The Conference Theme

Emerging Materials and Devices
for
Next-Generation Electronics

Advanced Program

6/21…………………………………

Tutorials (in Japanese) **Chair: Mutsumi Kimura**

9:30-10:30 **Present status and issues of retinal prostheses**
Jun Ohta
(NAIST-Nara Institute of Science and Technology)

Short Break (10:30-10:40)

10:40-11:40 **Recent evolution and future prospects of gallium oxide materials and devices**
Shizuo Fujita
(Kyoto University)

Opening

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

Keynote Speeches **Chair: Minoru Noda**

13:10-13:50
K-1 **Ferroelectric Thin Films and Electron Devices**
Masanori Okuyama
(Osaka University)

Short Break (13:50-14:00)

Session A (Silicon Devices)

Chairs: Naoto Matsuo / Yoshinari Kamakura

14:00-14:40 - Invited -

A-1 **Future of Tunnel FET for Low-Power High-Frequency Applications**

Abhijit Mallik
(University of Calcutta)

14:40-15:00

A-2 **Aspects and Reduction of Miller Capacitance of Lateral Tunnel FETs**

Yuyang Jiang [1], Shingo Sato[1], Yasuhisa Omura[1] and Abhijit Mallik[2]
([1]Kansai University, [2]University of Calcutta)

Short Break (15:00-15:10)

15:10-15:30

A-3 **Fabrication of Si//patterned metal layer/Si junctions for hybrid multijunction solar cells with improved bonding interface properties**

Takashi Hishida, Naoteru Shigekawa and Jianbo Liang
(Osaka City University)

15:30-15:50

A-4 **Penetration depth of effects of irradiation of Ar fast atom beams in n-Si surfaces**

Yuji Matsumoto, Shohei Hisamoto, Jianbo Liang and Naoteru Shigekawa
(Osaka City University)

15:50-16:10

A-5 **A novel design of P implanted regions for a power MOSFET**

Wen-Bin Yeh[1], Yi-Che Su[1], Kung-Yen Lee[1], Chia-Hui Cheng[2] and Chih-Fang Huang[2]
([1]National Taiwan University, [2]National Tsing Hua University)

Short Break (16:10-16:20)

Poster Session

Short Presentation – 2min. each (6/21, 16:20-17:30)

Chairs: A:Masahiro Moniwa, B:Tokiyoshi Matsuda, C:Yuichi Ando

PA-01 **Microscopic Imaging of Inversion Layer Formation in Insulator/Semiconductor Structure by Scanning Capacitance Transient Microscopy**
Hidenobu Mori and Haruhiko Yoshida
(University of Hyogo)

PA-02 **Improved RF Modeling of Intrinsic Output Equivalent Circuit for HR PD-SOI MOSFETs**
Changjo Lee and Seonghearn Lee
(Hankuk University of Foriegn Studies)

PA-03 **Tamper Resistance Evaluation of Noise based Countermeasure for IoT Devices**
Kazuya Shibagaki, Yusuke Nozaki and Masaya Yoshikawa
(Meijo University)

PA-04 **Physical Unclonable Function using Energy Harvesting**
Yusuke Nozaki and Masaya Yoshikawa
(Meijo University)

PA-05 **Dependence of characteristics of directly-bonded SiC/Si junctions on bonding temperature**
Kazufumi Shimozato[1], Jianbo Liang[1], Manabu Arai[2] and Naoteru Shigekawa[1]
([1]Osaka City University, [2]New Japan Radio Co.,Ltd.)

PA-06 **Heat Flow Analysis in a Thermal Hybrid Solar Cell System with Concentrating Light**
Yoshihiro Watanabe, Yuya Ashida and Akira Takahashi
(National Institute of Technology, Nara College)

PA-07 **Analysis of IH System with Equivalent Circuit Corresponding to Magnetic Flux**
Shuya Matsuhashi, Fumiya Hattori and Manabu Ishitobi
(National Institute of Technology, Nara College)

PB-01 **High-Mobility Single-Crystalline WO3 Epiaxial Films Grown on LSAT Substrates**
Hiroki Mito[1], Ryota Nakamura[1], Kazuto Koike[1], Shigehiko Sasa[1], Mitsuaki Yano[1], Shintaro Kobayashi[2] and Katsuhiko Inaba[2]
([1]Osaka Institute of Technology, [2] Rigaku Corporation)

PB-02 **Development of highly-sensitive transient photocapacitance mesurement system for deep defects in boron-doped diamond (100) films**
Kenta Miyawaki, Ryosuke Yamashita, Taishi Kodama and Osamu Maida
(Osaka University)

PB-03 **Development of memristor characteristic device using In-Ga-Zn-O thin film**
Ayata Kurasaki, Sumio Sugisaki, Ryo Tanaka, Tokiyoshi Matsuda and Mutsumi Kimura (Ryukoku University)

PB-04 **Stable fabrication of high breakdown voltage mesa-structure vertical GaN p-n junction diodes using electrochemical etching**
Hiroshi Ohta[1], Naomi Asai[1], Tomoyoshi Mishima[1], Fumimasa Horikiri[2], Yoshinobu Narita[2] and Takehiro Yoshida[2]
([1]Hosei University, [2]SCIOCS)

PB-05 **In-Ga-Zn-O Thin Film Synapse in Neural Network Using LSI**
Yuki Shibayama[1], Daiki Yamakawa[1] , Mutsumi Kimura[1] and Yasuhiko Nakashima
([1]Ryukoku University, [2] Nara Institute of Science and Technology)

PC-01 **Study on effect of Hf layer thickness on Ti/Hf/HfO 2/Au ReRAM device**
Ryo Nakajima, Atsushi Azuma, Hayato Yosida, Tomohiro Shimizu, Takeshi Ito and Shoso Shingubara
(Kansai University)

PC-02 **Multilayer Cross-Point Device using IGZO as Synapses in Artificial Neural Networks**
Atsushi Kondo, Mutsumi Kimura and Tokiyoshi Matsuda
(Ryukoku University)

PC-03 **Hf Oxide Film Sputtering Condition Dependence of Ti/HfOx/Pt Resistive Random Access Memory**
Atsushi Azuma, Ryo Nakajima, Hayato Yoshida, Tomohiro Shimizu, Takeshi Ito and Shoso Shingubara
(Kansai University)

PC-04 **Multilayer Cross-Point Synapses using Ga-Sn-O Thin Films for Neural Network**
Jumpei Shimura, Keisuke Ikushima, Mutsumi Kimura and Tokiyoshi Matsuda
(Ryukoku University)

PC-05 **Characteristic analysis of Ga-Sn-O TFT subjected to UV annealing treatment**
Kenta Tanino, Ryo Takagi, Mutsumi Kimura and Tokiyoshi Matsuda
(Ryukoku University)

PC-06 **Evaluation of Ga-Sn-O Thermoelectric Device**
Yoku Ikeguchi[1], Kota Imanishi[1], Ryuki Nomura[1], Kenta Umeda[2], Mutsunori Uenuma[2] and Mutsumi Kimura[1]
([1]Ryukoku University, [2] Nara Institute of Science and Technology)

PC-07 **Evaluation of GTO film deposited using mistCVD method**
Yuta Takishita, Ryugo Okamoto, Mutsumi Kimura and Tokiyoshi Matsuda
(Ryukoku University)

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Session B (Compound Devices)

Chairs: Masaaki Kuzuhara / Hiroyuki Sakai

9:30-9:50

B-1 **Characterization of resistivity and breakdown field in Fe-doped semi-insulating GaN substrates**

Atsuki Aoai[1], Kousuke Suzuki[1], Asubar Joel Tacla[1], Hirokuni Tokuda[1], Kohei Nojima[2], Naoto Ishibashi[2], Narihito Okada[2] and Kazuyuki Tadaomo[2] and Masaaki Kuzuhara[1],
([1]University of Fukui, [2]Yamaguchi University)

9:50-10:10

B-2 **Study on Threshold Voltage Hysteresis in GaN-based Vertical Trench MOSFETs**

Shoichi Murata[1], Masataka Sasada[1], Joel Asubar[1], Hirokuni Tokuda[1], Katsunori Ueno[2], Masaharu Edo[2] and Masaaki Kuzuhara
([1]University of Fukui, [2]Fuji Electric Co., Ltd.)

10:10-10:30

B-3 **Improved Current Collapse in AlGaN/GaN MOS-HEMTs with 1dual Field-Plates**

Takashi Nishitani, Ryota Yamaguchi, Taisei Yamazaki, Asubar Joel Tacla, Hirokuni Tokuda and Masaaki Kuzuhara
(University of Fukui)

Short Break (10:30-10:40)

10:40-11:00

B-4 **Effect of Post-gate Deposition Annealing on the Electrical Characteristics of AlGaN/GaN HEMTs with p-GaN Gate**

Shinsaku Kawabata, Joel Asubar, Hirokuni Tokuda and Masaaki Kuzuhara
(University of Fukui)

11:00-11:20

B-5 **Reduced Current Collapse in AlGaN/GaN HEMTs with p-GaN layer at the gate-drain access region**

Takashi Ozawa, Asubar Joel Tacla, Hirokuni Tokuda and Masaaki Kuzuhara

(University of Fukui)

11:20-11:40

B-6 **Thermoelectric conversion devise using Ga-Sn-O thin film prepared by mist CVD method**

Tatsuya Aramaki[1], Ryuki Nomura[1], Tokiyoshi Matsuda[1], Kenta Umeda[2], Mutsunori Uenuma[2], Yukiharu Uraoka[2] and Mutsumi Kimura[1]

([1]Ryukoku University, [2]Nara Institute of Science and Technology)

Lunch (11:40-13:00)

Session C (Emerging Devices)

Chairs: Minoru Noda / Mutsumi Kimura

13:00-13:40 – Invited –

C-1 **Development of corundum-structured gallium oxide power devices by MIST EPITAXY®**

Takashi Shinohe

(FLOSFIA)

13:40-14:20 – Invited –

C-2 **Brain-inspired computing with spintronics devices**

Sumito Tsunegi

(National Institute of Advanced Industrial Science and Technology)

Short Break (14:20-14:30)

14:30-14:50

C-3 **Evaluation of $(Bi,La)_4Ti_3O_{12}$ Thin Film for Capacitor-Type Synapses**

Yuta Miyabe[1], Isato Ogawa[1], Mutsumi Kimura[1], Eisuke Tokumitsu[2], Kenichi Haga[2] and Isao Horiuchi[3]

([1]Ryukoku University, [2]Japan Advanced Institute of Science and Technology, [3]KOA Corporation)

14:50-15:10

C-4 **RESERCH ON THE TRANS-LINKED FOUR-PHASE INTERLEAVED STEP DOWN CHOPPER**

Yuuki Sogabe

(National Institute of Technology, Maizuru College)

15:10-15:30

C-5 **Variations among heart rate varibility of pulse waves simulataneously measured at different sites**

Junichiro Hayano, Kento Yamamoto, Hiroki Ogasawara, Emi Yuda and Yutaka Yoshida

(Nagoya City University)

Short Break (15:30-15:40)

Poster Viewing Session

15:40-17:40 at Poster Room

Closing

17:40-18:00 Award and Closing: Mutsumi Kimura (Ryukoku University)