

**IPFA 2021 Virtual Conference**  
**Technical Program 14 September - 13 October 2021**

Time, SGT (GMT + 0800hrs)	Plenary Session 14 September, Tuesday	
09:00 - 09:15 hrs	Opening Address by General Chair - Nagarajan Raghavan, Singapore University of Technology & Design, Singapore	
09:15 - 09:20 hrs	Technical Program Briefing by TPC Chair - Alfred Quah, GlobalFoundries, Singapore	
09:20 - 09:30 hrs	BREAK ( Connect to KN1 Live Session)	
09:30 hrs	Live Keynote Sessions (KN 1 - KN 3 )	
09:30 - 10:30 hrs	<p style="text-align: center;"><b>KN 1</b> Session Chair : Nagarajan Raghavan</p>	<p style="text-align: center;"><b>Anomalous Mechanical Deformation – New Variable in Reliability for Flexible and Stretchable CMOS Electronics</b> <i>Speaker - Professor Muhammad Mustafa Hussain, UC Berkeley, USA</i></p>
10:30 - 10:40 hrs	BREAK ( Connect to KN2 Live Session)	
10:40 - 11:40 hrs	<p style="text-align: center;"><b>KN 2</b> Session Chair : Alfred Quah</p>	<p style="text-align: center;"><b>Reliability Insights from 25 Million Fully Autonomous Miles</b> <i>Speaker - Noah Lassar Waymo, USA</i></p>
11:40 - 11:50 hrs	<p style="text-align: center;">Session Chair : Alfred Quah</p>	<p style="text-align: center;"><b>EDFAS FA Technology Roadmap Overview</b> <i>Speaker - Vinod Narang Advanced Micro Devices, Singapore</i></p>
11:50 - 13:00 hrs	Lunch BREAK ( Connect to KN3 Live Session)	
13:00 hrs	Best Paper Exchange Session (Pre-Recorded Video Presentations)	
13:00 - 13:20 hrs	<p style="text-align: center;">ISTFA 2020 Exchange Paper</p>	<p style="text-align: center;"><b>Quantum Diamond Microscope: Integrated Circuit Magnetic Field Imaging</b> <i>Dr. Edlyn V. Levine The MITRE Coporation Harvard University University of Maryland</i></p>
13:30 - 13:50 hrs	<p style="text-align: center;">ESREF 2020 Exchange Paper</p>	<p style="text-align: center;"><b>FEM Simulation-Based Failure Analysis of Additive Manufacturing Liquid Cold Plates for More Reliable Power Press-Pack Assemblies</b> <i>Davide Spaggiari<sup>1</sup>, Nicola Delmonte<sup>1</sup>, Danilo Santoro<sup>1</sup>, Federico Portesine<sup>2</sup>, Filippo Vaccaro<sup>2</sup>, Emilio Sacchi<sup>2</sup>, Paolo Cova<sup>1</sup> <sup>1</sup>University of Parma, Italy, <sup>2</sup>POSEICO S.p.A, Italy</i></p>
13:50 - 14:00 hrs	BREAK	
14:00 - 15:00 hrs	<p style="text-align: center;"><b>KN 3</b> Session Chair : Samuel Chef</p>	<p style="text-align: center;"><b>What's wrong with my chip? – Dr. AI, can you please diagnose?</b> <i>Speaker - Professor Aaron Thean National University of Singapore, Singapore</i></p>
End of Live Day		

Tutorials Session 14 September - 13 October 2021 ( Video On Demand )			
FA Tutorials		Reliability Tutorials	
FA 1	<p style="text-align: center;"><b>Scanning Probe Microscopies for Correlative Analysis of Advanced Technology Nodes</b> <i>Dr. Umberto Celano IMEC, Belgium</i></p>	REL 1	<p style="text-align: center;"><b>Robust and Reliable Design for In-Memory Computing</b> <i>Prof Alex Tuo-Hung National Yang Ming Chiao Tung University, Taiwan</i></p>
FA 2	<p style="text-align: center;"><b>Faster Fault Isolation with Advanced Data Analysis and Computer Vision</b> <i>Dr. F. Stellari IBM, USA</i></p>	REL 2	<p style="text-align: center;"><b>Automotive Reliability Requirements &amp; Challenges for Semiconductor Foundries</b> <i>Dr Oliver Aubel GlobalFoundries, Germany</i></p>

FA 3	Contactless Fault Isolation Techniques and IC Hardware Security <i>Prof C. Boit TU Berlin, Germany</i>	REL 3	3D IC Process Technology – Drivers, Technology Platforms, Challenges & Solution <i>Prof Tan Chuan Seng Nanyang Technological University, Singapore</i>
FA 4	Introduction of TEM/STEM Techniques and Some Puzzles of Them in Analyzing Nano Materials <i>Dr Jong-Shing Bow Integrated Service Technology Group, Taiwan</i>	REL 4	Laser Diodes: An Introductory Tutorial <i>Prof Massimo Vanzi University of Cagliari, Italy</i>

**Track A - Emerging Topics in Failure Analysis & Reliability**  
**14 September - 13 October 2021 ( Video On Demand )**

Invited	Evaluation of Breakdown Interference and Strategy of Mitigating Yield Loss in Crossbar Memory Arrays <i>Dr. I-Ting Wang - National Yang Ming Chiao Tung University, Taiwan</i>		
A1.1 (ID 16)	Data analytics and Machine Learning: Root-Cause Problem-Solving Approach to prevent Yield Loss and Quality Issues in Semiconductor Industry for Automotive Applications <i>Corinne Bergès<sup>1</sup>, Jim Bird<sup>2</sup>, Mehul D. Shroff<sup>3</sup>, René Rongen<sup>4</sup>, Chris Smith<sup>3</sup></i> <sup>1</sup> NXP, France, <sup>2</sup> NXP Chandler, USA, <sup>3</sup> NXP Austin, USA, <sup>4</sup> NXP Nijmegen, Netherlands	A1.5 (ID 74)	Reinforcement Learning to Reduce Failures in SOT-MRAM Switching <i>Johannes Ender<sup>1,2</sup>, Roberto Lacerda de Orio<sup>2</sup>, Simone Fiorentini<sup>1,2</sup>, Siegfried Selberherr<sup>2</sup>, Wolfgang Goes<sup>3</sup>, Viktor Sverdllov<sup>1,2</sup></i> <sup>1</sup> Christian Doppler Laboratory, <sup>2</sup> Institute for Microelectronics, TU Wien, Austria, <sup>3</sup> Silvaco Europe Ltd, United Kingdom
A1.2 (ID 48)	Digital IC Netlist Recognition Using Graph Neural Network <i>Xuenong Hong, Tong Lin, Yiqiong Shi, Bah Hwee Gwee</i> Nanyang Technological University, Singapore	A1.6 (ID 93)	Extraction of Secrets from Allegedly Secret-free IoT Sensors using Artificial Intelligence <i>Tuba Kiyani, Thilo Krachenfels, Elham Amini, Zarin Shakibaei, Christian Boit, Jean-Pierre Seifert</i> TU Berlin, Germany
A1.3 (ID 59)	IC SynthLogo: A Synthetic Logo Image Dataset for Counterfeit and Recycled IC detection <i>Mukhil Azhagan Mallaivan Sathiaseelan, Manoj Yasaswi Vutukuru, Suryaprakash Vasudev Pandurangi, Shayan Taheri, Navid Asadizanjani</i> University of Florida, USA	A1.7 (ID 94)	Failure Analysis of Large Area Pt/HfO <sub>2</sub> /Pt Capacitors Using Multilayer Perceptrons <i>J. Muñoz-Gorrión<sup>1</sup>, S. Monaghan<sup>2</sup>, K. Cherkaoui<sup>2</sup>, J. Sufé1, P.K. Hurley<sup>2</sup>, E. Miranda<sup>1</sup></i> <sup>1</sup> Universitat Autònoma de Barcelona, Spain, <sup>2</sup> University College Cork, Ireland
A1.4 (ID 62)	Virtual Metrology of Visualizing Copper Microstructure Featured with Computer Vision and Artificial Neural Network <i>Ling-Yen Yeh, Rencheng Chen</i> Sun Innovation Co. Ltd, Taiwan	A1.8 (ID 101)	Generative Adversarial Network for Integrated Circuits Physical Assurance Using Scanning Electron Microscopy <i>Md Mahfuz Al Hasan, Nidish Vashistha, Shayan Taheri, Mark Tehranipoor, and Navid Asadizanjani</i> University of Florida, USA
A1.9 (ID 123)	Hybrid Modelling for the Failure Analysis of SiC Power Transistors on Time-Domain Reflectometry Data <i>Simon Kamm, Kanuj Sharma, Ingmar Kallfass, Nasser Jazdi, Michael Weyrich</i> University of Stuttgart, Germany		

**Track B - Metrology & Package Failure Analysis**  
**14 September - 13 October 2021 ( Video On Demand )**

**B1. Package Level Failure Analysis**

Invited	3D MIM Capacitor Embedded in TSV: Concept, Device Demonstration, Reliability and Applications <i>Prof. Tan Chuan Seng - Nanyang Technological University, Singapore</i>		
B1.1 (ID 9)	Atmospheric Corrosion of Ag/Cu Plated FeNi Based Leadframe used in MOSFET Package <i>Lois Jinzhi Liao<sup>1</sup>, Bisheng Wang<sup>2</sup>, Juanlu Cai<sup>2</sup>, Tao Zhang<sup>3</sup>, Jing Liu<sup>4</sup>, Liu Binhai<sup>1</sup>, Xi Zhang<sup>1</sup>, Younan Hua<sup>1</sup>, Xiaomin Li<sup>1</sup></i> <sup>1</sup> WinTech Nano-Technology Services, Singapore <sup>2</sup> Huawei Technologies, China, <sup>3</sup> Northeastern University, China, <sup>4</sup> Wuhan University of Technology, China	B1.4 (ID 91)	Mechanical BEoL Stability Investigation at Cu-Pillars under Cyclic Load <i>Jendrik Silomon<sup>1</sup>, Jürgen Gluch<sup>2</sup>, André Clausner<sup>2</sup>, Ehrenfried Zschech<sup>2</sup></i> <sup>1</sup> Volkswagen AG, Germany, <sup>2</sup> Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany
B1.2 (ID 30)	Simple Methods to Improve the CSAM Thru-Scan Efficiency on Package Units <i>Hao Tan, Hnin Hnin Win Thoung, Krishnanunni Menon, Htin Kyaw, Naiyun Xu, Pik Kee Tan, Changqing Chen</i> GlobalFoundries, Singapore	B1.5 (ID 95)	A New 3D X-ray Solution for Non-Destructive Construction Analysis of Advanced Electronics Packages <i>Yanjing Yang<sup>1</sup>, Allen Gu<sup>2</sup>, Thom Gregorich<sup>3</sup>, Masako Terada<sup>2</sup></i> <sup>1</sup> Carl Zeiss X-ray Microscopy Applications, Singapore <sup>2</sup> Carl Zeiss Research Microscopy Solutions, USA <sup>3</sup> Carl Zeiss Semiconductor Manufacturing Technology, USA

<b>B1.3</b> (ID 66)	<b>Failure Analysis on Diode-Triggered Silicon-Controlled Rectifiers By using Nondestructive X-ray Microscopy</b> <i>Xinqian Chen<sup>1</sup>, Mengge Jin<sup>1</sup>, Feihou<sup>3</sup>, Fang Liang<sup>1</sup>, Zijian Zhang<sup>1</sup>, Yanan Wang<sup>1</sup>, Dongming Liu<sup>1</sup>, Le Chen<sup>2</sup>, Chaolun Wang<sup>1</sup>, Zhiwei Liu<sup>2</sup>, Xing Wu<sup>1</sup></i> <sup>1</sup> East China Normal University, China, <sup>2</sup> University of Electronic Science and Technology of China, China, <sup>3</sup> Chengdu University, China	<b>B1.6</b> (ID 107)	<b>A Systematic Failure Analysis Approach on Copper Pad Discoloration Issue</b> <i>Hemalatha Somu, Krishnan Arul</i> Infineon Technology (Kulim) Sdn. Bhd, Malaysia
<b>B1.7</b> (ID 118)	<b>Digital Twin Aided IC Packaging Structure Analysis for High-quality Sample Preparation</b> <i>Chengjie Xi, Aslam A. Khan, John True, Nidish Vashistha, Nathan Jessurun, Dr. Navid Asadizanjani</i> University of Florida, USA		
<b>B2. Sample Preparation, Metrology &amp; Defect Characterization</b>			
<b>B2.1</b> (ID 20)	<b>SIMS Analysis of Ultra-Shallow Boron Implant</b> <i>Han Wei Teo, Yun Wang, Kenny Ong, Zhi Qiang Mo</i> GlobalFoundries, Singapore	<b>B2.7</b> (ID 57)	<b>New Routine to Determine Microstructures of Metallic Interconnectors Using SEM-EBSD Technique</b> <i>Jiang Wu, and Eugene Choo</i> Oxford Instruments, Singapore
<b>B2.2</b> (ID 21)	<b>Sample Preparation For VCSEL Device Contamination Analysis</b> <i>Lei Zhu, Derrick Tan, Caryn Sek, Binghai Liu, Younan Hua, Xiaomin Li</i> WinTech Nano-Technology Services, Singapore	<b>B2.8</b> (ID 68)	<b>Super wide area cross sectioning using broad Ar ion beam on solder bumping</b> <i>Natsuko Asano, Tamae Omoto, Lu Jinfeng, Shogo Kataoka, Shunsuke Asahina</i> JEOL, Japan
<b>B2.3</b> (ID 24)	<b>A Novel CMOS Image Sensor Package Cover Glass White Stain Material Identification Metrology by TOF-SIMS</b> <i>Yeh Yee Kee, Kei Lin Sek, Lei Zhu, Younan Hua, Xiaomin Li</i> WinTech Nano-Technology Services, Singapore	<b>B2.9</b> (ID 69)	<b>SIMS Methodology Study of Indium Implant Quantification</b> <i>Yun Wang, Kian Kok Ong, Han Wei Teo, Ramesh Rao Nistala and Zhi Qiang Mo</i> GlobalFoundries, Singapore
<b>B2.4</b> (ID 35)	<b>The Monitor and Management of Sulfide Contamination for Probing FAB clean room</b> <i>Frank Su, W.F. Hsieh, Henry Lin, Vincent Chen, Y.S. Lou</i> Ardentec Corporation, Taiwan	<b>B.2.10</b> (ID 85)	<b>TEM-EDX Characterization of Immersion Pd &amp; Pd-MoOx on Cu &amp; NiP</b> <i>Wan Tatt Waj, Arul Krishnan</i> Infineon Technologies Sdn Bhd, Malaysia
<b>B2.5</b> (ID 40)	<b>X-ray Microanalysis Background Noise Reduction by FIB sample Preparation</b> <i>Kim Hong Yip, Poh Chuan Ang, Kwai Fun Lee, Ley Hong Khoo</i> GlobalFoundries, Singapore	<b>B2.11</b> (ID 99)	<b>Automatic Defect Review of a Patterned Wafer using Hybrid Metrology</b> <i>Byung Woon Ahn, Ahjin Jo, Jubok.lee, Sang-Joon Cho</i> Park Systems Corp, South Korea
<b>B2.6</b> (ID 52)	<b>Principal Component Analysis (PCA) of Surface Contamination by TOF-SIMS</b> <i>Kei Lin Sek, Pei Lin Lee, Khin Yin Pang, Younan Hua, Lei Zhu, Xiaomin Li</i> WinTech Nano-Technology Services, Singapore	<b>B2.12</b> (ID 100)	<b>Guidelines of Plasma-FIB Delayering techniques for Advanced Process Node</b> <i>Ching-Chun Lin, Yun-Da Li, Kim Hsu</i> Integrated Service Technology Inc., Taiwan
<b>B2.13</b> (ID 136)	<b>Simultaneous, Submicron Infrared and Raman Microspectroscopies for Effective Failure and Contamination Analyses</b> <i>Michael Lo<sup>1</sup>, Mustafa Kansiz<sup>1</sup>, Eoghan Dillon<sup>1</sup>, Jay Anderson<sup>1</sup>, Curtis Marcott<sup>2</sup></i> <sup>1</sup> Photothermal Spectroscopy Corp., USA, <sup>2</sup> Light Light Solutions LLC, USA		

**Track C - Electrical Fault Isolation & Product Diagnostic**  
**14 September - 13 October 2021 ( Video On Demand )**

**C1. Advanced Electrical Fault Isolation Techniques and Case Studies**

<b>Invited</b>	<b>Tool Automation and Computer Vision Methodologies for Faster IC Diagnostics</b> <i>FRANCO STELLARI, Chung-Ching Lin, Fei Lan and Peilin Song - IBM, USA</i>		
<b>Invited</b>	<b>Logic State Imaging - From FA Techniques for Special Applications to One of the Most Powerful Hardware Security Side-Channel Threats</b> <i>Prof. Christian Boit - TU Berlin, Germany</i>		
<b>C1.1</b> (ID 78)	<b>Low-Voltage EBIC Investigation of Fails</b> <i>Andreas Rummel<sup>1</sup>, Greg M. Johnson<sup>2</sup>, Matthias Kemmler<sup>1</sup>, Thomas Rodgers<sup>3</sup></i> <sup>1</sup> Kleindiek Nanotechnik, Germany, <sup>2</sup> Zeiss Microscopy, USA, <sup>3</sup> Zeiss Microscopy, Germany	<b>C1.5</b> (ID 44)	<b>MIPI RFFE Functional Leakage Failure Debug using an Integrated NI-PXIe Setup</b> <i>D. Nagalingam, A.C.T. Quah, S.J. Moon, J.C. Alag, A.W. Teo</i> GlobalFoundries, Singapore

<b>C1.2</b> <b>(ID 81)</b>	<b>Proposal for Advanced Devices Analysis using 930nm Light Source and GaAs SIL</b> <i>Tomonori Nakamura</i> , Akihito Uchikado, Mitsunori Nishizawa, Ikuo Arata, Masanori Kobayashi, Xiangguang Mao, Akira Shimase Hamamatsu Photonick K.K., Japan	<b>C1.6</b> <b>(ID 67)</b>	<b>Finding Invisible Cracks via Nano-Probing</b> <i>Lai-Seng Yeoh</i> <sup>1</sup> , Kok-Cheng Chong <sup>1</sup> , Susan Li <sup>2</sup> , Andreas Rummel <sup>3</sup> <sup>1</sup> Infineon Technologies Memory Solutions Malaysia Sdn. Bhd, Malaysia, <sup>2</sup> Infineon Technologies Inc., USA, <sup>3</sup> Kleindiek Nanotechnik GmbH, Germany
<b>C1.3</b> <b>(ID 92)</b>	<b>Meticulous System Calibration as a key for extracting correct Photon Emission Spectra</b> <i>Norbert Herfurth</i> <sup>2</sup> , Christian Boit <sup>1</sup> <sup>1</sup> Berlin University of Technology, Germany, <sup>2</sup> IHP – Leibniz-Institut für innovative Mikroelektronik, Germany	<b>C1.7</b> <b>(ID 90)</b>	<b>Case Studies: Masked Read-Only Memory Failure Fault Isolation without Bitmapping</b> <i>BL Yeoh</i> , MH Thor, LS Gan, SH Goh, YH Chan, WF Soh, C. Shaalini, Wiswa Naradha GlobalFoundries, Singapore
<b>C1.4</b> <b>(ID 33)</b>	<b>Dynamic Defect Localization by Toggling Integrated Circuits States</b> <i>Ke-Ying Lin</i> , <i>Paul Kenneth Ang</i> , Chun-Wei Ke, Toby Chen NXP Semiconductors, Taiwan	<b>C1.8</b> <b>(ID 98)</b>	<b>Significance of Dynamic Electrical Fault Isolation Techniques on Buried Via Void defects</b> <i>MH Thor</i> , SH Goh, BL Yeoh, LS Gan, YH Chan GlobalFoundries, Singapore

## C2 Product Test and Diagnostics

<b>Invited</b>	<b>Localization of Front-end Defects Using Volume Scan Diagnosis</b> <i>Jayant D'Souza</i> - Siemens EDA, USA		
<b>C2.1</b> <b>(ID 54)</b>	<b>Hysteresis Effect Induces the Inductor Power Loss of Converter during the Voltage Conversion</b> <i>Jian-Hsing Lee</i> <sup>1</sup> , Karuna Nidhi <sup>1</sup> , Chung-Yu Hung <sup>2</sup> , Ting-Wei Liao <sup>2</sup> , Wu-Yang Liu <sup>2</sup> , Hung-Der Su <sup>2</sup> <sup>1</sup> Vanguard International Semiconductor Corp, Taiwan <sup>2</sup> Richtek Technology Corporation, Taiwan	<b>C2.3</b> <b>(ID 124)</b>	<b>E-test Probe Mark Topology-induced Failure</b> <i>JF Jong</i> <sup>1</sup> , TW Lim <sup>1</sup> , SH Goh <sup>1</sup> , Yang Qu <sup>2</sup> , Jeffrey Lam <sup>2</sup> <sup>1</sup> Globalfoundries Singapore <sup>2</sup> Star-Quest Technologies Singapore
<b>C2.2</b> <b>(ID 111)</b>	<b>Digital and AMS Yield Diagnosis Flow Combining Automated Testing and Fault Injection-based Circuit Simulation</b> <i>C. Shaalini</i> <sup>1</sup> , Song li <sup>1</sup> , SH Goh <sup>1</sup> , WF Soh <sup>1</sup> , GlobalFoundries, Singapore	<b>C2.4</b> <b>(ID 125)</b>	<b>Failure Analysis of a PROM at Low Temperature Induced by Process Deviation</b> <i>Pengfei Lian</i> <sup>1</sup> , Jianshe Lou <sup>1</sup> , Yunlong Liu <sup>2</sup> , Peipei Fan <sup>1</sup> , Rong Zhao <sup>1</sup> , Zebin Kong <sup>1</sup> , Weiming Zhu <sup>1</sup> , Kunshu Wang <sup>1</sup> , Lu Tang <sup>3</sup> <sup>1</sup> Institute of Shanghai Academy of Spaceflight Technology, China, <sup>2</sup> Shenzhen State Microelectronics Co., China, <sup>3</sup> University of Shanghai for Science and Technology, China

<b>Track D - Physical Failure Analysis</b> <b>14 September - 13 October 2021 ( Video On Demand )</b>			
<b>D1. Advanced Physical Failure Analysis Techniques</b>			
<b>Invited</b>	<b>Dielectric Breakdown in Hexagonal Boron Nitride</b> <i>Dr. Alok Ranjan</i> - Singapore University of Technology & Design, Singapore		
<b>D1.1</b> <b>(ID 13)</b>	<b>Investigation on the Copper Void Defect by Transmission Electron Microscope (TEM)</b> <i>Chi Wen Soo</i> , Jie Zhu GlobalFoundries, Singapore	<b>D1.5</b> <b>(ID 65)</b>	<b>Local Capacitance-Voltage Profiling and Deep Level Transient Spectroscopy of SiO<sub>2</sub>/SiC Interfaces by Scanning Nonlinear Dielectric Microscopy</b> <i>Kohei Yamasue</i> , Yasuo Cho Tohoku University, Japan
<b>D1.2</b> <b>(ID 22)</b>	<b>Silicon Defect Observation From Ultra-Thick Sample Using TEM EELS Technique</b> <i>Gek Li Lee</i> , Kok Wah Lee, Jie Zhu GlobalFoundries, Singapore	<b>D1.6</b> <b>(ID 103)</b>	<b>Improving Tomographic Sensing of Scalpel SPM with Multi-Probe Functionality and Automatic Removal Rate Extraction</b> <i>C. O'Sullivan</i> <sup>1</sup> , M. Tedaldi <sup>1</sup> , C. Drilakis <sup>2</sup> , T. Hantschel <sup>2</sup> , A.D.L. Humphris <sup>1,3</sup> , J.P.Hole <sup>1</sup> , J. Goulden <sup>1</sup> , U. Celano <sup>2,4</sup> <sup>1</sup> Infinitesima, United Kingdom, <sup>2</sup> IMEC, Belgium, <sup>3</sup> University of Bristol, United Kingdom, <sup>4</sup> University of Twente, Netherlands
<b>D1.3</b> <b>(ID 38)</b>	<b>TEM EELS Analysis for DRAM Failure Analysis</b> <i>S. Y. Chen</i> , W. Yang, G. F. Xu, C. T. Liu Changxin Memory Technologies, China	<b>D1.7</b> <b>(ID 109)</b>	<b>Innovative use of TCAD Process Simulation for Device Failure Analysis</b> <i>Shang Yi Lim</i> , Joydeep Ghosh, Aaron Thean National University of Singapore, Singapore
<b>D1.4</b> <b>(ID 56)</b>	<b>3D NAND Memory Auto-delayering with Generic Delayering Model Using PFIB</b> <i>Bingxing Wu</i> <sup>1</sup> , Ruixin Zhang <sup>1</sup> , Zhengqiang Guo <sup>1</sup> , Zhenxin Zhong <sup>2</sup> <sup>1</sup> Thermo Fisher Scientific, China, <sup>2</sup> Thermo Fisher Scientific, USA	<b>D1.8</b> <b>(ID 121)</b>	<b>Failure Localization of Bipolar Integrated Circuits by Implementing Active Voltage Contrast</b> <i>Yiqiang Ni</i> , Xuanlong Chen, Enliang Li, Linting Zheng, Liang He, Shizheng Yang China Electronic Product Reliability and Environmental Testing Research Institute, China
<b>D2. Case Studies on Physical Failure Analysis</b>			

Invited		ESD Failure Analysis by using Transmission Electron Microscopy at the Atomic Scale Prof. Xing Wu - East China Normal University, China	
D2.1 (ID 55)	<b>The Failure Mechanism of the E-SOA Boundary of Power Transistor Collapsed at Higher Gate Voltage</b> <i>Jian-Hsing Lee, Karuna Nidhi, Tingyou Lin, Hsueh-Chun Liao, Fu-Chun Tseng, Scott Lee</i> Vanguard International Semiconductor Corp., Taiwan	D2.5 (ID 73)	<b>Failure Analysis on MIM Capacitor Failures of RF Devices using Simple Circuit Edit Passive Voltage Contrast Method</b> <i>Siong Luong Ting, Pik Kee Tan, Naiyun Xu, Hnin Hnin Win</i> Though, Htin Kyaw, Krishnanunni Menon, Yanlin Pan, Hao Tan, Changqing Chen GlobalFoundries, Singapore
D2.2 (ID 58)	<b>Reliability Analysis using Advanced Modeling Technique for MEMS Microphone</b> <i>Shubham Shubham, Xin Song, Yunfei Ma, Mark G. da Silva, Zhijun Guo, Jeremy Johnson, Michael Pedersen</i> Knowles Corporation, USA	D2.6 (ID 76)	<b>Application of Ion Chromatography in Corrosion Failure Analysis of Components and Devices</b> <i>Chao Cui<sup>1</sup>, Yun Zhao<sup>1</sup>, Yong Xiao<sup>1</sup>, Ziwen Cai<sup>1</sup>, Haolin Wang<sup>1</sup>, Jin Li<sup>2</sup>, Shengzong He<sup>3</sup></i> <sup>1</sup> Electric Power Research Institute of CSG, China <sup>2</sup> Honghe Power Supply Bureau, China <sup>3</sup> CEPREI Lab, China
D2.3 (ID 60)	<b>Study on the Factors of Start-up White Line Caused by Coupled Electric Field in TFT LCD</b> <i>Xin Li, Yong Song, Hongjun Yu, Chuncheng Che, Hailin Xue</i> BOE Optoelectronics Technology CO., China	D2.7 (ID 86)	<b>The Influence of Adhesive Tape on L0 Light Leakage of TFT-LCD Products after Reliability Test</b> <i>Tianyu Xu<sup>1</sup>, Gang Yang<sup>1</sup>, Zheng Jia<sup>1</sup>, Jingang Wang<sup>1</sup>, Yong Song<sup>1</sup>, Hongjun Yu<sup>1</sup>, Chuncheng Che<sup>1</sup>, Hailin Xue<sup>2</sup></i> <sup>1</sup> Beijing BOE Optoelectronics Technology Co., China, <sup>2</sup> BOE Technology Group Co., China
D2.4 (ID 63)	<b>Metal Migration Induced Breakdown from Gate Contact in Bulk FinFET Devices</b> <i>Xin Yang<sup>1</sup>, Yihong Qing<sup>2</sup>, Kuei-Shu Chang-Liao<sup>3</sup>, Yuchong Qiao<sup>1</sup>, Chaolun Wang<sup>1</sup>, Zhiwei Liu<sup>2</sup>, Luoyong Li<sup>4</sup>, Chihang Tsai<sup>4</sup>, Yongren Wu<sup>4</sup>, Yazhen Xie<sup>4</sup>, Weisong Yu<sup>4</sup>, Xing Wu<sup>1</sup></i> <sup>1</sup> East China Normal University, China, <sup>2</sup> University of Electronic Science and Technology of China, China, <sup>3</sup> National Tsing Hua University, Taiwan, <sup>4</sup> China Chinaisti (Shanghai) Testing Technology Co., China	D2.8 (ID 115)	<b>Failure Analysis Techniques and Studies on Vertical Short Issue for Production Wafers</b> <i>P.K. Tan, S.L. Ting, Y.L. Pan, N.Y. Xu, D. Nagalingam, H.H.W. Though, H. Kyaw, H. Tan, K. Menon, R. Fransiscus, A. Quah, P.T. Ng, S. M. Parab, C.Q. Chen.</i> GlobalFoundries, Singapore
D2.9 (ID 137)	<b>Analysis of a Failure in High-Voltage VDMOS Device caused by Die Contamination</b> <i>Zhaoxi Wu, Chao Duan, Zhiming Ding, Yaning Wu, Rui Cao, Xu Wang, Meng Meng</i> China Aerospace Components Engineering Center, China		

**Track E - Devices, Interconnects & Packaging Reliability**  
14 September - 13 October 2021 ( Video On Demand )

**E1. Transistor and NVM Device Reliability**

Invited		Random Telegraph Noise for Advanced True Random Number Generation in the IoT ecosystem Dr. Francesco Puglisi - Università di Modena e Reggio Emilia, Italy	
Invited		Wafer-Scale Epitaxial 2D Transition Metal Dichalcogenides for High-Performance Scaled Transistors Dr. Shi Yuanyuan - IMEC, Belgium	
E1.1 (ID 5)	<b>Analysis for the Physical Mechanism of the Abnormal Increase of Idsat in NMOS under HCI</b> <i>Wei-Cheng Chu, Bo-An Tsai, Cheng-Te. Chen, Chi-Li Chang, Weifong Lin</i> Powerchip Semiconductor Manufacturing Corp., Taiwan	E1.7 (ID 97)	<b>Pitfalls for the Characterization of Self-Heating Effect in Nano-Scaled Devices</b> <i>Dongxing Zhang, Pengpeng Ren, Zhigang Ji</i> Shanghai Jiaotong University, China
E1.2 (ID 6)	<b>Physical Mechanism for Different Phases and Turn-Around of Idsat in PMOS under HCI Stress</b> <i>Bo-An Tsai, Wei-Cheng Chu, Yu-Chih Chang, Yi-Heng Chen, Chien-Fu Chen</i> Powerchip Semiconductor Manufacturing Corp., Taiwan	E1.8 (ID 102)	<b>A Reliability-Concerned Compute-in-Memory Behavior Model for Convolutional Neural Network</b> <i>Kaili Cheng, Jiahao Song, Xinyue Zhang, Yandong He, Runsheng Wang, Yuan Wang</i> Peking University, China

<p><b>E1.3</b> <b>(ID 32)</b></p>	<p><b>Influence of RPO Film and CESL Material on Data Retention in Non-Volatile Memory</b> <i>Yen-Ting Chen, Ming-Shan Lo</i> eMemory Technology Inc., Taiwan</p>	<p><b>E1.9</b> <b>(ID 104)</b></p>	<p><b>Comparison of DC/AC Hot Carrier Degradation between Short Channel Si Bulk and SiGe SOI p-FinFETs</b> <i>Hao Chang<sup>1,3</sup>, Yongkui Zhang<sup>1,3</sup>, Longda Zhou<sup>1,3</sup>, Zhigang Ji<sup>2</sup>, Hong Yang<sup>1,3</sup>, Qianqian Liu<sup>1,3</sup>, Yongliang Li<sup>1,3</sup>, Renrong Liang<sup>4</sup>, Eddy Simoen<sup>5</sup>, Huilong Zhu<sup>1,3</sup>, Jun Luo<sup>1,3</sup>, Wenwu Wang<sup>1,3</sup></i> <sup>1</sup> Chinese Academy of Science, China, <sup>2</sup> Shanghai Jiaotong University, China, <sup>3</sup> University of Chinese Academy of Sciences, China, <sup>4</sup> Tsinghua University, China, <sup>5</sup> IMEC, Belgium</p>
<p><b>E1.4</b> <b>(ID 46)</b></p>	<p><b>NAND Flash Relationship Between the Initial State of Non-Volatile Memory Cycling Endurance and the High Temperature Data Retention Ability of Post Cycling</b> <i>Chia-Sheng Huang, Yun-Chi Liao</i> Powerchip Semiconductor Manufacturing Corp., Taiwan</p>	<p><b>E1.10</b> <b>(ID 114)</b></p>	<p><b>Analysis of The Threshold Voltage Instability under Semi-ON Hot Electron Stress in AlGaIn/GaN High Electron Mobility Transistor</b> <i>Fong-Min Ciou<sup>1</sup>, Yu-Shan Lin<sup>1</sup>, Jia-Hong Lin<sup>1</sup>, Ting-Tzu Kuo<sup>1</sup>, Jui-Tse Hsu<sup>2</sup>, Po-Hsun Chen<sup>3</sup>, Ting-Chang Chang<sup>1</sup></i> <sup>1</sup> National Sun Yat-sen University, Taiwan, <sup>2</sup> National Tsing Hua University, Taiwan, <sup>3</sup> R. O. C. Naval Academy, Taiwan,</p>
<p><b>E1.5</b> <b>(ID 72)</b></p>	<p><b>A Comprehensive Negative Bias Temperature Instability Model for Gallium-nitride Metal-insulator-semiconductor High Electron Mobility Transistors From 77K to 393K</b> <i>Ting-Tzu Kuo<sup>1</sup>, Ying-Chung Chen<sup>1</sup>, Yu-Shan Lin<sup>1</sup>, Yu-Chieh Chien<sup>2</sup>, Fong-Min Ciou<sup>1</sup>, Po-Hsun Chen<sup>3</sup>, and Ting-Chang Chang<sup>1</sup></i> <sup>1</sup> National Sun Yat-sen University, Taiwan, <sup>2</sup> National University of Singapore, Singapore, <sup>3</sup> R. O. C. Naval Academy, Taiwan</p>	<p><b>E1.11</b> <b>(ID 117)</b></p>	<p><b>Degradation Studies on 8-Layer 3D Vertical Resistive Random Access Memory Under Moisture</b> <i>Dengyun Lei<sup>1</sup>, Huiwei Wu<sup>1</sup>, Yiqiang Chen<sup>1</sup>, Yun Huang<sup>1</sup>, Yunfei En<sup>1</sup>, Qiantong Guo<sup>2</sup>, Feng Zhang<sup>3</sup>, Rui Gao<sup>1</sup></i> <sup>1</sup> The No.5 Electronics Research Institute of the Ministry of Industry and Information Technology, China, <sup>2</sup> China Electronics Corporation, China, <sup>3</sup> Chinese Academy of Sciences, China</p>
<p><b>E1.6</b> <b>(ID 83)</b></p>	<p><b>HCI SOA Enhancement for EDNMOS with Metal Field Plate</b> <i>J.M. Soon, P.Y. Tan, C.W. Eng, M.Cai, M.Li</i> GlobalFoundries, Singapore</p>	<p><b>E1.12</b> <b>(ID 133)</b></p>	<p><b>Study of Layout Effect on Gate Oxide TDDB in Sub-16nm FinFET Technology</b> <i>Xiangyu Liu<sup>1</sup>, Yongsheng Sun<sup>1</sup>, Junlin Huang<sup>1</sup>, Changze Liu<sup>1</sup>, Xiaolu Shang<sup>1</sup></i> Hisilicon Technologies Co., China</p>

## E2. Interconnect and Packaging Reliability

<p><b>Invited</b></p>	<p><b>BEOL Reliability Challenges in Advanced Nodes for Automotive Applications</b> <i>Dr Markus Herklotz - GlobalFoundries, Germany</i></p>		
<p><b>E2.1</b> <b>(ID 17)</b></p>	<p><b>Failure Mechanism of Stress Migration in Via Sidewall for Dual Damascene Cu Interconnection</b> <i>Yu Chun Teng, Liwei Yang</i> Powerchip Semiconductor Manufacturing Corp., Taiwan</p>	<p><b>E2.5</b> <b>(ID 96)</b></p>	<p><b>Rapid Assessment of Semiconductor Thermal Quality</b> <i>Yoon Hon Wong<sup>1</sup>, Andras Vass-Varnai<sup>2</sup>, Antonio Caruso<sup>3</sup>, Young Joon Cho<sup>4</sup>, Yong Seoung Lee<sup>4</sup>, Kwon Hyung Lee<sup>4</sup></i> Siemens Digital Industry Software, <sup>1</sup> Singapore, <sup>2</sup> USA, <sup>3</sup> Italy, <sup>4</sup> Republic of Korea</p>
<p><b>E2.2</b> <b>(ID 37)</b></p>	<p><b>Electromigration of Gold Metallization</b> <i>Christine Hau-Riege, YouWen Yau</i> Qualcomm Technologies, Inc., USA</p>	<p><b>E2.6</b> <b>(ID 108)</b></p>	<p><b>Temperature Cycling Failure Analysis and Improvement of A Panel Level Fan-out QFN Package</b> <i>Li Chen<sup>1</sup>, Wei Gao<sup>1</sup>, Yan Huo<sup>2</sup>, Lei Xie<sup>2</sup>, Yuyu Peng<sup>1</sup>, Min Ren<sup>1</sup>, Bo Zhang<sup>1</sup></i> <sup>1</sup> University of Electronic Science and Technology of China, China, <sup>2</sup> SiPLP Microelectronics(Chongqing) Co., China</p>
<p><b>E2.3</b> <b>(ID 88)</b></p>	<p><b>In-situ SEM Micromechanical Experiments on Dual Damascene Copper Test Structures for Investigation of Interfacial Properties of Copper Interconnects</b> <i>Wieland Heyn<sup>1</sup>, Hanno Melzner<sup>2</sup>, Klaus Goller<sup>2</sup>, Sergey Ananiev<sup>2</sup>, André Clausner<sup>1</sup>, Johannes Zechner<sup>3</sup>, Ehrenfried Zschech<sup>1</sup>,</i> <sup>1</sup> Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany, <sup>2</sup> Infineon Technologies AG, Germany, <sup>3</sup> KAI Kompetenzzentrum Automobil- und Industrietechnik GmbH, Austria</p>	<p><b>E2.7</b> <b>(ID 116)</b></p>	<p><b>Analytical and Finite Element Study on Warpage and Stress of 2.5D Chip-Package Structures</b> <i>Sida Hao<sup>1</sup>, Weishen Chu<sup>1</sup>, Paul S. Ho<sup>1</sup>, Joonsik Sohn Lee<sup>2</sup>, Rui Huang<sup>1</sup></i> <sup>1</sup> University of Texas, USA, <sup>2</sup> Samsung Electronics, S.Korea</p>
<p><b>E2.4</b> <b>(ID 89)</b></p>	<p><b>Nano-CT Imaging of Electrically Stressed Power Device Metallization</b> <i>Dominik Mueller<sup>1</sup>, Christian Fella<sup>2</sup>, Frank Altmann<sup>3</sup>, Jonas Graetz<sup>2</sup>, Andreas Balles<sup>2</sup>, Matt Ring<sup>4</sup>, Jeff Gambino<sup>4</sup></i> <sup>1</sup> University of Würzburg, Germany, <sup>2</sup> Fraunhofer Development Center X-Ray Technology EZRT, Germany, <sup>3</sup> Fraunhofer Institute for Microstructure of Materials and Systems IMWS, Germany, <sup>4</sup> ON Semiconductor, USA</p>	<p><b>E2.8</b> <b>(ID 134)</b></p>	<p><b>Electromigration Failure Controlled by Aging-like Gradual Resistance Shift in Co-Capped Cu Interconnects</b> <i>Hui Zheng, Yongsheng Sun, Weichun Luo, Junlin Huang</i> Hisilicon, China</p>

**Track F - ESD/Latchup, Photonics & High Power Reliability**  
**14 September - 13 October 2021 ( Video On Demand )**

**F1. Photonics and High Power/Wide Bandgap Device Reliability and Failure Analysis**

<b>Invited</b>	<b>Wave Aspects in Laser Diode Catastrophic Optical Damages</b> <i>Prof. Massimo Vanzi - University of Cagliari, Italy</i>		
<b>Invited</b>	<b>Reliability and Characterization of GeSe OTS Selector Device</b> <i>Prof. Weidong Zhang - Liverpool John Moores University, United Kingdom</i>		
<b>F1.1 (ID 29)</b>	<b>Research on the Design Factors Affecting the COG Mura of IPS Display Products</b> <i>Bao Yazhou, YANG Gang, JIA Xingge, SONG Yong, YU Hongjun, CHE Chuncheng, XUE Hailin</i> <i>Beijing BOE Optoelectronics Technology Co., China</i>	<b>F1.4 (ID 87)</b>	<b>Stability of Schottky Barrier Diode Integrated in p-GaN Enhancement-mode GaN Power Technology</b> <i>Jethro Oroceo Gallardo<sup>1</sup>, Brice De Jaeger<sup>2</sup>, Sachidananda Dash<sup>1</sup>, Shun-Wei Tang<sup>1</sup>, Thanh Nga Tran<sup>1</sup>, Dirk Wellekens<sup>2</sup>, Benoit Bakeroot<sup>2,3</sup>, Stefaan Decoutere<sup>2</sup>, and Tian-Li Wu<sup>1</sup></i> <sup>1</sup> National Yang Ming Chiao Tung University, Taiwan <sup>2</sup> IMEC, Belgium, <sup>3</sup> IMEC and Ghent University, Belgium
<b>F1.2 (ID 50)</b>	<b>Analysis and Improvement of Repeated Wake-up Jittering H-line</b> <i>Qiang Wang, Zhengxin Zhang, Ye Wang, Honggui Jin, Qi Sun, Yong Song, Hongjun Yu, Hailin Xue, Chuncheng Che</i> <i>Beijing BOE Optoelectronics Technology Co., China</i>	<b>F1.5 (ID 110)</b>	<b>Failure Analyses and Reliability Improvement of the Corner Region of Variation Lateral Doping Termination</b> <i>Min Ren<sup>1</sup>, Xuefan Zhang<sup>1</sup>, Xin Zhang<sup>2</sup>, Junwei Feng<sup>1</sup>, Yahan Yang<sup>1</sup>, Youke Bai<sup>1</sup>, Jiakang Fan<sup>1</sup>, Rongyao Ma<sup>2</sup>, Fang Zheng<sup>2</sup>, Yining Ma<sup>1</sup>, Zehong Li<sup>1</sup>, Bo Zhang<sup>1</sup></i> <sup>1</sup> University of Electronic Science and Technology of China, China, <sup>2</sup> Wuxi China Resources Huajing Microelectronics Co., China
<b>F1.3 (ID 71)</b>	<b>Research on the Relationship between the Limit Design and Material of the LGP and the Damage of the LGP</b> <i>Wang Shixin<sup>1</sup>, Yang Gang<sup>1</sup>, Song Yong<sup>1</sup>, Yu Hongjun<sup>1</sup>, Che Chuncheng<sup>1</sup>, Xue Hailin<sup>1</sup>, Wang Kai<sup>2</sup></i> <sup>1</sup> Beijing BOE Optoelectronics Technology Co., China, <sup>2</sup> Beijing Digital Video Technology Co., China	<b>F1.6 (ID 119)</b>	<b>Charge-Sensing method for Nickel Contamination Detection on a 4H-SiC PowerMOSFET</b> <i>B. Mazza<sup>1,2</sup>, F. Cordiano<sup>1</sup>, M. Boscaglia<sup>1</sup>, V. Scuderi<sup>1</sup>, M. Frazzica<sup>1</sup>, R. Ricciari<sup>1</sup>, M. Poma<sup>1</sup>, C. Gagliano<sup>1</sup>, S. Patané<sup>2</sup></i> <sup>1</sup> STMicroelectronics, Italy, <sup>2</sup> Universita' degli Studi di Messina, Italy

**F2. ESD, Latchup and Reliability for Space Applications**

<b>Invited</b>	<b>Latchup: From the Beginning to Today</b> <i>Dr. Stephen H Voldman - Voldman Consulting, USA</i>		
<b>F2.1 (ID 14)</b>	<b>Study on Transmitter with Stacking-MOS Structure of Interface Circuits for Cross-Domain CDM ESD Protection</b> <i>Cheng-Yun Hsueh, Ming-Dou Ker</i> <i>National Yang Ming Chiao Tung University, Taiwan</i>	<b>F2.3 (ID 53)</b>	<b>Analyze the ESD Performance and Bandwidth Difference for LC T-Network and Bridged T-Coil</b> <i>Jian-Hsing Lee<sup>1</sup>, Karuna Nidhi<sup>1</sup>, Natarajan Mahadeva Iyer<sup>2</sup></i> <sup>1</sup> Vanguard International Semiconductor Corp., Taiwan <sup>2</sup> Allegro Microsystems Inc., USA
<b>F2.2 (ID 27)</b>	<b>Research on reducing electro-static discharge of tearing film of EPD</b> <i>Haowei Zou, Xin Li, Yong song, Hanqing Liu, Junru Ma, Hongjun Yu, Chuncheng Che, Hailin Xue</i> <i>BOE Optoelectronic Technology Co., China</i>	<b>F2.4 (ID 112)</b>	<b>HV ESD Device Solution Evaluations in 55nm BCD Technology</b> <i>Sagar P Karalkar<sup>1</sup>, Milova Paul<sup>1</sup>, Xiao Mei Elaine Low<sup>1</sup>, Kyong Jin Hwang<sup>1</sup>, Robert Gauthier Jr<sup>2</sup></i> <sup>1</sup> GlobalFoundries, Singapore <sup>2</sup> GlobalFoundries, USA
<b>F2.5 (ID 126)</b>	<b>Electrostatic Discharge Switch Simulation Enablement in RF SOI Technologies</b> <i>Mengfu Di, Anindya Nath, Meng Miao, XiangXiang Lu, Lin Lin, Robert Gauthier</i> <i>GlobalFoundries Corporation, USA</i>		

Note : IPFA 2021 Technical Program is tentative and subjected to changes