
802.3dj - Comments D1.1

Annex 179A - TBDs

Chris DiMinico
PHY-SI LLC/SenTekse LLC/MC Communications
cdiminico@ieee.org

Purpose

- Comments D1.1 - D1.1- 179A.5 - TBDs
 - Mated Test Fixture
 - TP0d-TP2, TP3-TP5d

Supporters

- Sam Kocsis - Amphenol
- Upen Reddy Kareti - Cisco
- Scott Sommers - Molex
- Terry Little - Foxconn Interconnect Technology
- Nathan Tracy - TE

Background - D1.0

- Baseline adoption
 - TP1-TP4 and MCB IL adopted
 - MTF and HCB TBD

Motion #13

Move to adopt the "TP1-TP4 IL" column in the table and MCB insertion loss (2.7 dB) on slide 9 of diminico_3dj_01_2311 for 200GBASE-CR1, 400GBASE-CR2, 800GBASE-CR4 and 1.6TBASE-CR8 PHYs.

M: Chris Diminico

S: Nathan Tracy

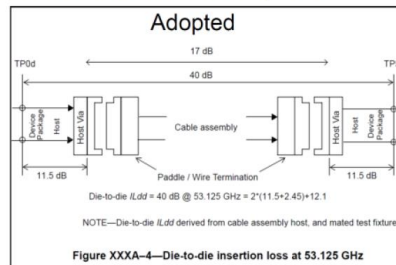
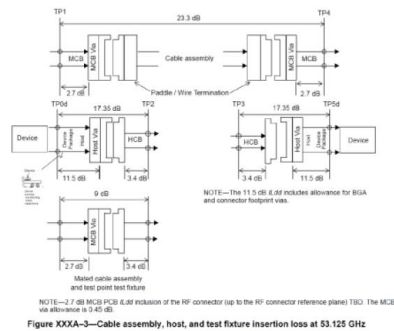
Technical (>=75%)

802.3 voters only

Result: passed by unanimous consent. 9:02 a.m.

Task Force: 3dj

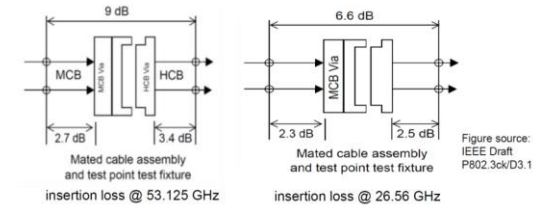
- Flexible host architectures and cable assemblies HN-HN depicted



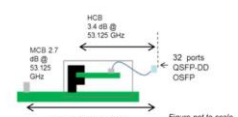
- Informative annex with inclusion of flexible host architectures and cable assemblies IL @53.125 GHz

Cable Assembly	Link Configurations	IL	TP0d-TP2 IL (dB)	TP3-TP5d IL (dB)	Cable +2*connector IL (dB)	TP1-TP4 IL (dB)	MTF IL (dB)	Die-to-die IL (dB)
CA-A	HH-HN	22.35	17.35	17.35	12	18.3	9	40
CA-B	HH-HL	22.35	12.35	12.35	17	23.3	9	40
CA-B - depicted	HN-HN	17.35	17.35	17.35	17	23.3	9	40
CA-C	HN-HL	17.35	12.35	12.35	22	28.3	9	40
CA-D	HL-HL	12.35	12.35	12.35	27	33.3	9	40

Mated test fixture insertion loss - HFSS model



Component	Insertion Loss (dB)
Module Compliance Board (MCB) PCB - 2" of -1.35 dB/in	2.7
Host Compliance Board (HCB) - 1inch*1.35dB/in + finch coax * .28dB/inch + 0.5dB via and co-ax transitions	3.4
Mated Test Fixture (MTF)	9
MTF connector + 2 via s	2.9



Mated test fixture and host insertion loss allocations @ 53.125 GHz

Source: https://www.ieee802.org/3/df/public/adhoc/electrical/22_0502/diminico_3dj_01_220502.pdf

Background - D1.1 - with comment#568 revision

CI 179A SC 179A.5 P 667 L 32 # 586

Ghiasi, Ali Ghiasi Quantum/Marvell
 Comment Type T Comment Status A HCB and MCB

MCB via allowance and HCB are TBD

Suggested Remedy

See Ghiasi C2M May-24 presentation
 MCB via = 0.8 dB
 HCB=3.8 dB to allow practical implementations

Response Response Status C

ACCEPT IN PRINCIPLE.

The following presentation was reviewed by the task force in the May 2024 interim meeting:
https://www.ieee802.org/3/dj/public/24_05/ghiasi_3dj_02a_2405.pdf

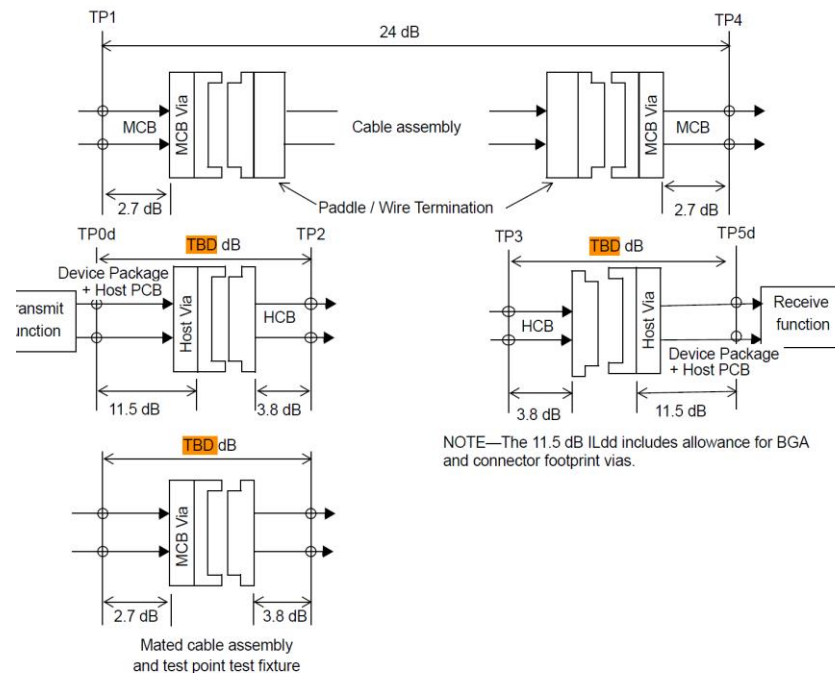
Note that the value of HCB loss appears 3 times in the diagram.
 Implement the suggested remedy with editorial license.

Table 179A-3—Maximum Insertion loss budget values at 53.125 GHz

Link Configuration	$IL_{Ca,max}$	$IL_{Ch,max}$
Host-High to Host-Nominal	CA-A (19 dB)	40
Host-High to Host-Low	CA-B (24 dB)	40
Host-Nominal to Host-Nominal	CA-B (24 dB)	40
Host-Nominal to Host-Low	CA-C (29 dB)	40
Host-Low to Host-Low	CA-D (34 dB)	40

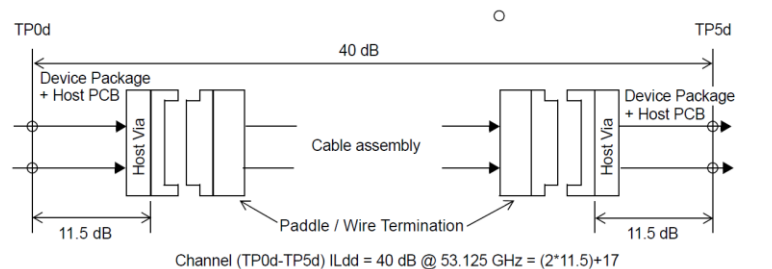
Table 179A-1—Recommended differential insertion loss limits at 53.125 GHz

Host designation	Host channel		TP0d to TP2 or TP3 to TP5
	Max (dB)	Min (dB)	Max (dB)
Host-Low (HL)	6.5	TBD	TBD
Host-Nominal (HN)	11.5	TBD	TBD
Host-High (HH)	16.5	TBD	TBD



NOTE (TBD)—2.7 dB MCB PCB ILdd includes the RF connector (up to the RF connector reference plane). The MCB via allowance is 0.8 dB.

Figure 179A-3—Host-Nominal to Host-Nominal, Cable assembly, and test fixture insertion loss at 53.125 GHz

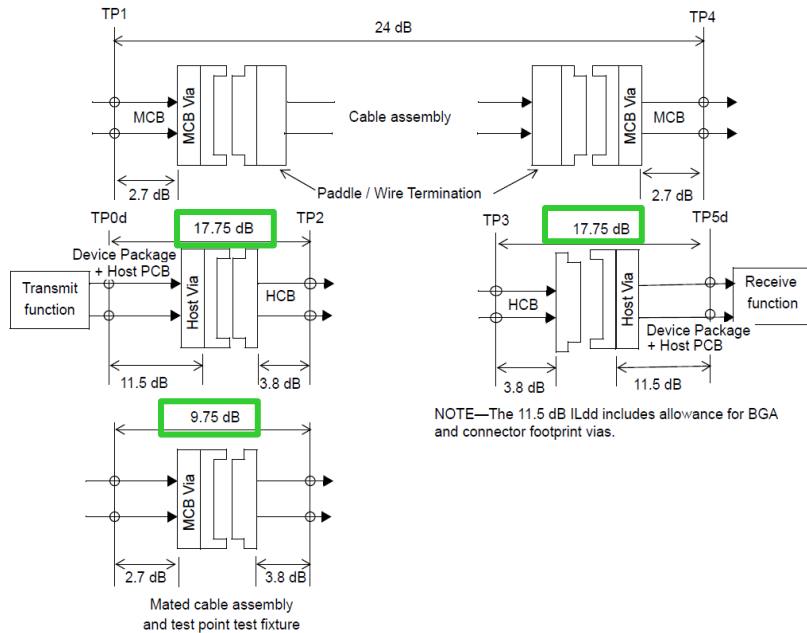


NOTE—Channel (TP0d-TP5d) ILdd derived from cable assembly host, and mated test fixture

Figure 179A-4—Host-Nominal to Host-Nominal Channel (TP0d-TP5d) at 53.125 GHz

Proposal - 179A.5 - TBDs; MTF and TP0d-TP2, TP3-TP5d

- 179A.5 - TBDs; Mated Test Fixture 9.75 dB @53.125 GHz, TP0d-TP2, TP3-TP5d (Table 179A-1)



NOTE—The 11.5 dB ILdd includes allowance for BGA and connector footprint vias.

Table 179A-1—Recommended differential insertion loss limits at 53.125 GHz

Host designation	Host channel		TP0d to TP2 or TP3 to TP5
	Max (dB)	Min (dB)	Max (dB)
Host-Low (HL)	6.5	TBD	12.75
Host-Nominal (HN)	11.5	TBD	17.75
Host-High (HH)	16.5	TBD	22.75

NOTE (TBD)—2.7 dB MCB PCB ILdd includes the RF connector (up to the RF connector reference plane). The MCB via allowance is 0.8 dB.

Figure 179A-3—Host-Nominal to Host-Nominal, Cable assembly, and test fixture insertion loss at 53.125 GHz

Proposal - 179A.5 - TBDs; MTF and TP0d-TP2, TP3-TP5d

- 179A.5 - TBDs; Mated Test Fixture 9.75 dB @53.125 GHz, TP0d-TP2, TP3-TP5d (Table 179A-1)

Table 179A-1—Recommended differential insertion loss limits at 53.125 GHz

Host designation	Host channel		TP0d to TP2 or TP3 to TP5
	Max (dB)	Min (dB)	Max (dB)
Host-Low (HL)	6.5	TBD	12.75
Host-Nominal (HN)	11.5	TBD	17.75
Host-High (HH)	16.5	TBD	22.75

Table 179A-3—Maximum Insertion loss budget values at 53.125 GHz

Link Configuration	$ILdd_{CA,max}$	$ILdd_{Ch,max}$
Host-High to Host-Nominal	CA-A (19 dB)	40
Host-High to Host-Low	CA-B (24 dB)	40
Host-Nominal to Host-Nominal	CA-B (24 dB)	40
Host-Nominal to Host-Low	CA-C (29 dB)	40
Host-Low to Host-Low	CA-D (34 dB)	40

$$ILdd_{Ch,Max}(f) = ILdd_{CA,Max}(f) + ILdd_{Host1,Max+TF}(f) + ILdd_{Host2,Max+TF}(f) - 2ILdd_{MTFref}(f) \quad (179A-10)$$

$$ILdd_{Ch,Min}(f) = ILdd_{CA,Min}(f) + ILdd_{Host1,Min}(f) + ILdd_{Host2,Min}(f) - 2ILdd_{MTFref}(f) \quad (179A-11)$$

for $0.05 \leq f \leq$ TBD

where

$ILdd_{Ch,Max}(f)$

is the maximum channel insertion loss between TP0d and TP5d in dB

$ILdd_{Ch,Min}(f)$

is the minimum channel insertion loss between TP0d and TP5d in dB

$ILdd_{CA,Max}(f)$

is the maximum cable assembly insertion loss (TP1 to TP4) in dB, Table 179A-3

$ILdd_{CA,Min}(f)$

is the minimum cable assembly insertion loss (TP1 to TP4) in dB, Table 179A-4

$ILdd_{Host1}(f)$

is the maximum insertion loss from TP0d to TP2d in dB (Table 179A-2) for link configurations Table 179A-3

$ILdd_{Host2}(f)$

is the maximum insertion loss from TP3d to TP5d in dB (Table 179A-2) for link configurations Table 179A-3

$ILdd_{MTFref}(f)$

is the reference insertion loss of the mated test fixture in dB, using Equation (179B-5)

f

is the frequency in GHz

dB @53.125 GHz

Cable Assembly	Link Configurations	IL	TP0d-TP2 IL	TP3-TP5d IL	Cable +2*connectors IL	TP1-TP4 IL	MTF IL	$ILdd_{Ch,max}$
CA-A	HH-HN		22.75	17.75	12	19	9.75	40
CA-B	HH-HL		22.75	12.75	17	24	9.75	40
CA-B	HN-HN		17.75	17.75	17	24	9.75	40
CA-C	HN-HL		17.75	12.75	22	29	9.75	40
CA-D	HL-HL		12.75	12.75	27	34	9.75	40

Summary

- Comments D1.1 - D1.1- 179A.5 - TBDs
 - Mated Test Fixture
 - TP0d-TP2, TP3-TP5d