



IEEE



May 23 - 26, 2022

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IEEE MICROELECTRONICS DESIGN & TEST SYMPOSIUM

Applications of Analog Defect Simulation to Digital, Memory, ADC and Package Level Tests

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Abstract:

Application of semiconductor electronics is getting unavoidable, widespread and diverse. Cost, power, quality and reliability requirements are getting stringent with the explosion of end applications into IoT, industrial and automotive markets among others. All these have driven more and more integration of analog, power management, HF line and RF communication front end circuits and systems. Further there is an increasing integration of not only features, but more components and chips within one package. These trends drive stringent test requirements including the need for defect coverage quantification and defect based testing of analog.

In this presentation we will present the state of the rapidly emerging field of analog defect simulation and applications of analog defect simulation through diverse industrial case-studies. These include

- a) application to improve the quality of digital logic and SRAM tests;
- b) application to improve the ADC test cost by identifying effective alternate tests and further quality improvement by defect based test augmentation; and
- c) application for package level defects through pre-silicon identification and verification of test suite and defect coverage analysis.

We will also briefly discuss the vectors that will drive the analog defect based testing to the mainstream and avoid costly, conventional, functional and specification based tests.

Lakshmanan Balasubramanian is a Principal Engineer & Member, Group Technical Staff with Texas Instruments (India) Pvt. Ltd., Bengaluru, primarily responsible for AMS SoC design integration and verification aspects for the low power (MSP43x) and wireless connected microcontroller SoC development. He has industrial and research experience of more than 22 years with expertise in various fields of VLSI such as analog & embedded power management

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Supraja R joined Texas Instruments, India in 2008 after completing her Masters from Indian Institute of Science, Bangalore. She has worked on Design & Verification of a wide range of Analog & Mixed signal designs with varying levels of complexities. She has been focused in delivering quality & improving efficiencies in Design Verification & is a Member, Group Technical Staff.

Rubin Parekhji has been with Texas Instruments (India), Bangalore, since 1996, working on several DFT and test technology projects across multiple product lines, and is a distinguished member of technical staff. He has co-authored several conference papers and tutorials, has organized multiple special sessions, and is a joint inventor of several patents. He has held industry chair roles, has been a visiting faculty member at IIT Bombay and IISc Bangalore, and has guided a large number of students on industrial projects. He has a Ph.D. from Indian Institute of Technology, Bombay.