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…from Simberian Inc.

Welcome to the latest edition of Simberian News!

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1) Simbeor results for Teraspeed's PLRD-1 verification board

Physical Layer Reference Design (PLRD-1) board has been recently developed by Teraspeed Consulting Group in collaboration with Simberian for measurement-based verification of electromagnetic and signal integrity software. This is the industry-first project of this kind, and we were happy to be a part of it. A board with thirty test structures has been built and investigated over the frequency band from 300 KHz to 20 GHz. Material properties were identified using transmission line segments and resonant structures. Typical elements of multi-gigabit data channels including different types of via-holes were investigated numerically and experimentally. We observed good correspondence of Simbeor results with the measured data for practically all structures – the comparison results are available on request and will be published soon. Simbeor demonstrated superior performance in the material parameters extraction due to the advanced broad-band causal modeling of conductor and dielectric related loss and dispersion effects. **Accurate frequency-domain measurements and de-embedding methodology developed by Teraspeed and accurate 3D full-wave Simbeor's models were two important components for the accurate material properties identification over a wide frequency band.** We observed over 10% variation of the dielectric constant over the investigated frequency band. Note that dielectric parameters defined with a static field solver on the base of TDR measurements may be considerably different from the actual values at frequencies starting as low as 1 GHz. Only frequency-domain measurements and 3D full-wave analysis provide sufficient accuracy and capture the dispersion and loss at multi-gigahertz frequencies.

The PLRD-1 board as well as the measurement and de-embedding methodology, material parameters extraction methodology and numerical models built with Simbeor are all available for either independent evaluation or to learn the frequency-domain measurement and modeling techniques. For more information, contact to us or to Alfred Neves at +1-(503) 718-7172.

2) Simbeor screen-casts

To overcome the fear of electromagnetic software, we have recently recorded a few videos or screen-casts with Simbeor demos - they are available at http://www.simberian.com/ScreenCasts.php. Some of our new customers became productive with Simbeor immediately after watching the detailed demos. Advanced stackup planning and interconnect budget investigation with 3D full-wave models is just one of the tasks that requires just 15 minutes of learning.

3) New application notes

Simbeor application notes are available at http://www.simberian.com/AppNotes.php. Four new app notes have been added recently:

#2008_06: Dielectric models and dispersion and loss in transmission lines – shows how dielectric model affects the characteristics of transmission lines. Wideband Debye, multi-pole Debye and model with constant DK and LT are compared with each other and with the experimental results provided by Teraspeed Consulting Group.

#2008_05: Minimization of reflection from bends - example of what if application of Simbeor to the widely discussed problem of bends. It shows that any cut-out of the bend conductor that reduces the capacitance of the bend and does not substantially increases the inductance of the bend can be used to minimize the reflection from the bends.

<u>#2008_04: Minimization of reflection from AC coupling capacitors</u> – shows how to minimize the reflection and to build electromagnetic models for AC coupling capacitors mounting structures with cut-outs in the reference plane.

<u>#2008_03: Electromagnetic analysis of spiral inductors</u> – contains verification of MIC inductor analysis by comparison with experimental data and example of analysis of stacked inductor on silicon.

4) New Simbeor licensing options

New Level 0 license is available to support all activities related to Touchstone models and to multiport models in general – model quality evaluation, quality restoration, transformations and plotting S/Y/Z-parameters in different forms, transformations to and from the mixed-mode space and output in different formats. **Level 0** license annual price is **$290.00** including support and updates.

Considering growing interest to Simbeor's use as the advanced stackup planning and interconnect budget exploration tool, we bundled all features necessary for this activity into the license **Level 1** and competitively priced it as **$2,900.00** per year. <u>Click here to see a complete list of Simbeor 2008 features and prices for different license levels</u>.

<u>Download and try Simbeor today</u>, or let us know if you would like to have an overview and demo of Simbeor 2008 over the webex.

Sincerely,
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