IMFEDK 2022 Program

Nov, 28 (Mon)

Opening

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

Keynote Speech-I **Chair: Mutsumi Kimura**

10:05-10:45
IN01 ***<Invited> Lessons Learned in Omnidirectional Co-Design of Neuromorphic Systems***
Catherine D. Schuman, <online>
(University of Tennessee)

General Session - Emerging 1 - **Chair: Takeshi Fukuda**

10:45-11:25
IN08 ***<Invited> Algorithm/Hardware Co-design for Reliable AI***
Shinya Takamaeda,
(University of Tokyo)

11:25-11:45
R07 ***Monolithic Integration of GaN-based Optocoupler***
Chengshiun Liou and Chingfu Tsou,
(Feng Chia University)

11:45-12:05
R08 ***Multi-Channel Near-Infrared Bandpass Mosaic Filter for Spectral Fundus Imaging***
Honghao Tang, Hironari Takehara, Yusuke Horiki, Makito Haruta, Hiroyuki Tashiro, Kiyotaka Sasagawa and Jun Ohta,
(NAIST)

12:05-12:25
R11 ***Carrier Control of In_2O_3 TFT Fabricated by Atomic Layer Deposition***
Yuto Kawato, Mutsunori Uenuma, Takanori Takahashi and Yukiharu Uraoka,
(NAIST)

12:25-13:30 Lunch

General Session - Compound 1 - Chair: Mutsunori Uenuma

13:30-14:10

IN05 ***<Invited> Progress and Challenges of Vertical GaN Power Devices on GaN Substrates***
Tohru Oka,
(Toyoda Gosei)

14:10-14:50

IN06 ***<Invited> Demonstration of E-mode Operation in EID AlGaN/GaN MOS-HEMT***
Takuma Nanjo, Tomohiro Shinagawa, Masayuki Furuhashi, Kazuyasu Nishikawa and Takashi Egawa,
(Mitsubishi Electric)

14:50-15:10

R12 ***Quasi-Normally-Off operation via Selective Area Growth in high-K-insulated GaN MIS-HEMTs***
S. Maeda, J. T. Asubar, I. Nagase, S. Urano, T. Nezu, T. Igarashi, A. Baratov, A. Yamamoto and M. Kuzuhara,
(University of Fukui)

15:10-15:30 Short Break

General Session - Compound 2 - Chair: Hidetoshi Ishida

15:30-16:10

IN07 ***<Invited> Mist chemical vapor deposited-gate insulators for GaN-based MIS devices applications***
Zenji Yatabe, Joel T. Asubar and Yusui Nakamura,
(Kumamoto University)

16:10-16:30

R13 ***Effect of High-Temperature Annealed Al_2O_3 insulator on GaN MIS-HEMTs performance***
David Lau Bi Da, S. Yamazaki, S. Urano, A. Baratov, J. T. Asubar and M. Kuzuhara,
(University of Fukui)

16:30-16:50

R14 ***Effect of Oxygen plasma treatment on the performance of GaN-based MIS-HEMTs***

K. Sekiyama, M. Ishiguro, T. Nezu, S. Urano, A. Baratov, J. T. Asubar and M. Kuzuhara,
(University of Fukui)

16:50-17:10

R15 ***Improved Ohmic Contact Model for Accurate Simulation of GaN-based HEMTs Using Ensemble Monte Carlo Methods***

Kei Sakota, Kai Herbert, Kazuki Shibata, Masaaki Kuzuhara, Joel T. Asubar and Kazuki Kodama,
(Kwansei Gakuin University)

Nov, 29 (Tue)

Poster Short Presentation

Chair: Joel T. Asubar

9:30-10:10

P01 ***Combination of memristor and capacitor for synapse device in neuromorphic spiking computing***

T. Kuwahara, R. Oshio, H. Kawanishi, M. Kimura and Y. Nakashima,
(Ryukoku University)

P02 ***Gate Voltage Dependence of Quantum Electron Density Distribution for Nanosheet FETs***

Masashi Matsuda and Akira Hiroki,
(Kyoto Institute of Technology)

P03 ***The influence of the process parameters on the quality of SiO_2 film for the switching operation of ReRAM devices***

T. Taniyama and S. Sato,
(Kansai university)

P04 ***The Impact of Carrier Lifetime on the Electrical Characteristics of Z^2-FET***

S. Kim and S. Sato,
(Kansai university)

P05 ***Detailed analysis of electrical components on SOI wafer with an ac pseudo-MOS method***

Y. Yifan and S. Sato,
(Kansai university)

P08 ***Ga-Sn-O channel FeTFT with $(Bi,La)_4Ti_3O_{12}$ as a single-layer ferroelectric gate***
Ryoma Edahiro, Tomoki Fukui, Taiyo Shinoda, Hidenori Kawanishi, Tokiyoshi Matsuda and Mutsumi Kimura,
(Ryukoku University)

P09 ***Alloying β-$(Al_xGa_{1-x})_2O_3$ thin films grown on (010) β-Ga_2O_3 substrates by mist CVD***
Masahiro Kaneko, Hiroyuki Nishinaka, Yuki Kajita, Kazutaka Kanegae and Masahiro Yoshimoto,
(Kyoto Institute of Technology)

P10 ***Atomic Structure of Gallium Oxide Layer at Al_2O_3/GaN Interface***
Shingo Kuwaharada, Mutsunori Uenuma, Hiroto Tomita, Masaki Tanaka, Zexu Sun, Yusuke Hashimoto, Tomohiro Matsushita and Yukiharu Uraoka,
(NAIST)

P11 ***Estimation of SPICE Parameters for MOSFETs with CNN Regression***
Kohei Akazawa and Yoshinari Kamakura,
(Osaka Institute of Technology)

P12 ***Monte Carlo Simulation of Electron Transport in SiC MOS Inversion Layers Considering Capture and Emission by Interface States***
Fumitaka Tanaka, Hajime Tanaka and Nobuya Mori,
(Osaka University)

P13 ***Development of a simulation framework for graphene nanoantenna based on finite-difference time-domain method***
Shota Ogisawa and Satofumi Souma,
(Kobe University)

P14 ***Development of Microfluidics Combined With a Cantilever Sensor Array for Multi-sample Detection***
Y. Takahashi, K. Kamitani, R. Mitobe, T. Hasegawa, C. F. Werner, M. Sohgawa and M. Noda,
(Kyoto Institute of Technology)

P15 ***Effect of Schottky Barrier at Fe_2VWAl/Si Interface on Thermoelectric Properties***
Toshimitsu Maeda, Mutsunori Uenuma, Koki Enomoto and Yukiharu Uraoka,
(NAIST)

P16 ***Ga-Sn-O thin-film device using mist CVD method and Spike-Timing-Dependent-Plasticity (STDP)***
Norito Komai, Tetsuya Katagiri, Naoki Sahara, Kazuma Uno, Hidehito Kita, Tokiyoshi Matsuda, Hidenori Kawanishi and Mutsumi Kimura,
(Ryukoku University)

P17 ***Building process datasets for academic papers on bulk thermoelectric materials***
Chowdhury Mohammad Mahir Asef, Mutsunori Uenuma, Hiroyuki Shindo, Yukiharu Uraoka, Shanshan Liu and Yuji Matsumoto,
(NAIST)

P18 ***Characterization of In-Ga-Zn-O thin film synapses for neuromorphic device using spike-timing-dependent-plasticity***
Naoki Sahara, Tetuya Katagiri, Kenta Yachida, Kazuki Morigaki, Norito Komai, Tokiyoshi Matsuda, Hidenori Kawanishi and Mutumi Kimura,
(Ryukoku University)

P19 ***Optimization of deposition temperature for GTO thin film thermoelectric conversion devices using mist CVD method***
Naoki Shibata, Ryo Ito, Yuhei Yamamoto, Hidenori Kawanishi, Tokiyoshi Matsuda and Mutumi Kimura,
(Ryukoku University)

P20 ***Metal electrode-dependent properties of a-IGZO ReRAM***
Tetsuya Katagiri, Kazuki Morigaki, Kenta Yachida, Hidenori Kawanishi, Mutsumi Kimura and Tokiyoshi Matsuda,
(Ryukoku University)

P21 ***Analog and digital memristor characteristics in Ga-Sn-O three-layered ReRAM***
Shu Shiomi, Daisuke Makioka, Hidenori Kawanishi, Tokiyohi Matsuda and Mutsumi Kimura,
(Ryukoku University)

P22 ***Evaluation of poly-Si TFT as an optical sensor***
Yuise Sadamura and Mutumi Kimura,
(Ryukoku University)

10:10-10:30 Short Break

Keynote Speech-II

Chair: Hirobumi Watanabe

10:30-11:10
IN02 ***<Invited> Future System Integration Technology Based on 3D Integration***
Mitsumasa Koyanagi,
(Tohoku University)

General Session - Emerging 2 - **Chair: Minoru Noda**

11:10-11:50
IN09 ***<Invited> Heat Storage Thermoelectric Generator for Wireless IoT Sensing Systems***
Takahito Ono, Nguyen Van Toan and Trung Thi Kim Tuoi **<online>**
(Tohoku University)

11:50-12:30
IN10 ***<Invited> Surface engineering of oxide nanostructures for efficient energy technologies***
Matthias T. Elm,
(University of Giessen)

12:30-13:30 Lunch

Special Session
– Supported by IEEE SSCS Kansai Chapter -

Chair: Kazutoshi Kobayashi

13:30-14:10
IN14 ***<Invited> Embedded SRAM Design Challenges in Leading-Edge FinFET Technologies***
Koji Nii and Kazutoshi Kobayashi, **<online>**
(Kyoto Institute of Technology)

14:10-14:50
IN15 ***<Invited> Investigation of Soft Error Sensitivity in EUV 7 nm FinFET Technology at Terrestrial Environment***
Taiki Uemura,
(Samsung Electronics)

14:50-15:10
R03 ***Dual-Band Single-Output WLAN Directional Coupler in a SOI CMOS Process***
Ryangsu Kim, Kenta Seki and Kazuhito Osawa,
(Murata Manufacturing Co., Ltd)

15:10-15:30
R10 ***Evaluation of Soft Error Tolerance on Flip-Flops Restoring from a Single Node Upset by C-elements***
Takafumi Ito, Ryuichi Nakajima, Jun Furuta and Kazutoshi Kobayashi,
(Kyoto Institute of Technology)

15:30-15:50 Short Break

General Session - Silicon 1 - **Chair: Naoteru Shigekawa**

15:50-16:30

IN04 ***<Invited> Study on Fluorographene Charge Trapping layer for Nonvolatile Memory Applications***

Yuichiro Mitani, R. Kawashima, R. Ishikawa and H. Nohira, **<online>**
(Tokyo City University)

16:30-16:50

R04 ***1/f Noise Characterizing Method of MOSFET Devices and Processes by the Power Spectral Density Integrated Method***

Yoshiki Murayama, Masato Kijima, Takehiko Yamashita, Yusuke Takezaki, Masanori Miyata, Ryuta Isobe and Hirobumi Watanabe,
(Nisshinbo Micro Devices Inc.)

General Session - Emerging 3 - **Chair: Takatoshi Kato**

16:50-17:10

R01 ***Polyimide-supported AlScN thin films based surface acoustic wave (SAW) delay line for flexible electronics***

KANOUNI Fares and LAIDOUDI Farouk, **<online>**
(Research center in Industrial Technologies, Algeria)

17:10-17:30

R02 ***S2 Lamb-mode acoustic resonator with grooved micro-channels for liquids characterization***

Farouk Laidoudi, Fares Kanouni and Cinzia Caliendo, **<online>**
(Research center in Industrial Technologies, Algeria)

Nov, 30 (Wed)

General Session - Silicon 2 -

Chair: Shunsuke Koba

9:30-10:10

IN03 ***<Invited> R&D of 3D-IC technology through the national project***

Katsuya Kikuchi,
(AIST)

10:10-10:30

R06 ***Modeling of Super Steep Subthreshold Slope Device by using Neural Network***

Kengo Nakata, Takayuki Mori and Jiro Ida,
(Kanazawa Institute of Technology)

10:30-10:50

R09 ***Effect of Post Deposition Annealing on Electrical Properties of GaOx/Si structure by Mist Chemical Vapor Deposition Method***

Hidenobu Mori and Haruhiko Yoshida,
(University of Hyogo)

10:50-11:10 Short Break

Special Session
– IMFEDK Celebrating the 20th Anniversary -

Chair: Yasuhisa Omura

11:10-11:40

SP01 ***<Invited> Compatibility of Ferroelectric Memory or Functional Memory and System Application for Biomass plantation***

Hiroshi Nozawa and Yoshiaki Yamanishi,
(Kyoto University)

11:40-12:10

SP02 ***<Invited> Is the Japan semiconductor industry declining?***

Daisuke Ueda,
(Nagoya University)

12:10-12:40

SP03 ***<Invited> Micropower extraction circuits for vibrational energy harvesters***

Kenji Taniguchi,
(Osaka University)

12:40-13:40 Lunch

Poster Viewing Session

13:40-15:00

15:00-15:20 Short Break

INDUSTRIAL SESSION

Chair: Masayuki Furuhashi

15:20-16:00

IN11 ***<Invited> Polarized light observation of semiconductor wafers for power devices***
Kenta Murayama, Seiya Mizutani, Yuya Mizutani and Shuta Harada,
(Mipox)

16:00-16:40

IN12 ***<Invited> Connect Everything Concept***
Ichiro Kashiwagi,
(Nisshinbo Micro Devices Inc.)

16:40-17:20

IN13 ***<Invited> Remote control of doping profile, silicon interface, and gate dielectric reliability via oxygen insertion into silicon channel***
Hideki Takeuchi, Robert J. Mears, Marek Hytha, Daniel Connelly, Paul E. Nicollian and Hiu-Yung Wong,
(Atomera)

17:20-17:30 Short Break

Awards & Closing Remarks

17:30-17:55	Award Presentation	Naohiro Ueda (Nisshinbo Micro Devices Inc.)
17:55-18:00	Closing Remarks	Hirobumi Watanabe (W.T.C.)