Documento preparado por:
Antonio Ferrer Vidal +34 629 608 189 / +1 404 993 3917
Alumno de la ETSIT, UPV anfervi@teleco.upv.es

Colaboración Internacional

Universidad Politécnica de Valencia – Georgia Institute of Technology

Visita del profesor Manos M. Tentzeris a la Universidad Politécnica de Valencia

Charla informativa y conferencia

1 Conferencia y presentación

Introducción

El presente documento especifica la fecha, hora y lugar en el que el Prof. Manos M. Tentzeris dará una conferencia técnica y presentación del Georgia Electronic Design Center (GEDC), centro que forma parte de la universidad Georgia Institute of Technology, situada en Atlanta, Georgia, EE.UU. Este acto forma parte de la visita del Prof. Tentzeris a la Universidad Politécnica de Valencia en representación del GEDC con la finalidad de estrechar los lazos de colaboración existentes, hasta ahora únicamente de intercambio de alumnos. La información y fechas presentadas en este documento son definitivas a no ser que acontezca algún imprevisto.

Conferencia a cargo del Prof. Tentzeris

Con el fin de presentar a los miembros de la comunidad universitaria en la UPV las actividades desarrolladas en el centro de investigación GEDC así como la exposición de un tema técnico se sugiere la siguiente conferencia a impartir por el Prof. Tentzeris.

Conferenciante:

Professor Manos M. Tentzeris

Lugar:

Sala de conferencias de CPI

Fecha y hora:

Jueves 25 de Mayo a las 12:30

Público:

Personal docente e investigador de ITACA, iTEAM y NTC, estudiantes de doctorado, alumnos, público en general.

Información de sala:

Aforo 150 personas

Invitación:

Extendida por la Oficina de Acción Internacional

Duración estimada:

75 minutos (60 minutos de conferencia + 15 de presentación del GEDC)

Versión resumida

Biografía:

Professor Manos M. Tentzeris received the Diploma Degree in Electrical and Computer Engineering from the National Technical University of Athens ("Magna Cum Laude") in Greece and the M.S. and Ph.D. degrees in Electrical Engineering and Computer Science from the University of Michigan, Ann Arbor, MI and he is currently an Associate Professor with School of ECE, Georgia Tech, Atlanta, GA.

He is the Georgia Electronic Design Center Associate Director for RFID/Sensors research. Also, he is the Georgia Tech NSF-Packaging Research Center Associate Director for RF Research and the RF Alliance Leader. He is also the leader of the RFID Research Group of the Georgia Electronic Design Center (GEDC) of the State of Georgia. He was the recipient of the 2006 IEEE MTT Outstanding Young Engineer Award for his work on 3D multiband/wideband wireless modules, 2004 IEEE Transactions on Advanced Packaging Commendable Paper Award, the 2003 NASA Godfrey "Art" Anzic Collaborative Distinguished Publication Award for his activities in the area of finite-ground low-loss low-crosstalk coplanar waveguides, the 2003 IBC International Educator of the Year Award, the 2003 IEEE CPMT Outstanding Young Engineer Award for his work on 3D multilayer integrated RF modules, 2000 NSF CAREER Award for his work on the development of MRTD technique that allows for the system-level simulation of RF integrated modules and the . He is the Associate Editor of IEEE Transactions on Advanced Packaging. He has given more than 50 invited talks in the same area to various universities and companies in Europe, Asia and America. He is a member of the Technical Chamber of Greece.

Título:

"Highly Integrated 3D RF Front-Ends for Broadband Convergent (Telecommunication, Computing and Entertainment) Applications: Status and Challenges"

Abstract:

Recently, there has been a lot of discussion about the convergence of telecommunications, entertainment and computing. Various standards covering PAN (Bluetooth, Zigby, UWB), LAN (802.11 a,b,g,n), WAN (WiMax, DVB) are competing for various environments and applications. In addition to these, 3G/4G cell phones are often capable of integrating GPS and RFID's. The major challenges for multiband/multistandard operation are the codesign of SOC and SOP, the integrated antennas in scalable architectures as well as the effective isolation and the minimized crosstalk between the different front-ends.

The current drawbacks of most commercially available microwave and millimeter wave front-ends for 3G/4G/WLAN/RFID/UWB and Sensor applications are their relatively large size, heavy weight primarily caused by discrete components such as the inductors and the filters, and separately located modules.

In this talk, there will be demonstrations of the design and optimization of fundamental components, such as embedded inductors, packaging-adaptive antennas (multilayer coupled patches, SHS and tri-band Topologies, conformal antenna arrays) and MEMS switches / reconfigurable circuits as well as minimization of the crosstalk between neighboring transmission lines that are commonly used for the feeding of neighboring MMIC's.

Versión completa

Biografía:

Professor Manos M. Tentzeris received the Diploma Degree in Electrical and Computer Engineering from the National Technical University of Athens ("Magna Cum Laude") in Greece and the M.S. and Ph.D. degrees in Electrical Engineering and Computer Science from the University of Michigan, Ann Arbor, MI and he is currently an Associate Professor with School of ECE, Georgia Tech, Atlanta, GA. He has published more than 230 papers in refereed Journals and Conference Proceedings and 10 book chapters and he is in the process of writing 3 books. Dr. Tentzeris has helped develop academic programs in Highly Integrated/Multilayer Packaging for RF and Wireless Applications, Microwave MEM's, SOP-integrated antennas and Adaptive Numerical Electromagnetics (FDTD, MultiResolution Algorithms) and heads the ATHENA research group (15 researchers). He is the Georgia Electronic Design Center Associate Director for RFID/Sensors research. Also, he is the Georgia Tech NSF-Packaging Research Center Associate Director for RF Research and the RF Alliance Leader. He is also the leader of the RFID Research Group of the Georgia Electronic Design Center (GEDC) of the State of Georgia. He was the recipient of the 2006 IEEE MTT Outstanding Young Engineer Award for his work on 3D multiband/wideband wireless modules, 2004 IEEE Transactions on Advanced Packaging Commendable Paper Award, the 2003 NASA Godfrey "Art" Anzic Collaborative Distinguished Publication Award for his activities in the area of finite-ground low-loss low-crosstalk coplanar waveguides, the 2003 IBC International Educator of the Year Award, the 2003 IEEE CPMT Outstanding Young Engineer Award for his work on 3D multilayer integrated RF modules, the 2002 International Conference on Microwave and Millimeter-Wave Technology Best Paper Award (Beijing, CHINA) for his work on Compact/SOP-integrated RF components for low-cost high-performance wireless front-ends, the 2002 Georgia Tech-ECE Outstanding Junior Faculty Award, the 2001 ACES Conference Best Paper Award and the 2000 NSF CAREER Award for his work on the development of MRTD technique that allows for the system-level simulation of RF integrated modules and the 1997 Best Paper Award of the International Hybrid Microelectronics and Packaging Society for the development of design rules for low-crosstalk finite-ground embedded transmission lines. He was also the 1999 Technical Program Co-Chair of the 54th ARFTG Conference, Atlanta, GA and the Chair of the 2005 IEEE CEM-TD Workshop and he is the Vice-Chair of the RF Technical Committee (TC16) of the IEEE CPMT Society. He has organized various sessions and workshops on RF/Wireless Packaging and Integration in IEEE ECTC, IMS and APS Symposia in all of which he is a member of the Technical Program Committee in the area of "Components and RF". He is the Associate Editor of IEEE Transactions on Advanced Packaging. Dr.Tentzeris was a Visiting Professor with the Technical University of Munich, Germany for the summer of 2002, where he introduced a course in the area of High-Frequency Packaging. He has given more than 50 invited talks in the same area to various universities and companies in Europe, Asia and America. He is a Senior Member of IEEE, a member of URSI-Commission D, an Associate Member of EuMA and a member of the Technical Chamber of Greece. He will be the TPC Chair for the IEEE-IMS 2008 to be held in Atlanta.

Abstract:

Recently, there has been a lot of discussion about the convergence of telecommunications, entertainment and computing. Various standards covering PAN (Bluetooth, Zigby, UWB), LAN (802.11 a,b,g,n), WAN (WiMax, DVB) are competing for various environments and applications. In addition to these, 3G/4G cell phones are often capable of integrating GPS and RFID's, as well as more and more powerful cameras. The major challenges for multiband/multistandard operation are the codesign of SOC and SOP, the integrated antennas in scalable architectures as well as the effective isolation and the minimized crosstalk between the different front-ends. Millimeter-wave frequency range (60 GHz) has also been proposed as an alternative for short-range broadband applications (in excess of 25 Gb/sec, e.g. video).

The current drawbacks of most commercially available microwave and millimeter wave front-ends for 3G/4G/WLAN/RFID/UWB and Sensor applications are their relatively large size, heavy weight primarily caused by discrete components such as the inductors and the filters, and separately located modules. Multi-layer ceramic (e.g. LTCC) and organic (e.g. LCP) SOP implementations are capable of overcoming this limitation by integrating components as part of the module package that would have otherwise been acquired in discrete form. On-package components not only miniaturize the module, but also eliminate or minimize the need for discrete components and thereby reduce the assembly time and cost as well. In this talk, there will be demonstrations of the design and optimization of fundamental components, such as embedded inductors, packaging-adaptive antennas (multilayer coupled patches, SHS and tri-band Topologies, conformal antenna arrays) and MEMS switches / reconfigurable circuits as well as minimization of the crosstalk between neighboring transmission lines that are commonly used for the feeding of neighboring MMIC's. The simulations have been performed using the finite-difference time-domain (FDTD) and the multiresolution time-domain (MRTD) schemes that have been modified in a way to allow for the development of composite cells that enable the intracell modeling of multiple PEC and dielectric interfaces. This approach has demonstrated a very high efficiency in the calculation of the scattering parameters, the Q-factor, as well as in the estimation of the radiation pattern, of the packaging effects and of the parasitic crosstalk between neighboring geometries. In addition, their inherent capability of global electromagnetic field calculation allows for the identification of "hot spots" of high field concentration and for the derivation of physical-driven solutions for the improvement of the overall system-on-package efficiency.

2 Información de contacto

Georgia Institute of Technology

Manos M. Tentzeris	**GEDC Associate Research Director for RFID and sensors**
Dirección	High Frequency Lab 85 5th Street, NW Room 539 Atlanta, Georgia 30308-0250 USA
Teléfono	+1 404.822.5350
Fax	+1 404.822.5350
Correo electrónico	etentze@ece.gatech.edu