Practical C2M Loss Limit

Addressing comment: 115

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Overview

❑ **Background on the C2M loss proposals**

❑ **Highlights of Kareti and Weaver channels**

❑ **COM results by adding PCB trace**

❑ **Practical C2M loss upper limit**

❑ **Summary.**

Background on C2M Loss Proposals

❑ **We started with two AUI C2M objectives one with ≤22 dB and another with ≤36 dB (bump-to-bump)**

　– Task force voted later to have single AUI objective with higher loss without needing MLSE

　– Over the same time assumed module loss has been decreased by 3 dB to proposed 3.8 dB today

❑ **Latest target AUI C2M loss proposals**

　– kareti_3dj_elec_01a_2408 for PCB 34 dB (bump-to-bump) for cabled host 31 dB based all C2M channel contributed

　　• At 34 dB (bump-to-bump) MLSE must be present in the module and selectively turned on as needed

　– ghiasi_3dj_01_2407 30 dB (bump-to-bump) based on analysis of Weaver and Kareti realistic line card designs

　　• Save ~10% power and doesn't require MLSE

　– noujeim_3dj_elec_01_240822 26 dB (bump-to-bump)

　　• Save ~15 % power and doesn't require MLSE

❑ **Baseline C2M equalizer doesn't have an MLSE**

　– What is the maximum practical loss for a well build channel without MLSE that is the answer we have been searching?

Channels for This Study

❑ **Kareti** SL. No 8 and 10 channels higher loss used for the study

❑ **Weaver** 9" OSFP channels vendor X and Y used for the study
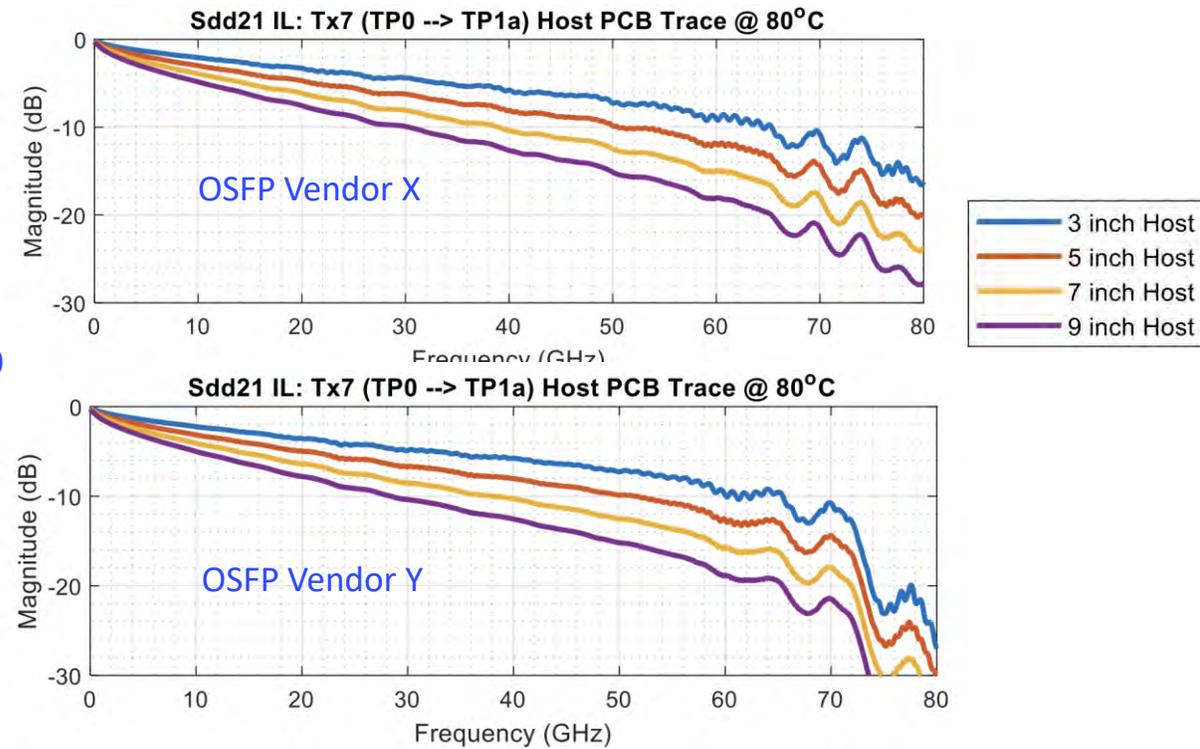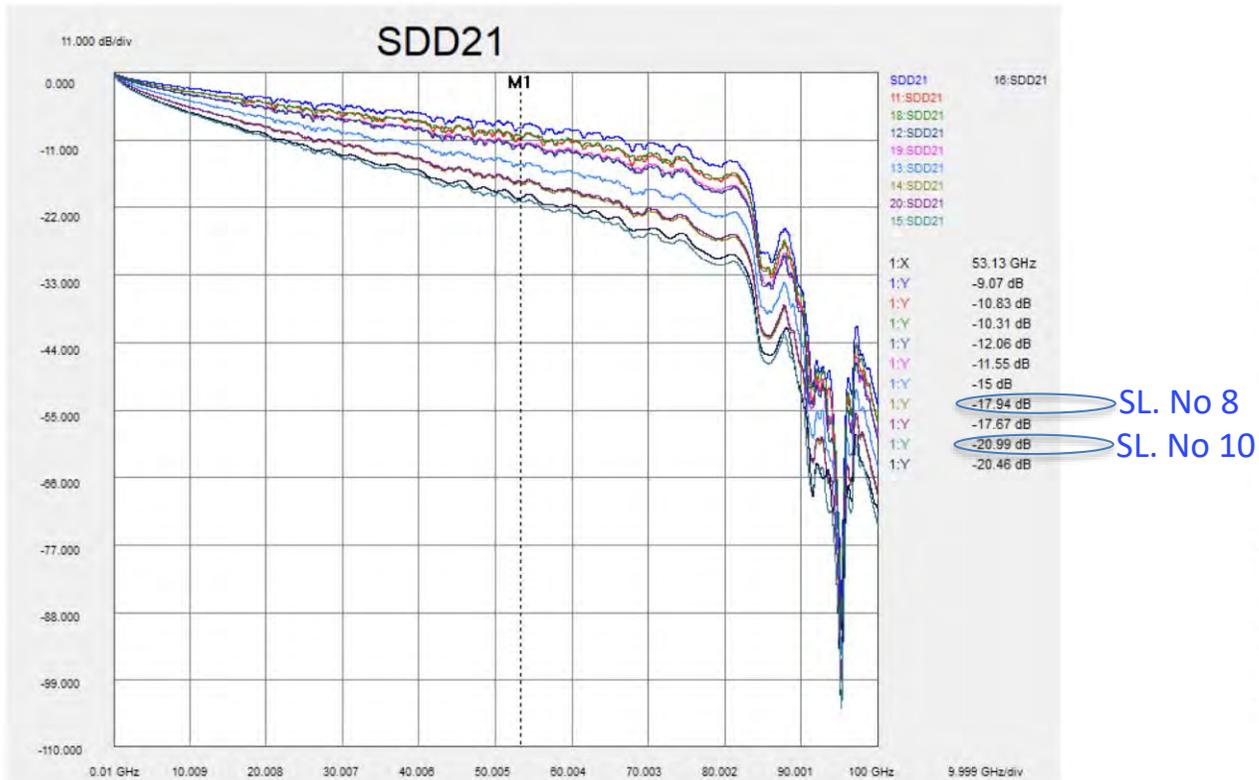
COM as Function of Loss

❑ **Weaver 9" vendor Y OSFP can support 32.5 dB but Kareti channel only ~30 dB (bump-to-bump)!**

– For COM configurations and other details see ghiasi_3dj_01_2407
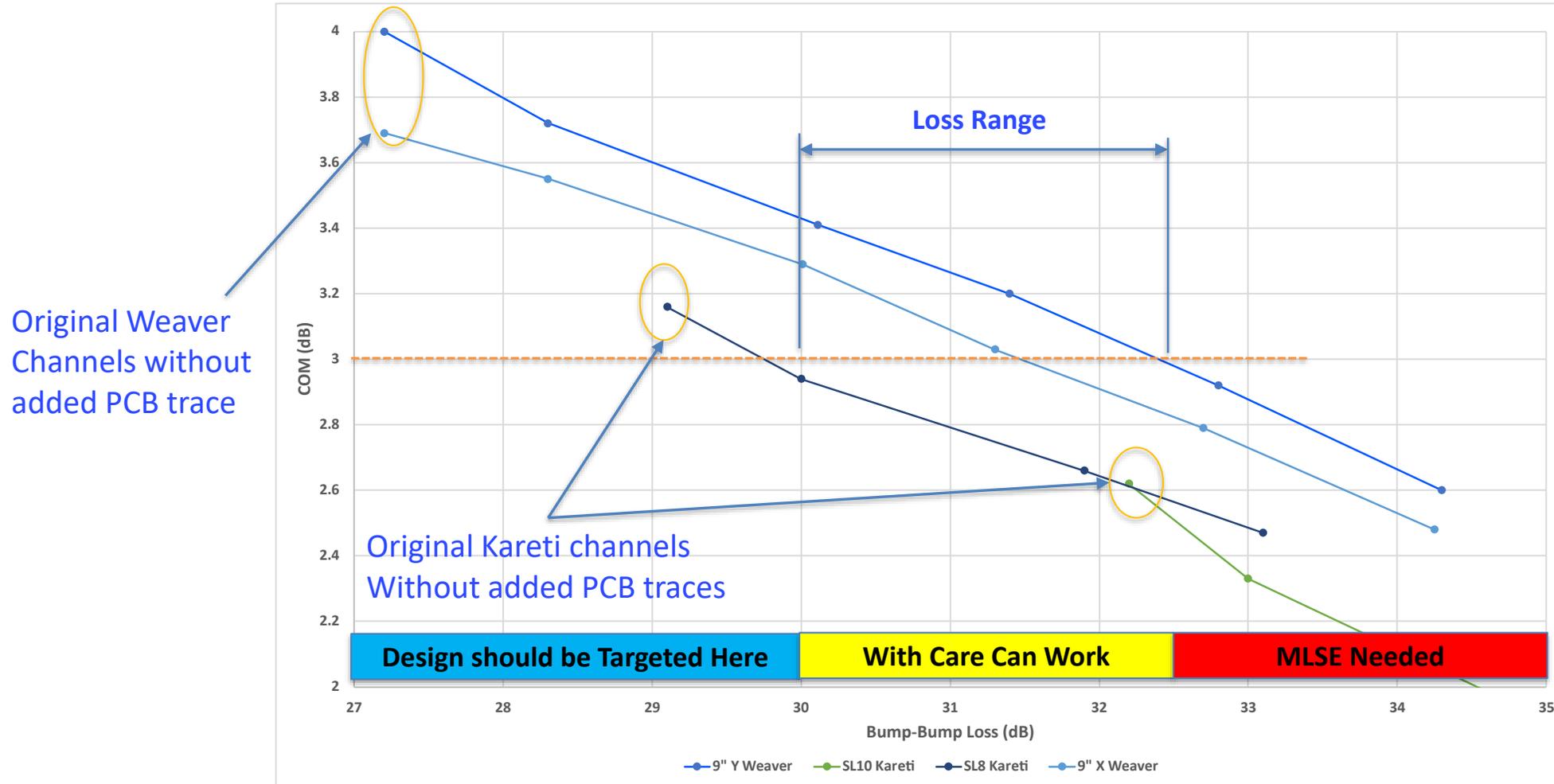
C2M Practical Loss Limit

❏ **The task force shouldn't specify C2M loss where only the best of the best channels will pass COM**

  – C2M link should not be operated in the red zone that may require MLSE as the adopted reference equalizer doesn't have an MLSE

  – There is no guarantee MLSE will be present in the module CDR/DSP or can be turned on due to added power

❏ **Loss ILdd is specified as "Up to" given this language we are proposing to adopt 32 dB (bump-to-bump)**

  – The 32 dB needs to be understood is the maximum measured loss under any conditions.
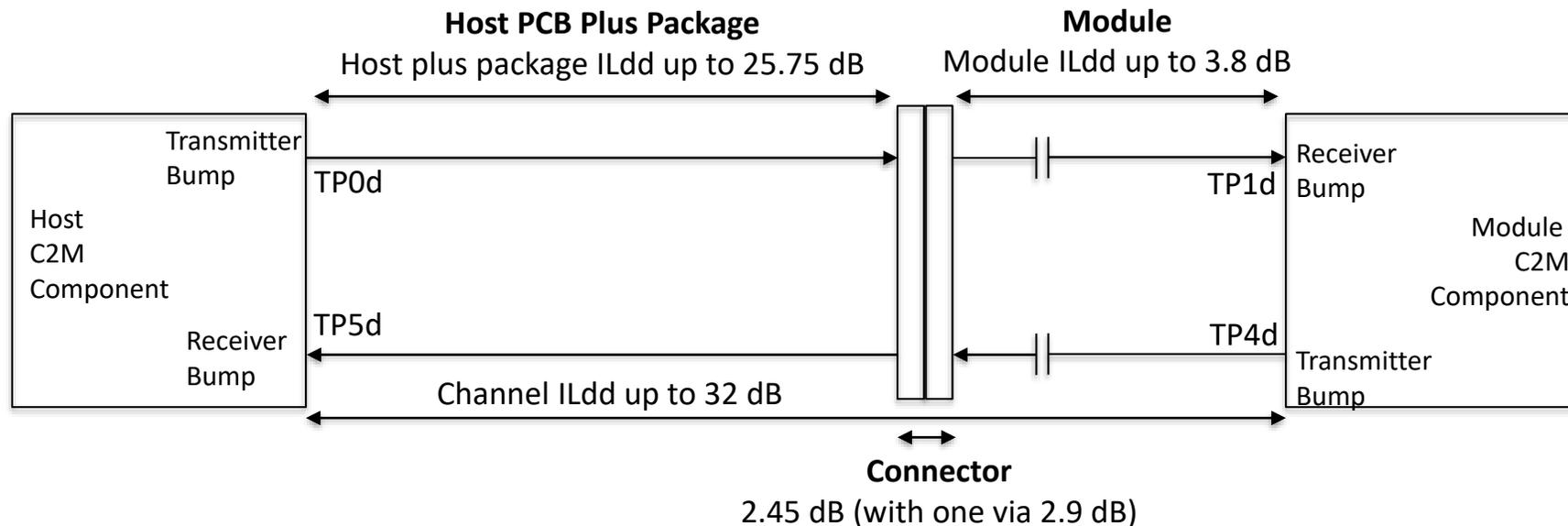
Summary

❑ **Task force need to make a decision on C2M loss to move forward**

  – With module plug loss consensus of 3.8 dB using advanced implementations, see Ghiasi_3dj_03_2409, the host is gaining ~ 3dB compared to assumed module plug loss in the 6-7 dB at the start of DJ Task Force

  – C2M adopted reference equalizer doesn't have an MLSE and we should not assume module DSP has an MLSE

  – C2M link should not be operated in the red zone >32.5 dB (bump-to-bump) but requires MLSE to be turned on selectively – this is beyond adopted reference equalizer objective

❑ **Practical C2M upper design loss limit is ≤ 30 dB to have sufficient margin**

❑ **Recommendation is to specify C2M "Channel ILdd up to 32 dB (bump-to-bump)".**