

IMFEDK 2025 Program

Nov. 13 (Thu).....

Opening Remarks

10:00-10:10 Opening Remarks Ken Nakahara (Rohm)

Poster Short Presentation

Chair: Prof. Fujii

10:10-10:50

P01 ***Pulse Stress-Induced Degradation Mechanisms in Junction-less Ferroelectric TFTs***

William Cheng-Yu Ma¹, Jhao-Fong Deng¹, Yen-Lun, Hsieh¹, Hong-Yi Lu¹, Ying-Ju Lai¹, and Chun-Jung Su² (¹National Sun Yat-sen University, ²National Yang Ming Chiao Tung University, ²Taiwan Semiconductor Research Institute)

P02 ***High Responsivity and Detectivity Sn δ -Doped ϵ -Ga₂O₃/ α -Ga₂O₃ Heterostructure Photodetector***

Han-Yin Liu and Wei-Han Chen (National Sun Yat-sen University)

P03 ***An FeFET-Capacitor Structure and its Application to Spiking Neuromorphic Systems***

Riku Horio¹, Kazuki Sawai¹, Hidenori Kawanishi^{1,3}, Tokiyoshi Matsuda², Takaaki Miyasako⁴, Sanggyu Koh⁴, Tadasu Hosokura⁴, Reon Oshio³, Takumi Kuwahara³, Yasuhiko Nakashima³, and Mutsumi Kimura^{1,3} (¹Ryukoku University, ²Kindai University, ³NAIST, ⁴Murata Manufacturing Co., Ltd.)

P04 ***Feasibility study on the design of tight-binding parameters using machine learning***

Kaito Seike and Shingo Sato
(Kansai Univeristy)

P05 ***Effect of oxygen partial pressure ratio on the electrical properties and electrical conductivity of GTO-TFTs***

Syunsuke Sano¹, Taiyo Shinoda¹, Ryo Oshima¹, Kota, Iwamoto¹, Hidenori Kawanishi¹, Mutsumi Kimura¹, and Tokiyoshi Matsuda² (¹Ryukoku University, ²Kindai University)

P06 ***Diamond Crystal Growth on Off-Angle HOPG Substrates***

Masaki Matsumoto¹, Hiroto Shimizu¹, Takaomi Matsutani¹, and Mami N. Fujii² (¹Kindai Univeristiy, ²Ritsumeikan University)

- P07 ***Solution-State Control and Electrical Stability of Ga–Sn–O With Stirring***
Kosuke Oyasu¹, Yuma Takaki¹, Hidenori Kawanishi¹, Mutsumi Kimura¹, Tokiyoshi Matsuda², and Tetsuji Okuda³ (¹Ryukoku University, ²Kindai University, ³Ryukoku University)
- P08 ***Thickness Dependence of GTO Thin-Film Memristors Fabricated by Mist-CVD***
Takeru Aoki¹, Ryohei Takahashi¹, Atsuya Tamaru¹, Hidenori Kawanishi¹, Tokiyoshi Matsuda¹, Mutsumi Kimura¹, and Tokiyoshi Matsuda² (¹Ryukoku University, ²Kindai University)
- P09 ***Composition-Gradient Multilayer GTO Memristors by Mist CVD: Oxide Dependence and Switching Characteristics***
Hiroto Takamura¹, Ryosuke Takahashi¹, Kosuke Oyasu¹, Hidenori Kawanishi¹, Mutsumi Kimura¹, and Tokiyoshi Matsuda² (c)
- P10 ***High-Mobility In₂O₃ and InGaO TFTs Using Aqueous Precursor Solutions and Excimer Light Irradiation Process***
Hideya Ochiai¹, Kazuki Ueda¹, Takuya Nomura¹, Akira Fujimoto¹, Hideo Wada¹, Masatoshi Koyama¹, Akihiko Fujii¹, Toshihiko Maemoto¹, Akihiro Shimizu², Noritaka Takezoe², and Hiroyasu Ito² (¹Osaka institute of technology, ²Ushio Inc.)
- P11 ***Investigation of Fast Locking in Overclocking Fractional-N PLL***
Yu Arima and Tsutomu Yoshimura (Osaka institute of technology)
- P12 ***Evaluation of electrical conduction properties using TLM analysis***
Shunsaku Takahashi¹, Keita Yamamoto¹, Hidenori Kawanishi¹, Mutsumi Kimura¹, Tokiyoshi Matsuda² (¹Ryukoku University, ²Kindai University)
- P13 ***Oxide MIM Diodes with ZnO/AlO_x Bilayer for High-Frequency Rectenna Applications***
Haruto Monda, Kensuke Nakata, Naoki Takada, Hideo Wada, Masatoshi Koyama, Akihiko Fujii, and Toshihiko Maemoto (Osaka institute of technology)
- P14 ***Fabrication and Characterization of Ga-Sn-O Based Flexible UV Photodetector***
Yukimasa Ota¹, Tokiyoshi Matsuda¹, Wen-Yi Zhang², Ya-Hsin Chen², Hung-Yu Ou², and Chien-Yie Tsay² (¹Kindai University, ²Feng Chia University)
- P15 ***Design on TCAD Simulation Experiments with Active Learning by Uncertainty Sampling***
Motoharu Sakono, Vanness Filbert Cierra, and Yoshinari Kamakura (Osaka Institute of Technology)

- P16 ***Design and performance of single-ended SRAM cell for near energy-minimum-point operation***
Tadakatsu Yaguchi, Yusaku Shiotsu, and Satoshi Sugahara (Institute of Science Tokyo)
- P17 ***Quantum Transport Simulation of 2D Semiconductor Tunnel FETs with Büttiker Probes for Dephasing and Recombination***
Ryo Issiki and Satofumi Souma (Kobe University)
- P18 ***Quantum FDTD Simulation for Analyzing Field Fluctuations in Photonic Devices***
Masahiro Kato and Satofumi Souma (Kobe University)
- P19 ***Simulation of Entangled Electron Dynamics by Two-Particle Bohmian Mechanics: Toward Qubit Device Applications***
Yuma Yamaguchi and Satofumi Souma (Kobe University)

10:50-11:00 Short Break

Keynote Speech

Chair: Prof. Kimura

11:00-11:40

KS01 (Keynote) ***Polarization inverted ScAlN piezoelectric multilayer RF filters***

Takahiko Yanagitani (Waseda University)

11:40-13:00 Lunch

Session 1 - Characterization -

Chair: Dr. Sakurano

13:00-13:40

IN01 (Invited) ***Imaging electrons, holes, and the depletion layer in semiconductor devices by operando photoemission electron microscopy***

Keiki Fukumoto (KEK)

13:40-14:00

R01 ***Impact of Probe-Induced Thermal Flow in Cryogenic I–V Measurement of Power Devices with Kelvin Connection***

Sanchari Guha, Hajime Takayama, Kazutaka Kanegae, and Michihiro Shintani
(Kyoto Institute of Technology)

14:00-14:20 Short Break

Session 2 - Process and Device Technology -Chair: Dr. Oku

14:20-15:00

IN02 (Invited) ***Epitaxial Graphene on Silicon Carbide***

Wataru Norimatsu (Waseda University)

15:00-15:20

R02 ***Enhanced Electrical Performance of Recessed-Gate GaN MIS-HEMTs Via Complete Barrier Removal and Regrowth of AlN/AlGaN Barrier***

K. Mori¹, S. Terai¹, S. Yamao¹, M. Uno¹, R. Kato¹, N. Islam¹, I. Nagase¹, S.

Maeda¹, A. Baratov¹, R. T. Ahmed¹, A. Yamamoto¹, J. T. Asubar¹, and M. Kuzuhara² (¹University of Fukui, ²Kwansei Gakuin University)

15:20-15:40

R03 ***Fabrication and Characterization of ZrO₂/AlGaIn/GaN MIS-HEMTs with ex-situ AlN cap Layer***

D. Matsubara¹, R. Kato¹, S. Terai¹, M. Uno¹, S. Yamao¹, M. A. Farhan¹, N. Islam¹, S. Maeda¹, A. Baratov¹, I. Nagase¹, A. Yamamoto¹, J. T. Asubar¹, and M. Kuzuhara² (¹University of Fukui, ²Kwansei Gakuin University)

15:40-16:00 Short Break

Session 3 - Process and Characterization -

Chair: Prof. Kamakura

16:00-16:40

IN03 (Invited) ***Novel crystallographic etching of β -Ga₂O₃***
Takayoshi Oshima (NIMS)

16:40-17:00

R04 ***Measurement of the Electrical Properties of Ti₄O₇ Produced by Surface Oxide Film Stripping /Transfer Method of Liquid Metal Alloys***
Kazuma Matsumura¹, Takahiko Ban¹, Masayoshi Ichimiya¹, Junichi Yanagisawa¹,
and Shin-ichi Yamamoto² (¹The University of Shiga Prefecture, ²Ryukoku University)

17:00-17:20

R05 ***Anodization of each individual titanium microwires on a chip under different conditions***
Takeru Hara, Soma Furuhashi, and Yasuo Kimura (Tokyo University of Technology)

17:20- Commemorative group photo with all participants

18:00- Banquet (1F in Jojukan)

Nov. 14 (Fri).....

Session 4 - Sensor -

Chair: Prof. Matsuda

9:30-10:10

IN04 (Invited) ***Flexible Hybrid Electronics for Sensing Applications***
 Joseph Andrews (Univ. Wisconsin-Madison)

10:10-10:20 Short Break

10:20-12:00 Poster Viewing Session

12:00-13:00 Lunch

Session 5 - Integrated Circuits -

Chair: Prof. Maemoto

13:00-13:40

IN05 (Invited) ***Challenges and Opportunities of Oxide-semiconductor Channel Transistor DRAM (OCTRAM)***
 Shoichi Kabuyanagi, Akinori Kamiyama, and Shosuke Fujii (KIOXIA)

13:40-14:00

R06 ***Cross-coupled Voltage Doubler with Improved Subthreshold Performance***
 Reyhan Ramadhan, Masato Saito, and Takashi Tokuda (Tokyo Institute of Technology)

14:00-14:20

R07 ***CMOS Image Sensor Pixels Capable of Extracting Two-Dimensional Edge Features***
 Hiroki MORITA¹, Koki FUJIWARA¹, Ryoya IEGAKI¹, Ryuichi UJIIE², Hideki SHIMA², Shunsuke OKURA¹ (¹Ritsumeikan University, ²Nisshinbo Micro Devices Inc.))

14:20-14:40

R08 ***Low-Noise Reset Transistor for LOFIC CMOS Image Sensors Using a Two-Step Reset Scheme***
 Nao KITAJIMA¹, Kazuki TATSUTA¹, Ken MIYAUCHI^{1,2}, Hideki OWADA², Isao TAKAYANAGI², Shunsuke OKURA¹ (¹Ritsumeikan University, ²Brillnics Japan Inc.)

14:40-15:00 Short Break

Special Lecture - Emerging Widebandgap Devices -

Chair: Prof. Uraoka, Prof. Shigekawa, and Prof. Asubar

15:00-15:40

IN06 (Invited) ***Toward High-Mobility and High-Reliability Oxide Semiconductor Thin-Film Transistors***
Yusaku Magari (Kochi Univ. of Tech.)

15:40-16:20

IN07 (Invited) ***Research and Development to Realize Inch-size Homoepitaxial Diamond Wafers***
Hideaki Yamada (AIST)

16:20-17:00

IN08 (Invited) ***Impact of Mg diffusion on Ga-polar n-GaN surface and its promising device applications***
Biplab Sarkar (IIT)

17:00-17:20 Short Break

(Award Assessments)

Award presentation

17:20-17:40 Award Presentation Kazushi Hayashi (Kobe Steel, Ltd.)

Closing Remarks

17:40-17:50 Closing Remarks J. T. Asubar (University of Fukui)

