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IEEE MICROWAVE THEORY & TECHNOLOGY SOCIETY

ITESO, Universidad Jesuita de Guadalajara
Departamento de Electrónica, Sistemas e Informática

El Comité de Educación de la Sociedad de Teoría y Tecnología de Microondas (MTT-S) del IEEE, la Sección Guadalajara del IEEE, y el Capítulo Guadalajara de la MTT-S, en colaboración con el Departamento de Electrónica, Sistemas e Informática del ITESO, invitan cordialmente a la conferencia magistral:

Transmission Lines for High-Speed/High-Frequency Integrated Circuits, Packaging Structures, and PCBs

by Prof. Shiban Kishen Koul

SYNOPSIS

Present day high-speed/high-frequency interconnects fall within the realm of radio frequency integrated circuits. These circuits generate strong electromagnetic interference (EMI) in signal transmission. Furthermore, if these circuits operate in the same EM environment, they are prone to mutual interference. It is therefore important to study EMI effects and suggest effective suppression mechanisms.

Transmission line is the backbone of any RF integrated circuit (IC) which use some sort of parallel or serial signals that are run at high speeds from a transmitter to a receiver, at the IC, package, or PCB levels. Proper selection of transmission lines will determine insertion loss, time delay, impedance levels, crosstalk, and radiation from discontinuities. Some of the conventional transmission lines used in high-speed layouts are stripline, microstrip line, and embedded microstrip line. This talk will first present characteristics of these conventional transmission lines and then list their advantages and disadvantages. Next, characteristics of several newer transmission lines for application in high speed/high frequency integrated circuit development will be presented. These transmission lines include inverted microstrip, suspended microstrip, recessed ground microstrip, micromachined microstrip, coplanar waveguide, suspended substrate line, suspended integrated substrate line, MEMS coaxial line, and non-radiative dielectric integrated guide. Characteristics of each of these transmission line in terms of loss, cross talk and radiation will then be described. Furthermore, some of the commonly used shielding suppression methods will also be briefly presented.

Finally, the talk will conclude by discussing practical RF circuit development of novel components using the newer transmission lines. The components include filters, mixers, and complete transceivers based on EM compatibility that minimizes mutual interference and ensures stability of signal transmission.

Shiban K. Koul received the Bachelor of Technology degree in Electrical Engineering from the Regional Engineering College in 1977, the Master of Technology degree in microwave engineering in 1979, and the PhD degree in the same field in 1983 from the Indian Institute of Technology, Delhi, in India. He is currently an Honorary Professor at the Indian Institute of Technology, Delhi.

His research interests include RF MEMS, high-frequency wireless communication, microwave engineering, microwave passive and active circuits, device modelling, millimeter and sub-millimeter wave IC design, body area networks, flexible and wearable electronics, medical applications of sub-terahertz waves, EMI/EMC suppression techniques and reconfigurable microwave circuits including miniaturized antennas.

He has successfully completed 38 major sponsored projects, 52 consultancy projects and 61 technology development projects. He has authored/co-authored 625 research papers, 23 state-of-the art books, 4 book chapters, and 2 e-books. He holds 26 patents, 6 copyrights and one trademark. He has guided 30 Ph.D. theses and more than 120 master's theses.

Prof. Koul is a Life Fellow of IEEE and Fellow of INAE and IETE. He is the Chief Editor of IETE Journal of Research. He has served as Distinguished Microwave Lecturer (DML) and Speaker Bureau Lecturer for IEEE MTT-S. He has been the recipient of an impressive set of international awards.

Miércoles 16 de octubre: 7:00 a 8:30 PM. ITESO, Auditorio W.

Entrada libre, cupo limitado. La conferencia será en inglés; al final de la misma (8 PM) habrá una convivencia.

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ITESO, Universidad Jesuita de Guadalajara
Periférico Sur Manuel Gómez Morín 8585, CP 45604, Tlaquepaque, Jalisco, México
Teléfono: +52/01 (33) 3669 35 98 Ext. 3096
https://www.iteso.mx/

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