

Handling of Passive Component Model in Transmission Line Simulation

Presentation edited to remove some vendor-specific content

ZUKEN Inc.

High-speed Solution Center

The Partner for Success

Motoyuki Kobayashi

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Agenda

- Necessity of Passive Component Models in Transmission Line Simulation
 - Existence of Connectors in High-speed Interconnects
 - Noise Filter in High-speed Interconnects
- Partnership with Component Vendors
 - Acquisition of Passive Component Models
 - Models through Partnership with Component Vendors
- Handling of S-Parameter Model
 - S-Parameter Model Support
 - Example flow of Transmission-line simulation using S-Parameter Model
 - Passivity and Causality
- Example of Simulation
 - Example of Simulation using S-Parameter Model



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in Transmission Line

Simulation

- Existence of Connectors in High-speed Interconnects
 - Connectors are often used to connect Multi Boards.
 - Generally, Connectors affect High-Speed Signals.



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Simulation

- Noise Filter in High-speed Interconnects
 - High-Speed Signal Transmission often requires Filter Components for noise reduction.
 - Noise reduction is main purpose, but affects waveform pattern.



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Partnership with Component Vendors

- Acquisition of Passive Component Models
 - For time-domain simulation, an equivalent circuit model is needed, but equivalent circuit models offered from Component Vendors are limited.
 - May not be usable in your simulator.



Partnership with Component Vendors

- Models through Partnership with Component Vendors
 - Improve model availability through co-operation of component vendors and tool vendors.



Handling of S-Parameter Model

- S-Parameter Model Support
 - Even if you can not get Equivalent Circuit Models, S-Parameter Models may be available.





Handling of S-Parameter Model

- Example flow of Transmission Line simulation using S-Parameter Model
 - S-parameter \Rightarrow N-port \Rightarrow SPICE netlist \Rightarrow Simulation



Handling of S-Parameter Model

- Passivity and Causality
 - If there are Passivity or Causality violations in analysis, the result is wrong or it may diverge.
 - Tools can generate SPICE Model which guarantee passivity.



Example of Simulation

- Example of Simulation using S-Parameter Model
 - Equivalent Circuit Model vs. N-Port Model Processor
 - Common Mode Filter [TDK : ACM3225-102-2P] •• N-Port Model Processor



Example of Simulation

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