IMFEDK 2023 Program

Nov, 16 (Thu)……………………………………………………

Opening

10:00-10:05 Opening Remarks Mutsumi Kimura (Ryukoku University)

Poster Short Presentation **Chair: Mami Fujii**

10:05-10:45

P01 ***Reset operation of thin-film neuromorphic devices integrating a memristor and a capacitor***
Kazuki Sawai, Kenta Yachida, Yoshiya Abe, Tokiyoshi Matsuda, Hidenori Kawanishi, and Mutsumi Kimura
(Ryukoku University)

P02 ***Switching characteristics of a-IGZO-based 3-layer ReRAM***
Tsuguyoshi Nakaso, Ryo Ito, Tokiyoshi Matsuda, Hidenori Kawanishi and Mutumi Kimura
(Ryukoku University)

P03 ***ReRAM using Al-Sn-O film formed by mist CVD method.***
Arashi Dakeyama, Ryo Ito, Seiya Nakagawa, Hidenori Kawanishi and Mutumi Kimura
(Ryukoku University)

P04 ***The Origin of Diamond/Al2O3 Interface Defects Analysis***
Masaki Matsumoto, Ryoya Atsumi, Mami N. Fujii, Yuta Miyagoshi, Takumi Tsuno, Masaki Tanaka, Hiroto Tomita, Yusuke Hashimoto, Mutsunori Uenuma, Yukiharu Uraoka, Tomohiro Matsushita and Yukako Kato
(Kindai University)

P05 ***Heteroepitaxial Growth of Diamond on Highly Oriented Pyrolytic Graphite***
Keiji Taniya, Keisuke Tokuhara, Yuki Nagai, Mami N. Fujii and Shuhei Toshinari
(Kindai University)

P06 ***Investigation of a wide-bandwidth and low-spur Fractional-N PLL***
Shunta Nakao and Tsutomu Yoshimura

(Osaka Institute of Technology)

P07 ***The spds*p*+Δ tight binding model for 3C-SiC***
S. Kanai, T. Nishikawa and S. Sato
(Kansai University)

P08 ***Influence of Electrode Materials and their Deposition Method on Switching Characteristics of ReRAM Devices***
S.Watanabe, S. Kawata, T. Taniyama,P. Wiśniewski, Y. Omura and S. Sato
(Kansai University)

P09 ***Study of EHB Tunnel Field Effect Transistor by means of numerical simulations***
Piotr Wiśniewski
(Warsaw University of Technology)

P10 ***Initial state dependent neuromorphic device on resistance change of a-IGZO memristor combined with capacitor***
Kunimoto Masaya, Kazuki Sawai, Kenta Yachida,Tokiyoshi Matsuda, Hidenori Kawanishi and Mutsumi Kimura
(Ryukoku University)

P11 ***TCAD Simulation Study of Single-Event Transient in CFET Latch Circuit***
Taichi Matsui, Ichiro Fujihara and Yoshinari Kamakura
(Osaka Institute of Technology)

P12 ***Characteristics of non-volatile charge trap memory based on a-IGZO TFTs with Hf0.5Zr0.5O2 as a gate insulator***
Taiyo Shinoda, Yuki Kawasaki, Ren Deguchi, Tokiyoshi Matsuda, Hidenori Kawanishi, and Mutsumi Kimura
(Ryukoku University)

P13 ***A Dual Conversion Gain Scheme for a Small Pixel CMOS Image Sensor***
Ayaka BANNO, Ken MIYAUCHI, Kazuki TATSUTA, Ai OTANI, Yuki MORIKAWA, Hideki OWADA, Isao TAKAYANAGI and Shunsuke OKURA
(Ritsumeikan University)

P14 ***Comparative studies of electron state distribution in Al2O3/AlGaN/GaN and ZrO2/AlGaN/GaN structures***
Nur Syazwani B. A. T., S. Maeda, A. Baratov, J. T. Asubar and M. Kuzuhara
(University of Fukui)

P15 ***Validity Investigation of a coupled heat and electric transport simulation within semiconductor devices***
Kazumasa Niimi, Shunsuke Koba, Takao Nishi and Shun Ochi
(Kobe City College of Technology)

P16 ***Simulation of spin qubits in silicon double quantum dot with magnetic gradient and valley splitting***
Yusuke Hayashi and Satofumi Souma
(Kobe University)

P17 ***Fabrication of Ga-Sn-O thin film device by mist CVD and the application to spiking timing dependent plasticity (STDP)***
Kazuma Uno, Hodehito Kita, Atushi Horiuchi, Tokiyoshi Matsuda, Hidenori Kawanishi and Mutsumi Kimura
(Ryukoku University)

P18 ***Low-temperature fabrication process of In2O3 thin-film transistors using aqueous precursor solution and excimer light***
Takeaki Komai, Ryosuke Kasahara, Hideo Wada, Masatoshi Koyama, Akihiko Fujii, Toshihiko Maemoto, Akihiro Shimizu, Noritaka Takezoe and Hiroyasu Ito
(Osaka Institute of Technology)

Keynote Speech **Chair: Hirobumi Watanabe**

10:45-11:25
IN02 ***<Invited> Future Perspectives of Advanced CMOS Logic Technology***
Toshiro Hiramoto
(The University of Tokyo)

11:25-11:40 Short Break

Session 1 - Silicon - **Chair: Katsuyuki Sakurano**

11:40-12:00
R01 ***Impact of n+/p+-doped Polysilicon Gate in Lateral Overflow Transistor on Organic Photoconductive Film CMOS Image Sensor Dark Currents***
Yoshihiro Sato, Tsutomu Kobayashi, Takayoshi Yamada, Kazuko Nishimura and Masashi Murakami
(Panasonic Holdings Corporation)

12:00-12:20
R02 ***Calculation of Electric Field Distribution in 3D Monte Carlo Device***

Simulation using Machine Learning
Shunsuke Kuramoto and Nobuya Mori
(Osaka University)

12:20-13:20 Lunch

Special Lecture **Chair: Ken Nakahara**

13:20-14:00
IN01 ***<Invited> Fundamentals, Commercialization, and Future Challenges of SiC Power Device***
Tsunenobu Kimoto
(Kyoto University)

Session 2 - Compound - **Chair: kazushi Hayashi**

14:00-14:40
IN06 ***<Invited> Recent researches of GaN-based materials and devices in NU-AIST***
Toshihide Ide, Hisashi Yamada, Xuelun Wang, Toshikazu Yamada, Reiko Azumi, and Toru Ujihara
(AIST)

14:40-15:00
R09 ***High performance normally-off recessed gate GaN-based MIS-HEMTs with oxygen plasma treatment***
M. Ishiguro, K. Sekiyama, S. Urano, A. Baratov, J. T. Asubar and M. Kuzuhara
(University of Fukui)

15:00-15:20
R10 ***AlGaN/GaN Schottky-Gate HEMTs with low thermal budget V/Al/Mo/Au ohmic contacts***
T. Igarashi, S. Maeda, A. Baratov, J. T. Asubar and M. Kuzuhara
(University of Fukui)

15:20-15:40
R04 ***Ferroelectric Memristive device based on the Wurtzite AlScN film***
Miaocheng Zhang*, Yixin Wei, Cong Han, Shilei Sun, Yu Wang, Minggao Zhang, Yerong Zhang, Yi Tong*Hao Zhang, Weijing Shao and Xinpeng Wang

(Nanjing University of Posts and Telecommunication)

15:40-16:00 Short Break

Session 3 - Emerging & Silicon - **Chair: Joel T. Asubar**

16:00-16:40

IN09 ***<Invited> MOVPE growth of AlGaN on RIE-treated GaN surfaces and its application to AlGaN/GaN electron devices***

Akio Yamamoto, Ali Baratov, Joel T. Asubar, and Masaaki Kuzuhara
(University of Fukui)

16:40-17:20

IN10 ***<Invited> Liquid-injection MOCVD-grown Ga_2O_3 on sapphire and 4H-SiC substrates: Material, transport, and MOSFET properties***

Milan Tapajna, Fridrich Egyenes, Fedor Hrubišák, Kristína Hušeková, Edmund Dobročka, Peter Nádaždy, Alica Rosová, Hemendra Chouhan, Javad Keshtkar, and Filip Gucmann
(Slovakia Academy of Science)

17:20-17:40

R06 ***Temperature Dependence of Oxygen Annealing Effect on Electrical Properties of GaOx/Si Structure by Mist Chemical Vapor Deposition***

Hidenobu Mori and Haruhiko Yoshida
(University of Hyogo)

17:40-18:00

R07 ***Fabrication and Evaluation of Resistive Switching Devices Utilizing Selective Surface Oxide Films of Liquid Metal Alloys***

Yuto Katsuma, Takahiko Ban, Masayoshi Ichimiya, Junichi Yanagisawa and Shin-ichi Yamamoto
(The University of Shiga Prefecture)

18:00-18:20

R08 ***Heat Treatment Dependence and Electrical Characterization of Resistive Switching Devices Using Liquid Metal***

Yuusuke Hirano, Takahiko Ban, Masayoshi Ichimiya and Junichi Yanagisawa
(The University of Shiga Prefecture)

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Session 4 - Emerging & Silicon -

Chair: Toshihiko Maemoto

9:20-9:40
R03 ***Lifetime Improvement Method for Memristor-Based Hyperdimensional Computing Accelerator***
Tetsuro Iwasaki and Michihiro Shintani
(Kyoto Institute of Technology)

9:40-10:00
R05 ***Study on Interface Trap and Fixed Charge Generation under Channel Hot Carrier Stressing at Low Temperature Using Device Simulation***
Yohei Miyaki, Tatsuya Suzuki and Yuichiro Mitani
(Tokyo City University)

10:00-10:20
R11 ***Characterization of resistive switching phenomena in thermal silicon oxide RRAM devices by means of small-signal measurements***
Piotr Wiśniewski, Jakub Jasiński, Bartłomiej Stonio and Andrzej Mazurak
(Warsaw University of Technology)

10:20-10:40
R12 ***Feature Extractable CMOS Image Sensor Pixel with RGB to Grayscale Conversion***
Shuhei OKUMURA, Yudai MORIKAKU, Yu OSUKA, Ryuichi UJIIE, Daisuke MORIKAWA, Hideki SHIMA and Shunsuke OKURA
(Ritsumeikan University)

10:40-11:00 Short Break

Session 5 - Industrial -

Chair: Masayuki Furuhashi

11:00-11:40
IN05 ***<Invited> Cutting-edge THz devices as essential parts of IOWN - Innovative Optical and Wireless Network***

Takuya Tsutsumi
(NTT)

11:40-12:20
IN04 ***<Invited> Establishment of "JOINT2" Consortium for Next Generation Semiconductor Package Evaluation and Development of Packaging Technology***
Sadaaki Katoh
(Resonac Corporation)

12:20-13:10 Lunch

Poster Viewing Session

13:10-14:30

14:30-14:40 Short Break

Session 6 - Silicon - Chair: Mutsumi Kimura

14:40-15:20
IN07 ***<Invited> Analog CMOS Implementation of Neuromorphic Hardware***
Shigeo Sato, Satoshi Moriya, Satoshi Ono, and Hideaki Yamamoto
(Tohoku University)

15:20-15:40
R13 ***Neural Network Modeling of Steep Turn-on Diodes Validation and Implementation in SPICE Simulations***
Kengo Nakata, Takayuki Mori and Jiro Ida
(Kanazawa Institute of Technology)

15:40-16:00 Short Break

Keynote Speech

Chair: Hidetoshi Ishida

16:00-16:40

IN03 ***<Invited> Gate Technology and transport mechanisms for Normally-off p-GaN HEMTs***

Giuseppe Greco, Patrick Fiorenza, Filippo Giannazzo, Ferdinando Iucolano, and Fabrizio Roccaforte
(CNR-IMM)

16:40-17:20

IN08 ***<Invited> Growth of Nitrides on Nearly Lattice-Matched Substrate ScAlMgO$_4$ and its Application***

Takashi Matsuoka, Hirotaka Yahara, Chihiro Hagiwara, Takuya Iwabuchi, and Takeshi Kimura
(Tohoku University)

17:20-17:50 Short Break

Awards & Closing Remarks

17:50-18:10	Award Presentation	Naohiro Ueda (Nisshinbo Micro Devices)
18:10-18:20	Closing Remarks	Mutsumi Kimura (Ryukoku University)