Extended Reach Choice - CDR

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Outline

- Summary
- Fiber Reach & PCB Trace Reach
- Common Form Factors
- Conclusions & Next Steps

Extended Reach Choice - CDR

Summary

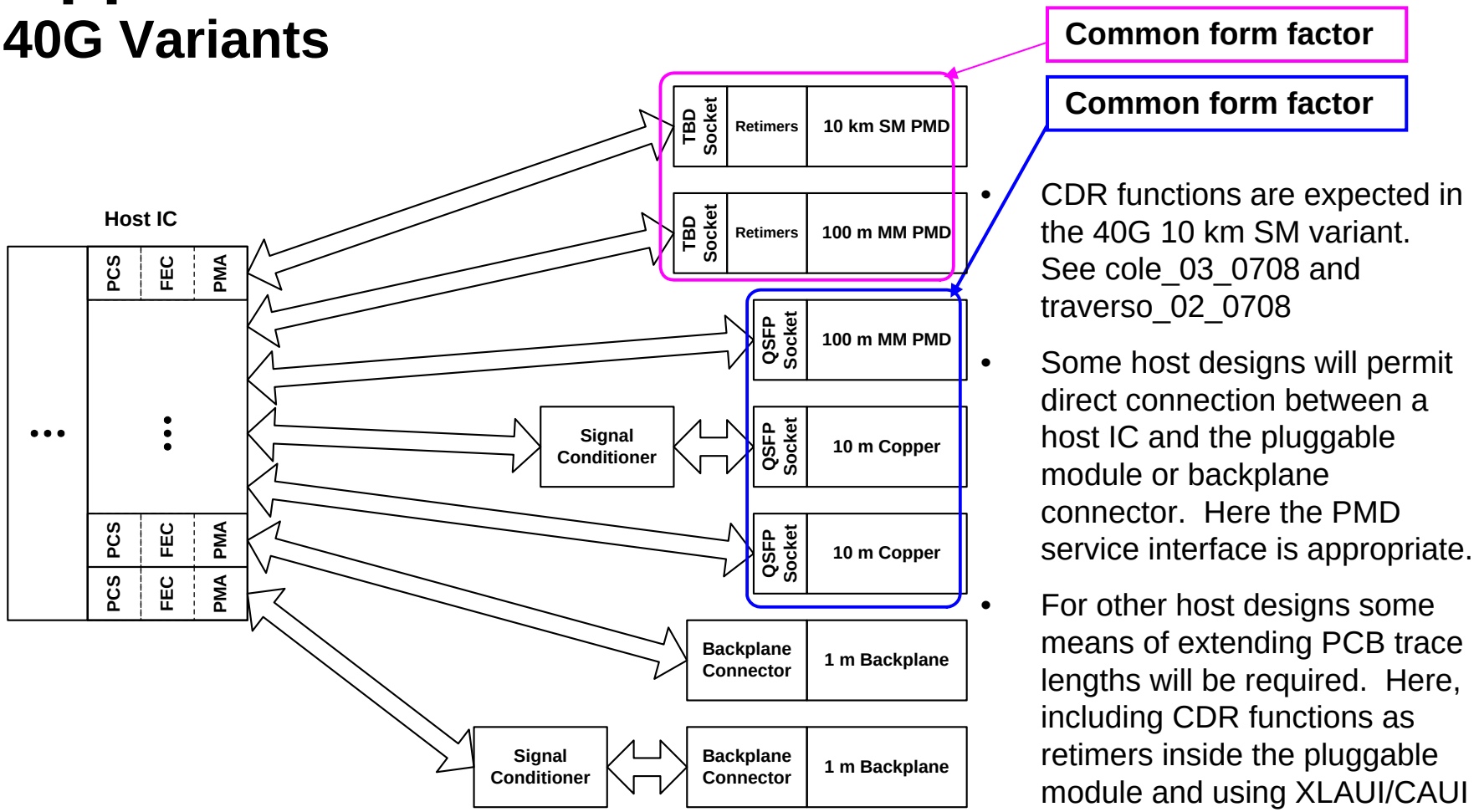
- For the 100 m OM3 variant, pluggable, multilane, non-retimed, limiting receiver, fiber optic modules are expected to provide the lowest power, highest density and lowest cost solution.
  - Direct connection between the module and host IC without intermediate signal conditioners maximizes the power, density and cost advantages but cannot be realized in all desired system designs.
- XLAUI/CLAUI or signal conditioners will be used where PCB layouts are challenging.
- XLAUI/CLAUI also will be used for form factors that support the 10 km and 40 km variants.
- The retimers associated with XLAUI/CLAUI can also satisfies extended fiber reach targets.
- Proliferation of module types can be minimized by taking advantage of the extended reach inherent in modules with XLAUI/CLAUI.

Extended Reach Comparison Summary

	Enhanced Tx	Internal CDR	Linear Rx & Simple EDC
OM3 reach one-sided	100 m	168 m	100 m
OM4 reach one-sided	126 m	207 m	126 m
OM3 reach two-sided	150 m	208 m	250 m
OM4 reach two-sided	250 m	251 m	300 m
PCB host IC to Tx	< 4” for SDD21 = -1dB/inch	~ 10” for SDD21 = -1dB/inch	< 4” for SDD21 = -1dB/inch
PCB host IC to Rx	< 4” for SDD21 = -1dB/inch	~ 10” for SDD21 = -1dB/inch	~ 10” for SDD21 = -1dB/inch

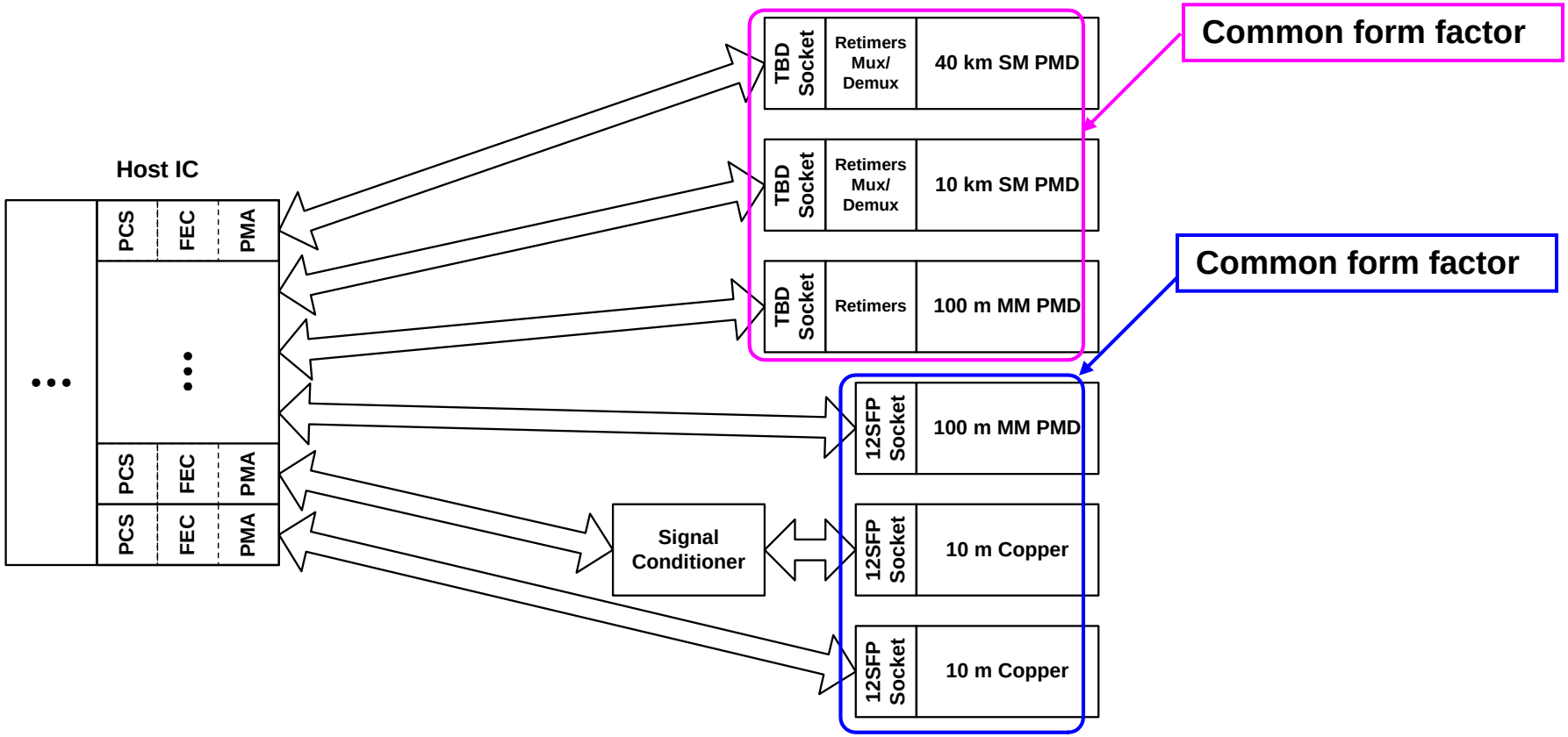
Opportunities for a Common Form Factor

40G Variants



- CDR functions are expected in the 40G 10 km SM variant. See cole_03_0708 and traverso_02_0708
- Some host designs will permit direct connection between a host IC and the pluggable module or backplane connector. Here the PMD service interface is appropriate.
- For other host designs some means of extending PCB trace lengths will be required. Here, including CDR functions as retimers inside the pluggable module and using XLAUI/CAUI permit a common form factor and electrical interface with the 10 km SM variant.

Opportunities for a Common Form Factor
100G Variants



- Some host designs will permit using the PMD service between a host IC and the pluggable module or backplane connector. For other host designs some means of extending PCB trace lengths will be required. Here, including CDR functions as retimers inside the pluggable module and using XLAUI/CAUI permit a common form factor and electrical interface with the 10 km and 40 km SM variants.

Conclusions, Recommendations & Next Steps

Conclusion:

- Using a CDR inside the pluggable module and adopting XLAUI/CLAUI as the electrical interface, is the best option for supporting the extended reach target:
  - It satisfies the targets for extended fiber reaches,
  - It is the best option for accommodating challenging host PCB layouts,
  - It permits a common form factor and electrical interface (XLAUI/CLAUI) with 10 km and 40 km SM variants.
  - It permits reuse of the baseline transmitters and receivers.

Next Steps:

- Prepare recommendation for 802.3ba.
- Prepare supporting material for 802.3ba recommendation.