cPPI-4 Channel and Compliance Boards

IEEE 802.3 100GCU

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Sept 13, 2011
Chicago

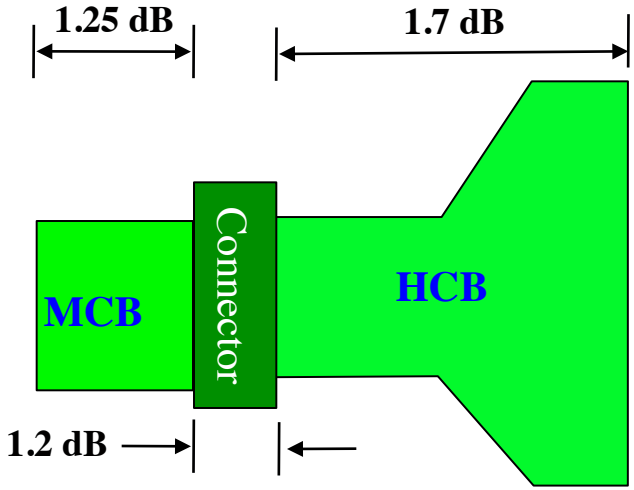
Basic Assumption on MCB-HCB and Host Construction

- **Connectors could be either based on Quattro or zQSFP**
- **MCB constructed from striplines with short blind via**
- **HCB constructed from striplines with short blind via or could be constructed from Microstrip**

Acknowledgment: To TE (Formerly Tyco Electronics) for providing model and boards for this effort.

HCB/MCB Instantiation

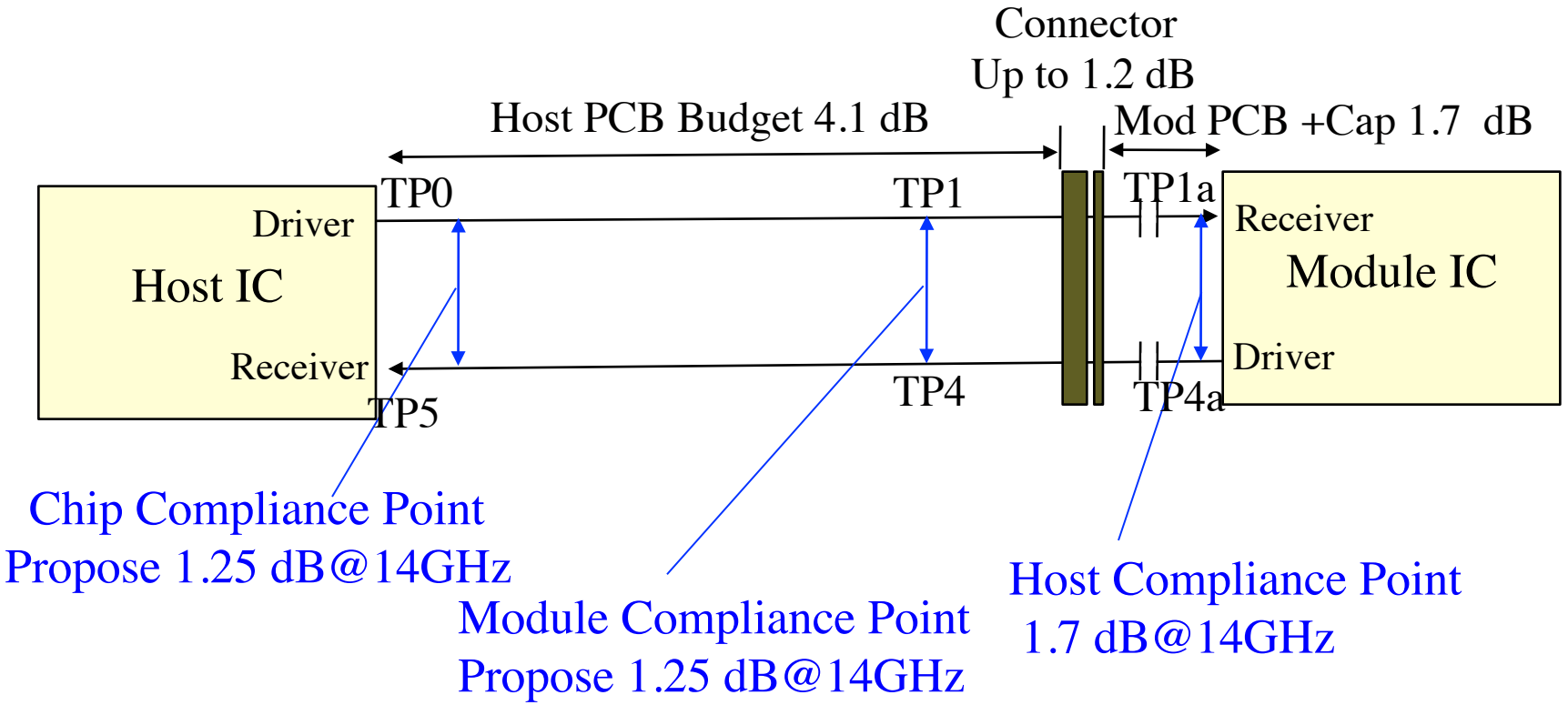
- HCB/MCB mated loss at 14 GHz will be 4.15 dB
  - HCB loss of 1.7 dB account for 0.5 dB loss for DC block
  - Actual HCB implementation will not incorporate DC blocks in order not to degrade the return loss and visibility into host



CFP2 or Other Retimed Modules

100 GCU Channel and Compliance Points

- **Host PCB + connector has loss of 5.3 dB**
  - **With majority of implementation based on SMT connector the host can use the extra margin**
  - **All MCB implementations assumes short blind vias**
  - **All host implementations assumes full length vias with short stub**



cPPI-4 Proposed Channel Loss Budget

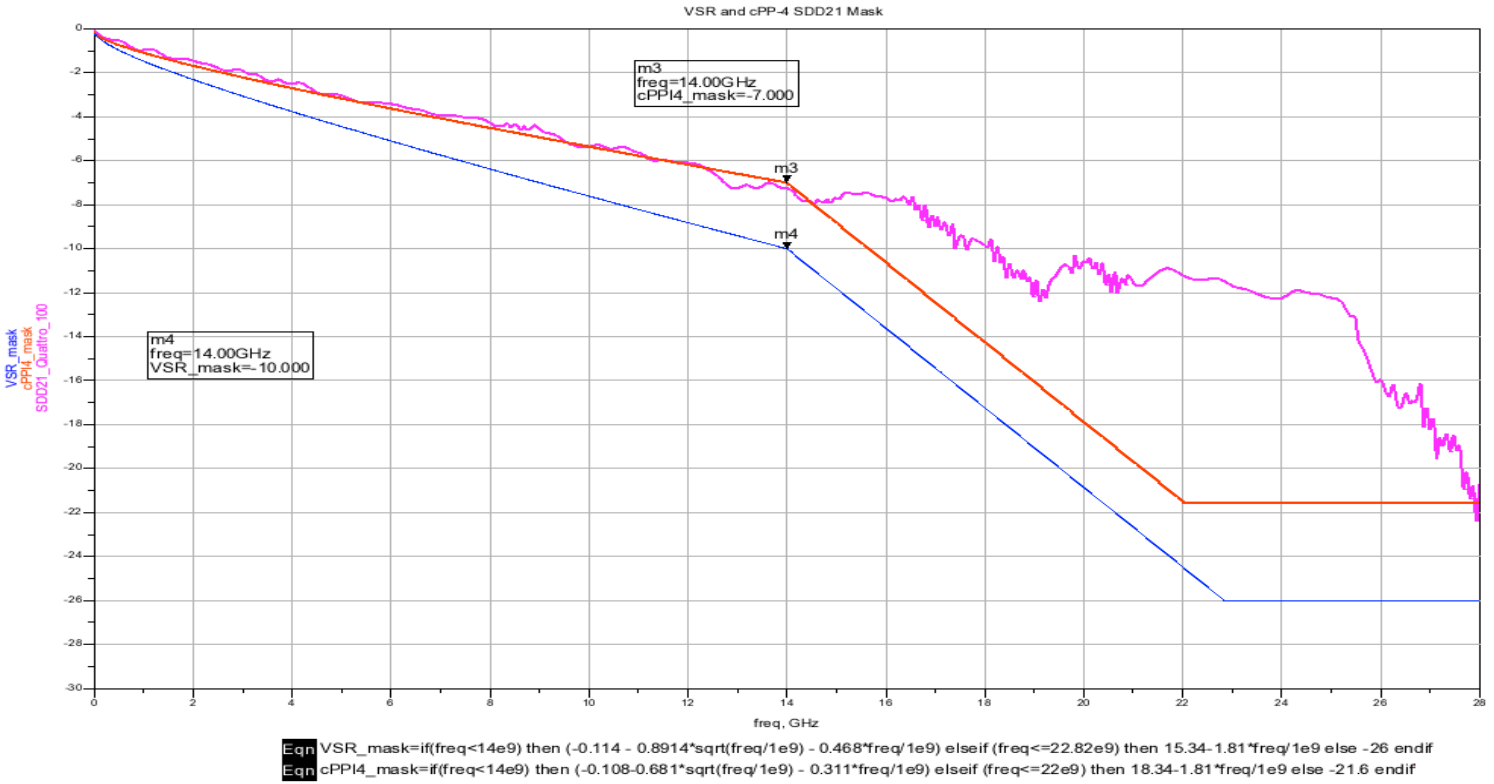
- **Attach cPPI-4 with 7 dB loss budget can support unretimed optical PMDs as well as100GCU copper cables**

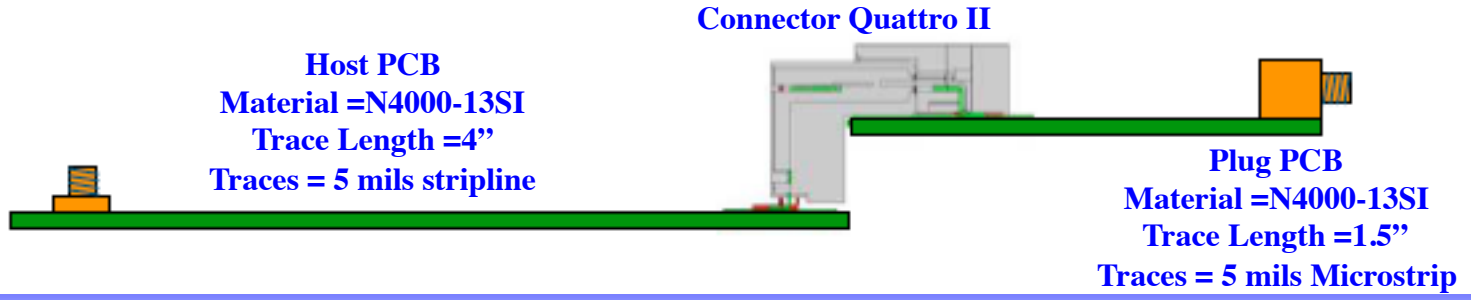
Traces	FR4-6	N4000-13	N4000-13SI	Megtron 6
Loss at 12.85 GHz /in	2	1.5	1.2	0.9
Connector loss at 14 GHz *	1.2			
Loss allocation for 2 Vias in the channel	0.5			
Max Module PCB Loss/DC Blocks at 14 GHz *	1.7			
PCB Trace Length Assuming 7 dB Loss Budget	1.8000	2.4000	3.0000	4.0000

* For 100 GbE operation since the HCB and connector are specified for operation up to 28GBd there will be 0.2-0.3 dB unallocated margin.

4” cPPI-4 Channel Based on TE Quattro II

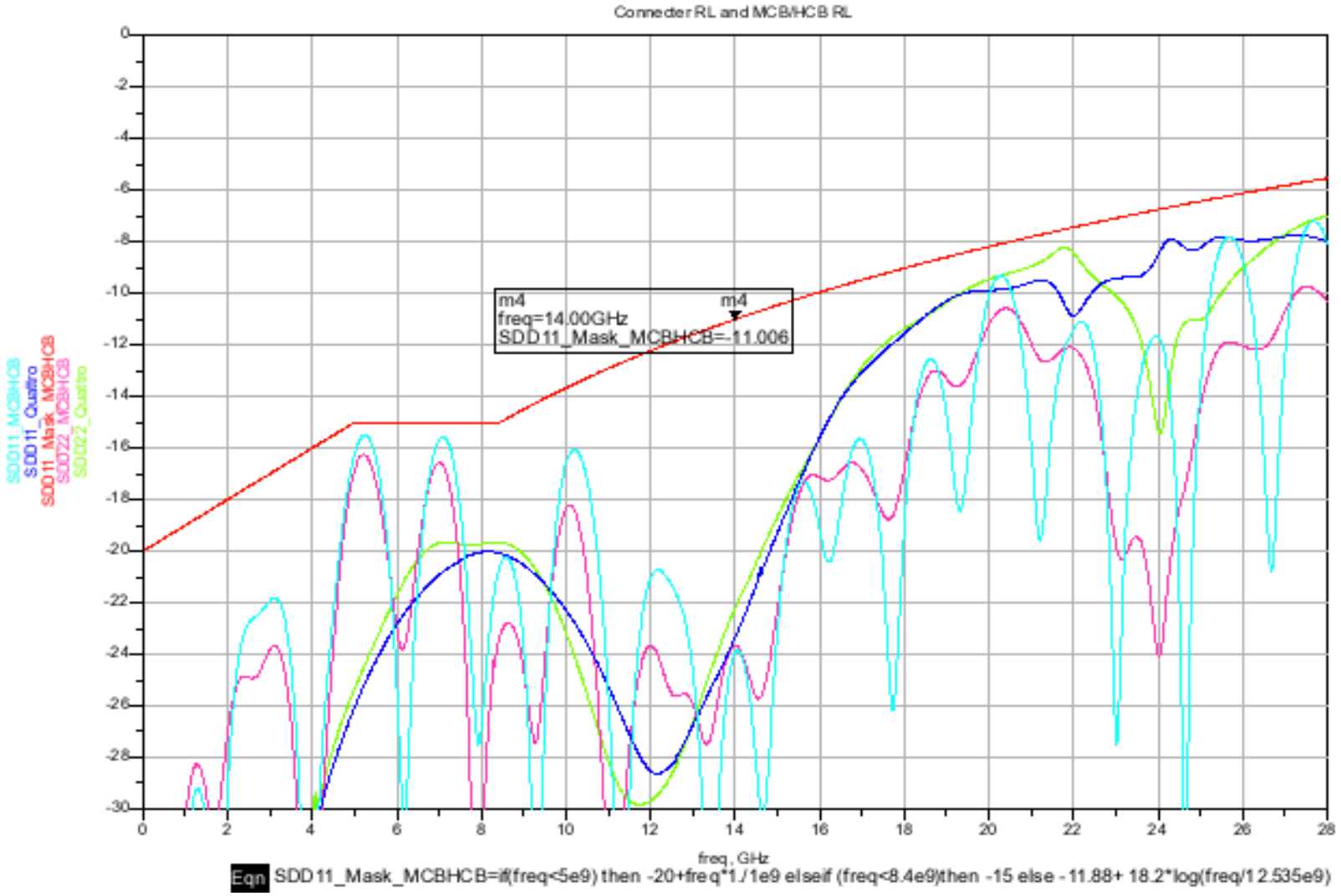
- **VSR mask also shown**





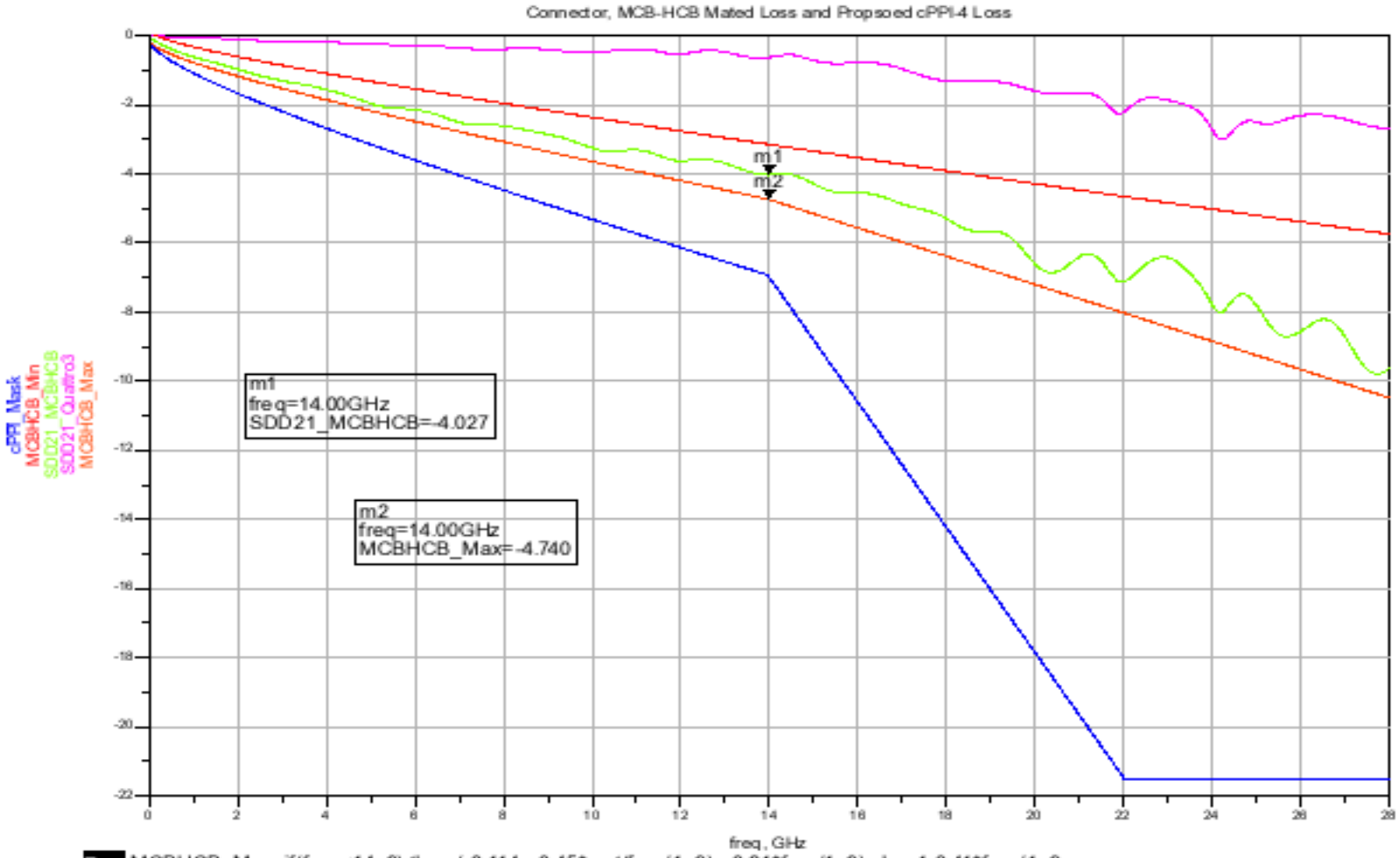
Proposed MCB-HCB Return Loss Limit

- **Also shown connector alone return loss**



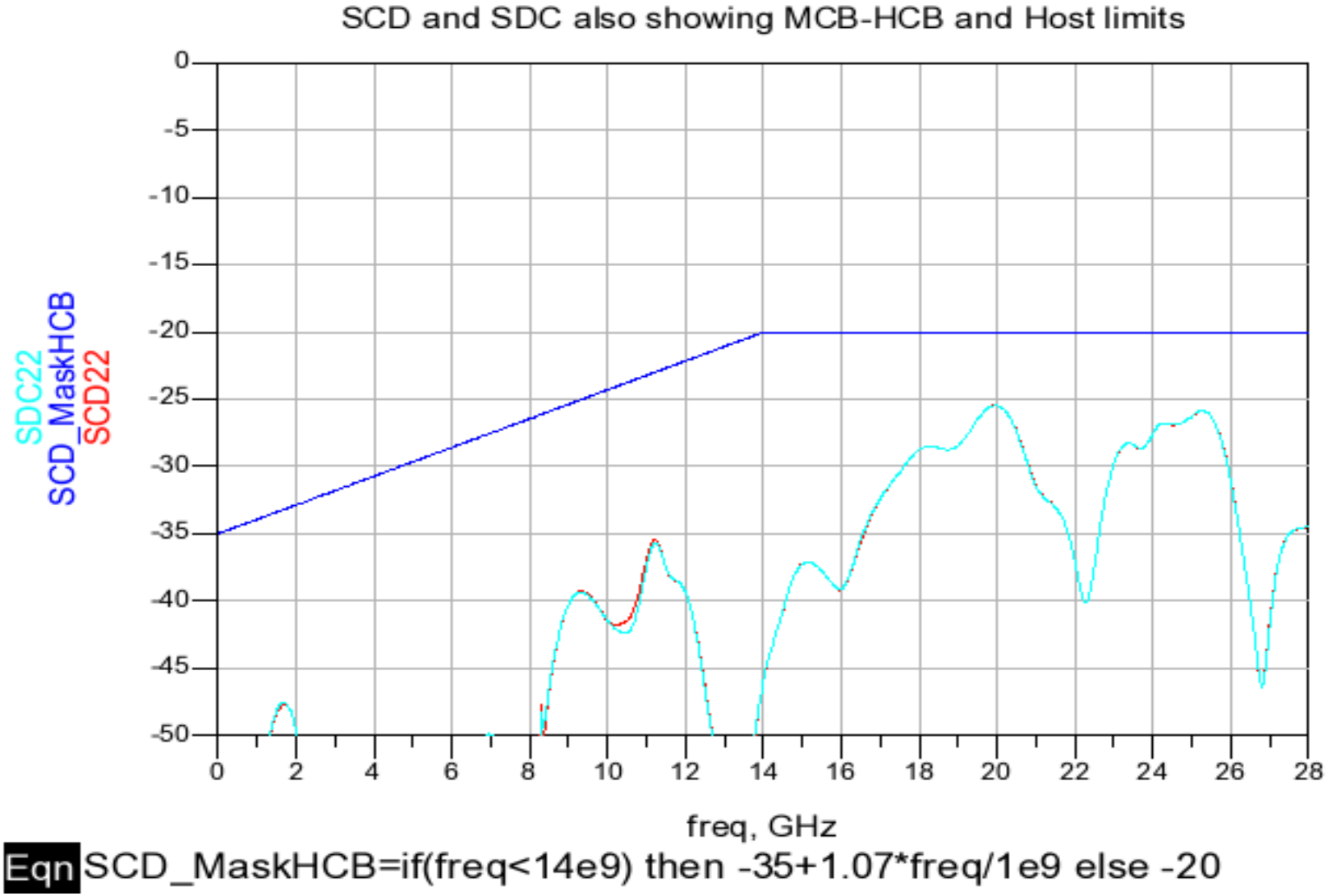
Proposed MCB-HCB Loss Also Shown cPPI-4 Channel Loss

- **MCB board has two short vias**



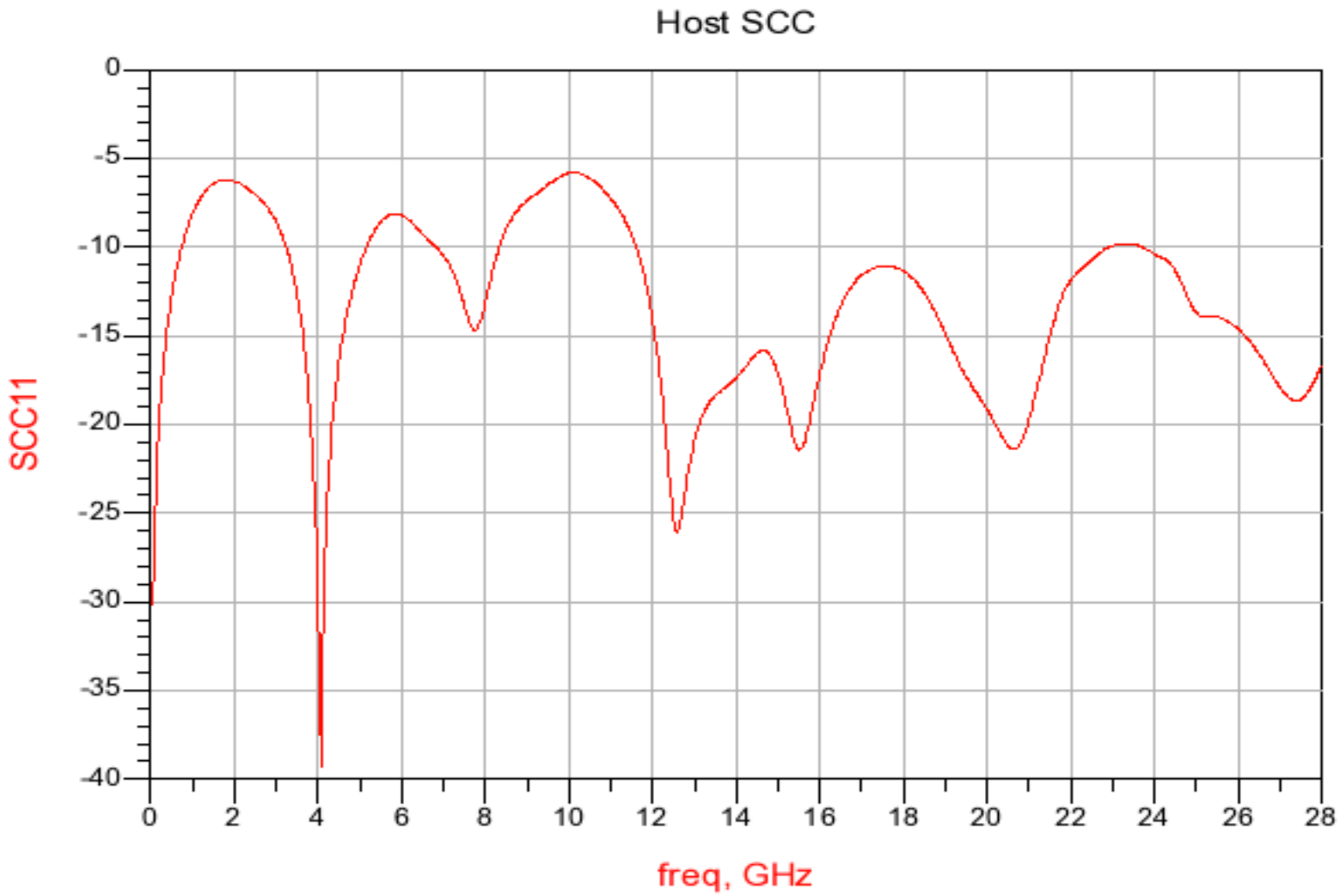
Proposed MCB-HCB SCD/SDC

- **MCB board has two short vias**



Mated Board SCC Response

- **Due to the nature of the SCC graph it does not make sense to define a -3 dB limit, instead SCD and SDC need to be tighter controlled**



Summary

- The MCB/HCB test methodology first developed in SFP+ then adopted in 802.3ba can be extend for operation at 25.78 GBd
  - The MCB/HCB response are specificed for operation up to 28 GBd for possible FEC support
- The proposed cPPI-4 channel will meet both Cu objective as well as unretiemd optics objective
- The MCB/HCB limits provided here will meet both zQSFP as well as Quattro based designs
- As the connector differential response has improved its SCC response has degraded in place of SCC
  - SCD – differential to common mode conversion will limit common mode generation
  - SDC – common mode to differential conversion will control nuisance signal