

# CR Mated Test Fixture Insertion Loss (Comment #357)

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TE Connectivity

EVERY CONNECTION COUNTS



# Supporters

# Agenda

- Introduction
- Background
- Problem Description
- Proposed Changes
- Summary

# Introduction

- Comment #140 against D1.4 resulted in a change to Figure 179A-1 that resulted in the loss of the MCB PCB and the via+connector being lumped into a single value.
- This has the unintended consequence of requiring adjustment to the MCB PCB design to compensate for any difference in via+connector insertion loss from the amount allocated to it prior to D1.5, which can increase the amount of MCB trace loss that must be included in a TP1-TP4 cable assembly measurement.
- To address the problem, we propose change Figure 179A-1 by either
  1. Reverting to the version that was in D1.4 (as proposed in D2.0 comment #289).
  2. (Preferred) Increasing the HCB loss (TP2-to-connector) to from 3.8 dB to 4.8 dB while reducing the MCB loss (TP1-to-connector 'far side') from 5.95 to 4.95 dB.

Note: Neither option affects the insertion loss allocation for cable assemblies or hosts.

# Background: MTF IL Specification Change Post D1.4

D1.4

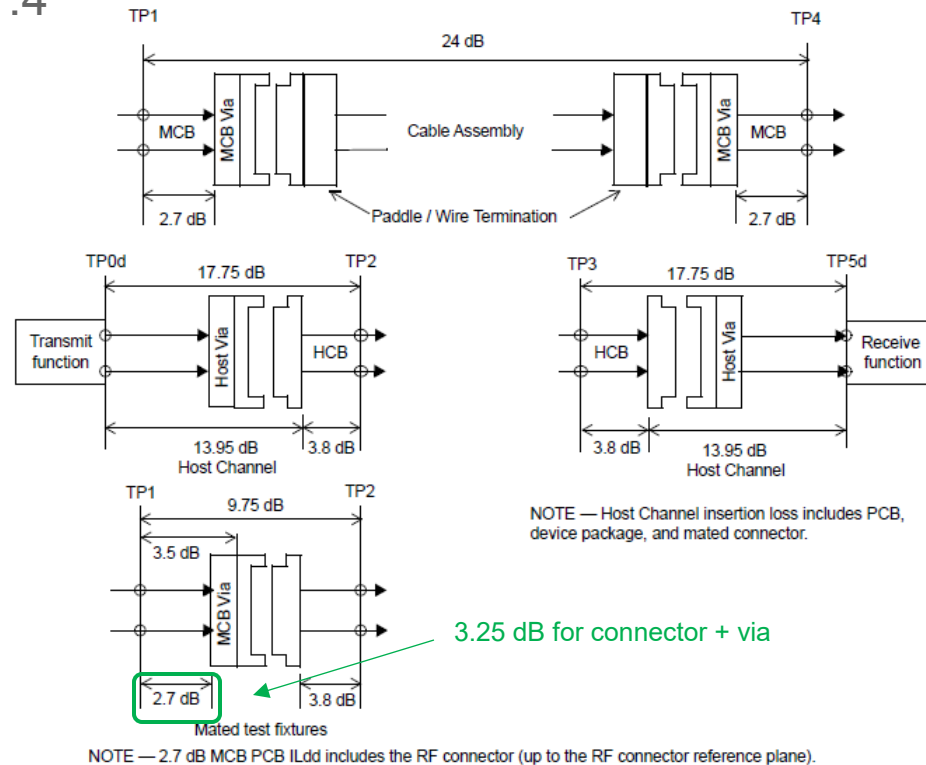


Figure 179A-1—Host-Nominal to Host-Nominal, Cable assembly, and test fixture insertion loss at 53.125 GHz

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The recommended maximum differential insertion loss (TP0d-to-TP2) or (TP3-to-TP5d) are consistent with the host channels and an assumed mated connector insertion loss of 2.45 dB.

D2.1

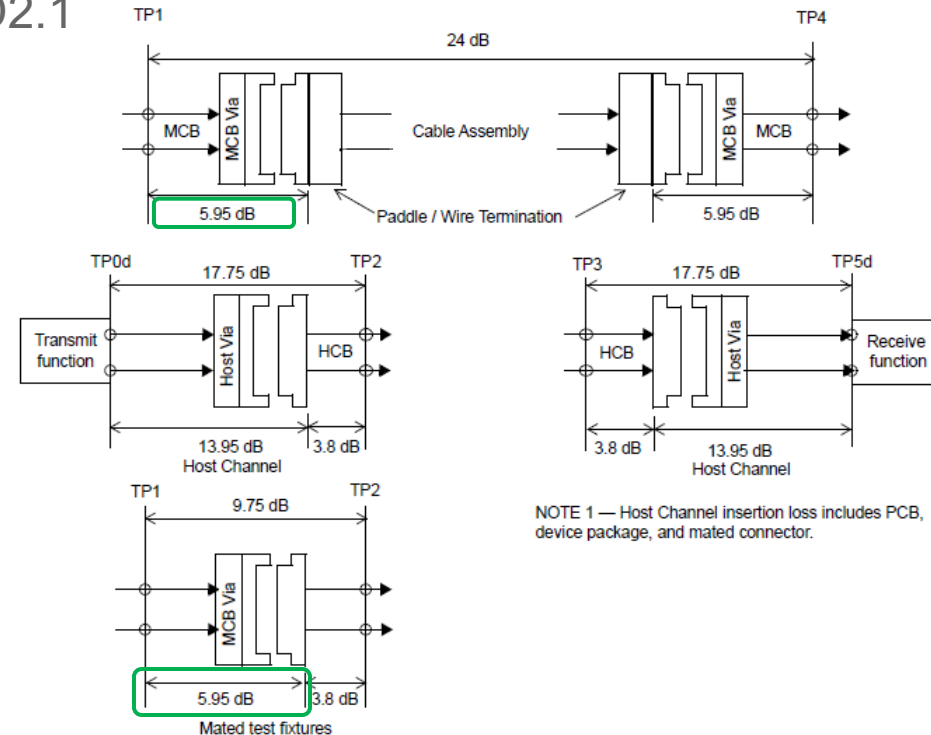


Figure 179A-1—Host-Nominal to Host-Nominal, Cable assembly, and test fixture insertion loss at 53.125 GHz

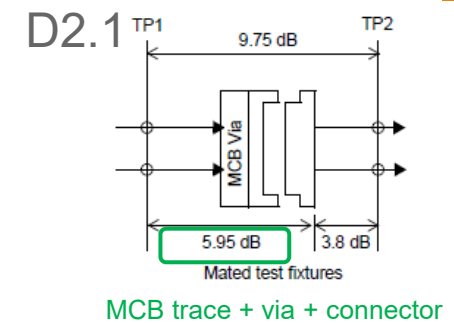
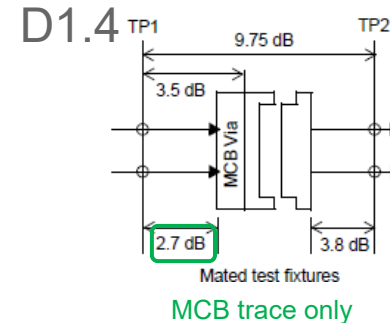
# Problem Description

- MTF loss specifications:

- TP1-TP2 = 9.75 dB
- HCB from TP2 to connector = 3.8 dB
- MCB from TP1 to the far side of the connector = 5.95 dB

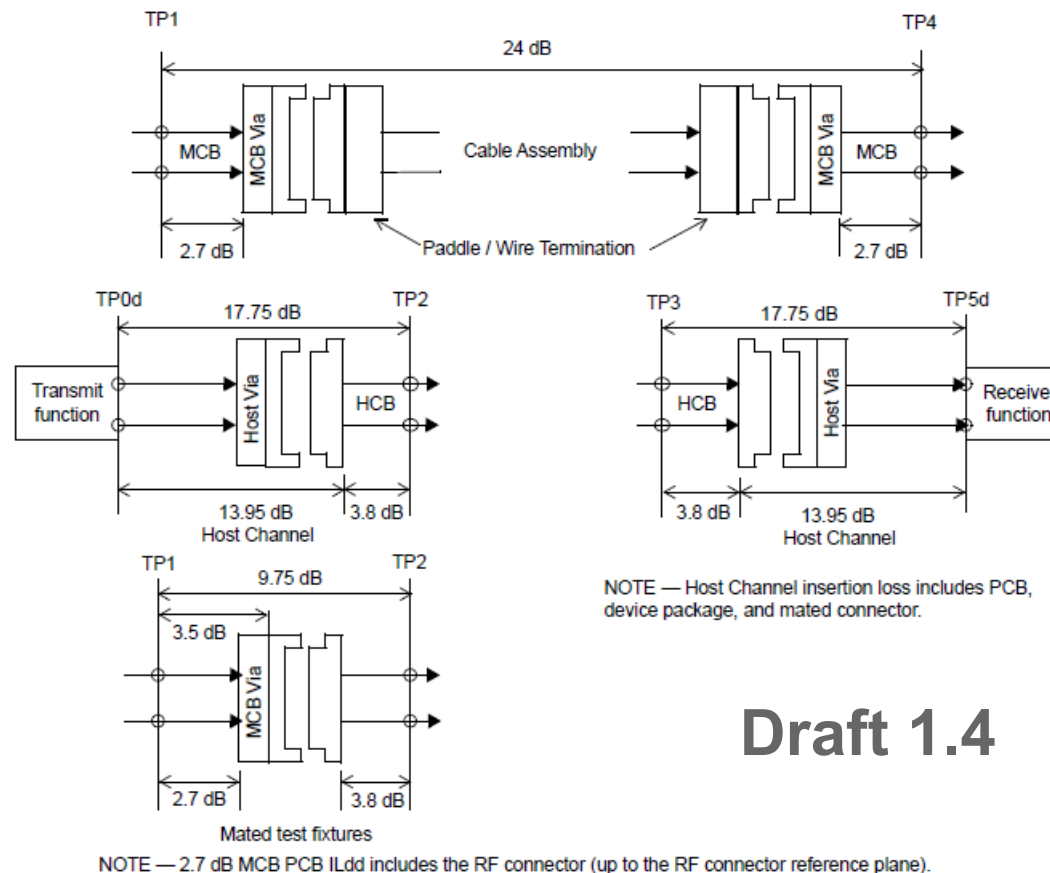
MCB loss specification therefore includes PCB, PCB via and the via+connector.

- Through D1.4, the MCB loss was specified as PCB only with a value of 2.7 dB, allocating 3.25 dB for the via+connector.
  - Note: Cable assemblies to date have been measured with MCBs designed to the 2.7 dB trace insertion loss.
- Measurement of MTFs are showing via+connector loss to be in the range of 2.25 dB.
  - Since MCB loss specification includes the via+connector, the MCB traces require 1 dB additional loss to compensate for the lower via+connector loss.
  - Based on all drafts since D1.5, all CR cable assemblies should be measured with redesigned MCB's
  - This increases the amount of MCB loss included in a TP1-TP4 cable assembly measurement by 2 dB, effectively reducing cable assembly portion of the loss by 2 dB (2 MCBs in a measurement), compromising the ability to meet the existing TP1-TP4 insertion loss specs. We do not believe this was the intent of the change made in D1.5



# Proposed Changes – Option 1

Return to the insertion specification in Figure 179A-1 from Draft 1.4.



Draft 1.4

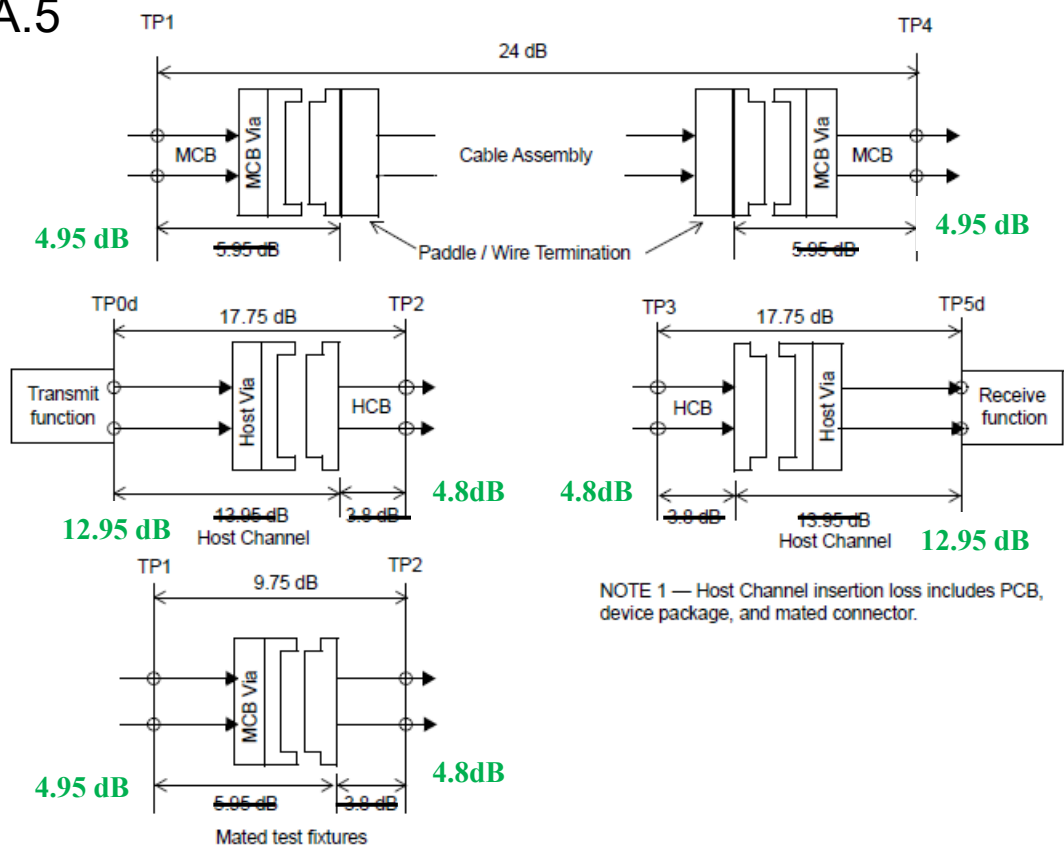
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The recommended maximum differential insertion loss (TP0d-to-TP2) or (TP3-to-TP5d) are consistent with the host channels and an assumed mated connector insertion loss of 2.45 dB.



# Proposed Changes - Option 2 (Preferred)

179A.5



NOTE 2 — The MCB and HCB ILdd allocations include the RF connector (up to the RF connector reference plane).

- MCB = Module Compliance Board, 179B.3
- HCB = Host Compliance Board, 179B.2
- MCB Via = transition via to MDI connector on an MCB
- Host Via = transition via to MDI connector on a Host Channel
- Paddle/Wire Termination = transition structure(s) in a Cable Assembly not present on an HCB

Figure 179A-1—Host-Nominal to Host-Nominal, Cable assembly, and test fixture insertion loss at 53.125 GHz

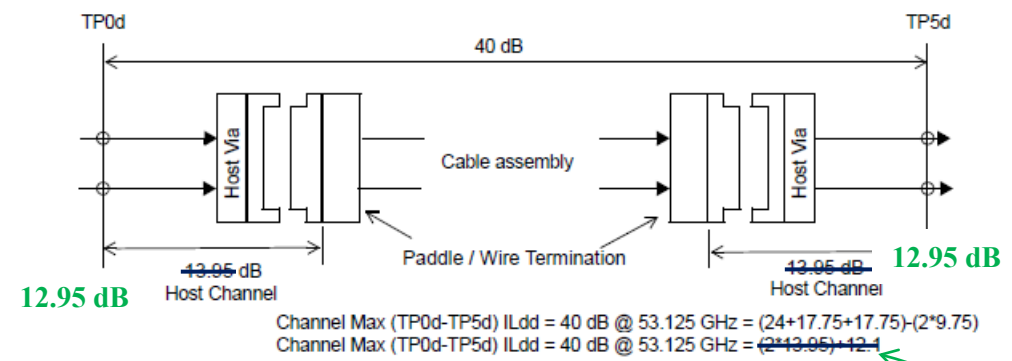


Figure 179A-2—HN-to-HN Channel Max (TP0d-TP5d) at 53.125 GHz

Channel Max (TP0d-TP5d) ILdd = 40 dB @ 53.125 GHz = (2\*12.95)+14.1

Note: The change in host channel loss is due solely to reduce connector loss. Host routing is not affected.



# Summary

- The MTF insertion loss specification requires adjustment of MCB trace insertion loss to account for difference between actual allocated connector insertion loss.
- Increasing MCB trace loss to account for lower than allocated connector loss results in additional fixture loss in TP1-TP4 cable assembly measurements, jeopardizing the ability to meet the cable assembly insertion loss specification.
- Proposed options for resolving the issue:
  - 1) Change the MCB specification back to "trace only" (D1.4).
    - Proven method used on past IEEE data rate specifications and acceptable to the commenter, but commenter believes is not desired by the people commenting on D1.4.
  - 2) (Preferred) Move 1 dB IL from MCB to HCB.
    - Preserves the intent of the change made in D1.5.
    - Preserves the full insertion loss allocation intent for the cable assembly.

# Thank you!