Technical Program

Time	2 July (Day 0) - Tutorials			
	Symposium Room II		**Symposium Room I**	
	Session TUT A: Tutorials (Reliability) Session Chair: Wardhana A. Sasangka *Singapore-MIT Alliance for Research and Technology, Singapore*		**Session TUT B: Tutorials (Failure Analysis)** Session Chair: Sun Litao *Southeast University, China*	
08:30-10:30	TUT A1	**Reliability of 3D Through-Silicon Via (TSV) Technologies** Dr. Dimitris P. Ioannou *Globalfoundries, USA*	TUT B1	**Principles and Applications of TEM and FIB in the Semiconductor Industry** Dr. David Su *TSMC, Taiwan (Retired)*
10:30-10:45	**Tea Break**			
10:45-12:45	TUT A2	**BTI: Testing and Predictive Modeling** Prof. Jianfu Zhang *Liverpool John Moores University, UK*	TUT B2	**Advanced 2.5D/3D Package Level Failure Analysis** Dr. Lihong Cao *ASE Group, TX, USA*
12:45-13:45	**Lunch**			
13:45-15:45	TUT A3	**Testing for Reliability of Power Electronic Components** Prof. Francesco Iannuzzo *Aalborg University, Denmark*	TUT B3	**Advanced Fault Isolation Technologies: Design House and Foundry Perspectives: PART I** Mr. Venkat Krishnan Ravikumar *AMD, Singapore*
15:45-16:00	**Tea Break**			
16:00-18:00	TUT A4	**MOL & BEOL Reliability Challenges for Advanced Technology Nodes** Dr. Baozhen Li *IBM System and Technology Group, Essex Vermont, USA*	TUT B4	**Advanced Fault Isolation Technologies: Design House and Foundry Perspectives: PART II** Dr. Szu Huat Goh *GlobalFoundries, Singapore*
End of Day 0				

Time	3 July (Day 1)			
09:00-09:10	**Opening Address by General Chair - Prof. Juin J. Liou** *Zhengzhou University, China*			
09:10-09:15	**Technical Program Briefing by TPC Chair - Zhiwei Liu** *UESTC, China*			
09:15-09:20	**IPFA 2018 Best Papers Award Presentation**			
09:20-10:20	**KN.1** Session Chair: Juin J. Liou	**Building Reliable Products Guided by Customer Obsession** Prasad Chaparala *Amazon Lab126, USA*		
10:20-10:40	**Tea Break**			
	Symposium Room II		**Symposium Room I**	
	Session 1A: Logic / NVM Device Reliability Session Chair: Jiezhi Chen *Shandong University, China*		**Session 1B: Package Level Failure Analysis** Session Chair: Hong Yang *IME, CAS, China*	
10:40-11:10	Paper ID: 331 Invited (1A.1)	**Challenge and solution for characterizing NBTI-generated defects in nanoscale devices** Jianfu Zhang Liverpool John *Moores University, UK*	Invited (1B.1)	**Challenge for Advanced Package Level Fault Isolation** Lihong Cao *ASE Group, Austin, TX, USA*
11:10-11:30	Paper ID: 289 (1A.2)	**Experiment Characterization of Front and Back Interfaces Impact on Back Gate Modulation in UTBB-FDSOI MOSFETs** Wangyong Chen et al. *Institute of Microelectronics, Peking University, China*	Paper ID: 261 (1B.2)	**Improvement of sensitivity of ultrasonic beam induced resistance change (SOBIRCH) method with ultrasound resonance in the mold resin** Takuto Matsui et al. *Toyohashi University of Technology, Japan*
11:30-11:50	Paper ID: 301 (1A.3)	**Resistive switching in atomic layer deposited and sputtered TiO2 films: electroforming observed by constant voltage stress** Tao Wang et al. *Soochow University, China*	Paper ID: 298 (1B.3)	**Enhancement of localization capability of lock-in thermography for power semiconductor devices by searching high-emissivity films** Norimichi Chinone, Toru Matsumoto and Kazushige Koshikawa *Hamamatsu Photonics K. K, Japan*
11:50-12:10	Paper ID: 283 (1A.4)	**Output Breakdown Characteristics and the Related Degradation Behaviors in Metal Oxide Thin Film Transistors** Xiaotong Ma et al. *Shenzhen University, China*	Paper ID: 128 (1B.4)	**The probe marker discoloration on Al pad and wafer storage** Wen-Fei Hsieh, Henry Lin, Vincent Chen, Irene Ou and YS Lou *Ardentec Cooperation, Taiwan, ROC*

^12:10-12:40 *12:10-12:30	^Paper ID: 330 Invited (1A.5)	**Advanced FinFET Device Reliability** Mu-Chun Wang *MUST, Taiwan*	*Paper ID: 226 (1B.5)	**Signal Processing Method for Scanning Acoustic Tomography Defect Detection based on a Correlation between Ultrasound Waveforms** Masayuki Kobayashi, Kaoru Sakai, Kenta Sumikawa and Osamu Kikuchi *Hitachi, Japan*
12:40-13:40	**Lunch**			
	Session 2A: Interconnect and Packaging Reliability Session Chair: Wardhana A. Sasangka *Singapore-MIT Alliance for Research and Technology, Singapore*		**Session 2B: Case Studies on Fault Isolation** Session Chair: Christian Boit *TU Berlin, Germany*	
13:40-14:10	Paper ID: 337 Invited (2A.1)	**Advanced On-Chip Interconnect Reliability** Baozhen Li *IBM System and Technology Group, Essex Vermont, USA*	Invited (2B.1)	**Challenges in laser probing at spatial resolution compromised technology nodes** Venkat Krishnan Ravikumar *AMD Singapore*
14:10-14:30	Paper ID: 162 (2A.2)	**Self-heating aware EM Reliability Prediction of Advanced CMOS Technology by Kinetic Monte Carlo Method** Linlin Cai et al. *Peking University, China*	Paper ID: 200 (2B.2)	**Using Microprobe to enhance Die Level Static Fault Isolation in Complex IC** Dayanand Nagalingam et al. *Globalfoundries, Singapore*
14:30-14:50	Paper ID: 275 (2A.3)	**CPB fcCSP BGA Package Reliability assessment via the study of Bump Cross Section Morphology after Product Realiability stress testing** Haitham Hamed and Vicky Wang *SK Hynix Memory Solutions, USA*	Paper ID: 114 (2B.3)	**Integrating NI LabVIEW in Soft Defect Localization of Temperature Dependent Voltage Failure** Paul Hubert Llamera, Camille Joyce Garcia-Awitan, Febus Reidj Cruz and Glenn Magwili *Maxim Integrated, Philippines*
14:50-15:10	Paper ID: 156 (2A.4)	**Comparison of Cl effects on Au-Al and Cu-Al HTS and bHAST reliability** Lois Jinzhi Liao et al. *Huawei Technologies, China*	Paper ID: 185 (2B.4)	**Increase Fault Isolation Efficiency by Using Scan Cell Visualizer for Scan Chain Failure** Thin Wei Chua, Loke Sheng Foo, Kim Choo Ng and Keith Serrels *NXP Semiconductors, Malaysia*
15:10-15:30	**Tea Break**			

	Session 3: Exhibitor Session
15:30-18:00	**Thermo Fisher Scientific** (8min) **ZEISS** (6min) **INTEGRATED SERVICE TECHNOLOGY** (6min) **SEMICAPS PTE LTD** (8min) **Kleindiek Nanotechnik** (4min) **TELTEC SEMICONDUCTOR PACIFIC LTD** (4min) **Hamamatsu Photonics (China) Co.,Ltd.** (4min) **Shanghai Winner International Trading CO., Ltd** (4min) **Crest Systems (Suzhou) CO., Ltd** (4min) **Nordson Advanced Technology Systems** (4min) **IMINA TECHNOLOGIES** (4min) **Materials Analysis Technology (Shanghai) Ltd** (4min) **Hitachi High-Technologies Corporation** (4min) **Ellipsiz iNETEST Co., Ltd** (4min) **Ellipsiz iNETest Shanghai CO.,LTD -- SELA Ltd** (4min) **Ellipsiz iNETest Shanghai CO.,LTD -- DIGIT- CONCEPT** (4min) **DIGIT CONCEPT SAS** (4min) **HMC Sales & Service Pte Ltd** (4min) **GALLANT PRECISION MACHINING CO., LTD** (4min) **ZURICH INSTRUMENTS** (4min) **Semishare（shenzhen）technology CO., LTD** (4min) **ESDEMC Technology LLC** (4min) **Platform Design Automation, Inc.** (4min) **WinTech Nano** (4min) **Oxford Instruments** (4min) **Hitachi Power Solution Co. ,Ltd.** (4min) **AMETEK TMC** (4min) **Advantest Corporation** (4min) **Gold Medal Analytical & Testing Group** (4min) **Sanying Precision Instruments Co.,Ltd** (4min) **ATOM SEMICON COMPANY LTD.** (4min) **GIGA FORCE ELECTRONICS CO.,LTD,** (4min) **Toyo Corporation China** (4min) **HANWA ELECTRONIC IND.CO., LTD** (4min) **Radiant Optronics Pte. Ltd** (4min) **JIACO INSTRUMENTS** (4min) **Phenom Desktop SEM** (4min) **Hongzhunda Tech** (4min)
End of Day 1	

Time	4 July (Day 2)			
08:30-09:30	**KN.2** Session Chair: Juin J. Liou	**Emerging Non-Volatile Memory's Applications in Neuro-Inspired Computing and Hardware Security** Shimeng Yu *Georgia Institute of Technology, USA*		
Session 4: Best Paper Exchange Session Chair : Nagarajan Raghavan, *SUTD, Singapore*				
09:30-10:00	ISTFA 2018 Exchange Paper (4.1)	**Scan Chain Fault Isolation using Single Event Upsets Induced by a Picosecond 1064 nm Laser** Keith Serrels *NXP Semiconductors, USA*		
10:00-10:30	ESREF 2018 Exchange Paper (4.2)	**Further Improvements of an Extended Hakki-Paoli Method** Massimo Vanzi *University of Cagliari, Italy*		
10:30-10:50	**Tea Break**			
	Symposium Room II		**Symposium Room I**	
	Session 5A: Transistor Reliability (ESD) Session Chair: Zhiwei Liu, *UESTC, China* and You Li, *Globalfoundries, USA*		**Session 5B: Advanced Electrical Fault Isolation Techniques** Session Chair: Venkat Krishnan Ravikumar *AMD, Singapore*	
10:50-11:20	Invited (5A.1)	**ESD / advanced FinFET device reliability** You Li *Globalfoundries, USA*	Invited (5B.1)	**Quantitative MIS Characterization Through Electro-Optical Signals** Christian Boit *TU Berlin, Germany*
11:20-11:40	Paper ID: 251 (5A.2)	**Modeling and Simulation of Diode Triggered Silicon Controlled Rectifier Behavior Under ESD Stresses** Meng Miao, You Li and Robert Gauthier *Globalfoundries, USA*	Paper ID: 308 (5B.2)	**EOFM measurements of lateral and vertical Bipolar Transistors in Silicon and SiGe:C Technologies** Anne Beyreuther, Tomonori Nakamura, Stefan Keil and Christian Boit *TU Berlin, Germany*
11:40-12:00	Paper ID: 203 (5A.3)	**Investigation of Electrical Parameters Degradations for 600V SOI-LIGBT under Repetitive ESD Stresses** Li Lu, Ran Ye, Siyang Liu and Weifeng Sun *Southeast University, China*	Paper ID: 307 (5B.3)	**EOFM for contactless parameter extraction of low k dielectric MIS structures** Norbert Herfurth, Stefan Keil, Tomonori Nakamura and Christian Boit *TU Berlin, Germany*
12:00-14:00	**Lunch** **Poster Session**			

14:00-14:20	Paper ID: 237 (5A.4)	**A Systematic Failure Analysis Approach to Determine True Electrical Overstress Failures on Integrated Circuits** Em Julius Dela Cruz *Maxim Integrated, Philippines*	Paper ID: 326 (5B.4)	**Fault Localization Using Dynamic Optical-beam Induced Current Variation Mapping** Man Hon Thor et al. *Globalfoundries, Singapore*
14:20-14:40	Paper ID: 150 (5A.5)	**New Approaches in ESD Risk Measurement of PCB Assembling Machines and ESD Countermeasures** Peter Jacob *Empa Duebendorf, Switzerland*	Paper ID: 325 (5B.5)	**Accurate Memory Bitmapping based on Built-in Self-Test: Challenges and Solutions** Lin Zhao, YT Ngow, SH Goh, YH Chan, Hao Hu *GLOBALFOUNDRIES, Product Diagnostic Engineering, Singapore* F Jeff, CC Tay *Mentor - A Siemens Business*
14:40-15:00	Paper ID: 285 (5A.6)	**Failure Analysis of Microwave Module by ESD Effect** Zhimin Ding et al. *China Academy of Space Technology, China*	Paper ID: 256 (5B.6)	**Characterization of 1122nm Laser for Laser Based Fault Isolation Applications** Vasanth Somasundaram, Yi Xuan Seah, Venkat Krishnan Ravikumar, Angeline Phoa and Choon Meng Chua *AMD, Singapore*
15:00-15:20	Paper ID: 204 (5A.7)	**Capacitor Modeling Methodology for System-level ESD Simulation** Li Xiang, Xie Xiaofei, Xia Nan and Gu Zhengdong *Huawei Technologies, China*	Paper ID: 121 (5B.7)	**Cycle-Shift Scan Chain Failure Analysis Using Single Pulse Test Pattern** Eric Paulraj, Chwee-Lin Choong and Yiang Won Chai *Intel Technologies, Malaysia*
15:20-15:40	**Tea Break**			
	Session 6A: Transistor Reliability Session Chair: Xinnan Lin *Peking University Shenzhen Graduate School*		**Session 6B: Case Studies on Fault Isolation** Session Chair: Szu Huat Goh *Globalfoundries, Singapore*	
15:40-16:10	Invited (6A.1)	**Reliability of STTRAM Devices** You Wang *Beihang University, China*	Paper ID: 334 Invited (6B.1)	**Failure Analysis for Advanced Package Technology** Ching-Chun Lin and Kim Hsu *Integrated Service Technology, Taiwan*
16:10-16:30	Paper ID: 210 (6A.2)	**Understanding lifetime prediction methodology for In0.53Ga0.47As nFETs under Positive Bias Temperature Instability (PBTI) condition** Zhigang Ji, Xiong Zhang and Jianfu Zhang	Paper ID: 191 (6B.2)	**Root cause analysis on analog circuit using TR-LADA** Winson Lua, Venkat Krishnan Ravikumar, Angeline Phoa, Gopinath Ranganathan and Girish AS *AMD, Singapore*

		Liverpool John Moores University, China		
16:30-16:50	Paper ID: 262 (6A.3)	**Comparison of NBTI kinetics in RMG Si p-FinFETs featuring ALD W Filling Metal Using B2H6 and SiH4 Precursors** Longda Zhou et al. *University of Chinese Academy of Sciences, China*	Paper ID: 178 (6B.3)	**Optical Failure Analysis on Pulsed Signals Embedded in Logic Cloud – A Case Study of Laser Voltage Tracing** Yuzhu Sun et al. *Thermo Fisher Scientific, USA*
16:50-17:10	Paper ID: 279 (6A.4)	**Impact of Channel Doping on NBTI Reliability and Variability in Nanoscale FinFETs** Zhe Zhang, Runsheng Wang, Yangyuan Wang and Ru Huang *Peking University, China*	Paper ID: 305 (6B.4)	**Methodology to Investigate the Root Cause of Threshold Voltage Drift of Transistor Devices using Capacitance Voltage Measurements** Chung Keow Ang et al. *Infineon Technologies, Malaysia*
17:10-17:30	Paper ID: 264 (6A.5)	**Study of Internal Latchup Behaviors in Advanced Bulk FinFET Technology** Wei Liang, Robert Gaunthier Jr, Souvick Mitra, You Li *Globalfoundries, USA*		
End of Day 2				
18:00-21:30	**IPFA 2019 BANQUET**			

Time	5 July (Day 3)			
	Symposium Room II		Symposium Room I	
	Session 7A: Reliability and Failure Analysis of Power Devices Session Chair: Min Ren *UESTC, China*		**Session 7B: Case Studies on Physical Faiure Analysis** Session Chair: Changze Liu *HiSilicon, China*	
08:30-09:00	Invited (7A.1)	**Wear- and Short-Circuit Testing of Silicon Carbide Power MOSFETs** Francesco Iannuzzo *Aalborg University, Denmark*	Invited (7B.1)	**Failure and Materials Analysis in the Logic Integrated Circuit Industry: Status and Challenges in Advanced Nodes** David Su *TSMC (Retired), Taiwan, R.O.C*
09:00-09:20	Paper ID: 132 (7A.2)	**High Resolution Mapping of Defects at SiO2/SiC Interfaces by Local-DLTS Based on Time-Resolved Scanning Nonlinear Dielectric Microscopy** Yuji Yamagishi and Yasuo Cho *Tohoku University, Japan*	Paper ID: 219 (7B.2)	**An Effective Monitored and Improved Method to Control Moisture for Outgoing FOSB** Yi-Ying Chen, Chiu-E Tseng, Hsin-Wen Fan and Chih-Chao Pai *Powerchip Corporation, Taiwan, R.O.C*
09:20-09:40	Paper ID: 288 (7A.3)	**Failure Analysis on TiAl Metallization Process for Ohmic Contact on 4H-SiC pMOSFET** Chia Lung Hung, Jung-Chien Cheng and Bing-Yue Tsui *National Chiao Tung University, Taiwan, R.O.C*	Paper ID: 222 (7B.3)	**The Application of Thermal Sensor to Locate IC Defects in Failure Analysis** Authors: Kuan-Chieh Huang and Yi-Chen Lin, *Powerchip Corporation, Taiwan, R.O.C*
09:40-10:00	Paper ID: 228 (7A.4)	**Repetitive-avalanche-induced Electrical Degradation and Optimization for 1.2kV 4H-SiC MOSFETs** Hao Fu, Jiaxing Wei, Siyang Liu, Wangran Wu and Weifeng Sun *Southeast University, China*	Paper ID: 165 (7B.4)	**The Case of Failure Analysis of the PCBA Wire Corrosion under High Reliability Requirements** Zheng Jie et al. *CEPREI, China*
10:00-10:20			Paper ID: 247 (7B.5)	**Metallic Trace Contaminant Detection Using SEM/EDX** Aaron Lee, Bernice Zee and Fang Jie Foo *AMD, Singapore*
10:20-10:40	**Tea Break**			

	Session 8A: Reliability and Failure Analysis of RF and Power Devices Session Chair: Liu Siyang, *Southeast University, China*		Session 8B: Advanced Phyisical Failure Analysis Techniques Session Chair: Wu Xing, *ECNU, China*	
10:40-11:10	Paper ID: 233 Invited (8A.1)	**Reduction of current collapse in GaN (MIS)-HEMTs using dual material gate** Binit Syamal and Xing Zhou *Nanyang Technological University, Singapore*	Invited (8B.1)	**In-situ device microscopy** Sun Litao *South East University, China*
11:10-11:30	Paper ID: 212 (8A.2)	**100V Integrated Bootstrap Diode with Dynamic Field Limiting Rings for Solving Reverse Recovery Failure in GaN Gate Driver ICs** Ajiang Li et al. *Southeast University, China*	Paper ID: 318 (8B.2)	**Probing SRAM Signals for Yield Management** Greg Johnson et al. *Carl Zeiss, USA*
^11:30-12:00 *11:30-11:50	^Invited (8A.3)	**Hot Carrier reliability assessment strategies in advanced RF SOI technologies for 5G applications** Dimitris P. Ioannou *Globalfoundries, USA*	*Paper ID: 146 (8B.3)	**Simultaneous 2D carrier polarity (dC/dV) and density (dC/dz) distribution measurement of Si/SiC MOSFET based on scanning nonlinear dielectric microscopy** Takehiro Yamaoka et al. *Hitachi High-Technologies Corporation, Japan*
11:50-13:00	**Lunch**			
	Session 9A: 2D Materials and Devices: Reliability and Failure Analysis Session Chair: Mario Lanza *Soochow University, China*		**Session 9B: Emerging Technologies in Failure Analysis Techniques** Session Chair: Zhigang Ji *Liverpool John Moores University, UK*	
13:00-13:30	Paper ID: 333 Invited (9A.1)	**Reliability of 2D Field-Effect Transistors: from First Prototypes to Scalable Devices** Yury Illarionov *TU Wien, Austria*	Invited (9B.1)	**In situ TEM Study on Flexible Electronics Reliability and Failure Analysis** Wu Xing *ECNU, China*
13:30-13:50	Paper ID: 181 (9A.2)	**Performance Variability and Analog Behaviors of Memristive Devices with New Transition Metal Carbide** Fei Gao et al. *Nanjing University of Posts and Telecommunications, China*	Paper ID: 290 (9B.2)	**Study of Front-Side Approach to Retrieve Stored Data in Non Volatile Memory Devices Using Scanning Capacitance Microscopy** Jing Yun Tay, Jason Cheah, Qing Liu and Chee Lip Gan *Nanyang Technological University, Singapore*

13:50-14:10	Paper ID: 324 (9A.3)	**Low Power Resistance Switching Devices and Its High-Density Crossbar Arrays with a Novel 2D Material MXene for Performance Improvement of Reliability** Nan He et al. *Nanjing University of Posts and Telecommunications, China*	Paper ID: 276 (9B.3)	**The impact of endurance degradation in Analog RRAM for in-situ training** Yuyi Liu, Bin Gao, Huaqiang Wu, Meiran Zhao and He Qian *Tsinghua University, China*
^14:10-14:40 *14:10-14:30	^Invited (9A.4)	**Reliability Assessment for HfOx based Neuromorphic Devices / Systems** Bin Gao *Tsinghua University, China*	*Paper ID: 265 (9B.4)	**Generation and tracking of optical signals inside the IC to improve device security and failure analysis** Elham Amini, Jean-Pierre Seifert and Christian Boit *TU Berlin, Germany*
14:30-15:00	**Tea Break**			
	Session 10A: Transistor and 2D Materials Reliability Session Chair: Nagarajan Raghavan *SUTD, Singapore*		**Session 10B: Sample Preparation and Defect Characterisation** Session Chair: Sun Litao *Southeast University, China*	
^15:00-15:30 *15:00-15:20	^Invited (10A.1)	**Erroneous fabrication and reliability characterization of memristors: how to detect it?** Mario Lanza *Soochow University, China*	*Paper ID: 249 (10B.1)	**Application of Laser Deprocessing Technique in Physical Failure Analysis on Memory Bit-counting** Yanlin Pan et al. *Globalfoundries, Singapore*
^15:30-16:00 *15:20-15:40	^Invited (10A.2)	**Defect Properties and Charge Transport in h-BN / MoS2-based FET devices** Kosuke Nagashio *University of Tokyo, Japan*	*Paper ID: 220 (10B.2)	**Application of SIMS for the characterization of Nitrogen in TaN film** Yun Wang et al. *Globalfoundries, Singapore*
15:40-16:00			Paper ID: 273 (10B.3)	**Poly-Si Unetch Failure Due to Etching Rate Dependence of Si Orientation** Dahyun Nam et al. *Samsung Electronics, Korea*
16:00-16:20	Paper ID: 299 (10A.3)	**Tristate resistive switching analysis in graphene/hexagonal boron nitride/graphene cross-point memristors** Kaichen Zhu et al. *Soochow University, China*	Paper ID: 277 (10B.4)	**Three-dimensional Structure Recognition of Circuit Patterns on Semiconductor Devices Using Multiple SEM Images Detected in Different Electron Scattering Angles** Kenji Yasui, Mayuka Osaki, Atsushi Miyamoto and Hitoshi Namai *Hitachi, Japan*

16:20-16:40	Paper ID: 284 (10A.4)	**Light-Illumination-Induced Degradation and Its Long-Term Recovery in Indium-Tin-Zinc Oxide Thin-Film Transistors** Meng Zhang et al. *Shenzhen University, China*	Paper ID: 214 (10B.5)	**4-Point-Bending Characterization of Interfacial Adhesion Strength of Co-Zr-Ta and Co-Zr-Ta Variant Thin-Film Stacks** Xintong Zhu et al. *Globalfoundries, Singapore*
16:40-17:10	**Conference Closing Ceremony** **Best Poster Awards - Announcement** **Introduction to IPFA 2020, Marina Bay Sands, Singapore**			
End of Day 3				