IEEE 29th INTERNATIONAL SYMPOSIUM ON THE PHYSICAL AND FAILURE ANALYSIS OF INTEGRATED CIRCUITS (IPFA)

18-21 July 2022
Marina Bay Sands, Singapore

CALL FOR PAPERS

IPFA 2022 is devoted to the fundamental understanding of the electrical and physical characterization techniques and associated technologies that assist in probing the nature of wear-out and failure in conventional and new CMOS devices. The Technical Program Committee is inviting papers related, but not limited to, the following areas:

Product Test and Diagnostics: Embedded BIST and DFT test and diagnosis, Reliability testing, Silicon failure debug by test and yield engineering methodologies, Yield analysis and optimization, Defect-oriented testing, Protocol-aware testing, Test-to-Design Feedback, Mixed signal and analog tests.

Sample Preparation, Metrology and Defect Characterization: Device de-processing, Ion beam / TEM sample preparation, Metrology, Defect inspection, Test chips.

Case Studies on Fault Isolation: Die / Board / System-level electrical FA, Electrical characterization and nanoprobing.

Case Studies on Physical Failure Analysis: Die / Board / System-level physical FA, Design for manufacturing, Construction Analysis, Reverse engineering.

Package-Level Failure Analysis: 2.xD/3D/SiP Package FA, Magnetic/acoustic applications, 2.xD/3D X-ray, Lock-in thermography, FTIR, Non-destructive failure analysis, Workflows.

Advanced Electrical Fault Isolation Techniques: Advanced methodologies in photon and laser-based microscopy techniques, Dynamic techniques, Acoustic microscopy, Magnetic imaging, Nanoprobing, AFP, EBAC/EBIC.

Advanced Physical Failure Analysis Techniques: Advanced methodologies in PFA, Advanced optical/Ion beam approaches, Plasma/Laser FIB, Spectroscopy (EDX/EELS) techniques, Scanning probe microscopy, Circuit-edits, De-layering recipes and innovations, Tomography.

ESD, Latchup and Reliability for Space Applications: Component and system level ESD design: modeling and simulation, Single Event Effect (SEE) testing and analysis (particle accelerator, Pulsed Laser, Nanofocus X-ray) on COTS for New Space, Total Ionising Dose and Displacement Damage.

AI for Failure Analysis and Reliability: Artificial intelligence (AI) for FA – fault detection, Visual / image analytics, Pattern recognition, Signal Processing, Machine learning for prognosis and reliability. Exploring reliability assessment and quantification for new applications (e.g. neuromorphic devices and AI accelerator).

Hardware Assurance: Semi-Invasive and Invasive Analysis for attack of encryption system, PUF Circuit Characterization and Evaluation, Die-Level Reverse Engineering, Counterfeit Electronics Detection, Hardware Trojan localization.

Photonic Devices (Display, Lighting and Photovoltaic) Reliability and Failure Analysis: Degradation studies on display modules, LED, Solar cells made of silicon, CdTe, CIGS, organic materials, multi-junction, perovskite etc., Infrared photodetectors, Waveguides.

Transistor and NVM Reliability: Gate oxide/High-κ reliability, PBTI/NBTI, Hot carrier, Random telegraph noise and single dopant effects, Self-Heating in sub-10 nm CMOS, GAA FET / RFSOI/ HBM/stack DRAM device reliability, Process and stress-induced reliability issues and variability, Non-volatile memory reliability (PCRAM, RRAM, STT-MRAM, Ferroelectric devices, MRAM), 2D material and device reliability.

Interconnect and Packaging Reliability: TDDB dielectrics, Electromigration, stress migration, cracking, corrosion, and fatigue in bond pads, Reliability of 3DIC/ TSV/ MEMS, Heterogeneous Integration in SiP, Thermo-mechanical stress, Power dissipation issues, Wafer warpage, Wire bonding, Wafer bonding technology, yield & reliability.

High Power Electronics / Wide Bandgap Device Reliability & Failure Analysis: Reliability of devices based on GaAs, GaN, SiC and Ga_2O_3 systems, Trap-related degradation, Materials-related defect characterization, Process variability, III-V/Si integration.

For the first time since 2019, IPFA will be held IN-PERSON

Abstract Submission: 15 Dec 2021 – 11 Feb 2022 | **Notification of Abstract Acceptance:** 29 March 2022

- Submission format: Extended abstract (**minimum 2 pages**, including text and figures) of your original research work. Details on abstract submission, template and other information are available at https://www.ipfa-ieee.org/2022/.
- High quality papers presented at IPFA 2022 will be invited to submit an extended version of their work for the **Special Issue of *Microelectronics Reliability* journal (Elsevier)**, expected to be published in early 2023, or as articles in ***EDFA magazine***.

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