

Advanced Program

What are the next key devices for IoT era ?

6/23

Tutorials (in Japanese) Chair: Takatoshi Kato

9:30-10:30 The Coming SiC/GaN Age
~ Emerging Package and Analysis Technologies ~
Satoshi Tanimoto (Nissan Arc)

Short Break (10:30-10:40)

10:40-11:40 Oxide thin-film transistor technology and its application to flexible displays
Mitsuru Nakata
(NHK Science & Technology Research Laboratories)

Opening

13:00-13:10 Opening Remarks by Yasuhisa Omura (Kansai University)

Keynote Speeches Chair: Yukiharu Uraoka

13:10-13:50
K-1 Quest for Visual System of the Brain to Create Artificial Vision
Tetsuya Yagi (Osaka University)

Short Break (13:50-14:00)

Session A (Silicon Devices)

Chair: Naoto Matsuo, Yoshinari Kamakura

14:00-14:40 - Invited -

A-1 **Detection and Characterization of Single MOS Interface Traps by the Charge Pumping Method**
Toshiaki Tsuchiya (Shimane University)

14:40-15:20 - Invited -

A-2 **Heterogeneous integration of SiGe/Ge and III-V on Si for CMOS photonics**
Mitsuru Takenaka and Shinichi Takagi
(The University of Tokyo, JST-CREST)

Short Break (15:20-15:30)

15:30-15:50

A-3 **High Power Efficient and Scalable Noise-Shaping SAR ADC for IoT Sensors**
Yusuke Tsukamoto, Koji Obata, Kazuo Matsukawa and Koji Sushihara (Panasonic Corporation)

15:50-16:10

A-4 **Analysis of the SOG film crack mechanism for TEOS/SOG/TEOS structure**
Takuya Naoe, Takaaki Fujimoto, Masanori Miyata, Takuya Takahashi (Ricoh)

Short Break (16:10-16:20)

Poster Session

Short Presentation – 2min. each (6/23, 16:20-17:40)

Chairs: A:Matsuto Ogawa, B:Takatoshi Kato, C: Hirobumi Watanabe

PA-01 **Kinetic Monte Carlo Simulation for Switching Probability of ReRAM**
Masataka Shirasawa, Mlandeli Dlamini and Yoshinari Kamakura
(Osaka University)

- PA-02** **Analysis of Ultra-High-Speed Image Sensor Based on Drift-Diffusion Model**
Le Thi Yen¹, Natsumi Minamitani¹, Yoshinari Kamakura¹ and T. G. Etoh²
(¹Osaka University, ²Ritsumeikan University)
- PA-03** **Capacitance Analysis of Pseudo-MOSFET Using Cole-Cole Plots**
Isao Yarita, Shingo Sato, and Yasuhisa Omura
(Kansai University)
- PA-04** **Characteristic Reliability of a Hybrid-Type Temperature Sensor using Poly-Si Thin-Film Transistors**
Toshimasa Hori, Jun Taya, Hisashi Hayashi, Tokiyoshi Matsuda, and Mutsumi Kimura (Ryukoku University)
- PA-05** **Effects of Ar beam irradiation on Si-Based Schottky contacts**
Shohei Hisamoto, Jianbo Liang, and Naoteru Shigekawa
(Osaka City University)
- PA-06** **Stimulus Performance of Poly-Si Thin-Film Transistor in in-vitro Experiment for Artificial Retinas**
Keisuke Tomioka, Shota Haruki, Tokiyoshi Matsuda, and Mutsumi Kimura (Ryukoku University)
- PA-07** **Gate Voltage Dependence of Channel Length Modulation for 14 nm FinFETs**
Yuki Nariai and Akira Hiroki (Kyoto Institute of Technology)
- PA-08** **Study on Underwater Wireless Power Transfer via Electric Coupling**
Mitsuhiro Urano and Akira Takahashi
(National Institute of Technology)
- PA-09** **Evaluation of Initial Electron Distributions in Ensemble Monte Carlo Simulations**
Shin Hiratoko, Akira Hiroki and Nobuya Fujimoto
(Kyoto Institute of Technology)

- PA-10** **Wireless Power Supply to Artificial Retina using Poly-Si Thin-Film Transistor**
Yuki Yamamoto, Toshio Ishizaki, Tokiyoshi Matsuda, and Mutsumi Kimura (Ryukoku University)
- PA-11** **A 0.5-3.5GHz Wideband CMOS LNA for LTE Application**
Wei-Rern Liao and Jeng-Rern Yang (Yuan Ze University)
- PA-12** **A 1.8/2.6 GHz CMOS High Linearity Power Amplifier For LTE Application**
Chih-Huang Lin and Jeng-Rern Yang
(Yuan Ze University)
- PB-01** **Impact of Air Exposure on Physical Properties of Sputter-Deposited Undoped ZnO Films**
Naoto Takahashi, Jiesheng Zhang, Yasuhisa Omura and Tadashi Saitoh (Kansai University)
- PB-02** **Characteristic Evaluation of Ga-Sn-O Thin Films fabricated using RF Magnetron Sputtering**
Yuta Kato, Kenta Umeda, Daiki Nishimoto, Tokiyoshi Matsuda, and Mutsumi Kimura (Ryukoku University)
- PB-03** **Effects of nonparabolic band structure on intrinsic carrier concentration in $\text{In}_{0.53}\text{Ga}_{0.47}\text{As}$**
Nobuya Fujimoto, Akira Hiroki and Shin Hiratoko
(Kyoto Institute of Technology)
- PB-04** **Characteristic Evaluation of Ga-Sn-O Thin Film by Hall Measurement**
Kota Imanishi, Asuka Fukawa, Tokiyoshi Matsuda, and Mutsumi Kimura (Ryukoku University)
- PB-05** **Analysis of Inversion Layer Electron Density of InGaAs MOSFETs**
Taiki Fujimoto, Akira Hiroki and Takuma Katano
(Kyoto Institute of Technology)

- PB-06** **Evaluation of Ga-Sn-O Films fabricated using Mist Chemical Vapor Deposition**
Hiroki Fukushima, Masahiro Yuge, Tokiyoshi Matsuda, and Mutsumi Kimura
(Ryukoku University)
- PB-07** **Magnetoresistance Effect of Ga-Sn-O Thin-Film Device**
Asuka Fukawa, Kota Imanishi, Shogo Miyamura, Tokiyoshi Matsuda, and Mutsumi Kimura (Ryukoku University)
- PC-01** **Electrochromic Properties of Single-Crystalline Tungsten Trioxide films Grown by Molecular Beam Epitaxy**
Takayuki Murayama¹, Wataru Kuwagata¹, Kazuto Koike¹, Yoshiyuki Harada¹, Shigehiko Sasa¹, Mitsuaki Yano¹, Shintaro Kobayashi², Katsuhiko Inaba²
(¹Osaka Institute of Technology, ²Rigaku Corporation)
- PC-02** **Sensitivity of Resistive Transition of Sputter- Deposited TiO₂ Films to Electrode Material**
Nozomi Kawashima, Shingo Sato and Yasuhisa Omura
(Kansai University)
- PC-03** **Electrical Characteristics of SAB-Based n+-n Ge/4H-SiC Heterojunctions**
Sho Morita, Takuya Nishimura, Jianbo Liang and Naoki Shigekawa
(Osaka City University)
- PC-04** **Artificial Neural Networks using Poly-Si Thin-Film Transistors**
Sumio Sugisaki, Ryohei Morita, Yuki Yamaguchi, Tokiyoshi Matsuda, and Mutsumi Kimura
(Ryukoku University)
- PC-05** **Study on Simplification of Processing Elements in Neural Networks using Circuit Simulation**
Tomoharu Yokoyama, Nao Nakamura, Hiroki Nakanishi, Yuki Watada, Tokiyoshi Matsuda, and Mutsumi Kimura
(Ryukoku University)

- PC-06 Simplification of Synapse Devices in Cellular Neural Network**
Koki Watada, Hiroki Nakanishi, Nao Nakamura, Tomoharu
Yokoyama, Tokiyoshi Matsuda, and Mutsumi Kimura,
(Ryukoku University)
- PC-07 Tamper Resistance of IoT Devices against Electromagnetic
Analysis**
Yusuke Nozaki, Yoshiya Ikezaki and Masaya Yoshikawa
(Meijo University)
- PC-08 IoT Device Oriented Security Module using PUF**
Yoshiya Ikezaki, Yusuke Nozaki and Masaya Yoshikawa
(Meijo University)
- PC-09 Electrical Characteristics of Al Foil/Si Junctions by Surface
Activated Bonding Method**
Katsuya Furuna¹, Jianbo Liang¹, Naoteru Shigekawa¹, Moeko
Matsubara², Marwan Dhamrin² and Yoshitaka Nishio²
(¹Osaka City University, ²Toyo Aluminium K.K.)

6/24

Session B (Compound Devices)

Chair: Masaaki Kuzuhara, Hiroyuki Sakai

9:30-10:10 – Invited –

B-1 High Quality Free-standing GaN Substrates and Their Application to High Breakdown Voltage GaN p-n Diodes
Hiroshi Ohta, Tohru Nakamura, and Tomoyoshi Mishima
(Hosei University)

10:10-10:30

B-2 A New Criterion for Stability Assessment of the Microwave pHEMT-based Low-Noise Amplifiers
Josef Dobeš, František Vejražka, Jakub Popp, and Jan Michal
(Czech Technical University in Prague)

Short Break (10:30-10:40)

10:40-11:00

B-3 Effect of Metal Electrode Edge Irregularities on Breakdown Voltages of AlGaIn/GaN HEMTs
Shinya Makino, Shintaro Ohi, Joel Asubar, Hirokuni Tokuda and Masaaki Kuzuhara (University of Fukui)

11:00-11:20

B-4 Breakdown degradation of AlGaIn/GaN HEMTs with multi-finger gate patterns
Taisei Yamazaki, Yudai Suzuki, Shintaro Ohi, Joel Asubar, Hirokuni Tokuda and Masaaki Kuzuhara (University of Fukui)

11:20-11:40

B-5 Warpage Design for Transfer-Molded Power Modules
Seita Iwahashi, Takukazu Otsuka, Masao Saito and Takashi Nakamura (ROHM)

11:40-12:00

B-6 Estimation of Junction Temperature at Failure of SiC DMOSFETs in UIS Test

Yuichiro Nanen, Masatoshi Aketa, Hirokazu Asahara and Takashi Nakamura (ROHM)

Lunch (12:00-13:00)

Session C (Emerging Devices)

Chair: Minoru Noda, Mutsumi Kimura

13:00-13:40 – Invited –

C-1 High Resolution Silicon MEMS Tactile Sensors for Measurement of Fingertip Sensation

Hidekuni Takao (University of Kagawa)

13:40-14:20 – Invited –

C-2 Transverse Thermoelectric Effect and Its Applications using Synthetically or Naturally Anisotropic Materials

Tsutomu Kanno (Panasonic Corporation)

Short Break (14:20-14:30)

14:30-14:50

C-3 Potential of Perovskite Solar Cells for Power Sources of IoT Applications

Itaru Raifuku¹, Yasuaki Ishikawa¹, Seigo Ito² and Yukiharu Uraoka¹
(¹Nara Institute of Science and Technology, ²University of Hyogo)

14:50-15:10

C-4 Influence of top electrodes to vibration modes in impulse responses of MEMS piezoelectric diaphragms

Tomoki Nishioka, Taiki Nishiumi, Kaoru Yamashita and Minoru Noda
(Kyoto Institute of Technology)

15:10-15:30

**C-5 Simulation and Fabrication of Test Structure for Micro-Wall
Solar Cell with Electric-Field Effect**

Takashi Kusakabe, Naoto Matsuo and Akira Heya
(University of Hyogo)

15:30-15:50

C-6 Effects of layered CdTe nano particles on Si solar cells

Tomoki Ogawa, Jianbo Liang, Shingo Imasaki, Taichi Watanabe,
Daegwi Kim and Naoteru Shigekawa (Osaka City University)

Short Break (15:50-16:00)

Poster Viewing Session

16:00-17:50 at Poster Room

Short Break (17:50-18:00)

Closing

18:00-18:20 Award and Closing: Yukiharu Uraoka (NAIST)