Updated 200G Passive Copper Cable Assembly CR Channels

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TE Connectivity
May 2023

EVERY CONNECTION COUNTS

Contributors

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Overview

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

Goal is to provide an updated set of passive copper cable assembly CR 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.

Description

- Updated simulated CR channels, for 200G applications, using OSFP connector and passive copper cable assembly with various host architecture options

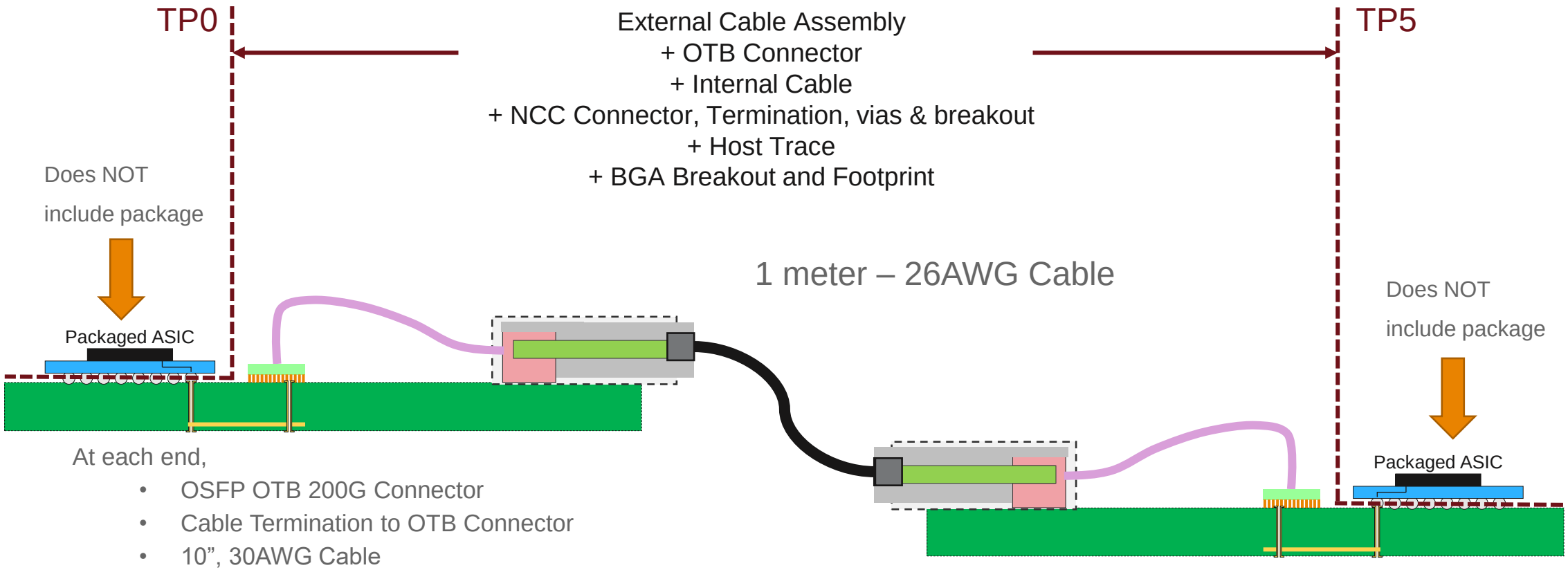
- The updates include –
  - Improved BGA escape
  - Updated paddle card and termination models
  - Updated Host losses based on feedback

- 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
  - Asymmetric architecture proposal (managed deployment)

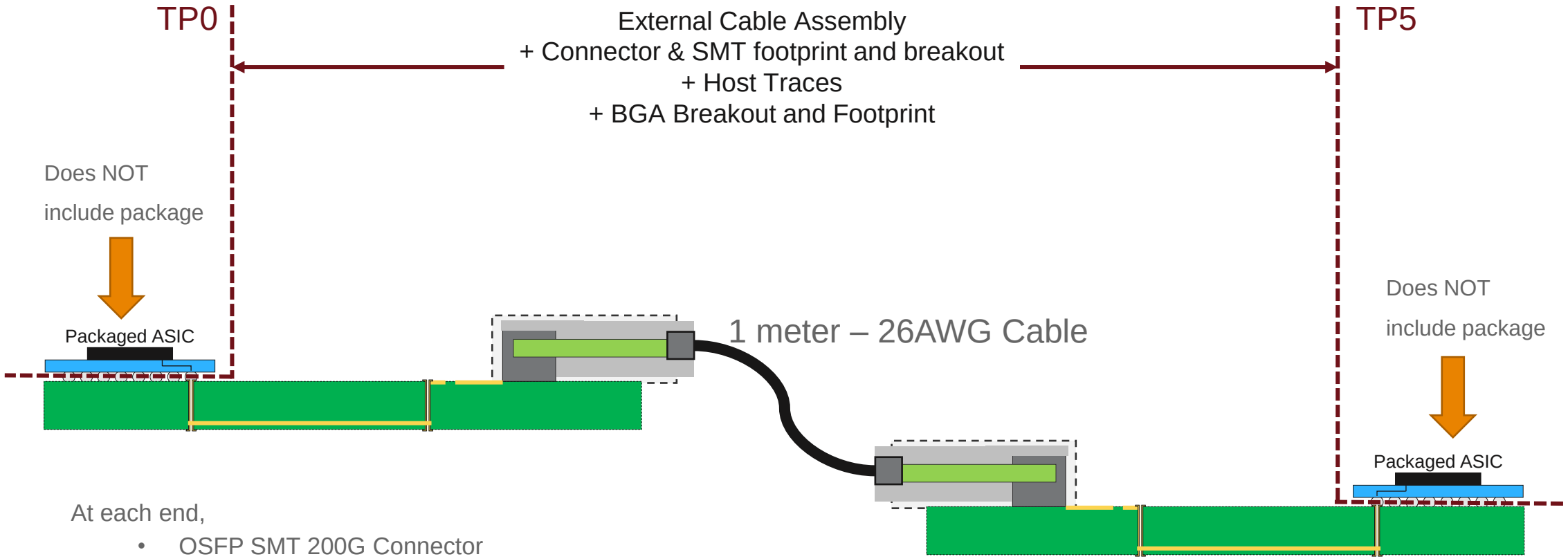
Copper Cable Assembly + Near Chip Copper [NCC] Host



At each end,

- 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
- All components are at room temperature
- Channels do not include additional skew beyond whatever is part of design.

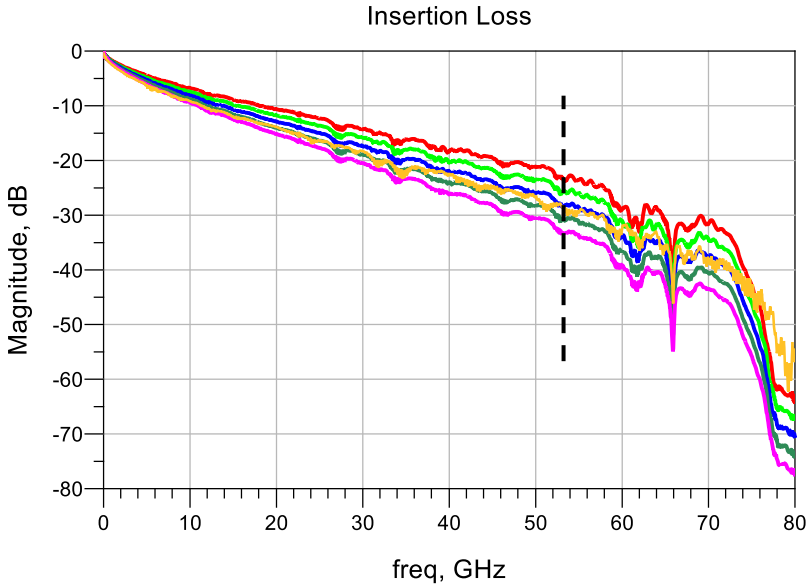
Copper Cable Assembly + Conventional Host

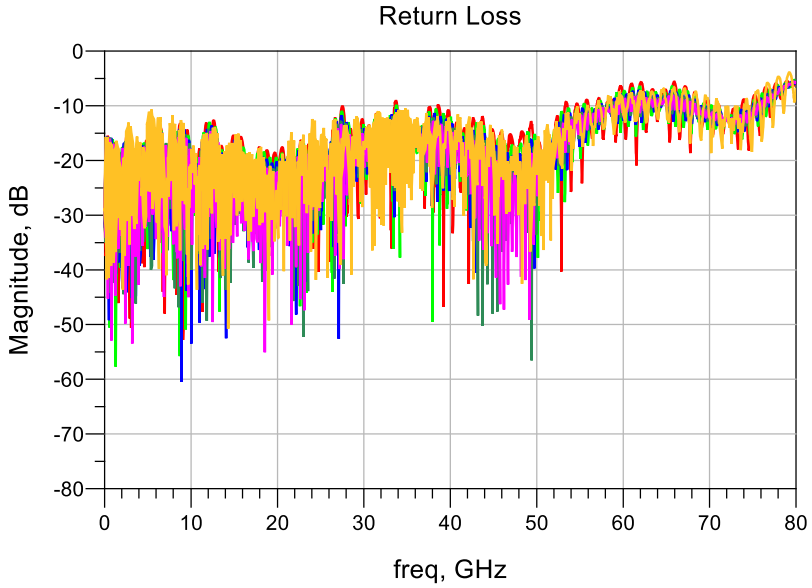


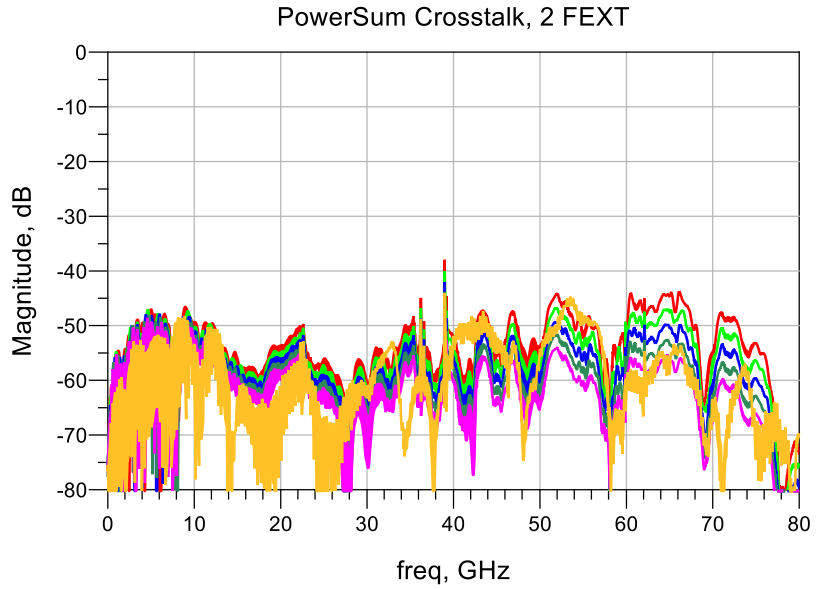
At each end,

- 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, ~4.9dB, ~6.1dB, ~7.3dB and ~8.5dB@ 53.125GHz
  - Host Loss includes BGA escape and traces
- All components are at room temperature
- Channels do not include additional skew beyond whatever is part of design.

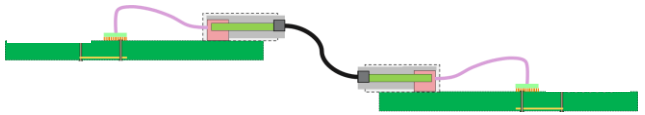
Performance Comparison



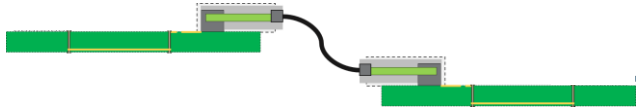




Ch1: Cabled Host 7.85dB

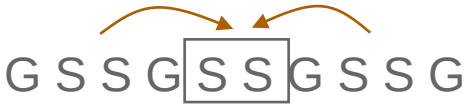


Ch2: PCB Host 3.7dB
Ch3: PCB Host 4.9dB
Ch4: PCB Host 6.1dB
Ch5: PCB Host 7.3dB
Ch6: PCB Host 8.5dB



	TP0 – TP5 IL, dB @53.125GHz
Ch1	28.4
Ch2	23.5
Ch3	25.9
Ch4	28.8
Ch5	30.8
Ch6	33.6

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-TP5 CR channels with –
  - Various host loss options resulting in TP0-TP5 loss ranging from ~23 to 34dB
  - 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 meaningful support for consensus building around IEEE 802.3dj CR clause.
- Touchstone files for data presented will be shared with the IEEE802.3dj community for COM analysis as we define the CR channel and refine and finalize the COM parameters.