Updated 200G Chip to Module Channels

Nathan Tracy
Megha Shanbhag

TE Connectivity
May 2023

EVERY CONNECTION COUNTS

Contributors

Regee Petaja, Broadcom

Chi Tu, Broadcom

Adam Healey, Broadcom

Overview

This contribution is an update to and replaces C2M channels provided in the November 2022 IEEE 802.3df meeting.

Goal is to provide an updated set of channels, based on conventional and unconventional architecture concepts, to help support technical feasibility, enable multi-party analysis and provide guidance to P802.3dj discussions.

Development work is on-going, updates and refinements are anticipated in future contributions.

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Description

- Updated simulated C2M channels, for 200G applications, using OSFP connector with various host architecture options

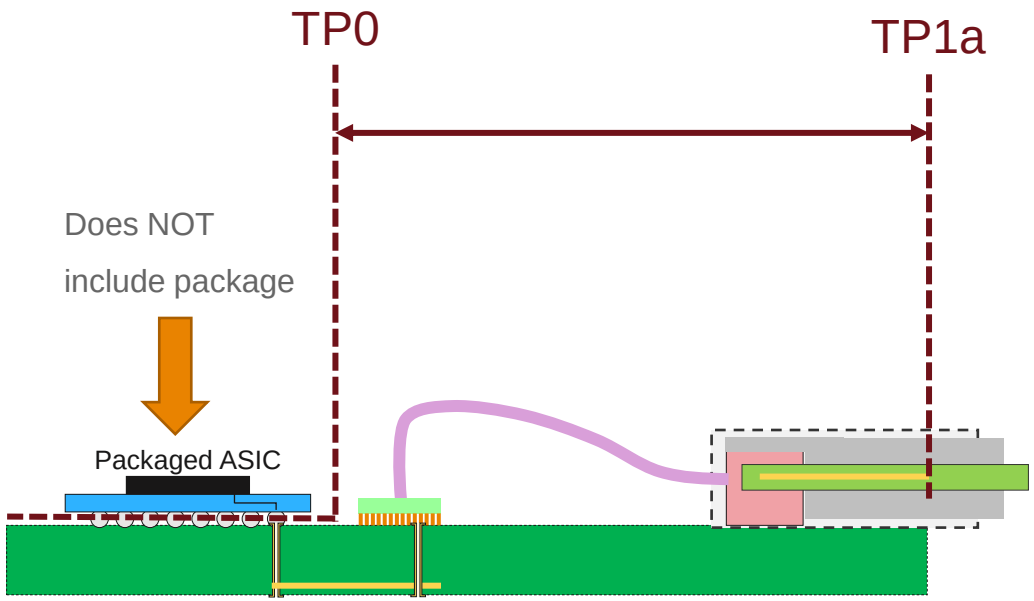
- The updates include –
  - Improved BGA escape
  - Updated host losses based on feedback

- BGA escape model provided by Regee Petaja and Chi Tu of Broadcom

- Does NOT include silicon package

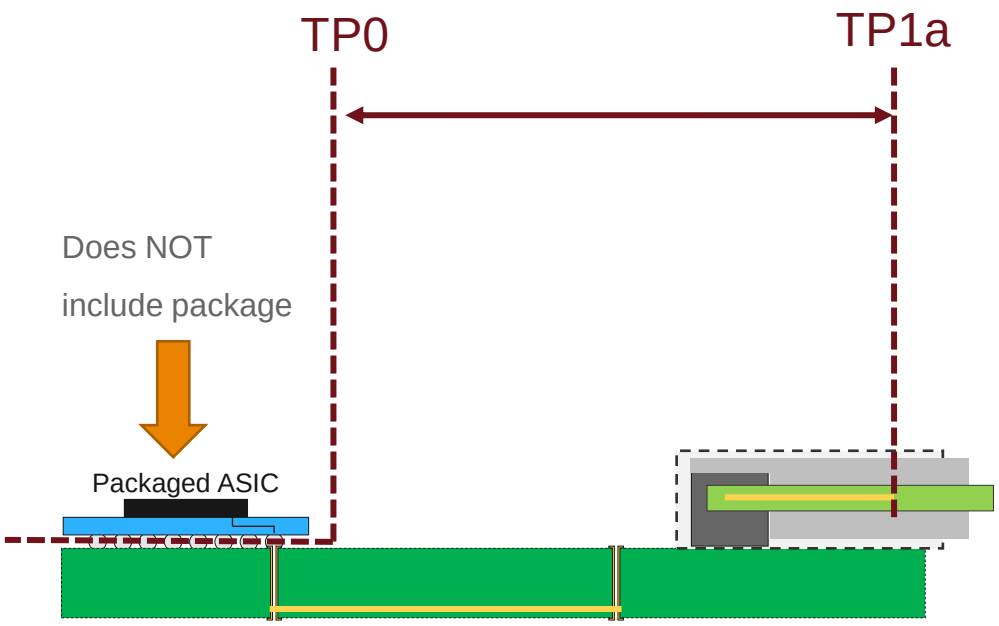
- What this presentation is NOT:
  - A specific host architecture proposal; comparative performance options are presented, i.e., traces vs. cabled host

Near Chip Copper [NCC] Host



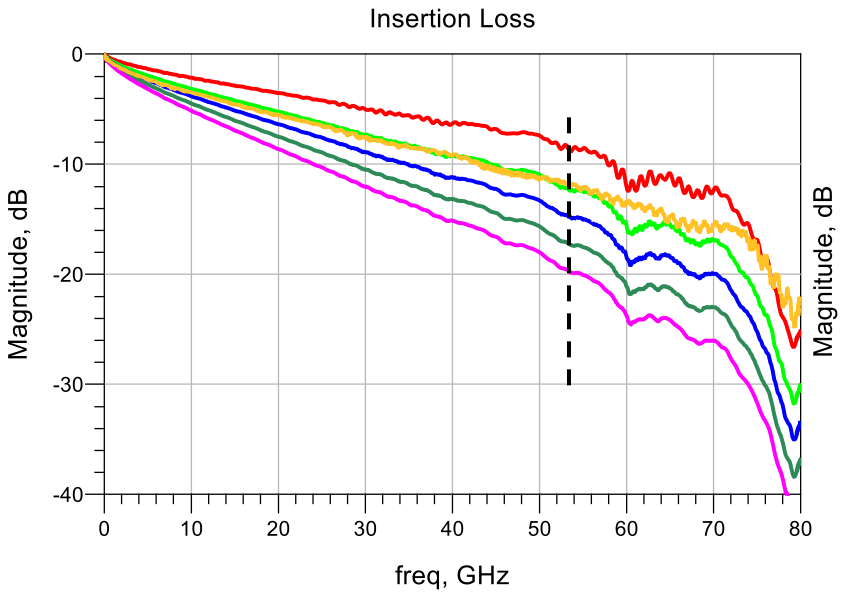
- OSFP OTB 200G Connector
- Cable Termination to OTB Connector
- 10”, 30AWG Cable
- Cable termination to NCC connector
- NCC connector
- NCC transition via and breakout traces
- Updated BGA footprint + breakout, 0.9-1.0mm pitch,
- Updated Host Loss,~7.85dB @ 53.125GHz
  - Host Loss includes BGA escape, traces, near chip connector and internal cable
- Updated Module Loss, ~2.5dB @ 53.125GHz
- All losses are at room temperature
- Channels do not include additional skew beyond whatever is part of design.

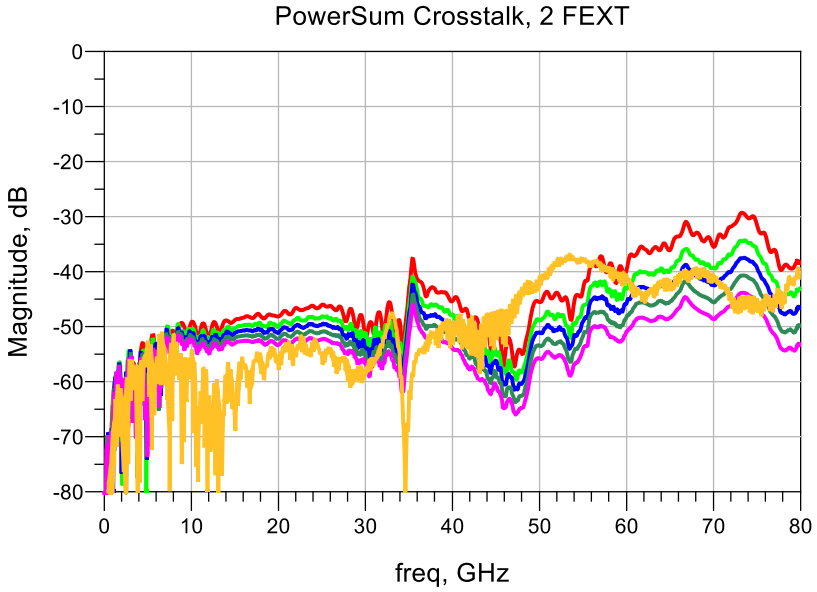
Conventional Host



- OSFP SMT 200G Connector
- Connector footprint and 1mm via transition, ~5mil stub included
- Updated BGA footprint + breakout, 0.9-1.0mm pitch
- Updated Host Loss,~3.7dB, ~7.3dB, ~9.8dB, ~12.2dB and ~14.6dB@ 53.125GHz
  - Host Loss includes BGA escape and traces
- Updated Module Loss, ~2.5dB @ 53.125GHz
- All losses are at room temperature
- Channels do not include additional skew beyond whatever is part of design.

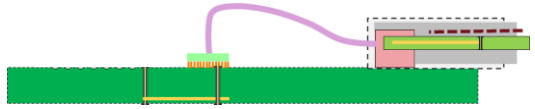
Performance Comparison





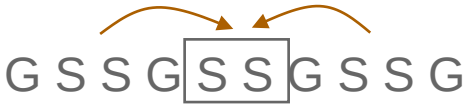
	TP0 – TP01a IL, dB @53.125GHz
Ch1	11.7
Ch2	8.4
Ch3	12.1
Ch4	14.6
Ch5	17.1
Ch6	19.6

Ch1: Cabled Host 7.85dB



Ch2: PCB Host 3.7dB
Ch3: PCB Host 7.3dB
Ch4: PCB Host 9.8dB
Ch5: PCB Host 12.2dB
Ch6: PCB Host 14.6dB

Crosstalk pinmap



Simulated results are provided to 80 Ghz, but channel bandwidth is assumed to be 67 Ghz max.

Summary

- Simulation results have been provided for 200G TP0-TP1a C2M channels with –
  - Various host loss options resulting in TP0-TP1a loss ranging from ~8 to 20dB
  - Includes traditional PCB based as well as cabled host architecture
- Not a final position on component or channel performance, further development is in process
- Intent is to provide continued meaningful support for 802.3dj C2M Analysis
- Touchstone files for data presented will be shared with the IEEE802.3dj community