

The Conference Theme
Innovative Electronics for Sustainable Society

Advanced Program

6/19

Tutorials (in Japanese)

9:30-10:30 Fundamentals of Biosensors and its Applications
Ichiro Yamashita (Nara Institute of Science and Technology)

Short Break (10:30-10:40)

10:40-11:40 Fundamentals of Thermoelectricity and its Application
Koji Miyazaki (Kyushu Institute of Technology)

Opening

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

Keynote Speech

13:10-13:50

K-1 Micro Systems for Sustainable Society
Masayoshi Esashi (Tohoku University)

Short Break (13:50-14:00)

Session A (Si Devices)

14:00-14:40 - Invited -

A-1 Understanding Carrier Transport in the Ultimate Physical Scaling Limit of MOSFETs
Hideaki Tsuchiya (Kobe University)

14:40-15:00

A-2 Body Channel Digital Pulse Transmission for Biometric Measurement by Fully Implantable CMOS Image Sensor
Hajime Hayami, Yoshiaki Ishii, Kiyotaka Sasagawa, Toshihiko Noda, Takashi Tokuda and Jun Ohta
(Nara Institute of Science and Technology)

Short Break (15:00-15:10)

15:10-15:30

A-3 Development of Solution-Derived Diffusion Barrier Layer for Back-Contact Crystalline Silicon Solar Cell
Yunjian Jiang, Yasuaki Ishikawa, Seiya Yoshinaga, Tatsuki Honda, and Yukiharu Uraoka (Nara Institute of Science and Technology)

15:30-15:50

A-4 Original amplifier using only emitter and base of a Si bipolar transistor
Kensho Okamoto, Junichi Fujita, Masaki Ishikawa and Tetsuo Hattori (Kagawa University)

Short Break (15:50-16:00)

Poster Session

Short Presentation – 2min. each (6/19, 16:00-17:20)

PA-01 Schottky Barrier Height Reduction of NiGe/Ge Junction by P Ion Implantation for Metal Source/Drain Ge CMOS Devices
Hiroshi Oka, Yuya Minoura, Takuji Hosoi, Takayoshi Shimura and Heiji Watanabe (Osaka University)

- PA-02** Study of the conduction mechanism of the DNA memory FET
Shouhei Nakamura, Naoto Matsuo, Kazushige Yamana, Akira Heya, Tadao Takada, Masataka Fukuyama, and Shin Yokoyama
(University of Hyogo)
- PA-03** Characteristics of a microbridge type MEMS sensor for the thermal conductivity measurement of gases by a steady state method
Kenta Fujii, Shigenobu Muraoka, Sigeru Omatu, and Mitsuaki Yano
(Osaka Institute of Technology)
- PA-04** Quantum Transport Simulation of Ultra-small V-groove Junctionless Transistors
Tatsuya Yamana¹ and Nobuya Mori^{1, 2}
(¹Osaka University, ²CREST)
- PA-05** Gate Voltage Dependence of Channel Length Modulation for Ge p-channel MOSFETs
Yuta Goto, Akira Hiroki, Akihiro Matsuda and Masaaki Nakamura
(Kyoto Institute of Technology)
- PA-06** Study of Thin Film Solar Cell with Metal-Insulator-Semiconductor Diode to Control Carrier Recombination
Shota Wakamiya, Naoto Matsuo, Takahiro Kobayasi and Akira Heya
(University of Hyogo)
- PA-07** Gate Voltage Dependence of Channel Length Modulation for InGaAs n-channel MOSFETs
Akihiro Matsuda, Akira Hiroki, Yuta Goto and Masaaki Nakamura
(Kyoto Institute of Technology)
- PA-08** Characterization of Noise Behavior of Ultrathin Inversion-Channel and Buried-Channel SOI MOSFETs in the Subthreshold Bias Range
Takaki Ito, Shingo Sato, and Yasuhisa Omura (Kansai University)
- PA-09** Macromodeling of Operational Amplifiers for Sound Effect Circuit Design
Takaya Oyama, Akira Hiroki and Takaaki Sano
(Kyoto institute of technology)

- PA-10** Germanium Diode Modeling for Sound Effect Circuit Design
Hirokazu Oda, Akira Hiroki, Takaaki Sano and Takaya Oyama
(Kyoto Institute of Technology)
- PB-01** Conduction-Type Dependence of Thermal Oxidation Rate on SiC(0001)
Takuma Kobayashi, Jun Suda and Tsunenobu Kimoto
(Kyoto University)
- PB-02** Study of current collapse in AlGaIn/GaN HEMTs passivated with sputter-deposited SiO₂ and SiN_x
Takuya Kakegami, Shintaro Ohi, Hirokuni Tokuda and Masaaki Kuzuhara (University of Fukui)
- PB-03** Mechanism of off-leakage current in InGaZnO thin-film transistors
Go Wakimura, Yoshimitsu Yamauchi, Toshimasa Matsuoka and Yoshinari Kamakura (Osaka University)
- PB-04** Interface Properties of n-GaN MIS Diodes with ZrO₂/Al₂O₃ Laminated Films as a Gate Insulator
Shintaro Kodama, Hirokuni Tokuda, and Masaaki Kuzuhara
(University of Fukui)
- PB-05** Fully transparent ZnO thin-film transistors using conducting AZO films fabricated at room temperature
Yi Sun, Toshihiko Maemoto and Shigehiko Sasa
(Osaka Institute of Technology)
- PB-06** Effect of passivation films on DC characteristics of AlGaIn/GaN HEMTs
Shintaro Ohi, Takuya Kakegami, Hirokuni Tokuda and Masaaki Kuzuhara (University of Fukui)
- PB-07** Electrical Characterization of n⁺-InSb/p-Si Heterojunction Grown by Surface Reconstruction Controlled Epitaxy
Koya Kimura, Kousuke Hosotani, Taihei Ito, Hiroya Shimoyama, Taichi Sakamoto, Masayuki Mori and Koichi Maezawa
(University of Toyama)

- PB-08** Surface charging effects on current stability of AlGaIn/GaN HEMTs
Kenya Nishiguchi and Tamotsu Hashizume
(Hokkaido University)
- PB-09** Postgrowth Annealing Effects on Structural, Optical, and Electrical Properties of β -MoO₃ Films Grown by Molecular Beam Epitaxy
Shinji Yagi, Masayuki Matsuo, Kazuto Koike, Yoshiyuki Harada, Shigehiko Sasa, and Mitsuaki Yano
(Osaka Institute of Technology)
- PB-10** Heteroepitaxial Growth of InSb thin films on a Ge(111) substrate
Takaaki Mitsueda, Taichi Sakamoto, Hiroya Shimoyama, Masayuki Mori, and Koichi Maezawa (University of Toyama)
- PB-11** Improvement in electrical properties in SAB-based n⁺-Si/n-4H-SiC junctions by annealing
Tomohiro Hayashi¹, Jianbo Liang¹, Shota Nishida¹, Naoki Shigekawa¹, and Manabu Arai²
(¹Osaka City University, ²New Japan Radio Co., Ltd.)
- PC-01** Artificial Retina using Thin-Film Devices driven by Wireless Power Supply - Working Confirmation of Pattern Recognition –
Atsushi Matsumura, Takahiro Fuchiya, Yoshiharu Maeda, Takayuki Kadonome, Takumi Tanaka, Tokiyoshi Matsuda and Mutsumi Kimura (Ryukoku University)
- PC-02** Resistive Hysteresis of BaTiO₃ Ferroelectric Thin Film Prepared by MOD method
Shuhei Hashimoto, Shinpei Fuchida, Shu Ou, Kaoru Yamashita and Minoru Noda (Kyoto Institute of Technology)
- PC-03** Noise Performance of an Implantable Self-reset CMOS Image Sensor
Takahiro Yamaguchi, Yoshinori Sunaga, Makito Haruta, Toshihiko Noda, Kiyotaka Sasagawa, Takashi Tokuda and Jun Ohta
(Nara Institute of Science and Technology)

- PC-04** Spectroscopic Electrical Characterization of Post-Resistive-Transition SiO₂ Films
Rintaro Yamaguchi, Shingo Sato, Yasuhisa Omura and Kazuhiro Nakamura (Kansai University)
- PC-05** Multiple-Input NAND Circuit using Polycrystalline Silicon Thin-Film Transistors and Set-Reset Flip-Flop Circuit using the NAND Circuits
Yosuke Nagase¹, Tokiyoshi Matsuda¹, Mutsumi Kimura¹, Taketoshi Matsumoto² and Hikaru Kobayashi² (¹Ryukoku Univ. ²Osaka Univ)
- PC-06** Maximum and Minimum Voltage Sample and Hold Circuits employing Operational Amplifiers composed of Polycrystalline Silicon Thin-Film Transistors
Yasuhiko Ohno, Yoshihiro Ito, Yosuke Nagase, Akito Yoshikawa, Tokiyoshi Matsuda and Mutsumi Kimura (Ryukoku University)
- PC-07** Magnetic Field Sensitivity of Poly-Si Hall Device improved by High Voltage Application
Akito Yoshikawa¹, Daiki Tadokoro¹, Yohei Yamaguchi¹, Tokiyoshi Matsuda¹, Mutsumi Kimura¹, Tokuro Ozawa², Koji Aoki², and Chih-Che Kuo² (¹Ryukoku Univ. ²AU Optronics Corp)
- PC-08** Fabrication and Characterization of Si/ ~10- μ m Mesa-Etched Si Junctions by Surface Activated Bonding
Kohji Takemura, Masashi Morimoto, Shota Nishida, Jianbo Liang and Naoteru Shigekawa (Osaka City University)
- PC-09** Effects of Annealing on GaAs/Si Bonding Interfaces for Hybrid Tandem Solar Cells
Li Chai, Jianbo Liang, Shota Nishida, Masashi Morimoto and Naoteru Shigekawa (Osaka City University)
- PC-10** Characteristics of polymer photodetectors using Ga-doped ZnO electrode modified by self-assembled monolayer treatment
Yi-Wei Liao, Yusuke Sato, Hirotake Kajii and Yutaka Ohmori (Osaka University)

- PD-01** Design of Millimeter-Wave CMOS Transmission-Line-to-Waveguide Transitions
Hitoshi Kunitake, Kyoya Takano, Mizuki Motoyoshi, Kosuke Katayama, Shuhei Amakawa, Takeshi Yoshida and Minoru Fujishima (Hiroshima University)
- PD-02** Design of CMOS Resonating Push-Push Frequency Doubler
Adachi Hiroshi, Mizuki Motoyoshi, Kyoya Takano, Kosuke Katayama, Shuhei Amakawa, Takeshi Yoshida and Minoru Fujishima (Hiroshima University)
- PD-03** A 23dBm Pre-distortion Power Amplifier for LTE Application
Chung-Ching Lin and Jeng-Rern Yang (Yuan Ze University)
- PD-04** A 1.8 GHz CMOS Power Amplifier with second harmonic control for LTE applications
Ming-Yi Chen and Jeng-Rern Yang (Yuan Ze University)
- PD-05** A Capacitance Detection Circuit For On-chip Microparticle Manipulation
Rie Yamane, Hirosuke Iwasaki, Yoshiaki Dei, Cui Ji and Toshimasa Matsuoka (Osaka University)
- PD-06** Estimation of Threshold Voltage from Frequency of Ring Oscillator
Takuya Matsumoto¹, Hiroshi Makino¹, Tsutomu Yoshimura¹, Shuhei Iwade¹ and Yoshio Matsuda²
(¹Osaka Institute of Technology, ²Kanazawa University)
- PD-07** Inductorless CMOS Low Noise Amplifier with a Noise-Canceling Technique for LTE Application
Guan-Yu Pan and Jeng-Rern Yang. (Yuan Ze University)

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Session B (Compound Semiconductor Devices)

9:30-10:10 – Invited –

- B-1** Power Electronics Innovation by Silicon Carbide Power Semiconductor Devices
Hajime Okumura (National Institute of Advanced Industrial Science and Technology)

10:10-10:30

- B-2** The Mechanism of Parasitic Oscillation in a Half Bridge Circuit Including Wide Band-gap Semiconductor Devices
Tatsuya Yanagi, Hirotaka Otake and Ken Nakahara (ROHM Co., Ltd)

Short Break (10:30-10:40)

10:40-11:00

- B-3** Reliability of Bottom Gate Amorphous InGaZnO Thin-Film Transistors with Siloxane Passivation Layer
Chaiyanan Kulchaisit, Mami Fujii, Yoshihiro Ueoka, Juan Paolo Bermundo, Masahiro Horita, Yasuaki Ishikawa, and Yukiharu Uraoka (Nara Institute of Science and Technology)

11:00-11:20

- B-4** Analysis of heating phenomenon in oxide thin-film transistor under pulse voltage stress
Kahori Kise¹, Mami Fujii¹, Shigekazu Tomai², Yoshihiro Ueoka¹, Haruka Yamazaki¹, Satoshi Urakawa¹, Koki Yano¹, Dapeng Wang³, Mamoru Furuta³, Masahiro Horita¹, Yasuaki Ishikawa¹ and Yukiharu Uraoka¹
(¹Nara Institute of Science and Technology, ²Idemitsu Kosan Co., Ltd., ³Kochi University of Technology)

Lunch (11:20-12:30)

Session C (Emerging Devices)

12:30-13:10 – Invited –

C-1 In-situ TEM Observation of ReRAM Switching
Yasuo Takahashi (Hokkaido University)

13:10-13:30

C-2 Soft Actuator using Ionic Polymer-Metal Composite driven with Ionic Liquid
Hiroshi Okazaki, Shigeki Sawada, Tokiyoshi Matsuda and Mutsumi Kimura
(Ryukoku University)

13:30-13:50

C-3 Orientation-controlled Dielectrophoretic Alignment of Silicon Microrod on a Substrate with High Positional Accuracy
Akihide Shibata¹, Keiji Watanabe¹, Takuya Sato¹, Hiroshi Kotaki¹, Paul Schuele², Mark Crowder², Changqing Zhan², John Hartzell² and Ryoichi Nakatani³
(¹Sharp Corporation, ²Sharp Laboratories of America, ³Osaka University)

Short Break (13:50-14:00)

Session D (Solid-State Circuits)

14:00-14:20

D-1 Correlation between BTI-Induced Degradations and Process Variations by Measuring Frequency of Ros
Michitarou Yabuuchi, Ryo Kishida and Kazutoshi Kobayashi
(Kyoto Institute of Technology)

14:20-14:40

D-2 Output Voltage Stability of SPMC Type AC-AC Converter for Power Management in IT System
Hiroaki Ohtsuka, Masakazu Muraguchi, Yitao Ma and Tetsuo Endoh (Tohoku University)

14:40-15:00

D-3 A dual channel switched RF beamformer for LTE small cell base-station receiver

Ying-Lou Chiang and Jeng-Rern Yang (Yuan Ze University)

Short Break (15:00-15:10)

Poster Viewing Session

15:10-17:10 at Lobby

Short Break (17:10-17:20)

Closing

17:20-17:40 Award and Closing: Akira Takahashi (Sharp Corporation)