

An aerial night photograph of a city skyline, likely Singapore, featuring a prominent skyscraper (Marina Bay Sands) and a river with a bridge. The sky is a mix of orange and blue from the sunset.

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Representing imperfections for CR Host Board

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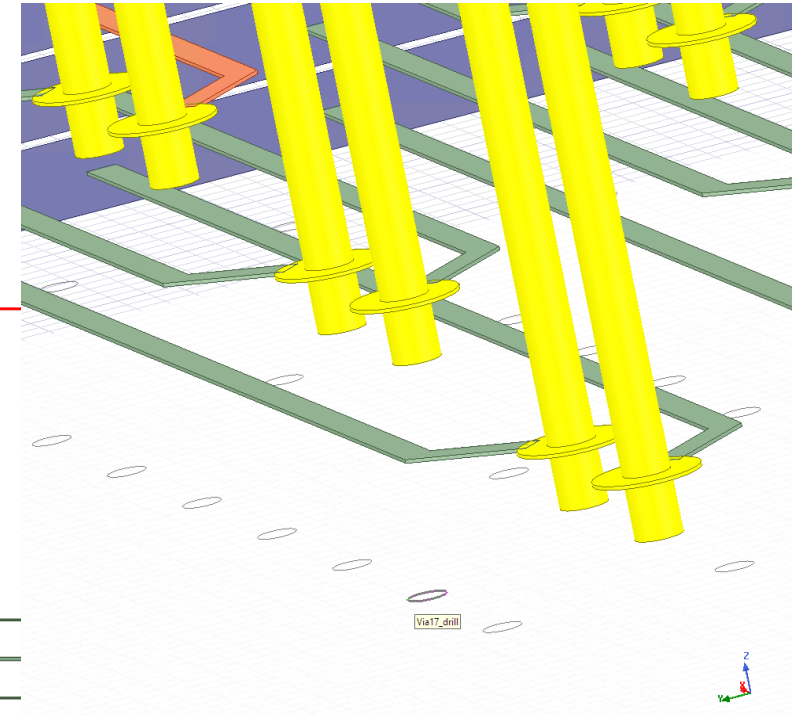
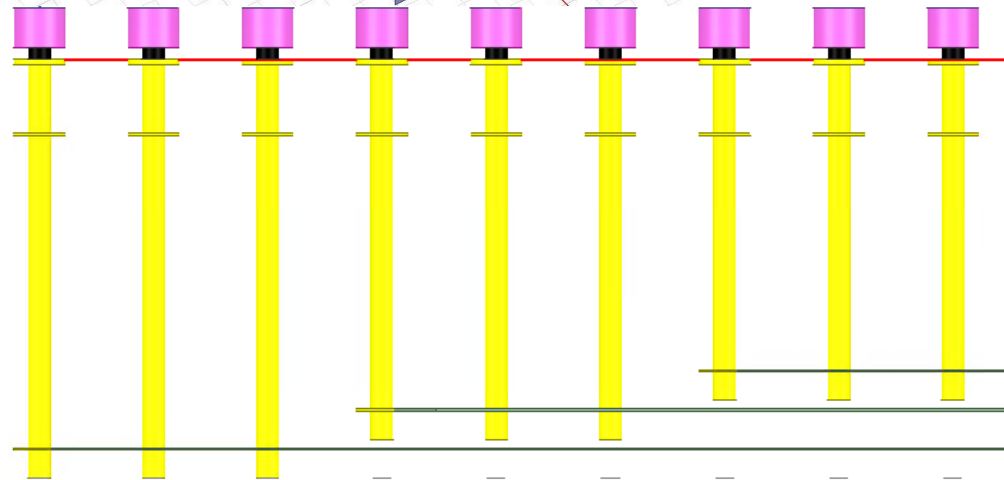
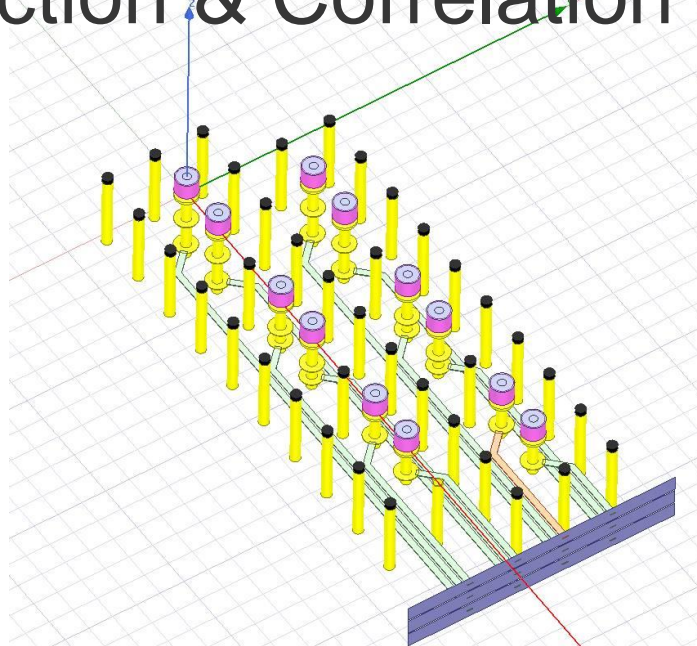
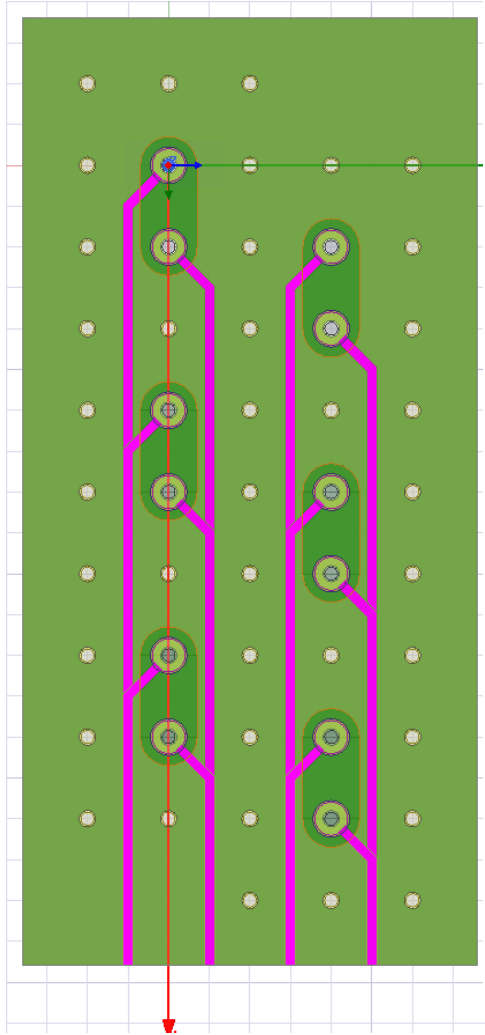
Executive Summary

- Include PCB initial representation was shown to have lower “reflection stamping” in reference to an optimized chip break-out & connector via area
- A “step at the right direction” will be recommended though not fully representing all phenomena
- One of the capacitive discontinuities of BO section and connector via were correlated to 29fF and 19fF respectively and presented during July Vienna Plenary – In a COM run, the resulting COM of capacitive discontinuities was still optimistic relative to BO section extraction by-itself – Correlation was done to the capacitance value rather than COM result – **Nevertheless still recommend using this methodology going forward, even though it underestimates the effect on COM**
- Crosstalk Tx and Rx sections were extracted and correlated to SNDR & Eta0 values

Models Extraction & Correlation Methodology Specifications

- Ball-out used for extraction was specified by a selected group of 802.3ck participants
- Long via field extracted and put @ Tx section (~2.5mm via + 10mil stub)
- Short via field extracted and put @ Rx section utilizing the upper section of the board stack-up (~1.0mm via with a 10mil stub)
- Swapping via length between Tx & Rx done as well to come up with alternative interconnect constellation
- Runs were done using COM 2.7 on multiple cable interconnects to correlate Tx crosstalk to SNDR effect and Rx crosstalk to Eta0 effect
- 8 lanes are of the same device origin – Is the assumption of no-correlation whatsoever between lanes adequate? Nevertheless was assumed here according to COM methodology to derive SNDR and eta0

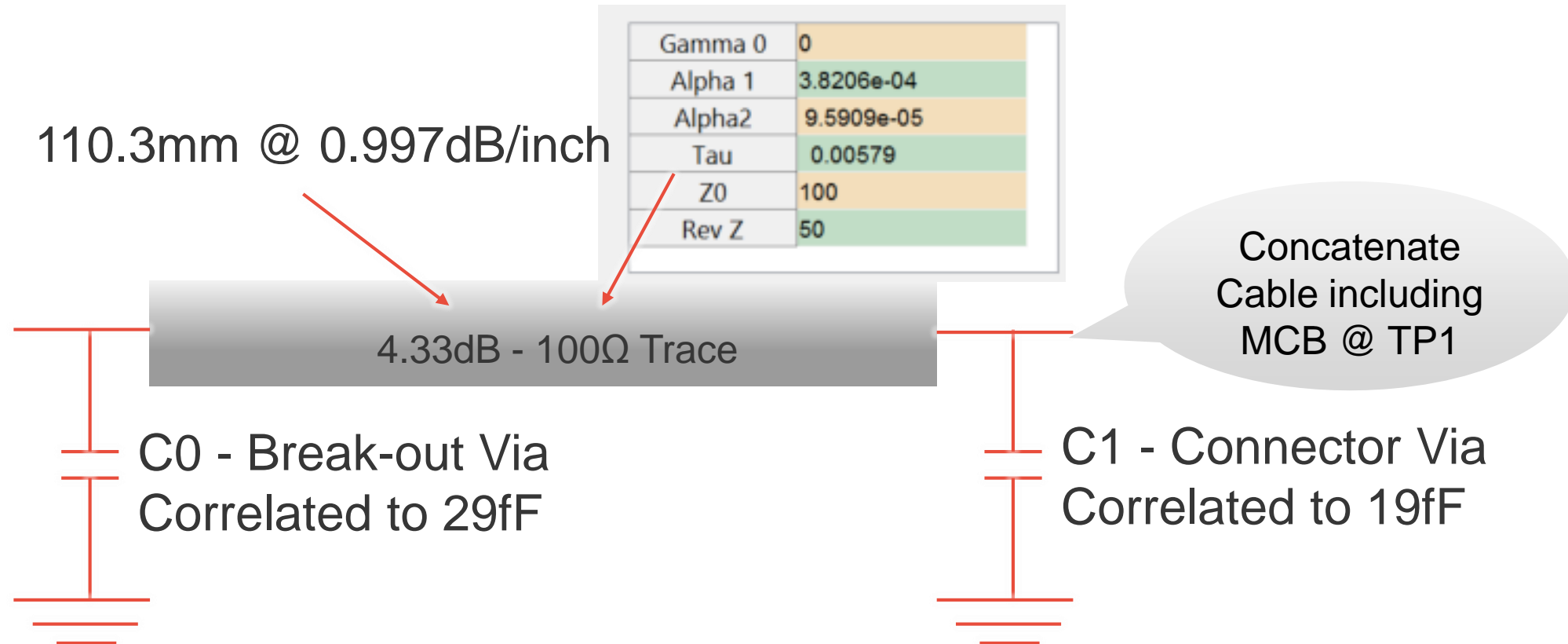
Models Extraction & Correlation Methodology Specifications



Models Extraction & Correlation Methodology Specifications

1. A Through lane(s) was concatenated with Tx and Rx through-break-out sections and run in COM for base-line reference – Baseline COM recorded
2. Breakout Tx crosstalk sections concatenated to the same interconnect(s) + Rx through BO section. COM was run with full ball-out surrounding – Target Crosstalk COM was recorded.
3. Rerun Phase1 with altering SNDR to come up with the Target Crosstalk COM by lowering SNDR – Result = 32.5dB/32.9dB
4. Breakout Tx through section was concatenated to the same interconnect(s) + Rx crosstalk section(s) - COM was run with full ball-out surrounding – Target Crosstalk COM was recorded.
5. Rerun Phase1 with altering ETA0 to come up with the target Crosstalk COM by increasing ETA0 – Result = 8.36e-9/9.35e-9

Model to be Inserted as “Include PCB” - Reminder



Summary, Conclusions, Recommendations & Next Steps

- Optimized break-out section effect on multiple lanes was translated to an updated Tx SNDR value of 32.5dB and $\text{Eta0} = 8.36\text{E-}9$ (if aggressors were changed to short, $\text{Eta0} = 8.69\text{E-}9$) **Recommending using these values for CR COM**, or SNDR=32.9 & $\text{Eta0} = 9.35\text{E-}09$
- Re-extracting the model with minimal via drill inaccuracy showed no actual effect on correlated SNDR/ Eta0
- Resulting SNDR & ETA0 assumed no statistical correlation between aggressor lanes (as is done in COM) – **Recommend further analysis if this assumption is appropriate/relevant for multi-lane port and adjust COM and SNDR/ Eta0 accordingly.**
- **Recommend using C0/C1 and trace parameters following slide #6 for “include_PCB” = 1**

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Backup

Two Possible Combination of SNDR/Eta0 according to Current Extraction

Cable	SNDR	Eta0	COM
P1_Tx4	32.5	8.36E-09	3.479
P1_Tx4	32.9	9.35E-09	3.363
P2_Tx3	32.5	8.36E-09	3.863
P2_Tx3	32.9	9.35E-09	3.742