

ESREF 2023 Editorial

This special issue of Microelectronics and Reliability is devoted to the publication of most of the papers presented during the 34th European Symposium on Reliability of Electron Devices, Failure Physics and Analysis, ESREF 2023, at Toulouse (France) from October 2nd to 5th 2023.

This international symposium continues to focus on recent developments and future directions in Quality and Reliability Management of materials, devices and circuits for micro-, nano-, and optoelectronics. It provides an European forum for developing all aspects of reliability management and innovative analysis techniques for present and future electronic applications.

The technical program of ESREF 2023 has been defined by the Technical Program Committee (TPC) organized in sub-committees with more than 180 renowned experts in the field of reliability of electronic components and systems. The TPC has proceeded to a careful selection from 185 submissions and selected 80 papers to be presented during the oral sessions and 49 as posters. In addition to this strict preselection of papers, the editorial effort provided by the Elsevier staff for the reviewing of the final papers has contributed to improve the overall quality of this special issue. This conference would not be possible without the commitment and expertise of all these contributors.

Accepted papers, from all around the world are organized in the following technical sessions:

- Topic A: Quality and Reliability assessment techniques and methods for Devices and Systems
- Topic B: Semiconductor Failure Mechanisms & Reliability for Si technologies & Nanoelectronics**
- Topic C: Progress in Failure Analysis: Defect Detection and Analysis
- Topic D: Reliability of Microwave devices and circuits**
- Topic E: Packaging and Assembly Reliability and Failure Analysis**
- Topic F: Power Devices and Electronic System: Reliability and Failure Analysis**
- Topic G: Photonics Reliability**
- Topic H: MEMS and sensors Reliability**
- Topic I: Extreme environments and Radiation**

Within the topical tracks, tutorials are offered to allow attendees refreshing and expanding their knowledge on the following topics:

“Review of 4 channel 850nm GaAs VCSELs on reliability investigations for AeroSpace applications” by Yannick Deshayes, IMS University of Bordeaux, France

“Aging-induced Failures Mechanisms in Microelectronics Packages” by *Amar Mavinkurve, NXP, Netherlands*

During the opening session, a keynote speeches will be given by Philippe Galy, who is expert in ESD/LU and new solutions dedicated to SOC level device in advanced CMOS and mature technologies (Bulk / FDSOI / planar & 3D, in ST Microelectronics France. He will present an overview of the Quantum applications with their technologies and design challenges at cryogenic temperature.

Based on an exchange agreement with the committees of the International Symposium on the Physical & Failure Analysis of Integrated Circuits Conference (IPFA 2023), the International Reliability Physics Symposium (IRPS 2023) and the International Symposium for Testing and Failure Analysis (ISTFA 2022), authors of awarded papers have been invited to present their work at ESREF 2023. These exchanges prove the fruitful collaboration between the Committees of these three conferences.

Five invited speakers who are recognized experts in their field give an overview of the state-of-the-art and special focus on advanced research work. Each invited talk focus on leading work in the areas of:

“Three decades of arc-free reproducible CDM-like ESD testing from VF-TLP to CC-TLP” by Horst Gieser, Heinrich Wolf, Johannes Weber and Ellen Jirutkova, Fraunhofer EMFT, Germany

“New reliability challenges for 3D integration stacking using hybrid bonding” by Sandrine Lhostis, STMicroelectronics, France A paper is available in this special issue.

“DC and RF Reliability, Failure Mechanisms and Predictive Life Models for 5G/mmW capable GaN HEMT Process” by Satyaki Ganguly, Wolfspeed Inc, USA

“An overview of numerical modeling techniques and case studies for thermal management in power electronics” by Nicola Delmonte, University of Parma, Italy

“Recent progress in vertical GaN power devices on foreign substrates and its implications for their reliability” by Max Reimer, Robert Bosch GmbH, Germany

Two workshops organized in correlation with the ESREF conference will give the opportunity to exchange the know-how and field returns on specific topic. The panel list speakers from these workshops is composed from industries and academic experts as Infineon, NXP Semiconductors, ST-Microelectronics, Texas Instruments, Robert Bosch GmbH, Microchip, KLA Corporation, Continental Automotive Technologies, Murata, Diodes Incorporated, Melexis, BMW Group, Onsemi, Micron Technologies, AMS Osram, Samsung Electronics, YAGEO-KEMET, Veoneer, Forvia (Hella), ECPE, NI-SET, SMA Solar Technology, ALTER Technology, IRT Saint-Exupéry, Nucléon, ...

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Topic A: Quality and Reliability assessment techniques and methods for Devices and Systems

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C. SALM, University of Twente (NL)

Topic B: Semiconductor Failure Mechanisms & Reliability for Si technologies & Nanoelectronics

A. BRAVAIX, IM2PN-CNRS, ISEN (F)

E. LANGER, Globalfoundries (G)

Topic C: Progress in Failure Analysis: Defect Detection and Analysis

J. GOXE, NXP (F)

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Topic D: Reliability of Microwave devices and circuits

M. DAMMANN, Fraunhofer IAF (D)

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Topic E: Packaging and Assembly Reliability and Failure Analysis

P. POVA, University of Parma (I)

A. GUÉDON-GRACIA, IMS-University of Bordeaux (F)

R. RONGEN, NXP (F)

Topic F: Power Devices and Electronic System: Reliability and Failure Analysis

F1: Smart-power devices, IGBT, Thyristors

M. CIAPPA, ETH Zurich (CH)

F2: SiC and GaN power devices

M.MENEGHINI, University of Padova (I)

L. THEOLIER, IMS, University of Bordeaux (F)

F3: Power Electronic System

F. IANNUZZO, University of Aalborg (DK)

W. LI, University of Zhejiang (CHN)

Topic G: Photonics Reliability

Y. DESHAYES, IMS-University of Bordeaux (F)

S. MARIOJOLS, Airbus (F)

Topic H: MEMS and sensors Reliability

P. BLONDY, XLIM-University of Limoges (F)

C. POULAIN, CEA LETI (F)

Topic I: Extreme environments and Radiation

I1: ESD-EOS, Latchup

F. CAIGNET, LAAS-CNRS, University of Toulouse (F)

P. GALY, STMicroelectronics (F)

I2: EMC-EMI (integrated circuits, power electronic systems)

F. CAIGNET, LAAS-CNRS, University of Toulouse (F)

T. DUBOIS, IMS, University of Bordeaux (F)

I3: Radiation impact on circuits and systems reliability

O. CREPEL, AIRBUS (F)

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