Proposed content for IL budget in 176E

Associated comments: 412, 515, 144, 411, 566

Adee Ran, Cisco

Updated per the results of straw poll #E-1
from the September 2024 meeting

Figure 176E-2 in D1.1

Figure 176E–2—Components of a 200 Gb/s per lane AUI-C2M and insertion loss budget at 53.125 GHz

NOTE—The number of lanes n is equal to 1 for 200GAUI-1, 2 for 400GAUI-2, 4 for 800GAUI-4, and 8 for 1.6TAUI-8.

#412:

Figure 176E-2 includes both components and insertion loss budget. This creates an impression that its content is normative, and leads to long dispute. In fact, nothing in this figure is normative, and the test points that appear in it are inaccessible.

The "loss budget" numbers should be listed in the "Recommended channel" subclause 176E.5 instead.

#515:

Figure 176E-2 is becoming overly inflated with both architecture depiction of the AUI-C2M and with the complex channel insertion loss parameters. This subclause (176E.3) and figure (Figure 176E-2) should be simplified to describe the AUI-C2M is general. All of the channel insertion loss parameters should be depicted and defined in a subclause dedicated to the channel and its characteristics.

Possible paths

- Both comment 412 and comment 515 suggest that the loss values should not appear in this figure, which is intended to depict a functional model.
  - The suggested remedy in 412 is to add a table in 176E.5.1 with recommended loss values instead.
  - The suggested remedy in 515 is to create a new related diagram in 176E.5.
  - Both options are presented; we should choose one.
- Additional comments address this figure:
  - 144 and 411 suggest redrawing for clarity of what the different boxes are. The suggested changes are shown on the next slide.
  - 115 suggest specific numbers for the TBDs. ~~The numbers are not addressed in this presentation.~~ **Based on straw poll #E-1 there is consensus to use TP0d-TP1a ILdd of 32 dB.**

Proposed update to Figure 176E-2

Figure 176E–2 depicts a typical 200 Gb/s per lane AUI-C2M application ~~and the associated ILdd budget at 53.125 GHz. This ILdd budget represents a minimum capability that components are expected to support~~. The recommended characteristics of the channel between the C2M components are provided in 176E.5.
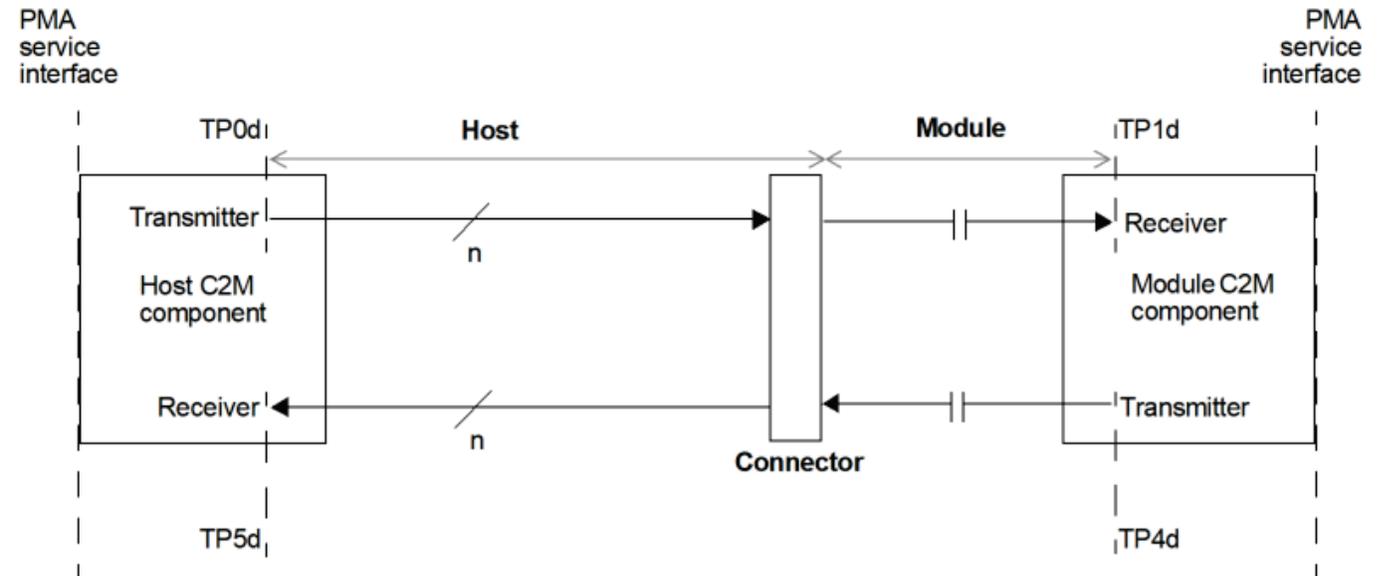
NOTE 1—The number of lanes n is 1 for 200GAUI-1, 2 for 400GAUI-2, 4 for 800 GAUI-4, and 8 for 1.6TAUI-8.
NOTE 2—The C2M channel is defined between TP0d and TP1d and between TP4d and TP5d, including any device packages that are part of the components.

Figure 176E–1—Components of a 200 Gb/s per lane AUI-C2M ~~and insertion loss budget at 53.125 GHz~~

~~Editor's note: Figure 176E–2 is intended to show die to die ILdd values, i.e., including packages where applicable. This is currently indicated by the test point designations TP0d, TP1d, TP4d, and TP5d, although these notations have not been adopted for this annex. Contributions on how this information is to be depicted in the diagram are encouraged.~~

Proposed update to 176E.5.1 – Table format

176E.5 Recommended channel

Unlike the related C2C interface specified in Annex 176D, the channel between the C2M components, with its associated insertion loss (ILdd), is not specified from end to end, since it is divided between two entities with different compliance requirements. The C2M components in the host and in the module with their respective portions of the channel are specified using their input and output characteristics at the specified test points (see 176E.4.1). The content of this subclause is a reference model that may be used for host and module design. It is expected that host and module specifications in this annex can be met with variety of approaches to host and module implementation.

176E.5.1 Reference insertion loss budget

Table 176E–5 lists the reference differential insertion loss (ILdd) values at 53.125 GHz for specific parts of the channel between the C2M components and for test fixtures associated with host and module specifications. The insertion loss is not expected to be measurable.

Table 176E–5—Reference ILdd values for the C2M channel

Path	Reference ILdd	Units
Host channel, between TP0d/TP5d and the connector pads		dB
Host connector		dB
Module channel, between paddle card edge and TP1d/TP4d	3.8	dB
Host and HCB, between TP0d/TP5d and TP1a/TP4a	32	dB
Module and MCB, between TP1d/TP4d and TP1/TP4		dB
HCB, between paddle card edge and TP1a/TP4a		dB
MCB, between the connector pads and TP1/TP4		dB

Fill in missing numbers based on D1.1 and resolved comments

# Proposed update to 176E.5.1 – Figure format

Fill in missing numbers based on resolved comments

176E.5 Recommended channel

Unlike the related C2C interface specified in Annex 176D, the channel between the C2M components, with its associated insertion loss (ILdd), is not specified from end to end, since it is divided between two entities with different compliance requirements. The C2M components in the host and in the module with their respective portions of the channel are specified using their input and output characteristics at the specified test points (see 176E.4.1). The content of this subclause is a reference model that may be used for host and module design. It is expected that host and module specifications in this annex can be met with variety of approaches to host and module implementation.

176E.5.1 Reference insertion loss budget

Figure 176E–5 depicts the reference differential insertion loss (ILdd) values at 53.125 GHz for specific parts of the channel between the C2M components and for test fixtures associated with host and module specifications. The insertion loss is not expected to be measurable.

Figure 176E–5—Reference insertion loss budget at 53.125 GHz
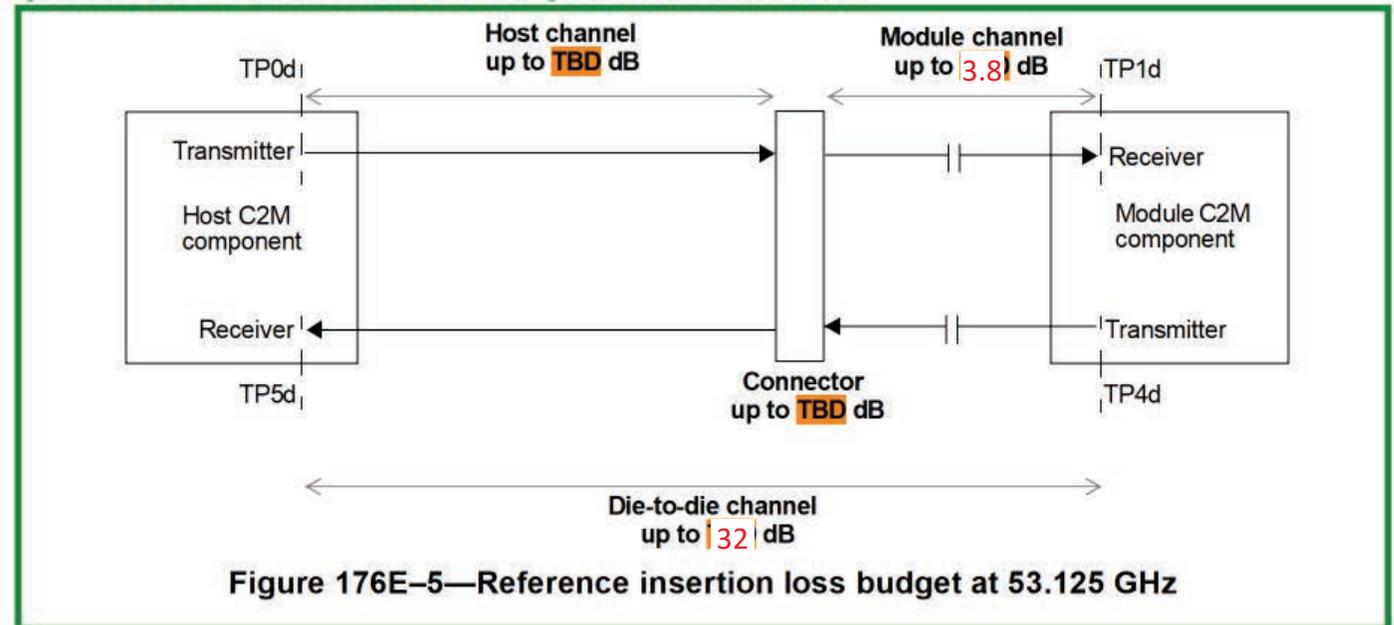
Connector allocation

- Comment #566 suggests that the connector should be considered part of the host channel, since it is part of the host design.
    - Although it is against 179A, it is applicable here too.

- If this comment is accepted, then the "host" and "connector" budgets in 176E.5.1 should be merged.

- This can be done with either of the suggested options, table or figure.

CI 179A   SC 179A.4   P739   L2   # 566

Dawe, Piers   Nvidia

Comment Type   T   *Comment Status* D   *Host channel IL*

Defining a "host channel" as "controlled impedance PCB, device package, and host connector footprints" is not realistic. There may be cables in the host, and the connector loss is significant and will not be the same for all connectors, cabled and not, on either side of the board... The connector is part of the host and its loss should be included. This will simplify things: there will be only two parts making up the TP0d to TP2 channel: the host and the HCB traces.

SuggestedRemedy

Define the host channel from TP0d to the outside of the connector, adding the nominal connector loss (2.9 dB because hundredths of a dB are to be avoided) to the values in Table 179A-1.

That's all

Questions?