

The Conference Theme

New functional devices for the next generation

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Tutorials (in Japanese)

9:30-10:10 Development history of blue light-emitting-diodes
Masafumi Hashimoto (Toyota Central R&D Labs.-Retired)

Short Break (10:10-10:30)

10:30-11:10 Fundamentals and Applications of Microwave Technology
Toshio Ishizaki (Ryukoku University)

Opening

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

Keynote Speeches

13:10-13:50
K-1 (p.18) III-V/Ge MOSFETs and Tunneling FETs on Si platform for Low Power Logic Applications
Shinichi Takagi and Mitsuru Takenaka (The University of Tokyo)

Short Break (13:50-14:00)

Session A (Compound Semiconductor Devices)

14:00-14:40 - Invited -

A-1 (p.22) Nano-Channel InAlN/GaN Fin-HEMTs for Ultra- High-Speed Electronics

Subramaniam Arulkumaran and Geok Ing Ng
(Nanyang Technological University)

14:40-15:00

A-2 (p.24) Characteristics of Perovskite Solar Cells under Low Illuminance Condition

Itaru Raifuku, Yasuaki Ishikawa and Yukiharu Uraoka (NAIST)

Short Break (15:00-15:10)

15:10-15:30

A-3 (p.26) AlGaAs/InGaAs HEMTs Passivated with Atomic Layer Deposited SiO₂ using Aminosilane Precursors

Takayuki Suzuki, Yosuke Takigawa, Naotaka Iwata, Dongyan Zhang and Yoshio Ohshita (Toyota Technological Institute)

15:30-15:50

A-4 (p.28) Evaluation of band structure and conductive property of iron pyrite (FeS₂) thin film deposited by spin-coating

Shunsuke Uchiyama, Yasuaki Ishikawa, Takahiro Doe and Yukiharu Uraoka (NAIST)

15:50-16:10

A-5 (p.30) Terahertz Resonant Tunneling Diode Systems for Next Generation Wireless Communication

Sebastian Diebold¹, Kazuisao Tsuruda^{1,2}, Jaeyoung Kim², Toshikazu Mukai², Masayuki Fujita¹ and Tadao Nagatsuma¹
(¹Osaka University, ²ROHM Co., Ltd.)

Short Break (16:10-16:20)

Poster Session

Short Presentation – 2min. each (6/4, 16:20-17:40)

PA-01 (p.34) Simulation study of NO₂-exposed H-terminated diamond FETs with Al₂O₃ insulator gate

Toshiyuki Oishi¹, Ryutaro Higashi¹, Kazuya Harada¹, Yuta Koga¹, Kazuyuki Hiramata² and Makoto Kasu¹
(¹Saga University, ²NTT Corporation)

PA-02 (p.36) Improved Current Collapse in AlGa_N/Ga_N HEMTs with 3-Dimensional Field Plate Structure

Atsuya Suzuki, Kosuke Akira, Joel Asubar, Hirokuni Tokuda and Masaaki Kuzuhara (University of Fukui)

PA-03 (p.38) Impact of the preheating temperature on the ZnO-TFT characteristics prepared by a sol-gel method

Yuki Kawakami, Takahumi Daito, Kenichi Ogata, Toshihiko Maemoto and Shigehiko Sasa (Osaka Institute of Technology)

PA-04 (p.40) A Potentiometric Glucose Sensing by an Enzyme-Modified Ta₂O₅/ZnO/Zn_{0.6}Mg_{0.4}O Solution-Gate Field-Effect Transistor

Ken Iketani, Kazuto Koike, Yuichi Hirofuji, Toshihiko Maemoto, Shigehiko Sasa and Mitsuaki Yano (Osaka Institute of Technology)

PA-05 (p.42) Cu/Al/Mo/Au and Ni/Al/Mo/Au ohmic contacts for AlGa_N/Ga_N heterostructures

Aki Sasakura, Joel Asubar, Hirokuni Tokuda and Masaaki Kuzuhara (University of Fukui)

PA-06 (p.44) Electrical characterization of GaAs/GaAs bonding interfaces

Li Chai, Jianbo Liang, Shota Nishida, Masashi Morimoto and Naoteru Shigekawa (Osaka City University)

PA-07 (p.46) Electrical properties of n⁺-Si/n-GaN junctions by room temperature bonding

Takuya Nishimura¹, Jianbo Liang¹, Noriyuki Watanabe² and Naoteru Shigekawa¹
(¹Osaka City University, ²NTT Corporation)

- PA-08 (p.48) Current Collapse in AlGaIn/GaN HEMTs with a GaN Cap Layer**
Satoshi Yoshida, Yoshiki Sakaida, Joel Asubar, Hirokuni Tokuda and Masaaki Kuzuhara (University of Fukui)
- PA-09 (p.50) Polarity Dependent Radiation Hardness of GaN**
Msayuki Matsuo¹, Takayuki Murayama¹, Kazuto Koike¹, Shigehiko Sasa¹, Mitsuaki Yano¹, Shun-Ichi Gonda³, Ryoya Ishigami⁴, Kyo Kume⁴, Akira Uedono², Tomomi Ohtomo⁵, Erika Furukawa⁵, Yoshiki Yamazaki⁵, Kazunobu Kojima⁵ and Shigefusa Chichibu⁵
(¹Osaka Institute of Technology, ²University of Tsukuba, ³Osaka University, ⁴The Wakasa Wan Energy Research Center, ⁵Tohoku University)
- PA-10 (p.52) High Drain Current and Low On-Resistance in AlGaIn/GaN HEMTs with Au-Plated Ohmic Electrodes**
Yudai Suzuki, Kouhei Tone, Joel Asubar, Masaaki Kuzuhara and Hirokuni Tokuda (University of Fukui)
- PA-11 (p.54) High Breakdown Voltage AlGaIn/GaN HEMTs on Free-Standing GaN Substrate**
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- PA-12 (p.56) Electrical Conduction Mechanisms of Zinc-Oxide Thin Films Prepared by RF Sputtering**
Jiesheng Zhang, Tadashi Saitoh and Yasuhisa Omura (Kansai University)
- PB-01 (p.58) Two-Dimensional Model for Asymmetric Double-Gate Tunnel FET Considering the Source-Channel Junction Depletion Region**
Hongfei Lv¹, Shingo Sato¹, Yasuhisa Omura¹ and Abhijit Mallik²
(¹Kansai University, ²University of Calcutta)
- PB-02 (p.60) Film Thickness Dependence of the Micro-Wall Solar Cell with Electric-Field Effect**
Kohei Ohki, Takashi Kusakabe, Naoto Matsuo and Akira Heya (University of Hyogo)

- PB-03 (p.62) Interface characteristics of Si/Si junctions by using surface-activated bonding**
Shoji Yamajo, Masashi Morimoto, Jianbo Liang and Naoteru Shigekawa (Osaka City University)
- PB-04 (p.64) Fabrication and characterization of Si-based bipolar transistor structures using low-temperature bonding**
Sae Shimizu, Shota Nishida, Jianbo Liang, Masashi Morimoto and Naoteru Shigekawa (Osaka City University)
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Yuta Goto, Akira Hiroki and Akihiro Matsuda (Kyoto Institute of Technology)
- PB-06 (p.68) Countermeasure of TWINE against Power Analysis Attack**
Yusuke Nozaki, Kensaku Asahi and Masaya Yoshikawa (Meiji University)
- PB-07 (p.70) Macromodeling of Operational Amplifiers for Overdrive Circuit Design**
Yuki Yamatoya, Akira Hiroki and Hirokazu Oda (Kyoto Institute of Technology)
- PB-08 (p.72) Evaluation of the extraction method of mobility in InGaAs n-MOSFET**
Akihiro Matsuda, Akira Hiroki and Yuta Goto (Kyoto Institute of Technology)
- PB-09 (p.74) Macromodeling of Operational Amplifiers for Compressor Circuit Design**
Oda Hirokazu, Akira Hiroki and Yuki Yamatoya (Kyoto Institute of Technology)
- PB-10 (p.76) Improving Linearity of CMOS Power Amplifier for LTE Application**
Tso-Yu Wu and Jeng-Rern Yang (Yuan Ze University)

- PC-01 (p.78) Hall Effect in a p-type poly-Si Thin-Film Transistor with Hall Terminals**
Haruki Shiga¹, Akito Yoshikawa¹, Takaaki Matsumoto¹, Shogo Miyamura¹, Tokiyoshi Matsuda¹, Tokuro Ozawa², Koji Aoki², Chih-Che Kuo² and Mutsumi Kimura¹,
(¹Ryukoku University, ²AU Optronics Corporation Japan)
- PC-02 (p.80) Characteristic Analysis of Thin-Film Phototransistors**
Shota Haruki, Takahiro Fuchiya, Takayuki Kadonome, Takumi Tanaka, Tokiyoshi Matsuda and Mutsumi Kimura
(Ryukoku University)
- PC-03 (p.82) Fabrication of visible-light-responsive titanium oxide microspheres by liquid-phase laser ablation**
Ryota Kajimoto, Yi Sun, Toshihiko Maemoto, Yoshiyuki Harada and Shigehiko Sasa (Osaka Institute of Technology)
- PC-04 (p.84) Hybrid-type Temperature Sensor using n-type Low-temperature Processed poly-Si Thin-Film Transistors**
Shuhei Kitajima, Katsuya Kito, Hisashi Hayashi, Tokiyoshi Matsuda and Mutsumi Kimura (Ryukoku University)
- PC-05 (p.86) Vibration mode analysis on piezoelectric diaphragms for ultrasonic microsensors**
Taiki Nishiumi, Kaoru Yamashita, Hikaru Tanaka, Kaito Arai and Minoru Noda (Kyoto Institute of Technology)
- PC-06 (p.88) Fabrication of the solar-blind photodetector based on Ni_xMg_{1-x}O films by radio-frequency sputtering**
Hiroki Nishitani, Kohei Ohta, Mitsuru Inada, Tomohiro Shimizu, Shoso Shingubara and Tadashi Saitoh (Kansai University)
- PC-07 (p.90) Neuron MOS Inverter and Source Follower using Thin-Film Transistors**
Nao Nakamura, Kenji Shimada, Tokiyoshi Matsuda and Mutsumi Kimura (Ryukoku University)

PC-08 (p.92) Evaluation of In₂O₃ thin film deposited by RF magnetron sputtering

Toshihiro Yoshioka, Junji Ogawa, Masahiro Yuge, Tokiyoshi Matsuda and Mutsumi Kimura (Ryukoku University)

PC-09 (p.94) Evaluation of SnO₂ / Al₂O₃ thin film deposited by RF magnetron sputtering

Junji Ogawa, Toshihiro Yoshioka, Masahiro Yuge, Tokiyoshi Matsuda and Mutsumi Kimura (Ryukoku University)

PC-10 (p.96) Basic Properties of Resistive Memory Diode Composed of BaTiO₃ Ferroelectric Thin Film by MOD Process

Toshiyuki Sugie, Shuhei Hashimoto, Ziyang Zhang, Kaoru Yamashita and Minoru Noda (Kyoto Institute of Technology)

PC-11 (p.98) Photo-excited carrier transport of CuPc/C₆₀ organic thin-film solar cells

Nozomi Isobe, Tomoki Miyake, Shozou Yamanaka, Tadashi Saitoh and Mitsuru Inada (Kansai University)

Session B (Silicon Devices)

9:30-10:10 – Invited –

B-1 (p.102) Evolution of Nanoscale Silicon CMOS Technology for Ultra Low Power Application

Takashi Matsukawa, Takahiro Mori, Yongxun Liu, Shin-Ichi O'Uchi, Shinji Migita and Meishoku Masahara (AIST)

10:10-10:30

B-2 (p.104) A Simulation Study on Soft Error Rate in STT-MRAM

Go Wakimura, Toshimasa Matsuoka and Yoshinari Kamakura (Osaka University)

Short Break (10:30-10:40)

10:40-11:00

B-3 (p.106) Impacts of Orientation and Cross-sectional Shape on Hole Mobility of Si Nanowire MOSFETs

Hiroaki Fujihara, Naoya Morioka, Hajime Tanaka, Jun Suda and Tsunenobu Kimoto (Kyoto University)

11:00-11:20

B-4 (p.108) Effects of Internal Electric Field on Efficiency of Carrier Multiplication Solar Cells

Futo Hashimoto and Nobuya Mori (Osaka University)

Lunch (11:20-12:30)

Session C (Emerging Devices)

12:30-13:10 – Invited –

C-1 (p.112) CMOS Circuits and Nanodevices for Spike Based Neural Computing

Takashi Morie (Kyushu Institute of Technology)

13:10-13:30

C-2 (p.114) Thermoelectric Properties of a-InGaZnO Thin Film

Yuta Fujimoto, Mutsunori Uenuma, Yasuaki Ishikawa and Yukiharu Uraoka (NAIST)

Short Break (13:30-13:40)

13:40-14:00

C-3 (p.116) Properties of novel atmospheric pressure plasma generator inducing surface airflow by scanning discharge

Tomoshige Furuhi, Shuichi Kawata and Takahiro Takada
(Murata Manufacturing Co., Ltd.)

14:00-14:20

C-4 (p.118) Low Drift MEMS Humidity Sensor by Intermittent Heating

Hideaki Ooe, Takeshi Eimori, Masanobu Nomura, Hiroshi Nishikawa, Katsumi Fujimoto and Takashi Hasegawa
(Murata Manufacturing Co., Ltd.)

14:20-14:40

C-5 (p.120) Temperature dependence of magnetoresistance characteristics of the on-state of resistive random access memory with ferromagnetic electrode

Daisuke Ito, Yoshifumi Hamada, Shintaro Otuka, Tomohiro Shimizu and Shoso Shingubara (Kansai University)

Short Break (14:40-14:50)

Session D (Microwave Theory and Techniques)

14:50-15:10

D-1 (p.124) Discrete-type 24GHz SPDT FET Switch for Millimeter-wave WiCoPT

Hiroya Hojo and Toshio Ishizaki (Ryukoku University)

15:10-15:30

D-2 (p.126) 1.2kW Power Combiner Unit using Phase Control for 2.4GHz band

Hikaru Ikeda, Tomohide Kamiyama, Tadashi Nitta, Takashi Uno, Motoyoshi Iwata, Kazuhiro Yahata
(Panasonic Corporation)

15:30-15:50

D-3 (p.128) Design of Harmonic Processing Circuit for Microwave GaN-HEMT Power Amplifier

Gaku Nishio, Keigo Nakatani and Toshio Ishizaki
(Ryukoku University)

Short Break (15:50-16:00)

Poster Viewing Session

16:00-17:30 at Poster Room

Short Break (17:30-17:40)

Closing

17:40-18:00 Award and Closing: Yukiharu Uraoka (NAIST)

