



# Suggested MTF ILdd fitted reference line, limit lines and associated equations for Annex 179B

802.3dj D1p4 comments #139, 140, & 142

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# Supporters

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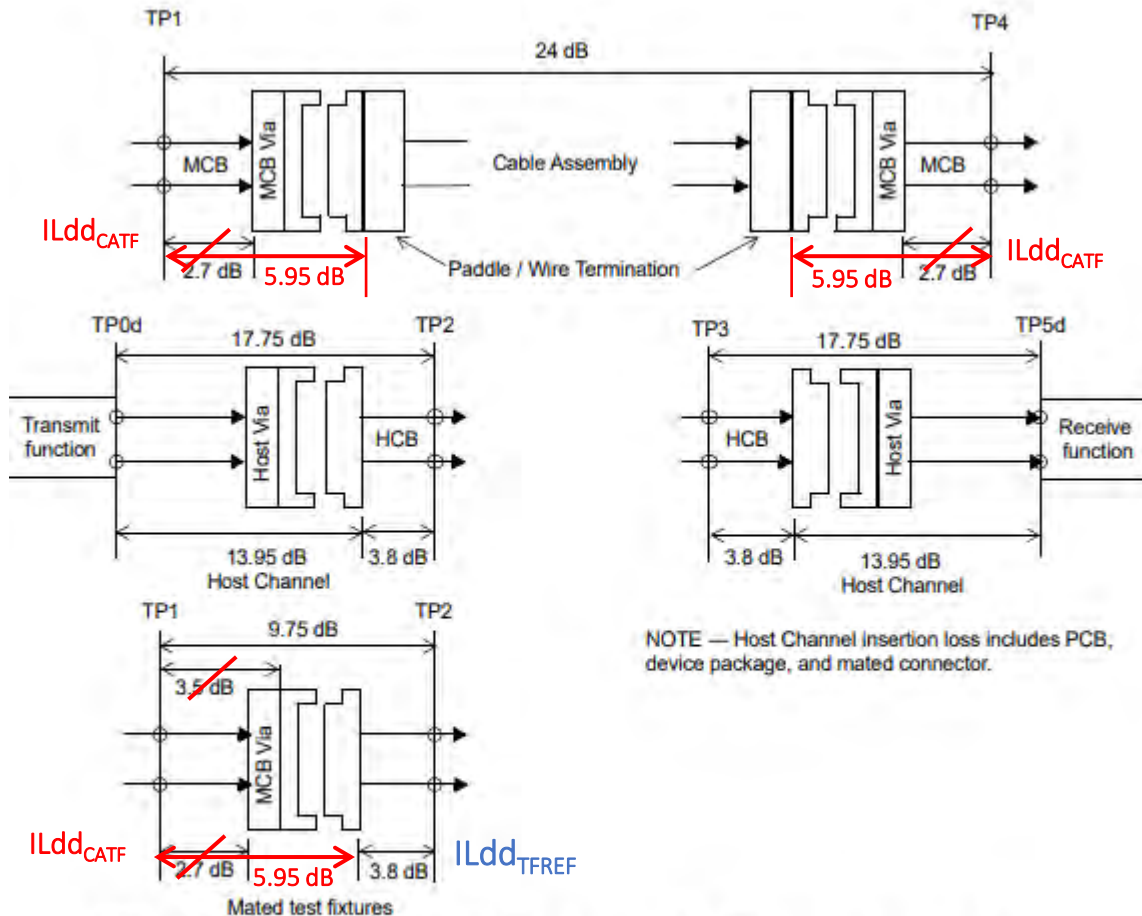
- Adee Ran – Cisco
- Rich Mellitz - Samtec

# Intent

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- Suggest ILdd mask limit lines and fitted equations for Mated compliance Test Fixtures (MTF) to fill TBD in 179B.4.1
  - Based on updated S4P data
- Not suggesting change to MTF ILdd reference line at this time – will likely change during Working Group as data from improved MDI connectors become available

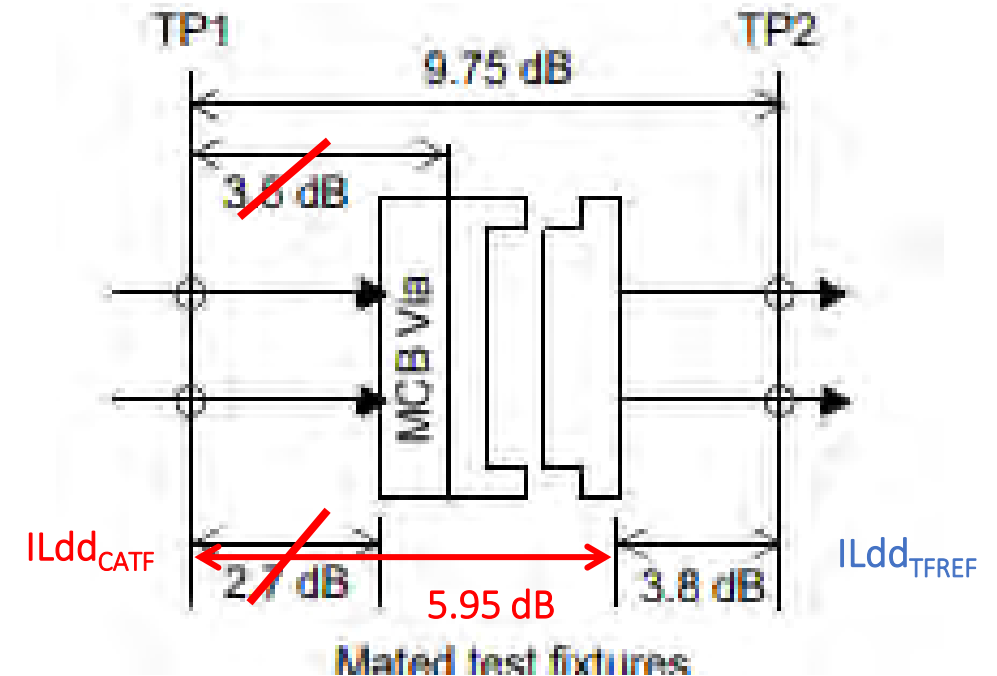
Figure 179A.1 correction (comment #140)



NOTE — Host Channel Insertion loss includes PCB, device package, and mated connector.

~~NOTE 2.7 dB MCB PCB ILdd includes the RF connector (up to the RF connector reference plane).~~

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



# MTF Measurement Setup & Curve Fitting Notes

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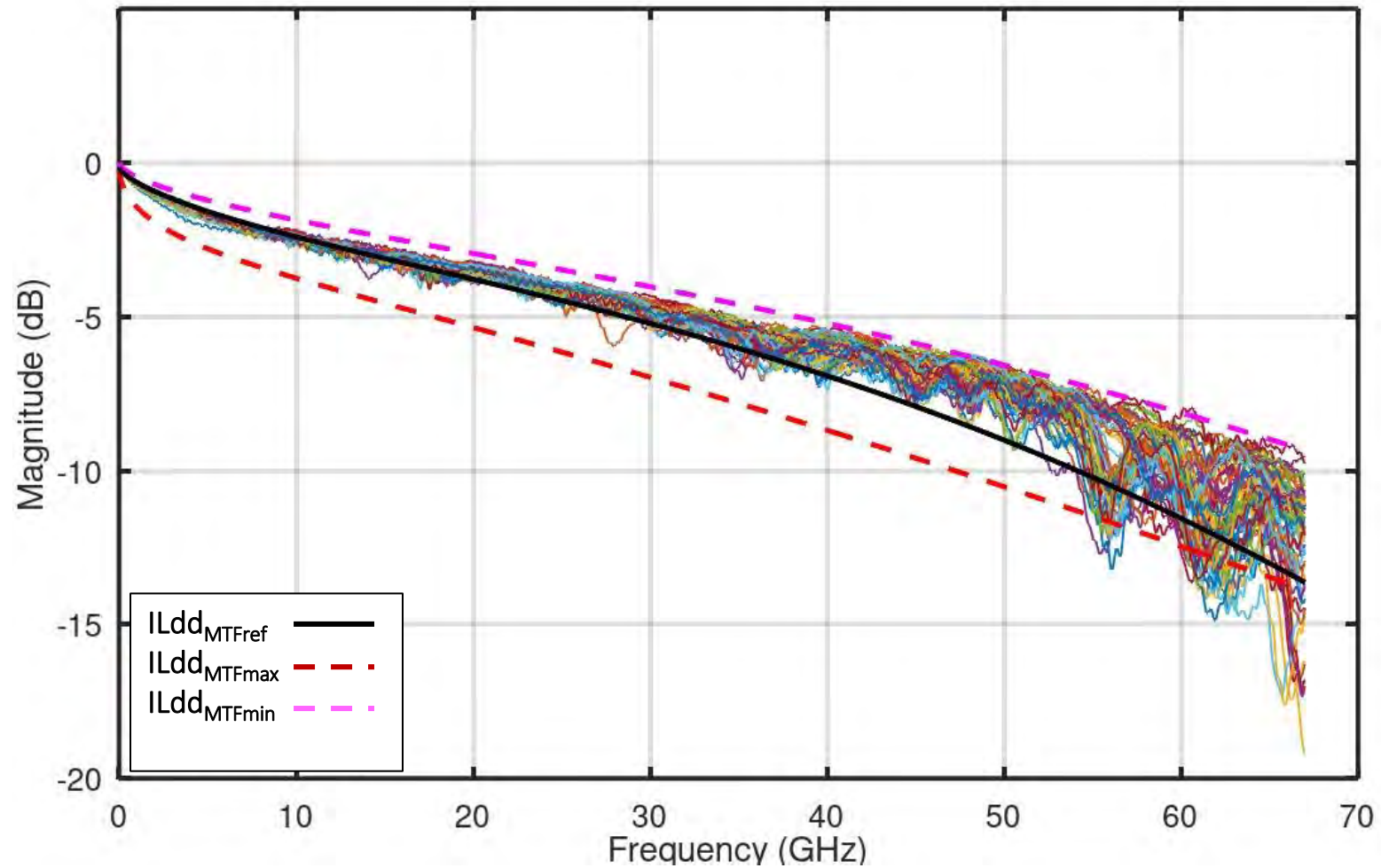
- Prototype HCB and MCB built with second generation module connector
- Based on data from 4 HCB + MCB sets
- 1.85 mm and 1.0 mm instrument connectors (2 each)
- S4P data measured to 110 GHz stop freq.; 10 MHz step size
- MCBs not tuned to target ILdd
  - Additional IL will be required
  - Current fixture sets not compliant – anticipate less spread between short and long legs to connect to PCB in future MDI connectors

# ILdd mask generation methodology assumptions

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- Sufficient mask margin to accommodate multi-sourcing of MDI connector
- Fitted reference MTF ILdd intersects with 9.75 dB @ Nyquist target already established by Task Force
- Low frequency MTF performance variance constrained by FOM\_ILD and ERL specifications rather than solely ILdd mask
- Suggested limit lines allow MCB and HCB fabrication with practical yields.
  - Further tightening of limit lines may be possible with forthcoming module connector improvement

# MTF ILdd Masks



# MTF ILdd Mask Equations

## 179B.4.1 Mated test fixtures insertion loss

The insertion loss of the mated test fixtures shall meet Equation (179B-3) and Equation (179B-4).

$$ILdd(f) \leq ILdd_{MTFmax}(f) = \begin{cases} TBD & 0.01 \leq f < TBD \\ TBD & TBD \leq f \leq 67 \end{cases} \quad (179B-3)$$

$$ILdd(f) \geq ILdd_{MTFmin}(f) = TBD \quad (179B-4)$$

for  $0.01 \leq f \leq 67$

where

$ILdd(f)$	is the measured insertion loss in dB at frequency $f$
$ILdd_{MTFmax}(f)$	is the maximum mated test fixtures insertion loss in dB at frequency $f$
$ILdd_{MTFmin}(f)$	is the minimum mated test fixtures insertion loss in dB at frequency $f$
$f$	is the frequency in GHz

$$0.03 + 1.6562\sqrt{f} - 0.286f + 0.0469f^{1.5} - 0.0014f^2$$

$$-0.0413 + 0.436\sqrt{f} + 0.0813f - 0.0153f^{1.5} + 0.00195f^2$$

\* Note:  $ILdd_{MTFmax}(f)$  is a continuous curve. Breakpoint knee as in 802.3ck is no longer present