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Invited Talk 1:

2019 Mar 19, 9:10 – 9: 40

Chair: Akio Higo, *The University of Tokyo, Japan*

9:00 Electronic photonic IC technology - challenges of on-wafer characterization and test

Invited1 [Invited]N/A

Lars Zimmermann, *IHP – Leibniz-Insitut für innovative Mikroelektronik, Germany*

Session 1: Photonic Test Structures

2019 Mar 19, 9:40 – 11: 00

Co-Chairs: Alexey Kovalgin, *University of Twente, The Netherland*

9:40 A Micro Racetrack Optical Resonator Test Structure to Optimize Pattern

1.1 Approximation in Direct Lithography Technologies 4

Akio Higo¹, Tomoki Sawamura², Makoto Fujiwara¹, Etsuko Ota¹, Ayako Mizushima¹, Eric Lebrasseur¹, Taro Arakawa³, and Yoshio Mita^{1,2}

¹*VLSI Design and Education Center, The University of Tokyo, Japan*

²*Graduate School of Engineering, The University of Tokyo, Japan*

³*Yokohama National University, Japan*

10:00 PbS Quantum Dot / ZnO Nanowires Hybrid Test Structures for Infrared

1.2 Photodetector 8

Haibin Wang¹, Akio Higo², Yoshio Mita³, Takaya Kubo¹, and Hiroshi Segawa^{1,4}

¹*Research Center for Advanced Science and Technology, The University of Tokyo, Japan*

²*VLSI Design and Education Center, The University of Tokyo, Japan*

³*Graduate School of Engineering, The University of Tokyo, Japan*

⁴*Graduate School of Art and Science, the University of Tokyo, Japan*

10:20 In search of a hole inversion layer in Pd/MoOx/Si diodes through I-V characterization

1.3 using dedicated ring-shaped test structures 12

Gaurav Gupta¹, Shivakumar D. Thammaiah^{1,2}, Raymond J.E. Hueting¹ and Lis K. Nanver^{1,2}

¹*MESA+ Institute for Nanotechnology, University of Twente, The Netherlands*

²*Department of Materials and Production, Aalborg University, Denmark*

10:40 Wafer-Level Test Solution Development for a Quad-Channel Linear Driver Die in a

1.4 400G Silicon Photonics Transceiver Module 18

Ye Wang, Hanyi Ding, Barry Blakely, Aidong Yan

Department of Silicon Photonics Test Development, GLOBALFOUNDRIES

SESSION 2: Yield & Reliability

2019 Mar 19, 11:20 – 12:20

Co-Chairs: Larg Weiland, *PDF Solutions, USA*
Shigetaka Mori, *SONY Corporation, Japan*

- 11:20** **Extracting BTI-induced Degradation without Temporal Factors by Using BTI-Sensitive and BTI-Insensitive Ring Oscillators** 24
2.1
Ryo Kishida¹, Takuya Asuke², Jun Furuta², and Kazutoshi Kobayashi²
¹*Department of Electrical Engineering, Faculty of Science and Technology, Tokyo University of Science, Japan*
²*Department of Electronics, Graduate School of Science and Technology, Kyoto Institute of Technology, Japan*
- 11:40** **Extremely Low Voltage Operatable On-Chip-Monitor-Test Circuit for Plasma Induced Damage using High Sensitivity Ring-VCO (Voltage Controlled Oscillator)** 28
2.2
Manabu Tomita, Shigetaka Mori, Yuzo Fukuzaki, Kazuhisa Ogawa, Shinichi Miyake, and Hidetoshi Ohnuma, *Sony Semiconductor Solutions Corporation, Japan*
- 12:00** **Analysis of a failure mechanism occurring in SiGe HBTs under mixed-mode stress conditions**33
2.3
Mathieu Jaoul^{1,2}, David Ney¹, Didier Céli¹, Cristell Maneux², and Thomas Zimmer²
¹ *STMicroelectronics, France*
² *IMS, Université Bordeaux I, France*

Invited Talk 2:

2019 Mar 19, 13:35 – 14:05

Chair: Tsuyoshi Sekitani, *Osaka University, Japan*

- 13:35** **High-k Oxides on Hydrogenated-Diamond for Metal-Oxide-Semiconductor**
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Yasuo Koide
Research Network and Facility Services Division, National Institute for Materials Science (NIMS), Japan

SESSION 3: Novel Process Characterization

2019 Mar 19, 14:05 – 15:25

Co-Chairs: Chadwin Young, *University of Texas at Dallas*

- 14:05** **Electrical characterization of hot-wire assisted atomic layer deposited Tungsten**
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Kees van der Zouw, Antonius A.I. Aarnink, Jurriaan Schmitz, Alexey Y. Kovalgin
MESA+ Institute for Nanotechnology, University of Twente, The Netherlands

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Co-Chairs: Stewart Smith, *U. Edinburgh, UK*

Christopher Hess, *PDF Solutions, USA*

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	Matthew Rerecich ¹ , and Chadwin D. Young ²	
	¹ <i>Samsung Austin Semiconductor, LLC, USA</i>	
	² <i>Materials Science and Engineering Department, University of Texas at Dallas, USA</i>	

Invited Talk 3:

2019 Mar 20, 09:00 – 09:30

Chair: Yoshio Mita, *The University of Tokyo, Japan*

09:00	Taming Emerging Devices' Variation and Reliability Challenges with Architectural and System Solutions [Invited]	90
	Yuyang Wang ¹ , Leilai Shao ¹ , Miguel Angel Lastras-Montaña ² , Kwang-Ting Cheng ³ ,	
	¹ <i>Department of Electrical and Computer Engineering, University of California, Santa Barbara, U.S.A.</i>	
	² <i>Instituto de Investigación en Comunicación Óptica, FC, Universidad Autónoma de San Luis Potosí, México</i>	
	³ <i>School of Engineering, Hong Kong University of Science and Technology, Hong Kong</i>	

SESSION 5: Power Device

2019 Mar 20 9:30 – 10:30

Co-Chairs: Tatsuya Ohguro, *Toshiba, Japan*

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	¹ <i>Institute of Industrial Science, the University of Tokyo, Japan</i>	
	² <i>Meiji University, Japan</i> , ³ <i>Tokyo Institute of Technology, Japan</i>	
	⁴ <i>Green Electronics Research Institute, Japan</i> , ⁵ <i>Kyushu University, Japan</i> ,	
	⁶ <i>Kyushu Institute of Technology, Japan</i>	
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	<i>Advanced Technology Development, Texas Instruments, USA</i>	

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	¹ <i>Faculty of Engineering, Kyoto University, Japan</i>	
	² <i>Graduate School of Science and Technology, Nara Institute of Science and Technology, Japan</i>	
	³ <i>Graduate School of Informatics, Kyoto University, Japan</i>	

SESSION 6: Matching & Variability

2019 Mar 20 10:50 – 12:10

Co-Chairs: Hans P. Tuinhout, *NXP Semiconductor, The Netherlands*
 Yuzo Fukuzaki, *Sony Corporation*

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	Juan Pablo Martinez Brito ^{1,2} , Sergio Bampi ¹	
	¹ <i>Graduate Program on Microelectronics - PGMICRO, Brazil</i>	
	¹ <i>Federal University of Rio Grande do Sul – UFRGS, Brazil</i>	
	² <i>CEITEC S.A. Semiconductors, Brazil</i>	
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	<i>Department of ECE, Indian Institute of Technology, India</i>	
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	<i>IMS Laboratory, University of Bordeaux, France</i>	

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2019 Mar 20 13:30 – 15:10

Co-Chairs: Francesco Driussi, *University of Udine – DPIA, Italy*
 Bill Verzi, *Keysight, USA*

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2019 Mar 20 15:30 – 16:30

Co-Chairs: Kiyoshi Takeuchi, *The University of Tokyo, Japan*
 Hirofumi Shinohara, *Waseda University, Japan*

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	¹ <i>Graduate School of Engineering, Kyoto University, Japan</i>	
	² <i>Graduate School of Informatics, Kyoto University, Japan</i>	
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	Hiroyuki Mitsuya ¹ , Hisayuki Ashizawa ¹ , Hiroaki Homma ² , Gen Hashiguchi ³ , and Hiroshi Toshiyoshi ²	
	¹ <i>Saginomiya Seisakusho, Inc., Japan</i>	
	² <i>Institute of Industrial Science, The university of Tokyo, Japan</i>	
	³ <i>Shizuoka University, Japan</i>	

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2019 Mar 21 9:20 – 10:20

Co-Chairs: Satoshi Habu, *Keysight, Japan*

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	¹ <i>STMicroelectronics Rousset, France</i> , ² <i>LTM CNRS, France</i>	
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	¹ <i>School of Electrical Engineering, The University of Tokyo</i>	
	² <i>VLSI Design & Education Center (VDEC), The University of Tokyo</i>	
	³ <i>NEXTY Electronics Corporation</i>	

SESSION 10: TFTs

2019 Mar 21 10:40 – 11:20

Co-Chairs: Yoshio Mita, *The University of Tokyo, Japan*

10:40 Understanding the Effects of Low-Temperature Passivation and Annealing on ZnO

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Rodolfo A. Rodriguez-Davila, Pavel Bolshakov, Chadwin D. Young, and Manuel Quevedo-Lopez

Department of Materials Science and Engineering, University of Texas at Dallas, USA

11:00 A compact model of I-V characteristic degradation for organic thin film transistors

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Michiaki Saito¹, Michihiro Shintani², Kazunori Kuribara³, Yasuhiro Ogasahara³, and Takashi Sato¹

¹*Graduate School of Informatics, Kyoto University, Japan*

²*Graduate School of Science and Technology, Nara Institute of Science and Technology, Japan*

³*National Institute of Advanced Industrial Science and Technology (AIST), Japan*