

2016 IEEE 25th Conference on Electrical Performance of Electronic Packaging and Systems (EPEPS 2016)

**San Diego, California, USA
23-26 October 2016**



**IEEE Catalog Number: CFP16EPP-POD
ISBN: 978-1-5090-6111-2**

**Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP16EPP-POD
ISBN (Print-On-Demand):	978-1-5090-6111-2
ISBN (Online):	978-1-5090-6110-5
ISSN:	2165-4107

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

Packaging Integration and Analysis

Power Delivery Network Design and Modeling for High Bandwidth Memory (HBM).....	3
Silicon-Package Co-Design of a 45nm 200MHz Bandwidth CMOS RF-to-Serdes Transceiver System on Chip (SoC)	7
Flip-Chip Package for 28G SerDes Interface	11

Electrical Analysis of Packaging Structures

RDL and Interposer Design for DiRAM4 Interfaces.....	17
E-shape Resonator Dualband Common Mode Filter	21
Scalable and Broadband Modeling of Coupled On-Chip Spiral Inductors Up to 110 GHz	25
8B9B Encoding for Crosstalk Reduction in a High- Speed Parallel Bus	29

Macromodeling and CAD

The Relationship Between Galerkin and Collocation Methods in Statistical Transmission Line Analysis	35
Passivity Enforcement using Incomplete Complex Frequency Hopping	39
Loewner-based macromodeling with exact interpolation constraints	43
A Stochastic Collocation Technique for Time-Domain Variability Analysis of Active Circuits...	47

Power Network Design

Mesh-based Impedance Sensitivity Formulation for DC/AC Power Integrity Design and Diagnosis.....	53
Guard Band Reduction Via Dynamic Voltage Sensing and Reference Setting Schemes in Power Gated Applications	57
Time domain PDN noise modeling for high performance system	61
Modeling and Design of System-in-Package Integrated Voltage Regulator with Thermal Effects	65

Poster Session and Industry Reception

SI-PI Analysis and Compliance Test of HDMI 1.4b Serial Channel with IBIS-AMI.....	71
A Novel Algorithm for Computing the Zeros of Transfer Functions by Local Minima	75
Techniques for detection of package issues in chip power integrity closure.....	79
A High-Performance Global Electromagnetic Noise Suppression Method for 3D TSV SiP.....	83
Electrical Modeling and Analysis of 3D Neuromorphic IC with Monolithic Inter-tier Vias.....	87
Impact of Wafer-Bonding Defects on Monolithic 3D Integrated Circuits	91

Loewner Matrix Interpolation for Noisy S-parameter Data	95
Reduced Order Modeling in FDTD with Provable Stability beyond the CFL Limit	99
Delay Rational Macromodels of Long Interconnects using Loewner Matrix	103
Radiation Compatible Ports and Loads for the PEEC Method.....	107
EMI Modeling and Correlation in a Highly Integrated Package Design.....	111
A Method to Assess the Radiated Susceptibility of Printed Circuit Boards.....	115
Enlarged Cell Technique for Conformal Equivalent Circuit Model of Power Delivery Network.....	119
Anisotropic Formulation of Hyperbolic Polynomial Chaos Expansion for High-Dimensional Variability Analysis of Nonlinear Circuits	123
Performance Modeling and Optimization for On-Chip Interconnects in Cross-Bar ReRAM Memory Arrays	127

Hardware Characterization

Reflection De-Embedding for High-Speed I/O Measurements	133
A Study of Load-line Effect on Power Supplies of Digital Networking Processors	137
Drawbacks and Possible Improvements of Short Pulse Propagation Technique	141

Machine Learning

Machine Learning in Physical Design	147
Neural Network Based Method for Predicting PCB Glass Weave Induced Skew	151
PCB Stack-Up Design and Optimization for Next Generation Speeds	155

Electrical Performance of Automotive Interconnect

Selective Harmonic Elimination Method of Radiation Noise from Automotive Wireless Power Transfer System Using Active Rectifier.....	161
Signal Integrity Analysis of Vertical Dual Port Coaxial Connector for Automotive System	165
Directional Hybrid FEM-MoM for Automotive System level Simulation.....	169

Electromagnetic Analysis for Packaging Applications

Removal of Artificial Resonances for Divide and Conquer Analysis using Boundary Element Method.....	175
Efficient Transient Full-Wave Analysis of High-Speed Interconnects in Multilayer PCBs	179
Toward Predictive Modeling of Full-Size Packages with Layered-Medium Integral-Equation Methods	183

Analysis of Novel Interconnect

Boosting Off-chip Interconnects through Power Line Communication	189
Fast Parameter Extraction for Transmission Lines with Arbitrarily-Shaped Conductors and Dielectrics Using the Contour Integral Method.....	193
A Dielectric Based Waveguide Integrated in a Multilayer PCB for Ultra High Speed Communications	197
Crosstalk Evaluation Between Ultra High Speed Multi-layer Compatible PCB Dielectric Waveguides and Reduction using Split Ring Resonators.....	201

Numerical Analysis Techniques

A Passivity Approach to FDTD Stability with Application to Interconnect Modeling.....	207
Parallel Transient Simulation of Power Delivery Networks using Model Order Reduction.....	211
Efficient and Robust Dyadic Green's Function Evaluation Algorithm for the Analysis of IC Packages and Printed Circuit Boards.....	215
New Detailed Understanding of the Mechanism of Radiation in Interconnect Problems.....	219

Author Index	223
---------------------------	------------