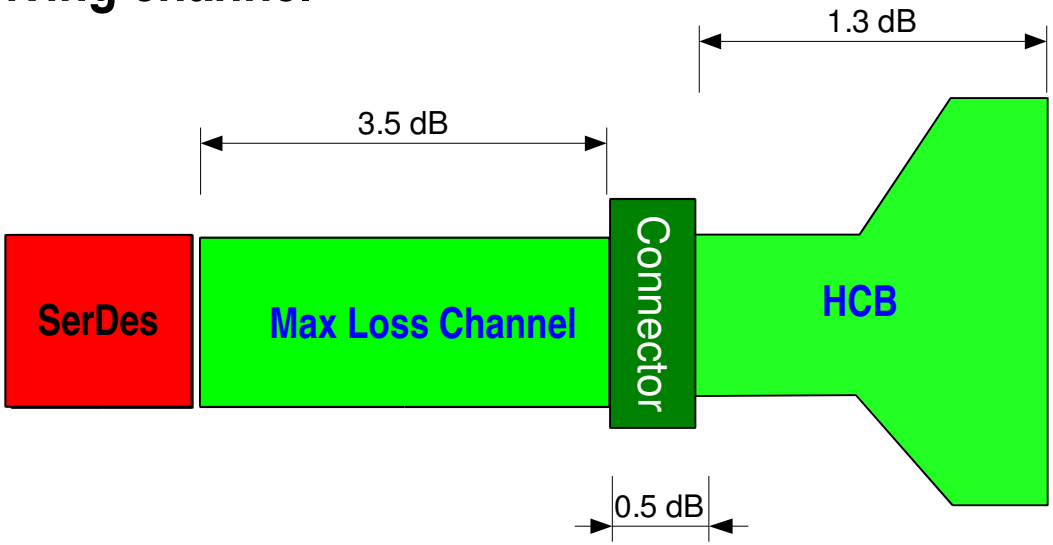
- **PMA to TP1 and TP4 to PMA loss**
- **Test point definition**
- **Channel loss budget**
- **MCB-HCB response**

# SR4/SR10 Loss Budget

- **SerDes test board driving MCB**

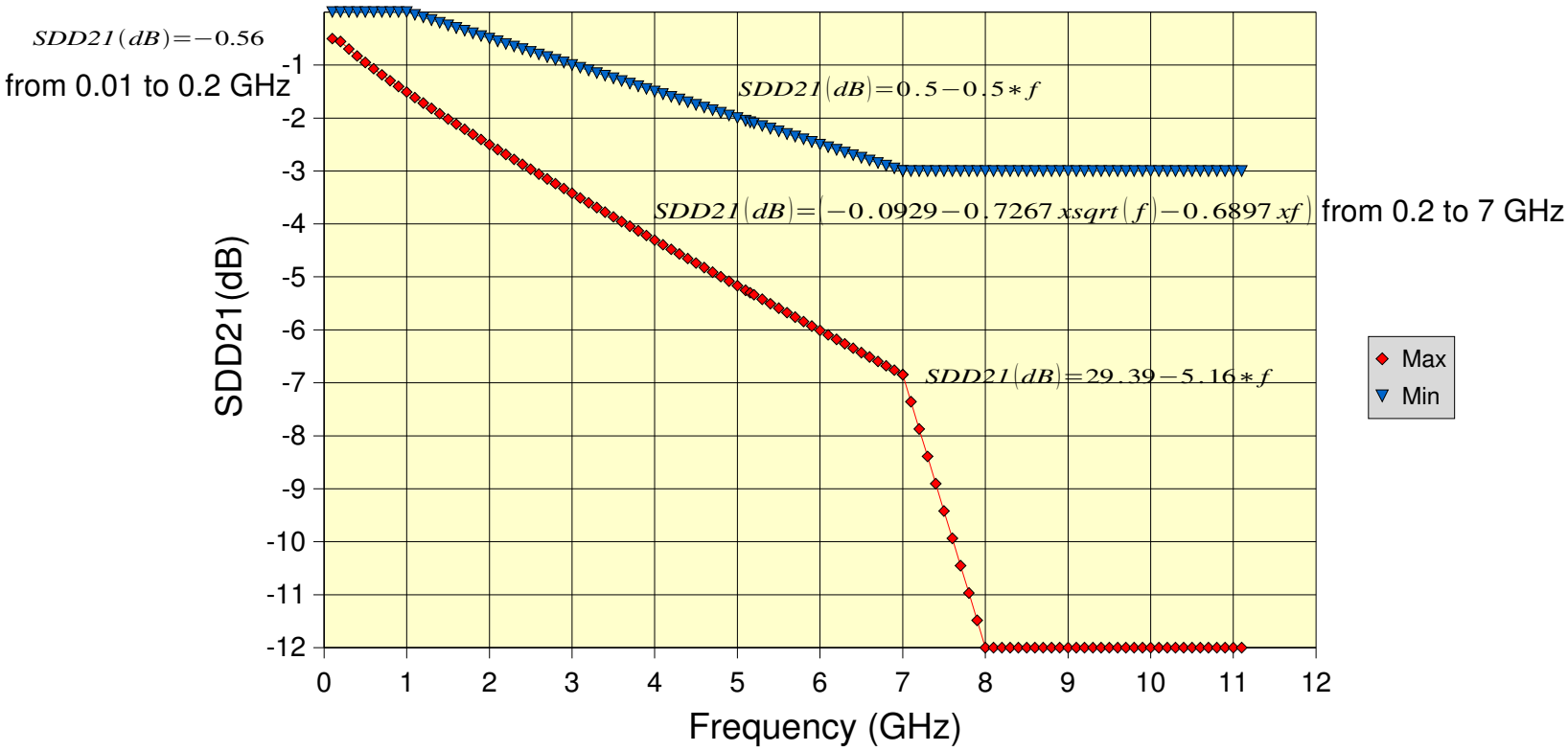



- **SerDes driving channel**



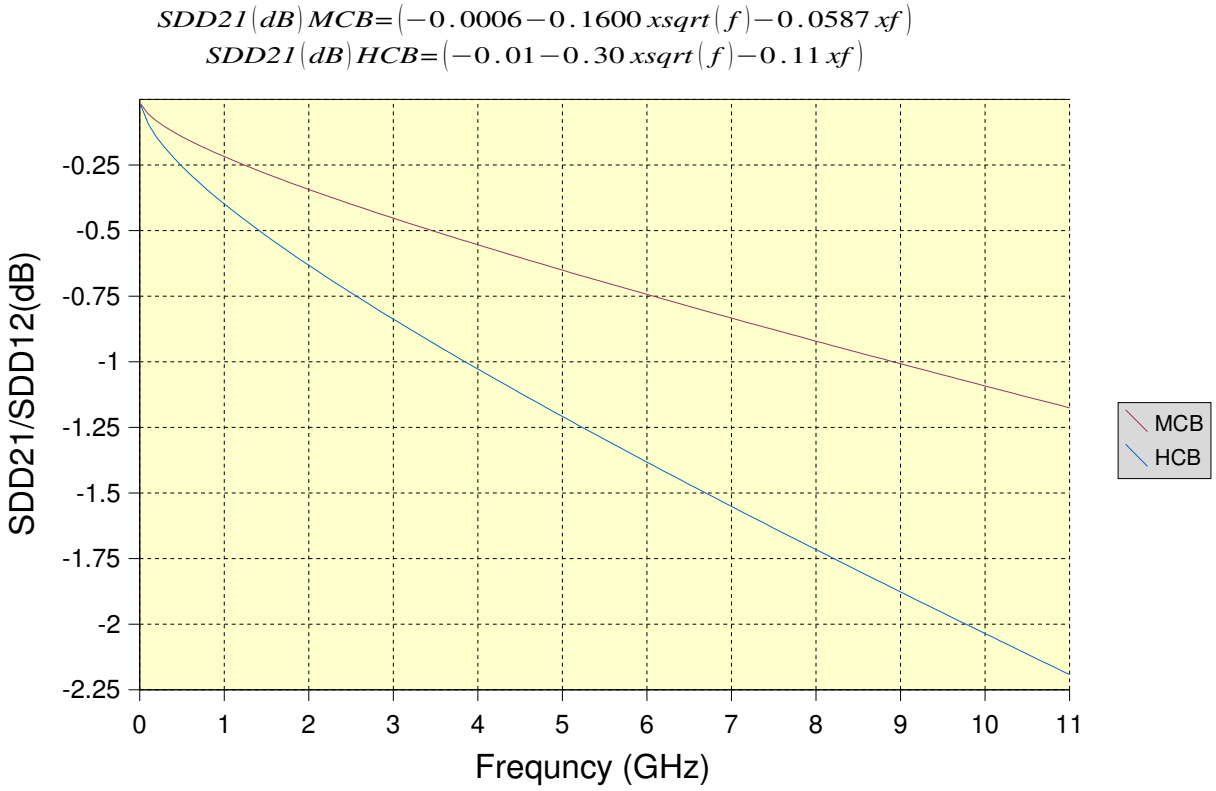
# Updated SR4/SR10 Channel Loss

- **5.3 dB loss at Nyquist include HCB loss assuming 1.3 dB**
  - **Host PCB Loss = 5.3 dB – 1.3 dB (HCB loss) – 0.5 (Connector loss)=3.5 dB**
    - **Supports 3 to 6” of PCB trace**



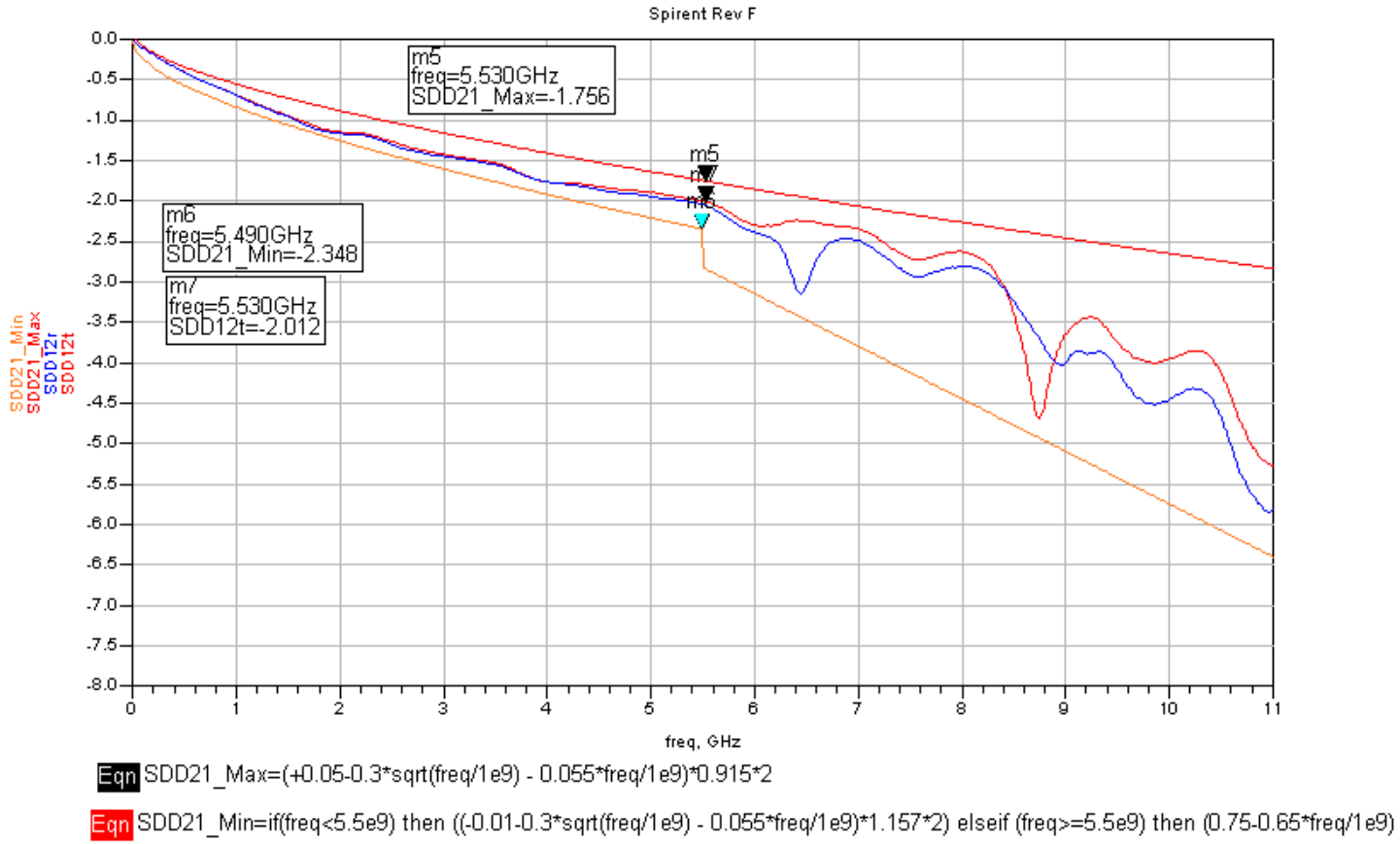
# MCB and HCB recommended PCB Loss

- **MCB and HCB PCB loss is increased by about 0.2 dB from from SFP+ loss at Nyquist to allow longer PCB traces.**



# SFP+ MCB-HCB Mated SDD21/SDD12 Response

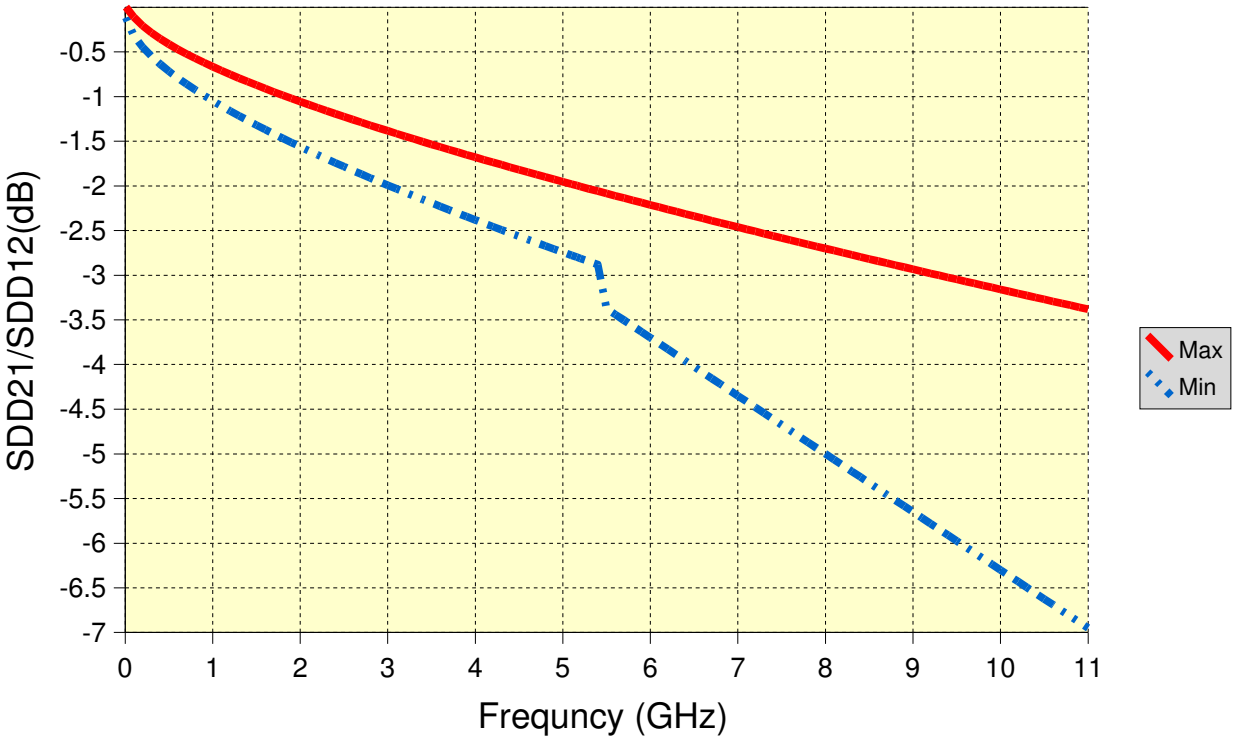
- **PPI MCB-HCB will have 0.4 dB nominal higher loss**



# PPI MCB-HCB Mated SDD21/SDD12 Response

- **PPI MCB-HCB has ~0.4 dB higher nominal loss at Nyquist than SFP+ MCB-HCB response**

$$SDD21(dB)max \geq 0.109 - 0.654 * \sqrt{(f)} - 0.120 * f$$ f in GHz from 0.01 to 11.1 GHz

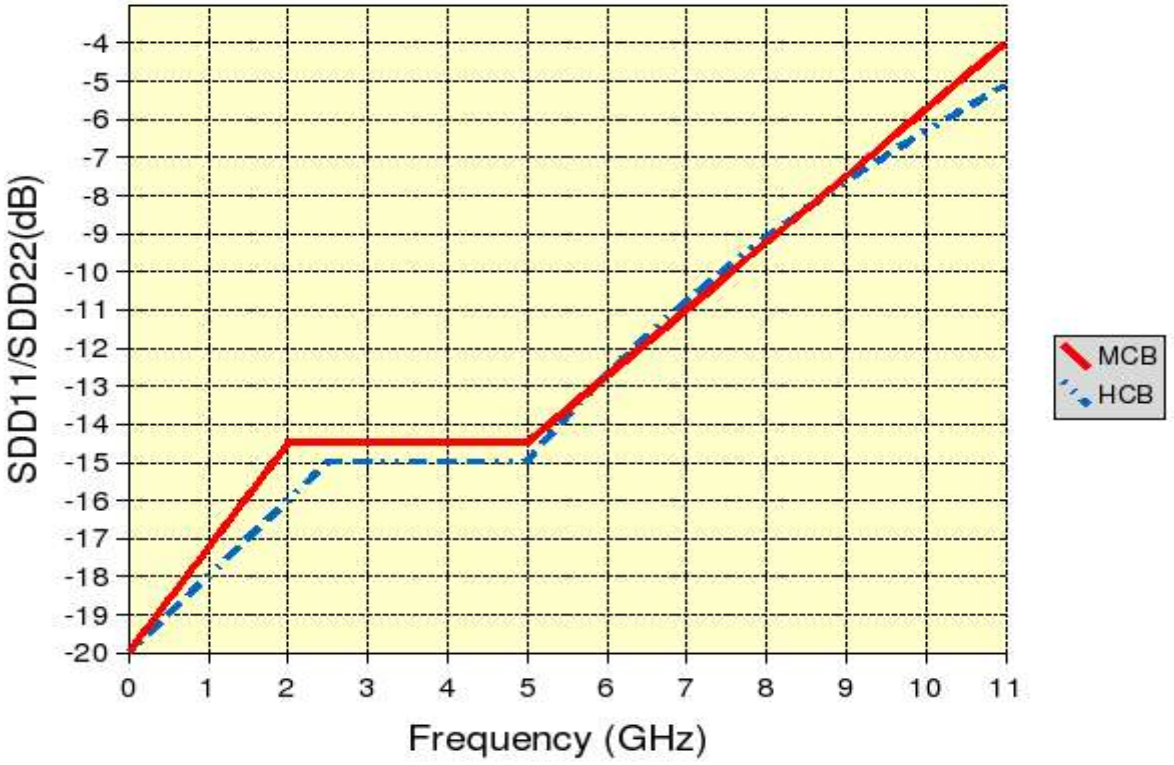



$$SDD21(dB)min \leq -0.029 - 0.861 * \sqrt{(f)} - 0.158 * f$$ f in GHz from 0.01 to 5.5 GHz

$$SDD21(dB)min \leq -0.2 - 0.65 * f$$ f in GHz from 5.5 to 11.1 GHz

# Mated MCB-HCB SDD11/SDD22 Response

- **MCB response is slightly worse due to higher loss**




MCB-Reponse

| | |
|---|---|
| $SDDxx(dB) \le -20 + 2.75 * f$ | f in GHz from 0.01 to 2 GHz |
| $SDDxx(dB) \le -14.5$ | f in GHz from 2 to 5 GHz |
| $SDDxx(dB) \le -23.25 + 8.75 * (f/5)$ | f in GHz from 5 to 11.1 GHz |

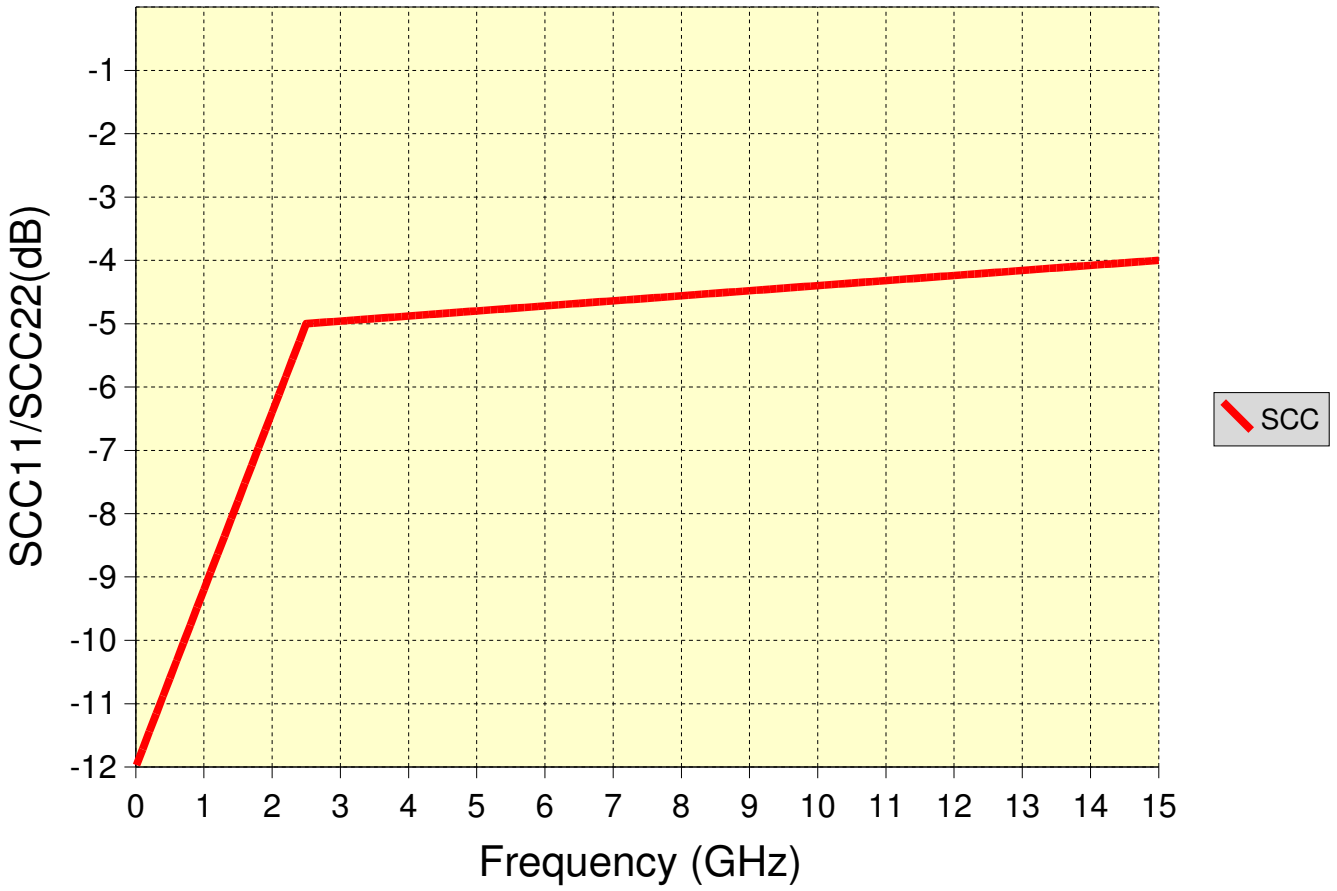
HCB-Reponse

| | |
|---|---|
| $SDDxx(dB) \le -20 + 2 * f$ | f in GHz from 0.01 to 2.5 GHz |
| $SDDxx(dB) \le -15$ | f in GHz from 2.5 to 5 GHz |
| $SDDxx(dB) \le -13.8 + 28.85 * log10(f/5.5)$ | f in GHz from 5 to 11.1 GHz |

# Mated MCB-HCB SCC11/SCC22 Response

- **The same as SFP+**

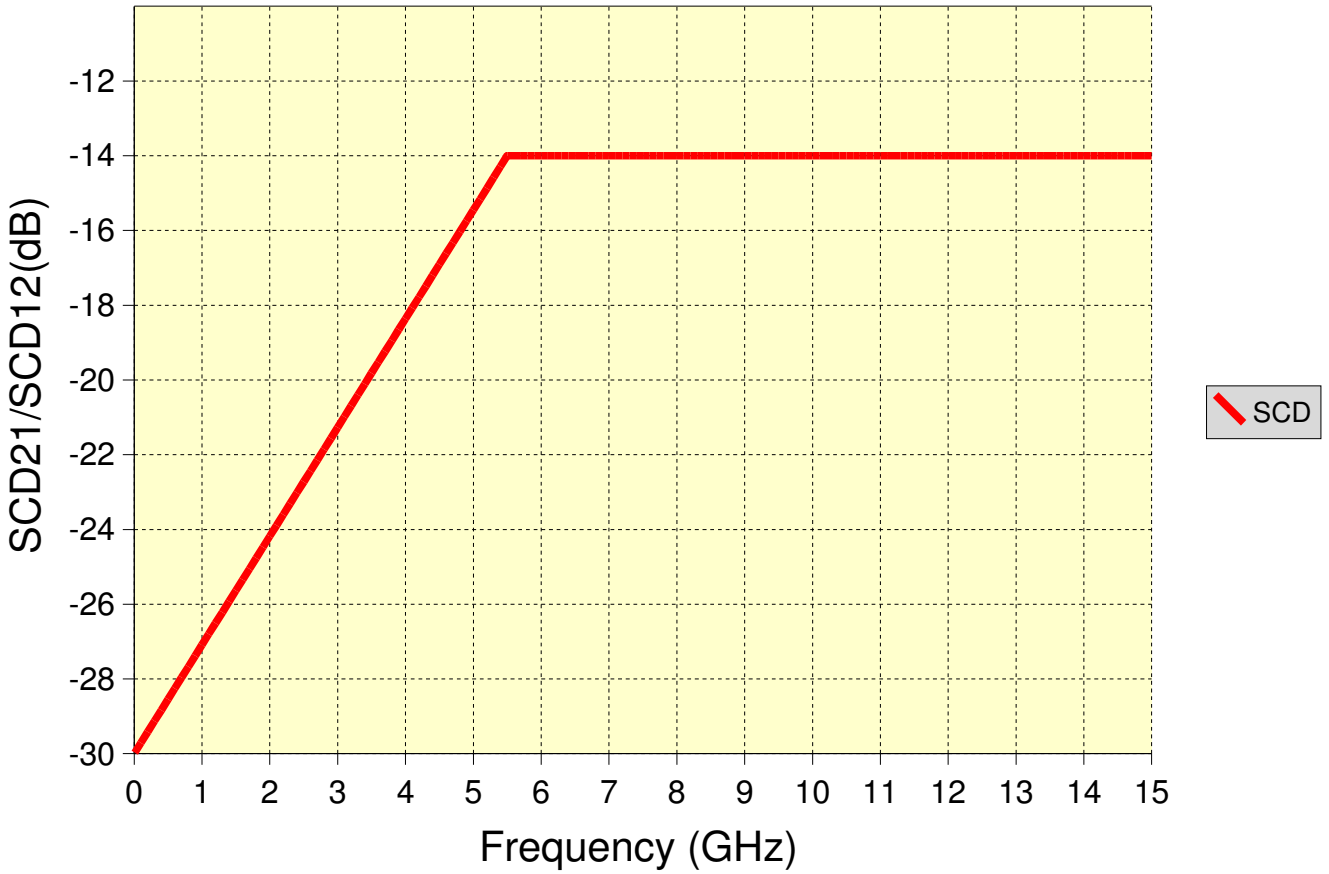
$SCC11(dB) \leq -12 + 2.8 * f$ f in GHz from 0.01 to 2.5 GHz
$SCC22(dB) \leq -5.2 + 0.08 * f$ f in GHz from 2.5 to 15 GHz



# Mated MCB-HCB SCD21/SCD12

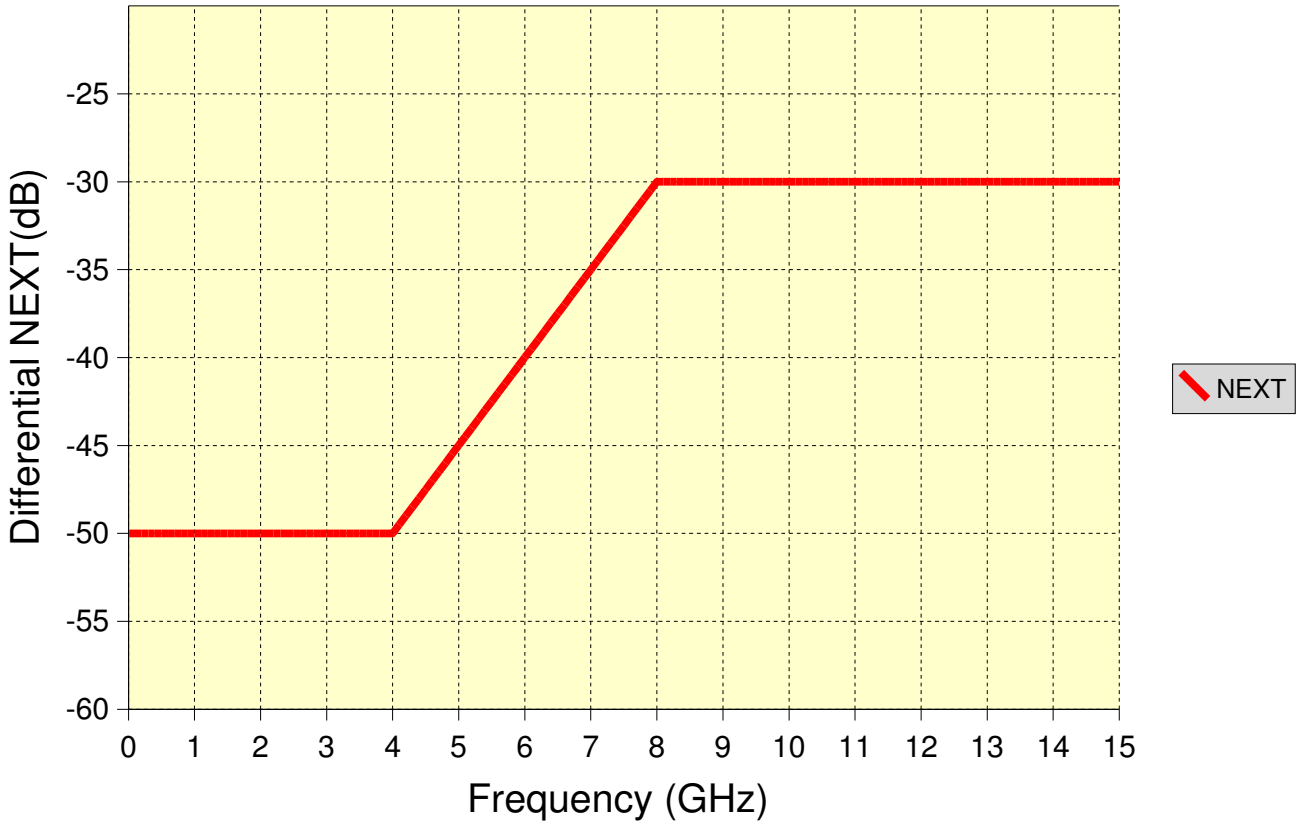
- **The same as SFP+**

$SCD12(dB) \leq -30 + 2.91 * f$ f in GHz from 0.01 to 5.5 GHz
$SCD21(dB) \leq -14$ f in GHz from 5.5 to 15 GHz



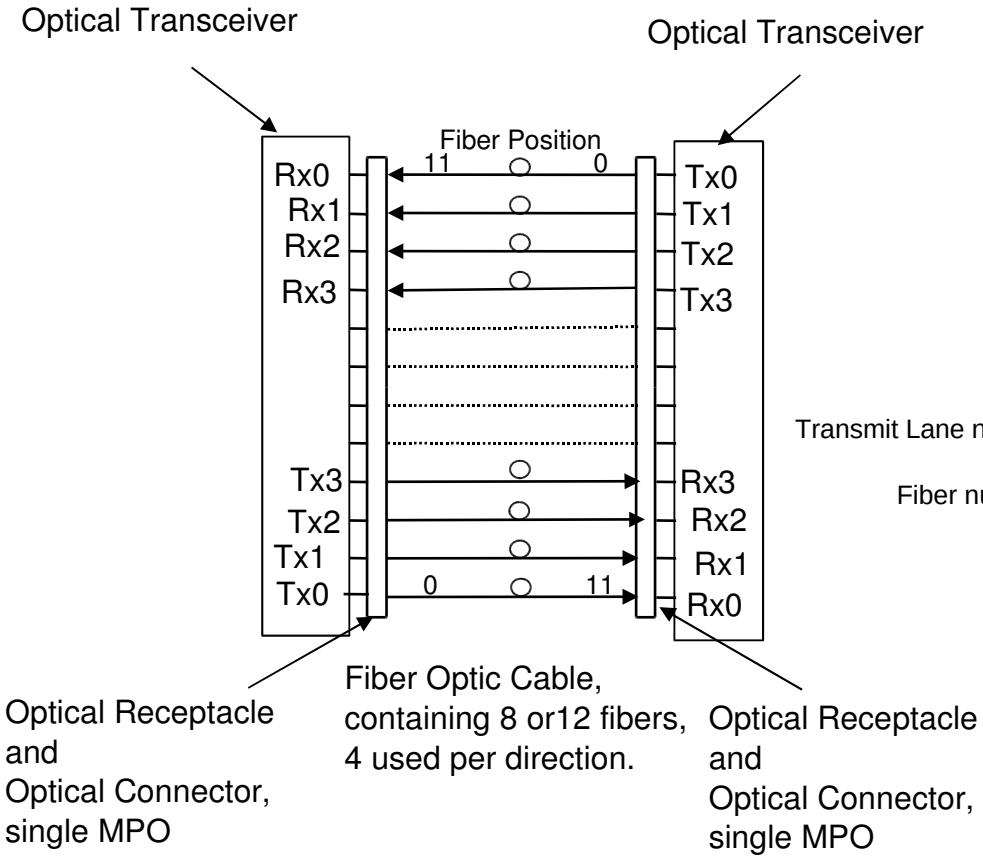
# Mated MCB-HCB NEXT and FEXT TBD

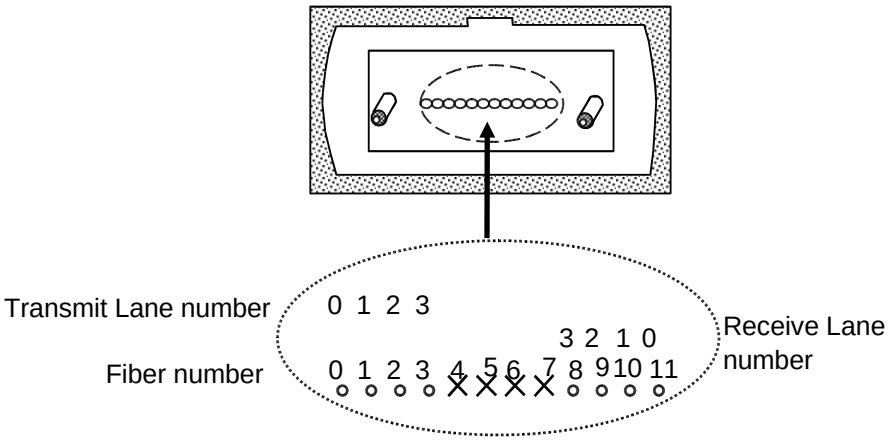
- **SFP+ differential NEXT shown below for reference**



# 40GBase-SR4 Optical Lane Assignment

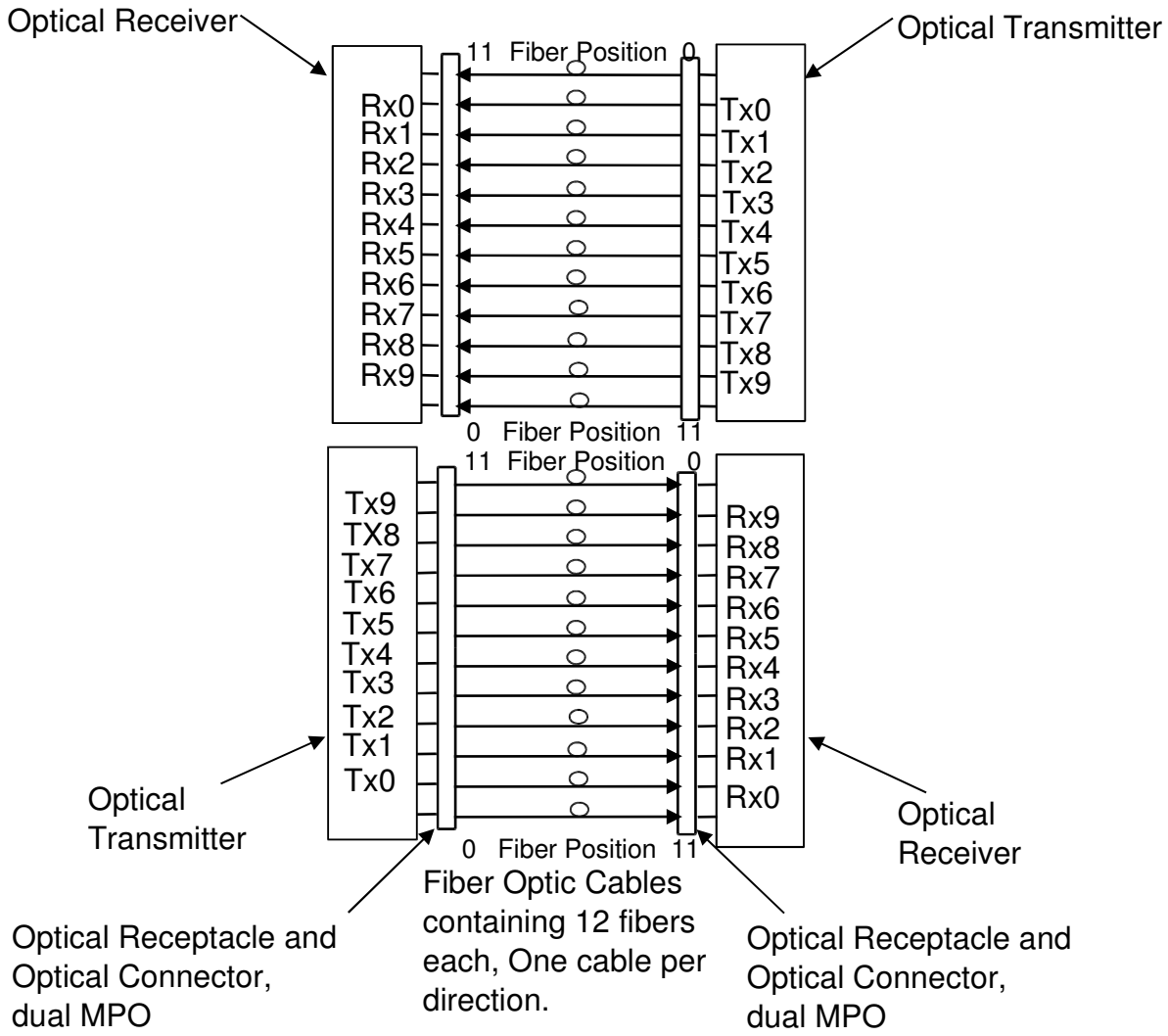
- **Figure 86-2 need to be updated to show fibre position as shown below and in addition a connector diagram with TX/RX lanes as well as fibre position is required.**



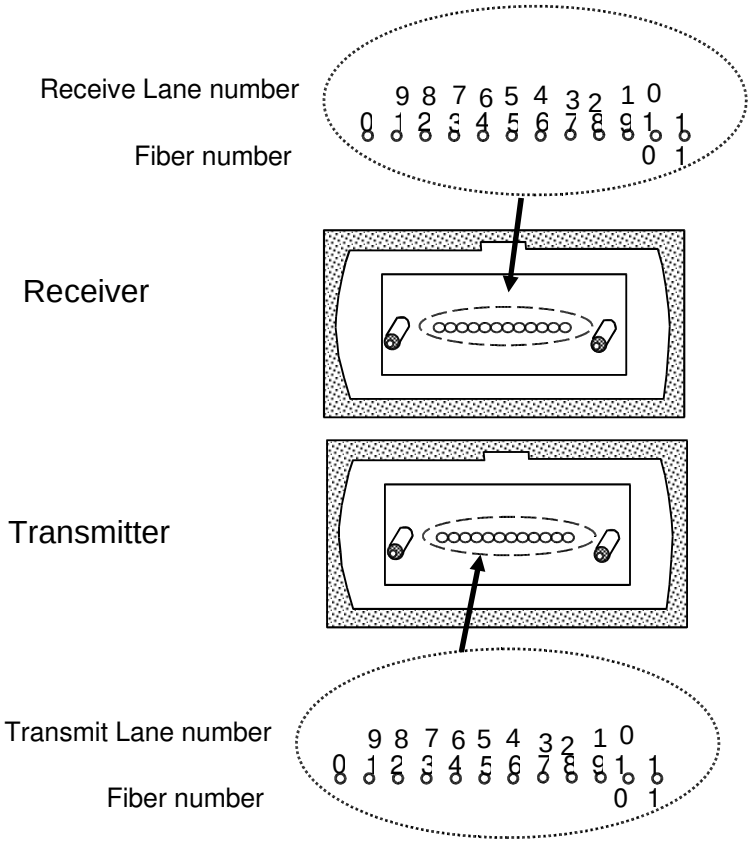
# 40GBase-SR10 Optical Lane Assignment

- **Figure 86-2 need to be updated to show fibre position as shown below for SR10.**



# Connector Lane Assignment

- **Assumes Table 85-9 pin assignment and without crossover in cable.**
  - **Not consistent with the SR4 definition!**
  - **We may want to consider reorder the table pin out 85-9 or just let MLD take care of the rotation.**



# Summary

- **PPI defines electrical specifications for the host and modules**
  - **The test fixture to test host “HCB” and fixture to test module “MCB” are required to accuracy, consistency, and compliance.**
- **SFF-8431 MCB and HCB definition which was also adopted by FC-PI-4 can be used here with few minor adjustment:**
  - **The MCB and HCB loss each are increased by about 0.2 dB at Nyquist to accommodated longer PCB traces.**
  - **The differential, common mode, and differential to common mode s-parameters can be adopted with no change.**
  - **Differential NEXT and FEXT should have a place holder with TBD as these can be very different.**