The Conference Theme

New functional devices for the next generation

Table of Contents

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 SiO_2 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 (FeS_2) 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 Diebold[1], Kazuisao Tsuruda[1,2], Jaeyoung Kim[2], Toshikazu Mukai[2], Masayuki Fujita[1] and Tadao Nagatsuma[1]
([1]Osaka University, [2]ROHM 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 NO_2-exposed H-terminated diamond FETs with Al_2O_3 insulator gate**

Toshiyuki Oishi[1], Ryutaro Higashi[1], Kazuya Harada[1], Yuta Koga[1], Kazuyuki Hirama[2] and Makoto Kasu[1]

([1]Saga University, [2]NTT Corporation)

PA-02 (p.36) **Improved Current Collapse in AlGaN/GaN HEMTs with 3-Dimensional Field Plate Sutructure**

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 Ta_2O_5/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 AlGaN/GaN 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, Jienbo 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 Nishimura[1], Jianbo Liang[1], Noriyuki Watanabe[2] and Naoteru Shigekawa[1]

([1]Osaka City University, [2]NTT Corporation)

PA-08 (p.48) **Current Collapse in AlGaN/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 Matsuo[1], Takayuki Murayama[1], Kazuto Koike[1], Shigehiko Sasa[1], Mitsuaki Yano[1], Shun-Ichi Gonda[3], Ryoya Ishigami[4], Kyo Kume[4], Akira Uedono[2], Tomomi Ohtomo[5], Erika Furukawa[5], Yoshiki Yamazaki[5], Kazunobu Kojima[5] and Shigefusa Chichibu[5]
([1]Osaka Institute of Technology, [2]University of Tsukuba, [3]Osaka University, [4]The Wakasa Wan Energy Research Center, [5]Tohoku University)

PA-10 (p.52) **High Drain Current and Low On-Resistance in AlGaN/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 AlGaN/GaN HEMTs on Free-Standing GaN Substrate**
Jiehong Ng, Kouhei Tone, Joel Asubar, Hirokuni Tokuda and Masaaki Kuzuhara (University of Fukui)

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 Lv[1], Shingo Sato[1], Yasuhisa Omura[1] and Abhijit Mallik[2]
([1]Kansai University, [2]University 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)

PC-01 (p.78) **Hall Effect in a p-type poly-Si Thin-Film Transistor with Hall Terminals**

Haruki Shiga[1], Akito Yoshikawa[1], Takaaki Matsumoto[1], Shogo Miyamura[1], Tokiyoshi Matsuda[1], Tokuro Ozawa[2], Koji Aoki[2], Chih-Che Kuo[2] and Mutsumi Kimura[1],

([1]Ryukoku University, [2]AU 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)

6/5 .....

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 Filed 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)