

PS-1-01

Defect Decoupling for Polycrystalline Silicon MOSFETs using a Single Pulse Charge Pumping Method

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PS-1-02

X-ray Photoelectron Spectroscopy Study of the Physical Chemistry of the TiN/Hf_{0.5}Zr_{0.5}O₂ Interface

[°]N. Barrett^{1,2,3}, W. Hamouda^{1,2,3}, A. Pancotti^{1,2,3}, C. Lubin^{1,2,3}, L. Tortech^{1,2,3}, C. Richter⁴, U. Schroeder⁴, ¹CEA Saclay (France), ²CNRS (France), ³Univ. Paris Saclay (France), ⁴NaMLab (Germany)

PS-1-03

Study on Random Telegraph Noise of High-κ/Metal-Gate Gate-All-Around Poly-Si Nanowire Transistors

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PS-1-04

Systematic analysis of electron traps of HfSiON/SiO₂ nMOSFETs using TSCIS

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PS-1-05

Characteristic Variability and Random Telegraph Noise of Gate-All-Around Silicon Nanowire MOSFETs with Asymmetric Dual Spacer Induced by Single Charge Trap

[°]S.R. Kola¹, Y. Li¹, N. Thoti¹, C.-Y. Chen¹, W.-L. Sung¹, ¹National Chiao Tung Univ. (Taiwan)

PS-1-06

Characteristics of Ni-silicided Schottky barrier MOSFET using Microwave annealing of low thermal budget

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PS-1-07

The Evaluation of PtHfSi/n-Si(100) Schottky Barrier Height by Boron Dopant Segregation with Short Annealing Duration

[°]R.M.D. Mailig¹, M.G. Kim¹, S. Ohmi¹, ¹Tokyo Tech (Japan)

PS-1-08

Low Temperature (<300°C) Fabrication of Ge MOS Structure for Advanced Electronic Devices

[°]K. Iseri¹, W.-C. Wen¹, K. Yamamoto¹, D. Wang¹, H. Nakashima¹, ¹Kyushu Univ. (Japan)

PS-1-09

Ge nMOSFETs with GeOx Passivation Formed by 450°C Oxygen RTA Postoxidation

[°]Y. Xu¹, H. Wang¹, G. Han¹, Y. Liu¹, J. Zhang¹, Y. Hao¹, ¹Xidian Univ. (China)

PS-1-10

Effects of Plasma Nitrided Trilayer High-k Gate Dielectric on Electrical Characteristics of FinFET

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PS-1-11

Enhanced Electrical Characteristics of FinFETs with Strained SiGe Super-Lattice Channel

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PS-1-12

A Junctionless SOI FET with Channel Thinning by Ion Implantation (CTIFET) and its application to 6T-SRAM Cell

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PS-1-13

Theoretical Investigation of Performance Improvement in GeSn/SiGeSn TFET with Double Type-II Staggered Heterojunction

[°]Y. Xu¹, H. Wang¹, G. Han¹, Y. Liu¹, Y. Hao¹, ¹Xidian Univ. (China)

PS-1-14

Novel Multi-Flux Device Simulation Method Applied to 2DEG Analyses - Drift Diffusion with subbands -

[°]K. Fukuda¹, J. Hattori¹, H. Asai¹, T. Ikegami¹, ¹AIST (Japan)

PS-1-15

Scalability and V_{th} Sensitivity Assessment of Core-Shell Junctionless MOSFET

[°]N. Jaiswal¹, A. Kranti¹, ¹Indian Institute of Technology Indore (India)

PS-1-16

Impact of Hafnium Oxide-Based Ferroelectric Material on Monolayer Black Phosphorus Transistor for Negative Capacitance and Memory Application

[°]K.-T. Chen¹, Y.-F. Chung¹, Y.-T. Tang¹, M.-H. Lee², S.-T. Chang¹, ¹National Chung Hsing Univ. (Taiwan), ²National Taiwan Normal Univ. (Taiwan), ³Taiwan Semiconductor Research Institute (TSRI) (Taiwan)

PS-1-17

Calculation of interfacial energy for design of phase change materials

[°]Y. Kim¹, M. Choi², H. Choi², J. Ahn², ¹KIST (Korea), ²Univ. of Hanyang (Korea), ³Univ. of Cologne (Korea)

PS-1-18

Memory window and retention time of double back gate Z²-FET

[°]Y. Kim¹, S. Kwon², F. Gamiz³, P. Galy³, S. Cristolovenau⁴, ¹KIST (Korea), ²Univ. of Hanyang (Korea), ³Univ. of Granada (Spain), ⁴INPG (France), ⁵STMicro (France)

PS-1-19 (Late News)

Extremely low temperature selective epitaxial processes for advanced CMOS applications

A. Hikavyi¹, [°]C. Porret¹, E. Rosseel¹, P. Favia¹, R. Loo¹, ¹imec (Belgium)

PS-1-20 (Late News)

Experiment and Modeling of Dynamical Hysteresis in thin film Ferroelectrics

[°]P. Chang¹, Y. Zhang¹, G. Du¹, X. Liu¹, ¹Peking Univ. (China)

PS-1-21 (Late News)

Circuit speed oriented device design scheme for double gate hetero tunnel FETs

K. Fukuda^{1,2}, N. Nogami², S. Kunisada², [°]Y. Miyamoto², ¹AIST (Japan), ²Tokyo Tech (Japan)

PS-1-22 (Late News)

Comparison of Voronoi and Cuboid Methods for Work Function Fluctuation and Suppression by Using Stacked-metal Gate on Gate-All-Around Nanowire n-MOSFETs

[°]Y.-S. Yang¹, W.-L. Sung¹, M.-H. Chuang¹, Y. Li¹, ¹National Chiao Tung Univ. (Taiwan)

PS-1-23 (Late News)

Improved Electro-Thermal Performance in FinFETs using SOD Technology for 7nm node High Performance Logic Devices

[°]V. Sankatali¹, A. Sudarsanan¹, K. Nayak¹, ¹Indian Inst. of Tech. Hyderabad (India)

PS-1-24 (Late News)

High Performance Negative Capacitance Field-Effect Transistor Featuring Low Off-State Current, High On/Off Current Ratio, and Steep Sub-60 mV/dec Swing

[°]C. Liu¹, H.-H. Chen¹, Y.-C. Tung¹, W.-C. Wang¹, B.-Y. Shih¹, S.-Y. Hsiung¹, S.-A. Wang², Y.-C. Fan², T.-M. Lee³, C.-L. Lin³, W.-C. Chou¹, C.-H. Cheng², H.-H. Hsu¹, ¹National Chiao Tung Univ. (Taiwan), ²National Taiwan Normal Univ. (Taiwan), ³National Taipei Univ. of Tech. (Taiwan)

PS-2-01

Spike Timing Dependent Plasticity Characteristics of Tunnel FET based MONOS Memory for Low Power Neural Network Circuits

[°]H. Kino¹, T. Fukushima¹, T. Tanaka¹, ¹Tohoku Univ. (Japan)

PS-2-02

Investigation of Adaptive Weight Quantization in Application for Convolutional Neuromorphic System Using Gated Schottky Diode

[°]D. Kwon¹, S. Lim¹, J.-H. Bae¹, S.-T. Lee¹, H. Kim¹, Y.-T. Seo¹, G. Yeom¹, B.-G. Park¹, J.-H. Lee¹, ¹Seoul National Univ. (Korea)

PS-2-03

Synapse Device for Low Voltage Operation and High Conductance Linearity Using Positive Feedback Field Effect Transistor

[°]S. Kim^{1,2}, M.-W. Kwon¹, K. Park¹, M.-H. Baek¹, S. Hwang¹, T. Jang¹, J. Lee¹, B.-G. Park¹, ¹Univ. of Seoul (Korea), ²Samsung Electronics Ltd. (Korea)

PS-2-04

Weight Update / Inhibition Method for NOR Flash Based Polysilicon Synapse Array

[°]M.-H. Baek¹, T. Jang¹, S. Hwang¹, S. Kim¹, B.-G. Park¹, ¹Seoul National Univ. (Korea)

PS-2-05

Impact of Low Temperature Formed GeO₂/Al₂O₃ Tunneling Layer on Reliability of Junctionless Poly-Ge Charge-Trapping Flash Memory Device

[°]T.-Y. Chiang¹, K.-S. Chang-Liao¹, H.-K. Fang¹, P.-Y. Lin¹, W.-H. Huang², C.-H. Shen², J.-M. Shieh², ¹National Tsing Hua Univ. (Taiwan), ²Taiwan Semiconductor Research Institute (Taiwan)

PS-2-06

Optimal Bias Condition of Dummy WL for Sub-Block Erase Operation in 3D NAND Flash Memory

[°]Y. Jeong¹, I. Ham¹, M. Kang¹, ¹Korea National Univ. of Transportation (Korea)

PS-2-07

Hot Carrier Injection Phenomenon due to Excessive Natural Local Self-Boosting Effect in 3D NAND Flash Memory

Y. Jeong¹, [°]I. Ham¹, S.J. Baik², M. Kang¹, ¹Korea National Univ. of Transportation (Korea), ²Hankyong National Univ. (Korea)

PS-2-08

Improvement of Hf-based MONOS Nonvolatile Memory Characteristics by Si Surface Atomically Flattening

[°]S. Ohmi¹, Y. Horiuchi¹, S. Kudoh¹, ¹Tokyo Tech (Japan)

PS-2-09

"Development of PCM and OTS combined Macro-models for HSPICE Compatible Simulation"

[°]B. K An¹, ¹Hanyang Univ. (Korea)

PS-2-10

Polycrystalline Silicon MOSFET-based Multi-Layer Capacitorless DRAM (1T-DRAM) for the Embedded System

[°]W.D. Jang¹, Y.J. Yoon², M.S. Cho¹, J.H. Jung¹, S.H. Lee¹, J. Jang¹, J.-H. Bae¹, I.M. Kang¹, ¹Kyungpook National Univ. (Korea), ²Korea Inst. of Sci. and Tech. (Korea)

PS-2-11
Novel Dot-Product Engine for Low-Voltage Analog Oxide ReRAM Array
°H. Veluri¹, Y. Li¹, M. Sivan¹, J.X. Niu¹, U. Chand¹, J.F. Leong¹, E. Zamburg¹, S. Samanta¹, X. Gong¹, K.X. Fong¹, A.V.-Y. Thean¹, ¹National Univ. of Singapore (Singapore)

PS-2-12
Operando observation of resistive switching in ReRAM by laser-excited photoemission electron microscope
°Y. Okuda^{1,2,3}, J. kawakita^{1,2}, T. Taniuchi^{1,2}, H. Shima^{1,4}, A. Shimizu^{3,4}, Y. Naitoh^{1,4}, K. Kinoshita³, H. Akinaga^{1,4}, S. Shin^{1,3}, ¹AIST-UTokyo OIL (Japan), ²ISSP Univ. Tokyo (Japan), ³Tokyo Univ. of Sci. (Japan), ⁴NeRI-AIST (Japan)

PS-2-13
In-situ Observation of Resistive Switching Mechanism in SrCoO₃ Based RRAM Device
°H.-Y. Lo¹, G.-M. Huang¹, P.-H. Yeh², W.-W. Wu¹, ¹National Chiao Tung Univ. (Taiwan), ²Tamkung Univ. (Taiwan)

PS-2-14
Low Power Characteristic of HfO₂ Based RRAM Device with Insertion of Si Film
°X. Ding¹, Y. Feng¹, W. Shen¹, L. Liu¹, ¹Peking Univ. (China)

PS-2-15
Physics in HRS-LRS Switching in Vacancy Modulated Conductive Oxide (VMCO) Memories
°T. Nakanishi¹, K. Chokawa², M. Araidai^{2,1}, T. Nakayama³, K. Shiraishi^{2,1}, ¹Nagoya Univ. (Japan), ²Inst. of Materials and System for Sustainability, Nagoya Univ. (Japan), ³Chiba Univ. (Japan)

PS-2-16
Failure and Recovery of Double-Layer CBRAM Studied by *In-Situ* TEM
°M. Arita¹, R. Ishikawa¹, K. Arima¹, A. Tsurumaki-Fukuchi¹, Y. Takahashi¹, M. Kudo², S. Matsumura², ¹Hokkaido Univ. (Japan), ²Kyushu Univ. (Japan)

PS-2-17 (Late News)
Two Phase Change Memory (2-PCM) Neuron for Implementation of Backpropagation Algorithm
°C. Li¹, J. An¹, Y.-H. Song¹, ¹Hanyang Univ. (Korea)

PS-2-18 (Late News)
Current Monitor Circuit with Cascode Amplifier Using Crystalline IGZO FETs Compatible with Low-Voltage Input to Detect Micro Short-Circuit in Lithium Ion Battery
°S. Fukai¹, M. Ito¹, K. Takahashi¹, F. Akasawa¹, T. Saito¹, M. Kozuma¹, T. Ikeda¹, T. Takeuchi¹, T. Murakawa¹, S. Yamazaki¹, ¹Semiconductor Energy Laboratory Co., Ltd. (Japan)

PS-2-19 (Late News)
Selectable Amplification of Sensor Using Coplanar Gate IGZO TFT with Variable Resistance Layer
°M.-S. Kang¹, E.-K. Hong¹, W.-J. Cho¹, ¹Kwangwoon Univ. (Korea)

PS-2-20 (Late News)
Enhanced Electroresistance in HfZrO based Metal/ferroelectric/Semiconductor Tunnel Junction
°Y. Goh¹, J.H. Hwang¹, G.U. Kim¹, H. Cho¹, S. Jeon¹, ¹Korea Advanced Institute of Science and Technology (KAIST) (Korea)

03: Interconnect / 3D Integrations / MEMS
(5 papers)

PS-3-01
Properties of barrierless Cu/ZrN_x/Si structure deposited at room temperature
°M. Sato¹, M.B. Takeyama¹, ¹Kitami Inst. of Tech. (Japan)

PS-3-02
Integrated Simulation Methodology for EM-induced Circuit Degradation
°Y. Xiao¹, H. Jiang¹, Z. Ahmed¹, Z. Ma¹, C. Prawoto¹, C.J. Estrada¹, L. Zhang², M. Chan¹, ¹The Hong Kong Univ. of Sci. and Tech. (Hong Kong), ²Shenzhen Univ. (China)

PS-3-03
Amorphous-Carbon Barrier against Moisture for Copper Metallization and Effects of CF₄ Plasma Treatment
°P. Gomasang¹, K. Ueno^{1,2}, ¹Shibaura Inst. of Tech. (Japan), ²SIT Res. Center for Green Innov. (Japan)

PS-3-04
Design and simulation of a novel piezoresistive pressure sensor for guidewires
°H.H.Q. Nguyen¹, ¹Seoul National Univ. of Sci. and Tech. (Korea)

PS-3-05 (Late News)
Chip-to-Wafer Gang Bonding for High Throughput 3D-Integration
°M. Mariappan¹, T. Fukushima¹, A. Nakamura¹, J.C. Bea¹, M. Koyanagi¹, ¹Tohoku Univ. (Japan)

04: Power Devices / High-speed Devices, and Materials
(30 papers)

PS-4-01
Turn-Off Loss Improvement by IGBT Scaling
°M. Fukui¹, T. Saraya¹, K. Itou¹, T. Takakura¹, S. Suzuki¹, K. Takeuchi¹, K. Kakushima², T. Hoshii², K. Tsutsui², H. Iwai², S. Nishizawa³, I. Omura⁴, T. Hiramoto¹, ¹Univ. of Tokyo (Japan), ²Tokyo Tech (Japan), ³Kyushu Univ. (Japan), ⁴Kyushu Inst. of Tech. (Japan)

PS-4-02
Active Voltage Balancing for Series Connected IGBT System using Gate Delay Control
°R.N. Tripathi¹, K. Harasaki¹, M. Tsukuda¹, I. Omura¹, ¹Kyushu Institute of Technology (Japan), ²Green Electronics Research Institute Kitakyushu (GRIK) (Japan)

PS-4-03
Evaluation of Carrier Recombination Lifetime in Silicon Epitaxial Layer by Open Circuit Voltage Decay Method
°S. Sasaki¹, N. Mitsugi¹, S. Samata¹, W. Manabe², M. Tsukuda², H. Y.-Kaneta², I. Omura², ¹SUMCO Corp. (Japan), ²Kyushu Institute of Technology (Japan)

PS-4-04
Fabrication of 4H-SiC PiN Diodes on Substrate Grown by HTCVD Method
°Y. Tokuda¹, H. Uehigashi¹, K. Murata², H. Tsuchida², ¹DENSO CORP. (Japan), ²Central Research Institute of Electric Power Industry (CRIEPI) (Japan)

PS-4-05
Numerical Study of 4H-SiC PiN Diode to Enable Forward Bias Degradation Prediction Considering BPD-TED Conversion Position in the SiC Epitaxial Wafer
°S. Torimi^{1,2}, Y. Obiyama¹, M. Tsukuda¹, I. Omura¹, ¹Kyushu Inst. of Tech. (Japan), ²Toyo Tanso, Co., Ltd (Japan)

PS-4-06
Fermi Level Pinning at Metal/4H-SiC Contact Induced by SiC_xO_y Interlayer
°K. Hashimoto¹, T. Doi¹, S. Shibayama¹, O. Nakatsuka^{1,2}, ¹Graduate School of Eng. Nagoya Univ. (Japan), ²Inst. of Materials and Systems for Sustainability, Nagoya Univ. (Japan)

PS-4-07
The effect of biaxial stress on the carrier-transport properties at SiO₂/4H-SiC interfaces
°W. Fu¹, A. Ueda², H. Yano¹, S. Harada², T. Sakurai¹, ¹Univ. of Tsukuba (Japan), ²AIST (Japan)

PS-4-08
A Local Oxidation of SiC (LOCOSiC) Process for 4H-SiC Integrated Circuits
B.-Y. Tsui¹, Y.-R. Jhuang¹, °J.-C. Cheng¹, ¹National Chiao Tung Univ. (Taiwan)

PS-4-09
Study on the Effects of Si Implantation on the Interface of 4H-SiC MOSFET
°J.-Y. Jiang¹, J.-Q. Hung¹, P.-W. Huang¹, T.-L. Wu², C.-F. Huang¹, ¹National Tsing Hua Univ. (Taiwan), ²National Chiao Tung Univ. (Taiwan)

PS-4-10
Synchrotron X-ray Photoelectron Spectroscopy on interface state densities of CVD-Grown SiO₂/4H-SiC Sturcures Treated by Post-Deposition Treatments
°A. Kiyoi¹, T. Suwa², K. Kawase¹, A. Teramoto², ¹Mitsubishi Electric Corp. (Japan), ²Tohoku Univ. (Japan)

PS-4-11
Improved vertical Schottky barrier diodes characteristics by eliminating killer defects in heavily B-doped diamond substrates
°A. Kobayashi¹, S. Ohmagari², D. Takeuchi², H. Umezawa², T. Saito¹, ¹Osaka Prefecture Univ. (Japan), ²AIST (Japan)

PS-4-12
Diamond Schottky barrier diodes on half-inch single-crystal wafers fabricated by Minimal Fab System
°T. Hanada¹, H. Umezawa², S. Ohmagari², D. Takeuchi², J. Higedon Kaneko¹, ¹Hokkaido Univ. (Japan), ²AIST (Japan)

PS-4-13
Characterization of defects in diamond PiN diodes by electron beam induced current
°H. Umezawa^{1,2}, T. Shimaoka³, K. Driche⁴, E. Gheeraert^{2,3}, S. Koizumi³, D. Takeuchi¹, ¹AIST (Japan), ²Univ. Grenoble Alpes, CNRS, Grenoble INP, Inst. Neel (France), ³NIMS (Japan), ⁴DiamFab (France), ⁵Univ. Tsukuba (Japan)

PS-4-14
Theoretical approach to oxygen incorporation mechanism in vicinal m-GaN MOVPE
°F. Shintaku¹, Y. Kangawa^{1,2,3}, J. Iwata⁴, A. Oshiyama², K. Shiraishi², A. Tanaka³, H. Amano³, ¹Dept. Aeronautics and Astronautics, Kyushu Univ. (Japan), ²RIAM, Kyushu Univ. (Japan), ³IMaSS, Nagoya Univ. (Japan), ⁴AdvanceSoft Corp. (Japan)

PS-4-15
Positive Shifting of Threshold Voltage of Nano-Channel (NC) AlGaIn/GaN HEMTs with Post Gate Annealing (PGA) Modulation
°S. Mazumder¹, Y.H. Wang¹, ¹National Cheng Kung Univ. (Taiwan)

PS-4-16
Effects of Deep Level States Generated by Mg-Ion Implantation on Electrical Properties of GaN MOS Diodes before Activation Annealing
°R. Kamoshida¹, S. Murai¹, M. Akazawa¹, ¹Hokkaido Univ. (Japan)

PS-4-17
Impacts of nitrogen plasma surface cleaning on threshold voltages of AlTiO/AlGaIn/GaN MIS devices
°D.D. Nguyen¹, Y. Deng¹, T. Suzuki¹, ¹JAIST (Japan)

PS-4-18
High Frequency AlGaIn/GaN T-gate HEMTs on Extreme Low Resistivity Silicon Substrates
C.-H. Li¹, °Y. Liu¹, W.-C. Hsu², C.-Y. Chuang², J.-Z. Liu², S.S.H. Hsu¹, ¹National Tsing Hua Univ. (Taiwan), ²Global Wafers Corp. (Taiwan)

PS-4-19
A Method for Accurate Extracting the Properties of Border Traps in Lateral GaN Power MOSFET with a Compact Distributed Network Model
°R. Yin¹, Y. Li¹, W. Lin², C.P. Wen¹, Y.L. Hao¹, Y. Fu¹, M. Wang¹, ¹Inst. of Microelectronics, Peking Univ. (China), ²School of Physics, Peking Univ. (China)

PS-4-20
Analysis of Inversion Channel Mobility in a GaN-based MOSFET
°D. Kikuta¹, T. Narita¹, T. Kachi², ¹Toyota Central R&D Labs., Inc. (Japan), ²Nagoya Univ. (Japan)

PS-4-21
Estimation of post-deposition annealing effects on electrical properties of ALD-SiO₂/AlGaIn/GaN MIS-HEMTs
°S. Yokoi¹, T. Kubo¹, T. Egawa¹, ¹Nagoya Inst. of Tech. (Japan)

PS-4-22
Observation of Slow Carrier Recombination in p-type GaN Epilayers on GaN Substrates
°S. Zhu¹, K. Ito², K. Tomita², T. Narita², T. Kachi³, M. Kato^{1,3}, ¹Nagoya Inst. of Tech. (Japan), ²Toyota Central R&D Labs. (Japan), ³Nagoya Univ. (Japan)

PS-4-23
Effect of Post-metallization Annealing on Interface Properties of Al₂O₃/GaN Fabricated on c- and m-plane Free-standing GaN Substrates
°Y. Ando¹, T. Nakamura², M. Deki², N. Taoka⁴, A. Tanaka^{2,3}, H. Watanabe², M. Kushimoto¹, S. Nitta², Y. Honda², H. Amano^{2,3,4,5}, ¹Dept. of Electronics, Nagoya Univ. (Japan), ²IMaSS, Nagoya Univ. (Japan), ³NIMS (Japan), ⁴ARC, Nagoya Univ. (Japan), ⁵VBL, Nagoya Univ. (Japan)

PS-4-24
InGaAs/InAlAs HEMT Terahertz Detector Integrated with Patch Antenna
°S. Suzuki¹, T. Otsuka¹, Y. Ueda¹, ¹Tokyo Tech (Japan)

PS-4-25 (Late News)
Demonstration of m-plane GaN metal-oxide-semiconductor field-effect transistors
°H. Okumura¹, T. Takahashi², M. Shimizu², ¹Univ. of Tsukuba (Japan), ²AIST (Japan)

PS-4-26 (Late News)
Modeling of the Leakage Current in GaN mediated through the Dislocation-Impurity Complex
°Y. Harashima¹, T. Nakano², A. Oshiyama¹, K. Shiraiishi^{1,2}, ¹IMaSS, Nagoya Univ. (Japan), ²Department of Eng., Nagoya Univ. (Japan)

PS-4-27 (Late News)
High current turn-off capability testing of a 3.3 kV SiC-MOSFET
°K. Takao¹, T. Sakano¹, Y. Hayashi¹, S. Hongliang¹, ¹Toshiba Corporation (Japan)

PS-4-28 (Late News)
Demonstration of n-MOSFET operation and internal charge analysis of SiO₂/Al₂O₃ gate dielectric on (111) oriented 3C-SiC
°R. Oka¹, K. Yamamoto¹, D. Wang¹, H. Nakashima¹, S. Hishiki², K. Kawamura², ¹Kyushu Univ. (Japan), ²Air Water Inc. (Japan)

PS-4-29 (Late News)
Cumulative Effects of Gamma Irradiation on Oxide Traps and Interface States in SiC MOS Capacitor
°Y.-X. Lin¹, D.-S. Chao², J.-H. Liang^{1,3}, J.-Y. Jiang⁴, C.-F. Huang⁴, ¹Department of Eng. and System Sci., National Tsing Hua Univ. (Taiwan), ²Nuclear Sci. and Tech. Development Center, National Tsing Hua Univ. (Taiwan), ³Inst. of Nuclear Eng. and Sci., National Tsing Hua Univ. (Taiwan), ⁴Inst. of Electronics Eng., National Tsing Hua Univ. (Taiwan)

PS-4-30 (Late News)
Temperature Dependence of Diamond MOSFET Transport Properties
°A. Traore^{1,2}, H. Kato², T. Makino^{1,2}, T. Matsumoto³, N. Tokuda², M. Ogura², Y. Kato², D. Takeuchi², S. Yamasaki², ¹Univ. of Tsukuba (Japan), ²AIST (Japan), ³Kanazawa Univ. (Japan)

05: Photonics: Devices, Integration and Related Technology

(10 papers)

PS-5-01
Numerical analysis of waveguide-integrated graphene thermal emitter
°H. Tang¹, S. Takagi¹, M. Takenaka¹, ¹Univ. of Tokyo (Japan)

PS-5-02
Withdrawn

PS-5-03
Design, fabrication, and evaluation of waveguide structure for Si/CaF₂ quantum-well intersubband transition lasers
°L. Liu¹, S. Ono¹, G. Tei¹, M. Watanabe¹, ¹Tokyo Tech (Japan)

PS-5-04
Comparison on characteristics of InGaIn-LEDs on sapphire substrates and (-2 0 1) β-Ga₂O₃ substrate
Y.-C. Chen¹, °S.-M. Hung¹, Y.-Y. Yeh¹, K.-J. Chen¹, Y.-P. Lan¹, ¹National Chiao Tung Univ. (Taiwan)

PS-5-05
Structural characterizations of GaN nanowires and GaInN/GaN multi-quantum shells grown by MOVPE
°N. Goto¹, W. Lu¹, H. Murakami¹, M. Terazawa¹, J. Uzuhashi², T. Sekiguchi², T. Ohkubo², J. Chen², W. Yi², K. Hono², S. Kamiyama¹, T. Takeuchi¹, M. Iwaya¹, I. Akasaki^{1,3}, ¹Meijo Univ. (Japan), ²NIMS (Japan), ³Nagoya Univ. (Japan)

PS-5-06
Effect of Joule Heating on Titanium Microbolometer with Integrated Heater and Thermistor
°D. Elamaram¹, K. Akiba², H. Satoh³, N. Hiromoto², H. Inokawa², ¹GSST, Shizuoka Univ. (Japan), ²GSIST, Shizuoka Univ. (Japan), ³RIE, Shizuoka Univ. (Japan)

PS-5-07
Characteristics of Multi-split Ring Resonator Structure for Application in Biosensor
°Z. Geng^{1,2}, J. Liu¹, L. Chen¹, Z. Wang², H. Chen¹, ¹Institute of Semiconductors, Chinese Academy of Sciences (China), ²School of information engineering, Minzu Univ. of China (China)

PS-5-08
1T Semi-floating Gate Image Sensor with Enhanced Quantum Efficiency and High Response Speed
°Z.-L. Tian¹, C.-X. Yue¹, C. Wang¹, L. Chen¹, H. Zhu¹, Q.-Q. Sun¹, W.D. Zhang¹, ¹Fudan Univ. (China)

PS-5-09
Numerical Evaluation of a new Optical MOS Modulator structure compatible with an arbitrary SOI thickness
°C. Barrera¹, Y. D  si  res², F. Boeuf¹, ¹STMicroelectronics (France), ²CEA LETI (France)

PS-5-10 (Late News)
Characteristics of Perovskite Solar Cell with UV Down-shifting layer and function as an Arc detector
°H. Lee¹, J.Y. Hwang¹, H.W. Choi¹, ¹Gachon Univ. (Korea)

PS-5-11 (Late News)
New Wavelength Generation in the Semiconductor Circular Ring Laser Diode by Four Waves Mixing
C.Y. Houng¹, J.M. Chen¹, °M.C. Shih¹, ¹National Univ. of Kaohsiung (Taiwan)

06: Photovoltaic / Energy Harvesting / Battery-related Technology

(23 papers)

PS-6-01
Boosting organic photovoltaics via third component studied by ultrafast time-resolved spectroscopy
°N.Z. She¹, A. Yabushita¹, H.W. Cheng¹, K.H. Wei¹, ¹Univ of Chiao-Tung (Taiwan)

PS-6-02
Withdrawn

PS-6-03
A Study of perovskite solar cell with Fe²⁺/Ga³⁺ doped TiO₂ layer
°S.G. Shin¹, H. Lee¹, H.W. Choi¹, ¹Univ.of Gachon (Korea)

PS-6-04
Effects of RbI and CuBr₂ addition to CH₃NH₃PbI₃Cl_δ photovoltaic devices
°N. Ueoka¹, ¹The Univ. of Shiga Prefecture (Japan)

PS-6-05
Investigation of A-site substitution of Sn-Perovskite on the solar cells performance
°K. Nishimura¹, D. Hirotani², M.A. Kamarudin¹, Q. Shen¹, T. Toyoda¹, S. Iikubo², T. Minemoto³, K. Yoshino⁴, S. Hayase^{2,1}, ¹The Univ. of Electro-Communications (Japan), ²Kyushu Inst. Tech. (Japan), ³Univ. of Ritsumeikan (Japan), ⁴Univ. of Miyazaki (Japan)

PS-6-06
Charge Separation in SnO₂/MAPbI₃ Interface with Cl-passivation: A First-Principles Study
°S.Y. Zhang¹, J. Su¹, J.J. Chang¹, ¹Xidian Univ. (China)

PS-6-07
Cu₂ZnSn(S,Se)₄ thin-film solar cells prepared by sulfurization using Cu₂ZnSnSe₄,NaF and KF compounds
°T. Yamaguchi¹, H. Ogawa¹, M. Nakashima¹, H. Naoi¹, J. Sasano², M. Izaki², ¹National Institute of Technology, Wakayama College (Japan), ²Toyohashi Univ. of Technology (Japan)

PS-6-08
Effect of Ag/Sn Mole Ratio of Ag-rich Ag₃SnS₆ Thin Film Prepared by Vacuum Evaporation
°T. Uchimura¹, S. Nakamura², H. Araki³, S. Seto⁴, T. Yamaguchi⁵, Y. Akaki¹, ¹National Institute of Technology (KOSEN), Miyakonojo College (Japan), ²National Institute of Technology (KOSEN), Tsuyama College (Japan), ³National Institute of Technology (KOSEN), Nagaoka College (Japan), ⁴National Institute of Technology (KOSEN), Ishikawa College (Japan), ⁵National Institute of Technology (KOSEN), Wakayama College (Japan)

PS-6-09
Evaluations of TOPCon Solar Cell Rear Structure on Numerical Simulations
°T. Sugiura¹, S. Matsumoto¹, N. Nakano¹, ¹Keio Univ. (Japan)

PS-6-10
Preparation and thermoelectric characterization of phosphorus-doped silicon nanocrystals/silicon oxide multilayers
°H. Kobayashi¹, R. Akaishi¹, S. Kato², M. Kurosawa¹, N. Usami¹, Y. Kurokawa¹, ¹Nagoya Univ. (Japan), ²Nagoya Inst. Tech. (Japan)

PS-6-11
Temperature Effects on the Nucleation and Growth of Li at Cu/LiPON Interfaces
°M. Hirota¹, M. Motoyama¹, T. Yamamoto¹, Y. Iriyama¹, ¹Nagoya Univ. (Japan)

PS-6-12
Numerical Simulation of Thin-Film-All-Solid-State-Lithium Battery
°R. Isomura¹, M. Motoyama¹, T. Yamamoto¹, Y. Iriyama¹, ¹Nagoya Univ. (Japan)

PS-6-13
In-liquid plasma synthesis of iron-nitrogen-doped carbon nanosheets with highly electro-catalytic activity for fuel cell application
R. Hamaji¹, T. Amano¹, °H. Kondo¹, T. Tsutsumi¹, K. Ishikawa¹, M. Sekine¹, K. Takeda², M. Hiramatsu², M. Hori¹, ¹Nagoya Univ. (Japan), ²Meijo Univ. (Japan)

PS-6-14
1D structural CNH dependency in needle type Solid-state CMOS compatible glucose Fuel Cell for open-circuit voltage and their biomedical application
°M.Z. Islam¹, S. Arata¹, K. Hayashi¹, A. Kobayashi¹, Y. Momo², K. Niitsu^{1,3}, ¹Nagoya Univ. (Japan), ²Toyo Co., Ltd., (Japan), ³PRESTO, JST, Saitama (Japan)

PS-6-15
Withdrawn

PS-6-16
Impact of Heat Guide Thickness on Output Power of Planar Silicon Thermoelectric Generator
°S. Hirao¹, K. Oda¹, K. Mesaki¹, H. Takezawa¹, M. Tomita¹, T. Matsukawa², T. Matsuki^{1,2}, T. Watanabe¹, ¹Waseda Univ. (Japan), ²AIST (Japan)

PS-6-17
Solar-Powered Overall Water Splitting System combing Metal-Organic Frameworks Derived Bimetallic Nanohybrids Based Electrocatalysts and One Organic Solar Cell
°H. Lei¹, ¹Jinan Univ. (China)

PS-6-18 (Late News)
ZIF-67/PEDOT Hybrid Conductive Composite as a Superior Electrode for AllSolid-State Symmetrical Supercapacitor
°S. Sundriyal^{1,2}, V. Shrivastav^{1,2}, S. Mishra^{1,2}, A. Deep^{1,2}, ¹Academy of Scientific and Innovative Research (India), ²Csir-Central Scientific Instruments Organization (India)

PS-6-19 (Late News)
MIL-125(Ti) Derived TiO₂ Nanoparticles Confined Carbon Skelton for Supercapacitor Application
°V. Shrivastav^{1,2}, S. Sundriyal^{1,2}, U.K. Tiwari², A. Deep², ¹Academy of scientific and innovative research (India), ²Central Scientific Instruments Organisation (India)

PS-6-20 (Late News)
Fabrication and stability characterization of PbI₂/PbCl₂ added CH₃NH₃PbI_{3-x}Cl_x solar cells
°N. Ueoka¹, T. Oku¹, ¹Univ. of Shiga Prefecture (Japan)

PS-6-21 (Late News)
Performance and Light Stability of Electron-Selective TiO₂ with an AlO_x Interlayer
°H. Lee¹, Y. Ohshita¹, ¹Toyota Tech. Inst. (Japan)

PS-6-22 (Late News)
Study of Transparent Cu₂O Solar Cells for High-efficiency, Low-cost Tandem Photovoltaics
°N. Nakagawa¹, S. Shibasaki¹, M. Yamazaki¹, Y. Honishi¹, Y. Someya-Hiraoka¹, K. Yamamoto¹, ¹Toshiba Corp. (Japan)

PS-6-23 (Late News)
Electrospun poly (methyl methacrylate) decorated Titanium dioxide, reduced graphene oxide composite nanofiber for dye and perovskite sensitized solar cell applications
°T. Stalini¹, ¹Alagappa Univ. (India)

PS-6-24 (Late News)
Preparing the high efficiency with non-vacuum and non-sulfurized CZTS (Cu₂ZnSnS₄) Solar Cell by improved annealing method
°S.M. Lin¹, S.-J. Chang¹, T.-J. Hsueh², C.-L. Hsu³, ¹National Cheng Kung Univ. (Taiwan), ²National Kaohsiung Univ. of Applied Sciences (Taiwan), ³National Univ. of Tainan (Taiwan)

PS-6-25 (Late News)
Influence of Processing Route and Chemical Composition on Capacity/Fading of Layered Oxide Cathodes
°K.-Z. Fung¹, K. Fung³, S.-Y. Tsai², C.-C. Chang³, ¹National Cheng Kung Univ., Department of Materials Science and Engineering (Taiwan), ²National Cheng Kung Univ., Hierarchical Green-Energy Materials (Hi-GEM) Research Center (Taiwan), ³National Univ. of Tainan, Department of Greenery (Taiwan)

07: Organic / Molecular / Bio-electronics
(19 papers)

PS-7-01
Metal-insulator Transition Field Effect Transistor Observed by 4-probe Lamination Contact Electrode
°M. Sakai¹, Y. Okada², T. Ueda¹, T. Sano¹, R. Takeda¹, K. Kudo³, H. Masu³, ¹Dept. of Electrical and Electronic Eng., Chiba Univ. (Japan), ²Center for Frontier Science, Chiba Univ. (Japan), ³Center for Analytical Instrumentation, Chiba Univ. (Japan)

PS-7-02
Polarity Tuning of Semiconducting Single-walled Carbon Nanotube by Dipole Field of Ferroelectric Polymer for Thermoelectric Conversion
°R. Yamasaki¹, S. Horike^{1,2}, Y. Koshiba¹, T. Fukushima¹, K. Ishida¹, ¹Kobe Univ. (Japan), ²AIST (Japan)

PS-7-03
Interface electrical property of ionic liquid on polarization field formed by TGS single crystal
°T. Kishimoto¹, T. Fukushima¹, Y. Koshiba¹, S. Horike¹, K. Ishida¹, ¹Kobe Univ. (Japan)

PS-7-04
High Sensitivity Temperature Sensor Based on Fresnel Reflection with Thermosensitive Polymer: Control Morphology and Coating Thicknesses
°T.T. Salunkhe¹, T.N. Vo¹, J.H. Bae¹, W.S. Kim¹, I.T. Kim¹, ¹Gachon Univ. (Korea)

PS-7-05
Organic p-type/n-type/piezoelectric tricolor superlattice for photo-responsive actuator
T. Yanase¹, T. Nagahama¹, °T. Shimada¹, ¹Hokkaido Univ. (Japan)

PS-7-06
Hydrogel-based Flexible Hybrid Electronics Technology for Biomedical Application
°N. Takahashi¹, Y. Susumago¹, T. Tanaka¹, T. Fukushima¹, ¹Tohoku Univ. (Japan)

PS-7-07
Self-Waveguided Gain Narrowing of Light Emission from Single Crystals of Hexyl-Substituted Thiophene/Phenylene Co-Oligomer
°H. Mizuno¹, F. Sasaki², H. Yanagi¹, ¹NAIST (Japan), ²AIST (Japan)

PS-7-08
Kelvin probe study of energy level bending at interface of solution-processed alkyl-substituted phthalocyanine thin film and n-Si substrate
°R. Ishiura¹, A. Fujii¹, M. Arita², K. Sudoh¹, M. Ozaki¹, ¹Osaka Univ. (Japan), ²Kyushu Univ. (Japan)

PS-7-09
Accurate and stable equal-pressure measurements of water vapor transmission rate of organic electronics packages reaching the 10⁻⁶ g m⁻² day⁻¹ range
°T. Shimada¹, ¹Hokkaido Univ. (Japan)

PS-7-10
Withdrawn

PS-7-11
The Selectivity of Nitric Oxide and Ammonia Gas Sensor based on Surface Modified Poly-Si Nanowires FETs
°H.-Y. Lin¹, Y.-P. Liu¹, H.-M.P. Chen¹, ¹National Chiao Tung Univ. (Taiwan)

PS-7-12
Thin film fabrication of organic-inorganic halide perovskite by bar-coating method and its blend effect of ammonium chloride
°M. Murata¹, M. Gi¹, R. Tsuji², A. Fujii¹, M. Ozaki¹, ¹Osaka Univ. (Japan), ²KANEKA Corp. (Japan)

PS-7-13
Heat Resistance Improvement of Deposited Vinylidene Fluoride Oligomer Based-Infrared Sensors by Parylene C Coating
°Y. Sutani¹, T. Fukushima¹, A. Mori¹, Y. Koshiba¹, T. Kodani², T. Kanemura², K. Ishida¹, ¹Kobe Univ. (Japan), ²DAIKIN INDUSTRIES, Ltd (Japan)

PS-7-14
Efficiency Enhancement of an Organic Light-Emitting Diode by Silicon Quantum Dots Doping
°Y.C. Liu¹, H.Y. Wei¹, T. Subramani², N. Fukata², Z. Pei¹, ¹Nat. Chung Hsing Univ. (Taiwan), ²NIMS (Japan)

PS-7-15
Investigation of electret devices using liquid crystal polymer
°T. Nishimoto¹, T. Fukushima¹, Y. Koshiba¹, S. Horike¹, Y. Tagushi², K. Ishida¹, ¹Kobe Univ. (Japan), ²POLYPLASTICS co., Ltd (Japan)

PS-7-16
Bottom-Contact Pentacene Thin-Film Transistor with Threshold Voltages Controlled by Oxygen Plasma Treatment
°H. Fujita¹, Y. Kimura¹, Y. Hattori¹, M. Kitamura¹, ¹Kobe Univ. (Japan)

PS-7-17
Improved sensitivity of pH sensors based on hydrothermally grown nickel oxide nanosheets on Si surface with pyramidal cones
°C.Y. Kuo¹, S.Y. Wang¹, S.J. Wang^{1,2}, R.M. Ko², Y.S. Chang¹, P.T. Chen¹, ¹Institute of Microelectronics, Dept. of Electrical Eng., National Cheng Kung Univ. (Taiwan), ²College of Electrical Engineering and Computer Science, National Cheng Kung Univ. (Taiwan)

PS-7-18 (Late News)
Improving NIR sensor detectivity of BODIPY/C₆₀ bulk heterojunction photodiode
°N. Oishi¹, T. Fukushima¹, R. Fujioka¹, Y. Koshiba¹, C. Takechi¹, S. Horike¹, K. Ishida¹, ¹Kobe Univ. (Japan)

PS-7-19 (Late News)
UV enhanced nitric oxide gas sensor based on vertical channel nano-porous organic diodes
°G. Madhaiyan¹, H.C. Lin¹, H.W. Zan², ¹Department of Materials science and Engineering, National Chiao Tung Univ., Hsinchu (Taiwan), ²Department of Photonics and Institute of Electro-Optical Engineering, National Chiao Tung Univ., Hsinchu (Taiwan)

PS-7-20 (Late News)
NH₂-MWCNT/ZnO Nanocomposite as Effective Electrode Material for the Electrochemical Detection of Morin
°W.-C. Yu¹, N. Sebastian¹, ¹National Taipei Univ. of Technology (Taiwan)

08: Low Dimensional Devices and Materials
(22 papers)

PS-8-01
SiC Quantum Dots in Si-Oxide Layer Fabricated by Double Hot-Si⁺/C⁺-Ion Implantation Technique
T. Mizuno¹, °R. Kanazawa¹, T. Aoki¹, T. Sameshima², ¹Kanagawa Univ. (Japan), ²Tokyo Univ. of Agri. and Tech. (Japan)

PS-8-02
Extended carrier lifetime in faceted PbS quantum dot superlattice fabricated by sedimentation method
°R. Kimura¹, S. Sugisaki¹, T. Sugimoto¹, M. Fujishima¹, S. Watanabe¹, K. Mukai¹, ¹Yokohama National Univ. (Japan)

PS-8-03
Solid-state photon generator of silica-coated quantum dot combined with metamaterial fabricated by the scanning probe microscope lithography
°T. Sugimoto¹, S. Sugisaki¹, S. Watanabe¹, K. Mukai¹, ¹Yokohama National Univ. (Japan)

PS-8-04
Phonon Lifetimes: A Dependency on Size for Nano Silicon and Nano Germanium
°S.Y.Y. Chung¹, M. Tomita¹, T. Watanabe¹, ¹Waseda Univ. (Japan)

PS-8-05
Withdrawn

PS-8-06
High-performance 1-dimensional In-Ga-Zn-O Nanofiber Thin Film Transistors on High-k Gate Dielectrics by Microwave Irradiation and Oxygen Plasma Treatment
°J.W. Shin¹, W.J. Cho¹, ¹Kwangwoon Univ. (Korea)

PS-8-07
The Optimization of Ar/O₂ Mixed-plasma Treatment for Improving the Microwave-assisted In-Ga-Zn-O Nanofiber Thin Film Transistors
°S.K. Cho¹, W.J. Cho¹, ¹Kwangwoon Univ. (Korea)

PS-8-08
PVD growth of monolayer SnS under S-rich condition toward piezoelectric application
°H. Kawamoto¹, N. Higashitarumizu¹, M. Nakamura², I. Yonemori³, K. Wakabayashi², K. Nagashio¹, ¹Univ. of Tokyo (Japan), ²NIMS (Japan), ³Kwansei Gakuin Univ. (Japan)

PS-8-09
Graphene/diamond (carbon sp²-sp³) heterojunctions as novel photoelectronic devices
°Y. Imai¹, K. Ueda¹, Y. Mizuno¹, H. Asano¹, ¹Nagoya Univ. (Japan)

PS-8-10
A MoS₂ channel-based Ferro- FET with charge trapping and switching effects
°M. Zhao¹, K. Huang², X. Liu¹, H. Liu¹, ¹Inst. of Microelectronics of Chinese Academy of Sciences (China)

PS-8-11
New Contact-first Two-dimensional Transistor
°Y.W. Kang¹, C.J. Su², T.H. Hou¹, ¹National Chiao Tung Univ. (Taiwan), ²Taiwan Semiconductor Research Inst. (Taiwan)

PS-8-12
Resistance change characteristics of spray-deposited carbon nanotube thin film with bending doformation
°M. Kozono¹, H. Sato¹, ¹Mie Univ. (Japan)

PS-8-13
The Reduction of Substrate-induced Strain of Monolayer MoS₂ Grown on a Nonplanar Sapphire Substrate
°C.Y. Chang¹, S.Y. Gu^{1,2}, H.T. Lin¹, M.S. Lai^{1,2}, C.L. Yu¹, H.C. Chou¹, S.Y. Lin¹, C. Chen¹, M.H. Shih^{2,1}, ¹Academia Sinica (Taiwan), ²National Chiao-Tung Univ. (Taiwan)

PS-8-14
Effect of thermal annealing at a low temperature on exciton dynamics in semiconducting MoTe₂ crystals
°S. Hayashida¹, K. Watanabe², T. Taniguchi², K. Sawano¹, Y. Hoshi¹, ¹Tokyo City Univ. (Japan), ²NIMS (Japan)

PS-8-15
Sensitivity study on different gate dielectric dependence of DG-CNTFET using atomistic simulation NEGF approach
°C. Pandy¹, R. Narayanan², H. Mimura¹, ¹Shizuoka Univ. (Japan), ²VIT Univ. (India)

PS-8-16
Fabrication of MoS₂ layers on free-standing GaN for heterojunction photoresponsive device applications
°P. Desai¹, A.K. Ranade¹, R.D. Mahyavanshi¹, M. Tanemura¹, G. Kalita^{1,2}, ¹Nagoya Inst. of Tech. (Japan), ²Frontier Res. Inst. for Material Sci. (Japan)

PS-8-17
First-Principles Study on Formation of Freestanding Silicene and Germanene
°M. Araidai^{1,2,3}, M. Kurosawa^{2,3}, A. Ohta^{2,3}, K. Shiraishi^{1,2}, ¹IMaSS, Nagoya Univ. (Japan), ²Grad. Sch. of Eng., Nagoya Univ. (Japan), ³IAR, Nagoya Univ. (Japan)

PS-8-18
Development of Fabrication process for tin sulfide (SnS_x) thin films by solution-based atmospheric-pressure mist CVD
°S. Sato¹, P. Rutthongjan¹, L. Liu^{1,2,3}, G.T. Dang^{1,2,3}, T. Kawaharamura^{1,2,3}, ¹Eng. Course, Graduate School of Engineering, Kochi Univ. of Technol. (Japan), ²School of Systems Engineering, Kochi Univ. of Technol. (Japan), ³Center for Nanotechnology, Res. Inst., Kochi Univ. of Technol. (Japan)

PS-8-19
Chemical Vapor Deposition of NbS₂ from a Chloride Source
T. Yanase¹, S. Watanabe¹, M. Weng¹, T. Nagahama¹, °T. Shimada¹, ¹Hokkaido Univ. (Japan)

PS-8-20 (Late News)
Thickness and Aspect Ratio Dependences of Magnetic Domain Structures in Patterned CoFe Thin Films on GaAs (001) Substrates
°K. Teramoto¹, R. Horiguchi¹, Y. Adachi², M. Akabori², S. Hara¹, ¹Hokkaido Univ. (Japan), ²JAIST (Japan)

PS-8-21 (Late News)
Photoresponse Enhancement in MoS₂ Phototransistors by the Photogating Effect
°R. Nur¹, K. Toprasertpong¹, S. Takagi¹, M. Takenaka¹, ¹Univ. of Tokyo (Japan)

PS-8-22 (Late News)
Highly sensitive electrochemical sensor based on one-step synthesis of nanorod-nanoflake hybrid WS₂ for detection of uric acid and quercetin
°S. Badhulika¹, L. Durai¹, C.Y. Kong², ¹Indian Inst. of Tech. (IIT), Hyderabad (India), ²Shizuoka Univ. (Japan)

PS-8-23 (Late News)
Unidirectional out-of-plane spin textures in two-dimensional group-IV monochalcogenide MX monolayer for persistent spin helix
°M.A.U. Absor¹, F. Ishii², ¹Gadjah Mada Univ. (Indonesia), ²Kanazawa Univ. (Japan)

09: Novel Functional / Quantum / Spintronic Devices and Materials (17 papers)

PS-9-01
Hole spin g-factor in p-type silicon single and double quantum dots
°H. Wei¹, S. Mizoguchi¹, R. Mizokuchi¹, T. Kodera¹, ¹Tokyo Tech (Japan)

PS-9-02
Boron-doped Diamond Superconducting Quantum Interference Devices Operating up to 10 K
°A. Morishita¹, I. Tsuyuzaki¹, T. Kageura^{1,2}, S. Amano¹, Y. Takano², M. Tachiki², S. Ooi², S. Arisawa², H. Kawarada^{1,3}, ¹Waseda Univ. (Japan), ²MANA NIMS (Japan), ³The Kagami Memorial Laboratory for Materials Sci. and Tech. (Japan)

PS-9-03
Low-temperature Ge/Si interstitials-mediated local densification and nanocrystallization of CVD Si₃N₄ for advanced Si photonics and electronics
°K.P. Peng¹, T.L. Huang¹, T. George¹, H.C. Lin¹, P.W. Li¹, ¹National Chiao Tung Univ. (Taiwan)

PS-9-04
Thickness Effect of SiGe Layers on SiGe/Si Quantum Well Based Thermistor Performance
°C.B. Kaynak¹, Y. Yamamoto¹, A. Goeritz¹, F. Teply¹, M. Stocchi¹, M. Wietstruck¹, Y. Gurbuz², M. Kaynak^{1,2}, ¹IHP-Leibniz-Institut fuer innovative Mikroelektronik (Germany), ²Sabanci Univ. (Turkey)

PS-9-05
Characterization of Electron Field Emission from Si Quantum Dots with Ge Core/Si Quantum Dots Hybrid Stacked Structures
°T. Takemoto¹, K. Makihara¹, A. Ohta¹, M. Ikeda¹, S. Miyazaki¹, ¹Nagoya Univ. (Japan)

PS-9-06
Withdrawn

PS-9-07
Crystal orientation dependence of the spin current transmission in single crystalline NiO thin films
°T. Ikebuchi¹, T. Moriyama¹, H. Mizuno¹, K. Oda¹, H. Iwaki¹, T. Ono¹, ¹Kyoto Univ. (Japan)

PS-9-08
Spin Wave Propagation in Ferrimagnetic GdCo
°S. Funada¹, T. Nishimura¹, Y. Shiota¹, S. Kasukawa¹, M. Ishibashi¹, T. Moriyama¹, T. Ono^{1,2}, ¹Kyoto Univ. (Japan), ²Osaka Univ. (Japan)

PS-9-09
A Study of Dynamics of Skyrmioniums by Spin Transfer Torque
°Y. Ishida¹, K. Kondo¹, ¹Hokkaido Univ. (Japan)

PS-9-10
High mobility Ni-doped topological Dirac semimetal Cd₃As₂ films
°H. Wang¹, J. Ma¹, J. Zhao¹, ¹Inst. Semi., Chinese Acad. Sci. (China)

PS-9-11
Indirect-to-Direct Bandgap Transition of GeSn by Phonon-assisted Tunneling Spectra in Esaki Diodes
°C.Y. Liu¹, P.Y. Chiu¹, Y. Chuang¹, J.Y. Li¹, ¹National Taiwan Univ. (Taiwan)

PS-9-12 (Late News)
Inorganic Thin Film-based Ionic Decision-maker for Adaptive Artificial Intelligence Technology
°D. Ettoh^{1,2}, T. Tsuchiya^{1,2}, Y. Kitagawa^{1,2}, M. Takayanagi^{1,2}, T. Tsuruoka¹, T. Higuchi², K. Terabe¹, ¹NIMS (Japan), ²Tokyo Univ. of Sci. (Japan)

PS-9-13 (Late News)
Single Spin Detection With Entangled States
°H. Hakoshima¹, Y. Matsuzaki¹, ¹AIST (Japan)

PS-9-14 (Late News)
Quantum transport in twisted bilayer graphene hydrid junction devices
°D. Rui¹, L. Sun², N. Kang¹, H. Peng², Z. Liu³, H. Xu¹, ¹Beijing Key Lab. of Quantum Devices, Key Lab. for the Physics and Chemistry of Nanodevices and Department of Electronics, Peking Univ. (China), ²Center for Nanochemistry, Beijing Sci. and Eng. Center for Nanocarbons, Beijing National Lab. for Molecular Sciences, College of Chemistry and Molecular Engineering, Peking Univ. (China)

PS-9-15 (Late News)
Sensitive current measurement on a quantum antidot with a Corbino-type electrode
°T. Hata¹, T. Uchino¹, T. Akiho², K. Muraki², T. Fujisawa¹, ¹Tokyo Inst. of Tech. (Japan), ²NTT Basic Res. Labs. (Japan)

PS-9-16 (Late News)
Magnetic tunnel junction with a metastable bcc Co₂Mn alloy electrode
K. Kunimatsu^{1,2}, °T. Tsuchiya^{3,4}, K. Elphick⁵, T. Ichinose², K.Z. Suzuki^{2,4}, A. Hirohata³, S. Mizukami^{2,3,4}, ¹Dept. Appl. Phys., Grad. Sch. of Eng., Tohoku Univ. (Japan), ²WPI-AIMR, Tohoku Univ. (Japan), ³CSIS (CRC), Tohoku Univ. (Japan), ⁴CSRN. Tohoku Univ. (Japan), ⁵The Univ. of York (UK)

PS-9-17 (Late News)
Optical Outlook of the Germanium–Vacancy Center in Diamond
°M. Hanks¹, W. Munro^{2,3,1}, K. Nemoto¹, ¹National Inst. of Informatics (Japan), ²NTT Basic Res. Labs., NTT Corp. (Japan), ³NTT Res. Center for Theoretical Quantum Physics, NTT Corp. (Japan)

PS-9-18 (Late News)
Efficient Heat Transfer by Through Silicon Via in 3D Packaging for Practical-scale Quantum Annealing Machine
°W. Feng¹, K. Kikuchi¹, M. Hidaka¹, H. Yamamori¹, Y. Araga¹, K. Makise¹, S. Kawabata¹, ¹AIST (Japan)

PS-10-01
Enhanced Electrical Performance and Reliability of Ti-IGZO Thin-Film Transistors with $\text{Hf}_x\text{Al}_{1-x}\text{O}$ Gate Dielectrics
°J.H. Wu¹, B.C. You¹, S.J. Wang^{1,2}, R.M. Ko², C.E. Lin¹, ¹Institute of Microelectronics, Dept. of Electrical Engineering, National Cheng Kung Univ, Tainan (Taiwan), ²College of Electrical Engineering and Computer Science, National Cheng Kung Univ., Tainan (Taiwan)

PS-10-02
Nanostructured High-Performance Thin-Film Transistors Fabricated by Near-Field Nanolithography Strategy
°K. Huang¹, Z. Chen¹, S. Hu¹, J. Wu¹, C. Liu¹, ¹Sun Yat-sen Univ. (China)

PS-10-03
Growth of Single Crystalline ZnO Films on 18%-Lattice Mismatched Sapphire Substrates via Inverse Stranski-Krastanov Mode
°N. Itagaki¹, D. Yamashita¹, K. Kamataki¹, K. Koga¹, M. Shiratani¹, ¹Kyushu Univ. (Japan)

PS-10-04
Inducing Thermoelectricity in C-axis Aligned Crystalline InGaZnO Thin Film via Hydrogen Annealing
°J.C.E. Felizco¹, M. Uenuma¹, H. Murakawa¹, Y. Ishikawa¹, Y. Uraoka¹, ¹NAIST (Japan)

PS-10-05
Growth mechanism of Zinc Oxide thin film by mist-CVD via the modulation of $[\text{H}_2\text{O}]/[\text{Zn}]$ ratios
°P. Rutthongjan¹, M. Nishi¹, L. Liu^{1,2}, S. Sato¹, G.T. Dang^{1,2}, T. Kawaharamura^{1,2}, ¹Graduated school of Engineering Kochi Univ. of Tech. (Japan), ²Center for Nanotechnology, Research Inst. Univ. of Tech. (Japan)

PS-10-06
Structure Analysis for Clarification of Spatial Distribution of Crystals and Boundary Region between Crystals in CAAC-IGZO
°H. Baba¹, S. Mizukami¹, N. Sorida¹, H. Nakayama¹, O. Ueda², S. Yamazaki¹, ¹Semiconductor Energy Lab. Co., Ltd. (Japan), ²Meiji Univ. (Japan)

PS-10-07
High Performance Hydrogenated Oxide Field-effect Transistor
°C.D. Chen¹, C. Liu¹, ¹Sun-Yat-Sen Univ.,Guangzhou (China)

PS-10-08
Characterization of $\text{Al}_{1-x}\text{Ti}_x\text{O}_2$ thin films deposited by mist-CVD
°Z. Yatabe¹, K. Nishiyama¹, K. Nishimura¹, Y. Nakamura^{1,2}, ¹Kumamoto Univ. (Japan), ²Kumamoto Phoenix (Japan)

PS-10-09
Twin Formation in One Dimensional crystal growth of Si Thin Film During Micro Chevron Laser Beam Scanning
°W.Y. Yeh¹, A.H. Pham¹, S. Morito¹, ¹Shimane Univ. (Japan)

PS-10-10
Characterization of Asymmetry in Ni-Seed-Induced Laterally Crystallized (SILC) TFTs by Bew Gate-Floating-Drain-Current (GFDC) Method
°C.C. Chung¹, L.C. Liu¹, T.S. Chao¹, ¹National Chiao Tung Univ. (Taiwan)

PS-10-11
Atmospheric-Pressure Plasma-Enhanced Chemical Vapor Deposition of Silicon and Silicon Oxide Layers for Low-Temperature Thin Film Transistors
°H. Kakiuchi¹, H. Ohmi¹, K. Yasutake¹, ¹Osaka Univ. (Japan)

PS-10-12
Novel Pixel Circuit with External Compensation Scheme to Compensate for V_{TH} Variations in LTPS TFTs for High-Resolution AMOLED Displays
°Z.-L. Yang¹, J.-H. Chang¹, M.-H. Cheng², C.-L. Lin¹, ¹National Cheng Kung Univ. (Taiwan), ²AU Optronics (Taiwan)

PS-10-13
Suppressing Electrical Characteristic Variations in LTPS TFTs with External Compensation Method to Generate Uniform Driving Currents for High Resolution AMOLED Displays
°C.-C. Hsu¹, M.-Y. Deng¹, M.-H. Cheng², C.-L. Lin¹, ¹National Cheng Kung Univ. (Taiwan), ²AU Optronics (Taiwan)

PS-10-14
Conduction and valence band offsets of $\text{MoS}_2/(\text{HfO}_2)_x(\text{Al}_2\text{O}_3)_{1-x}$ measured by X-ray photoelectron spectroscopy
°Z. Tian¹, ¹Univ. of Fudan (China)

PS-10-15 (Late News)
Modeling of Embedded Split-Gate Flash Memory for Pattern Classification
°L.R. Gan¹, C. Wang¹, ¹Fudan Univ. (China)

PS-10-16 (Late News)
Role of TiW Barrier Layer on Resistive Switching Characteristic of ZnO-nanorods Electrochemical Metallization Cell
°P. Singh¹, F.M. Simanjuntak², S. Chandrasekaran¹, D. Panda³, T.Y. Tseng¹, ¹National Chiao Tung Univ. (Taiwan), ²Tohoku Univ. (Japan), ³National Inst. of Sci. and Tech. (India)

PS-10-17 (Late News)
The investigation of nitrogen-doped LaB₆ thin film formation on n-Si(100) substrate utilizing RF sputtering
°K.E. Park¹, H. Kamata¹, S. Ohmi¹, ¹Tokyo Tech (Japan)

PS-11-01
Study of defects in diamond Schottky barrier diode by photocurrent and photoluminescence spectroscopy
°J. Guo^{1,2}, A. Traore¹, M.H.B. Abu Bakar^{1,2}, T. Makino^{1,2}, S. Yamasaki^{1,2}, M. Ogura², T. Sakurai¹, ¹Univ. of Tsukuba (Japan), ²AIST (Japan)

PS-11-02
Nanocarbon Fabrication from Pentacene using Tungsten Mesh Supported Nickel
°A. Heya¹, R. Yamasaki², N. Matsuo¹, ¹Univ.of Hyogo (Japan), ²Tocalo Co., Ltd. (Japan)

PS-11-03
Growth of Graphitic Carbon Layers on SiO₂ Surfaces of Silicon Nanowires
°S.M. Wallace^{1,2}, T. Subramani^{2,3}, N. Fukata^{1,2}, ¹Univ. of Tsukuba (Japan), ²NIMS (Japan), ³Int'l Center for Young Scientists (Japan)

PS-11-04
Sub 10nm Localized Thinning of Atomic Layers Tungsten Disulfide via In-situ STEM/TEM
°Y.T. Tseng¹, K.L. Tai¹, W.W. Wu¹, ¹National Chiao Tung Univ. (Taiwan)

PS-11-05
Optical Characterization of PbI₂ Crystals Grown by Chemical Vapor Transport
°B.C. Kuo¹, D.Y. Lin¹, H.P. Hsu², S.B. Hwang³, ¹National Changhua Univ. of Edu. (Taiwan), ²Ming Chi Univ. of Tech. (Taiwan), ³Chienkuo Tech. Univ. (Taiwan)

PS-11-06
Influence of Dopant on Thermoelectric Properties of Si-rich Poly-Si_{1-x}Sn_x Layers Grown on Insulators
°K. Sato¹, O. Nakatsuka^{1,2}, M. Kurosawa^{1,3,4}, ¹Grad. Sch. Eng., Nagoya Univ. (Japan), ²IMaSS, Nagoya Univ. (Japan), ³IAR, Nagoya Univ. (Japan), ⁴JST-PRESTO (Japan)

PS-11-07
Hole Mobility Enhancement Observed in (110)-Oriented Strained Si
°K. Arimoto¹, N. Utsuyama¹, S. Mitsui¹, K. Satoh¹, T. Yamada¹, J. Yamanaka¹, K.O. Hara¹, K. Sawano², K. Nakagawa¹, ¹Univ. of Yamanashi (Japan), ²Tokyo City Univ. (Japan)

PS-11-08
Low-Temperature Bi-Induced Layer Exchange Crystallization for Formation of n-Type Ge on Insulator
°X. Gong¹, S. Liu¹, H. Gao¹, T. Sadoh¹, ¹Kyushu Univ. (Japan)

PS-11-09
Metamorphic Growth of GaSb/AlGaSb on GaAs Substrates Using Antimonidation of Epitaxial Aluminum Nanofilms
°Y.H. Wu¹, J.S. Wu², S.D. Lin¹, ¹National Chiao Tung Univ. (Taiwan), ²National Changhua Univ. of Edu. (Taiwan)

PS-11-10
Laser Slicing Lift-Off Process for GaN-on-GaN Technology
°V. Voronenkov^{1,2}, N. Bochkareva¹, R. Gorbunov^{1,2}, A. Zubrilov^{1,2}, V. Kogotkov², P. Latyshev², Y. Lelikov^{1,2}, A. Leonidov², Y. Shreter^{1,2}, ¹Ioffe Institute (Russia), ²TRINITRI-Technology (Russia)

PS-11-11
Hydride Vapor Phase Epitaxy Reactor for Bulk GaN Substrate Manufacturing
°V. Voronenkov^{1,2}, N. Bochkareva¹, R. Gorbunov^{1,2}, A. Zubrilov^{1,2}, V. Kogotkov², P. Latyshev², Y. Lelikov^{1,2}, A. Leonidov², Y. Shreter^{2,1}, ¹Ioffe Institute (Russia), ²TRINITRI-Technology (Russia)

PS-11-12
Study on Initial Growth Mechanism of $(\text{ZnO})_{1-x}(\text{InN})_x$ Using First Principles Calculations
°R. Furuki¹, M. Oda¹, Y. Shinozuka¹, ¹Wakayama Univ. (Japan)

PS-11-13
Dynamic Observation of Functional Metal Oxide Conversion Behaviors in Fe/ZnO Interfaces
°C.Y. Huang¹, K.L. Tai¹, J.Y. Chen², W.W. Wu¹, ¹National Chiao Tung Univ. (Taiwan), ²National United Univ. (Taiwan)

PS-11-14
Optical and Humidity Sensors Fabricated by SnS₂ film and SnS₂ bulk Materials
°Y.C. Yang¹, D.Y. Lin¹, C.F. Lin², H.P. Hsu³, ¹National Changhua Univ. of Edu. (Taiwan), ²National Chung Hsing Univ. (Taiwan), ³Ming Chi Univ. of Tech. (Taiwan)

PS-11-15
Optical Sensors of Cd_{1-x}Zn_xTe Bulk Semiconductors Grown by Vertical Bridgman-Stockbarger method
°C.W. Chen¹, D.Y. Lin¹, H.P. Hsu², Y.F. Wu², K. Strzalkowski³, P. Sitarek⁴, ¹National Changhua Univ. of Edu. (Taiwan), ²Ming Chi Univ. of Tech. (Taiwan), ³Nicolaus Copernicus Univ. (Poland), ⁴Wroclaw Univ. of Sci. and Tech. (Poland)

PS-11-16
Electrochemical properties of Co-doped BiVO₄ nanoparticles
°J. Khajonrit¹, ¹Suranaree Univ. of Tech. (Thailand)

PS-11-17 (Late News)
Study of Si-layers on graphite-substrates obtained through electrochemical reduction of silica powder
°M.M. Islam¹, H. Said², H.H. Ahmed², K. Akimoto¹, T. Sakurai¹, ¹Univ. of Tskuba (Japan), ²Univ. Tunis-El-Manner (Tunisia)

PS-11-18 (Late News)
Optoelectronic properties of PSS/oxidized cabon nanohorns composite films
°R. Obara¹, Y. Chonan¹, T. Komiyama¹, K. Kotani¹, H. Yamaguchi¹, Y. Momo^{1,2}, ¹Akita Prefectural Univ. (Japan), ²Toyo Ltd. (Japan)

PS-11-19 (Late News)
Activation and Recrystallization of Ultra-High-Dose Phosphorus-Implanted Silicon using Multi-Pulse Nanosecond Laser Annealing
°H. Shin¹, H.-Y. Ryu¹, C.H. Song¹, H. Park¹, D.-H. Ko¹, ¹Yonsei Univ. (Korea)

Special: Advanced Circuits/Systems Interacting with Innovative Devices & Materials
(7 papers)

PS-SP-01
A 17.6-to-24.3 GHz -193.3-dB FoM₁ LC-VCO for 60-GHz Wireless Applications
°Z. Zhang^{1,2}, L. Liu^{1,2}, N. Qi^{1,2}, J. Liu^{1,2}, N. Wu^{1,2}, ¹Inst. of Semiconductors, Chinese Academy of Sciences (China), ²Univ. of Chinese Academy of Sciences (China)

PS-SP-02
Ultrasmall Area and Ultralow Frequency Ring-oscillator Using GIDL Current for IoT Edge Applications
°B. Du¹, Z. Qian¹, K.M. Lee¹, R. Yabuki¹, T. Fukushima¹, F. Alves Satake¹, H. Kino¹, T. Fukushima¹, K. Kiyoyama², T. Tanaka¹, ¹Tohoku Univ. (Japan), ²Nagasaki Inst. of Applied Sci. (Japan)

PS-SP-03
A Fast-Locking All-Digital PLL with Dynamic Loop Gain Control and Phase Self-Alignment Mechanism for Sub-GHz IoT Applications
°H.H. Wang¹, Y.L. Lo¹, W.B. Yang², ¹National Kaohsiung Normal Univ. (Taiwan), ²Tamkang Univ. (Taiwan)

PS-SP-04
Plasmonic Filters Integrated into Back-illuminated CMOS Image Sensor for Spectrometric Applications
Y. Lee, B. Kim, °D. Keum¹, T. Kim, H. Song, C. Moon, Y. Park, ¹Samsung Electronics CO., LTD. (Korea)

PS-SP-05
Gain control circuit for audio mixer utilizing CAAC-IGZO FETs
°K. Kimura¹, T. Hirose¹, Y. Ando¹, H. Kobayashi¹, T. Ikeda¹, S. Yamazaki¹, ¹Semiconductor Energy Lab. Co., Ltd. (Japan)

PS-SP-06
The Impact of Layout Dependent Parasitic RLC on High Frequency Performance in 3T and 4T MF nMOSFETs
°J.C. Guo¹, J.R. Ou¹, J.-M. Lin¹, ¹National Chiao Tung Univ. (Taiwan)

PS-SP-07 (Late News)
An Inductively Coupled Wireless Bus for Inter-Chiplet Communication
°J. Kadomoto¹, S. Mitsuno¹, H. Irie¹, S. Sakai¹, ¹Univ. of Tokyo (Japan)