The Conference Theme

What are the next key devices for IoT era ?

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Session A (Silicon Devices)

Chair: Naoto Matsuo, Yoshinari Kamakura

14:00-14:40 - Invited -

A-1 (p.22) **Detection and Characterization of Single MOS Interface Traps by the Charge Pumping Method**
Toshiaki Tsuchiya (Shimane University)

14:40-15:20 - Invited -

A-2 (p.24) **Heterogeneous integration of SiGe/Ge and III-V on Si for CMOS photonics**
Mitsuru Takenaka and Shinichi Takagi
(The University of Tokyo, JST-CREST)

Short Break (15:20-15:30)

15:30-15:50

A-3 (p.26) **High Power Efficient and Scalable Noise-Shaping SAR ADC for IoT Sensors**
Yusuke Tsukamoto, Koji Obata, Kazuo Matsukawa and Koji Sushihara (Panasonic Corporation)

15:50-16:10

A-4 (p.28) **Analysis of the SOG film crack mechanism for TEOS/SOG/TEOS structure**
Takuya Naoe, Takaaki Fujimoto, Masanori Miyata, Takuya Takahashi (Ricoh)

Short Break (16:10-16:20)

Poster Session

Short Presentation – 2min. each (6/23, 16:20-17:40)

Chairs: A:Matsuto Ogawa, B:Takatoshi Kato, C: Hirobumi Watanabe

PA-01 (p.32) **Kinetic Monte Carlo Simulation for Switching Probability of ReRAM**
Masataka Shirasawa, Mlandeli Ernest Dlamini and Yoshinari Kamakura
(Osaka University)

PA-02 (p.34) **Analysis of Ultra-High-Speed Image Sensor Based on Drift-Diffusion Model**
Le Thi Yen[1], Natsumi Minamitani[1], Yoshinari Kamakura[1] and T. G. Etoh[2]
([1]Osaka University, [2]Ritsumeikan University)

PA-03 (p.36) **Capacitance Analysis of Pseudo-MOSFET Using Cole-Cole Plots**
Isao Yarita, Shingo Sato, and Yasuhisa Omura
(Kansai University)

PA-04 (p.38) **Characteristic Reliability of a Hybrid-Type Temperature Sensor using Poly-Si Thin-Film Transistors**
Toshimasa Hori, Jun Taya, Hisashi Hayashi, Tokiyoshi Matsuda, and Mutsumi Kimura (Ryukoku University)

PA-05 (p.40) **Effects of Ar beam irradiation on Si-Based Schottky contacts**
Shohei Hisamoto, Jianbo Liang, and Naoteru Shigekawa
(Osaka City University)

PA-06 (p.42) **Stimulus Performance of Poly-Si Thin-Film Transistor in in-vitro Experiment for Artificial Retinas**
Keisuke Tomioka, Shota Haruki, Tokiyoshi Matsuda, and Mutsumi Kimura (Ryukoku University)

PA-07 (p.44) **Gate Voltage Dependence of Channel Length Modulation for 14 nm FinFETs**
Yuki Nariai and Akira Hiroki (Kyoto Institute of Technology)

PA-08 (p.46) **Study on Underwater Wireless Power Transfer via Electric Coupling**
Mitsuhiro Urano and Akira Takahashi
(National Institute of Technology)

PA-09 (p.48) **Evaluation of Initial Electron Distributions in Ensemble Monte Carlo Simulations**
Shin Hiratoko, Akira Hiroki and Nobuya Fujimoto
(Kyoto Institute of Technology)

PB-06 (p.66) **Evaluation of Ga-Sn-O Films fabricated using Mist Chemical Vapor Deposition**
Hiroki Fukushima, Masahiro Yuge, Tokiyoshi Matsuda, and Mutsumi Kimura
(Ryukoku University)

PB-07 (p.68) **Magnetoresistance Effect of Ga-Sn-O Thin-Film Device**
Asuka Fukawa, Kota Imanishi, Shogo Miyamura, Tokiyoshi Matsuda, and Mutsumi Kimura (Ryukoku University)

PC-01 (p.70) **Electrochromic Properties of Single-Crystalline Tungsten Trioxide films Grown by Molecular Beam Epitaxy**
Takayuki Murayama[1], Wataru Kuwagata[1], Kazuto Koike[1], Yoshiyuki Harada[1], Shigehiko Sasa[1], Mitsuaki Yano[1], Shintaro Kobayashi[2], Katsuhiko Inaba[2]
([1]Osaka Institute of Technology, [2]Rigaku Corporation)

PC-02 (p.72) **Sensitivity of Resistive Transition of Sputter- Deposited TiO_2 Films to Electrode Material**
Nozomi Kawashima, Shingo Sato and Yasuhisa Omura
(Kansai University)

PC-03 (p.74) **Electrical Characteristics of SAB-Based n+-n Ge/4H-SiC Heterojunctions**
Sho Morita, Takuya Nishimura, Jianbo Liang and Naoki Shigekawa
(Osaka City University

PC-04 (p.76) **Artificial Neural Networks using Poly-Si Thin-Film Transistors**
Sumio Sugisaki, Ryohei Morita, Yuki Yamaguchi, Tokiyoshi Matsuda, and Mutsumi Kimura
(Ryukoku University)

PC-05 (p.78) **Study on Simplification of Processing Elements in Neural Networks using Circuit Simulation**
Tomoharu Yokoyama, Nao Nakamura, Hiroki Nakanishi, Yuki Watada, Tokiyoshi Matsuda, and Mutsumi Kimura
(Ryukoku University)

PC-06 (p.80) **Simplification of Synapse Devices in Cellular Neural Network**
Koki Watada, Hiroki Nakanishi, Nao Nakamura, Tomoharu Yokoyama, Tokiyoshi Matsuda, and Mutsumi Kimura,
(Ryukoku University)

PC-07 (p.82) **Tamper Resistance of IoT Devices against Electromagnnetic Analysis**
Yusuke Nozaki, Yoshiya Ikezaki and Masaya Yoshikawa
(Meijo University)

PC-08 (p.84) **IoT Device Oriented Security Module using PUF**
Yoshiya Ikezaki, Yusuke Nozaki and Masaya Yoshikawa
(Meijo University)

PC-09 (p.86) **Electrical Characteristics of Al Foil/Si Junctions by Surface Activated Bonding Method**
Katsuya Furuna[1], Jianbo Liang[1], Naoteru Shigekawa[1], Moeko Matsubara[2], Marwan Dhamrin[2] and Yoshitaka Nishio[2]
([1]Osaka City University, [2]Toyo Aluminium K.K.)

Session B (Compound Devices)

Chair: Masaaki Kuzuhara, Hiroyuki Sakai

9:30-10:10 – Invited –

B-1 (p.90) **High Quality Free-standing GaN Substrates and Their Application to High Breakdown Voltage GaN p-n Diodes**
Hiroshi Ohta, Tohru Nakamura, and Tomoyoshi Mishima (Hosei University)

10:10-10:30

B-2 (p.92) **A New Criterion for Stability Assessment of the Microwave pHEMT-based Low-Noise Amplifiers**
Josef Dobeš, František Vejražka, Jakub Popp, and Jan Míchal (Czech Technical University in Prague)

Short Break (10:30-10:40)

10:40-11:00

B-3 (p.94) **Effect of Metal Electrode Edge Irregularities on Breakdown Voltages of AlGaN/GaN HEMTs**
Shinya Makino, Shintaro Ohi, Joel Asubar, Hirokuni Tokuda and Masaaki Kuzuhara (University of Fukui)

11:00-11:20

B-4 (p.96) **Breakdown degradation of AlGaN/GaN HEMTs with multi-finger gate patterns**
Taisei Yamazaki, Yudai Suzuki, Shintaro Ohi, Joel Asubar, Hirokuni Tokuda and Masaaki Kuzuhara (University of Fukui)

11:20-11:40

B-5 (p.98) **Warpage Design for Tranfer-Molded Power Modules**
Seita Iwahashi, Takukazu Otsuka, Masao Saito and Takashi Nakamura (ROHM)

11:40-12:00

B-6 (p.100) **Estimation of Junction Temperature at Failure of SiC DMOSFETs in UIS Test**
Yuichiro Nanen, Masatoshi Aketa, Hirokazu Asahara and Takashi Nakamura (ROHM)

Lunch (12:00-13:00)

Session C (Emerging Devices)

Chair: Minoru Noda, Mutsumi Kimura

13:00-13:40 – Invited –

C-1 (p.104) **High Resolution Silicon MEMS Tactile Sensors for Measurement of Fingertip Sensation**
Hidekuni Takao (University of Kagawa)

13:40-14:20 – Invited –

C-2 (p.106) **Transverse Thermoelectric Effect and Its Applications using Synthetically or Naturally Anisotropic Materials**
Tsutomu Kanno (Panasonic Corporation)

Short Break (14:20-14:30)

14:30-14:50

C-3 (p.108) **Potential of Perovskite Solar Cells for Power Sources of IoT Applications**
Itaru Raifuku[1], Yasuaki Ishikawa[1], Seigo Ito[2] and Yukiharu Uraoka[1]
([1]Nara Institute of Science and Technology, [2]University of Hyogo)

14:50-15:10

C-4 (p.110) **Influence of top electrodes to vibration modes in impulse responses of MEMS piezoelectric diaphragms**
Tomoki Nishioka, Taiki Nishiumi, Kaoru Yamashita and Minoru Noda (Kyoto Institute of Technology)

15:10-15:30

C-5 (p.112) **Simulation and Fabrication of Test Structure for Micro-Wall Solar Cell with Electric-Field Effect**
Takashi Kusakabe, Naoto Matsuo and Akira Heya
(University of Hyogo)

15:30-15:50

C-6 (p.114) **Effects of layered CdTe nano particles on Si solar cells**
Tomoki Ogawa, Jianbo Liang, Shingo Imasaki, Taichi Watanabe, Daegwi Kim and Naoteru Shigekawa (Osaka City University)

Short Break (15:50-16:00)

Poster Viewing Session

16:00-17:50 at Poster Room

Short Break (17:50-18:00)

Closing

18:00-18:20 Award and Closing: Yukiharu Uraoka (NAIST)