2020년 2월 14일(금), 14:00-15:30

하이원 그랜드호텔(컨벤션타워), 5층 로비 및 컨벤션홀 L

[FP1] Poster Session II

D. Thin Film Process Technology	
FP1-001	**Analysis of Switching Kinetics of (Hf, Zr)O2 Thin Films made by RF Sputtering Deposition Method** S. E. Moon[1,2], Y. Kim[1,3], J. Y. Woo[1], J. H. Kim[1], J. P. Im[1], S. Im[1], and S. M. Yoon[3] *[1]Emerging Materials Research Section, ETRI, [2]Department of Advanced Engineering, UST, [3]Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University*
FP1-002	**The Growth and Characteristics of $SrRuO_3$ thin films for electrodes on SiO_2 substrates by RF-Sputtering** Hyun Min Kim[1], Hong Seong Kim[1], and Ji-Hoon Ahn[2] *[1]Department of Electronic Material Engineering, Korea Maritime & Ocean University, [2]Department of Materials Science and Chemical Engineering, Hanyang University*
FP1-003	**Low Temperature Fabrication of Membrane Gate Field-effect-transistor Using Sacrificial Layer Release for a Versatile Sensor Platform** Nam-Hun Kim[1], Yeongcheol Seok[1], Jinhyun Kim[1], Manh Cuong Nguyen[1], An Hoang Thuy Nguyen[1], Jiyeon Yoon[1], Hyewon Kim[1], Sangwoo Kim[1], SeongYong Cho[1], Byung Chul Lee[2], and Rino Choi[1] *[1]Inha University, [2]KIST*
FP1-004	**Interface Dipole Modulation Device: The New Candidate of Non-Volatile Memory** Giuk Kim and Sanghun Jeon *School of Electrical Engineering, KAIST*
FP1-005	**유연기판에 제작한 a-ITGZO 박막트랜지스터의 전기적 특성 연구** 이호상, 조경아, 김상식 *고려대학교 전기전자공학과*
FP1-006	**ZnO 기반 삼진 로직 소자의 중간 전류 레벨 조절 연구** 김소영, 김소륜, 이호인, 이용수, 김기영, 이해원, 김채은, 황현준, 이병훈 *School of Material Science and Engineering, GIST*
FP1-007	**Elucidating Underlying Mechanism of Performance Enhancement of an IGZO TFTs with Al_2O_3 Interlayer** Tae Hyeon Kim, Woojin park, and Byungjin Cho *Department of Advanced Material Engineering, Chungbuk National University*

FP1-008	**Dual Band IGZO Phototransistor Implemented by an Al_2O_3 Interlayer** Jaeun Kim, Woojin park, and Byungjin Cho *Department of Advanced Material Engineering, Chungbuk National University*
FP1-009	**Development of Space Divided PE-ALD System and Process Design for Gap-fill Process in Advanced Memory Devices** Baek-Ju Lee, Dong-Won Seo, Jae-Soon Hwang, and Jae-Wook Choi *Machinery R&D Center, Hanwha Corporation*
FP1-010	**2-Dimensional Perovskite Oxide Thin Films Deposited by Atomic Layer Deposition for High-k Application** Seung Won Lee[1], Hyo Bae Kim[1], Jeong-Hun Choi[2], and Ji-Hoon Ahn[2] *[1]Department of Electronic Material Engineering, Korea Maritime and Ocean University, [2]Department of Materials Science and Chemical Engineering, Hanyang University*
FP1-011	**Atomic Layer Deposition of HfO_2 Thin Films on Graphene Surface** Jin Ha Hwang, Hyeok Jae Lee, and Sang Woon Lee *Department of Physics and Department of Energy Systems Research, Ajou University*
FP1-012	**Initial Growth Behavior of Atomic Layer Deposited TiO_2 Thin Film Depending on the Chemistry of Ru Substrate** Eui Young Jung[1], Jeongil Bang[2], Haeryong Kim[2], Dong Hee Han[1], and Woojin Jeon[1] *[1]Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University, [2]Nano Electronics Laboratory, Samsung Advanced Institute of Technology*
FP1-013	**Atomic-Layer-Deposited Tin Monoxide Channel for p-Type Oxide Thin-Film Transistors** Younjin Jang[1], In Won Yeu[1,2], Jun Shik Kim[1], Sukin Kang[1], Yonghee Lee[1], Kwangmin Kim[3], Whayoung Kim[1], Jeong Hwan Han[4], Jung-Hae Choi[2], and Cheol Seong Hwang[1,3] *[1]Department of Materials Science and Engineering and Inter-University Semiconductor Research Center, Seoul National University, [2]Center for Electronic Materials, KIST, [3]Graduate School of Engineering Practice, Seoul National University, [4]Department of Materials Science and Engineering, SEOULTECH*
FP1-014	**삼진상보보완회로를 위한 그래핀 기반의 P-type 삼진 로직 소자** 이용수, 김채은, 김소영, 김시현, 이호인, 김승모, 김기영, 이해원, 황현준, 이병훈 *School of Material Science and Engineering, GIST*
FP1-015	**Understanding Steric Hindrance Effect of Inhibitor and Precursor in AreaSelective Atomic Layer Deposition Using Monte-Carlo Simulation** 구본욱, Chi Thang Nguyen, 김현구, 이한보람 *인천대학교 신소재공학과*
FP1-016	**Demetallization of Molecular Layer Deposited Organic-Inorganic Hybrid Indicone Thin Films by Thermal Annealing** Miso Kim[1], Tran Thi Ngoc Van[1], Seunghwan Lee[2], Geon Ho Baek[3], Jung-Hoon Lee[2], Jin-Seong Park[2,3], and Bonggeun Shong[1] *[1]Chemical Engineering, Hongik University, [2]Materials Science and Engineering, Hanyang University, [3]Nano-Scale Semiconductor Engineering, Hanyang University*

FP1-017	**MoS_2 Thin Films by Plasma-enhanced Atomic Layer Deposition for Energy Applications** Seungmin Yeo[1,2], Jin Joo Ryu[1], Sunyoung Shin[1], Haneul Yang[1], Taeyong Eom[1], Gun Hwan Kim[1], Bo Keun Park[1], Hyungjun Kim[2], and Taek-Mo Chung[1] *[1]Division of Advanced Materials, KRICT, [2]School of Electrical and Electronic Engineering, Yonsei University*
FP1-018	**Plasma Diagnosis Using Optical Emission Spectrometry Analysis of Metal Film Fabricated by DC Magnetron Sputter** Jae-Eun Huh[1], Ki-Yeon Ryu[1], Chang-Min Jeong[1], Do-Hyun Oh[1], Johji Hiroishi[2], Eun-Kyoung Ma[1], Byeong-Hwa Jeong[1], and Eung-Joon Lee[1] *[1]ULVAC Korea, Ltd., [2]ULVAC Inc.*
FP1-019	**Enhancing the Growth Rate of ALD-grown TiO_2 Thin Film by Modulating the Chemisorption Characteristic Using Physisorbed H_2O** Byung Seok Kim, Ye Won Kim, Ae Jin Lee, jenam Kim, and Woojin Jeon *Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University*
FP1-020	**Effect of Oxygen Plasma Treatment on Electrical of Amorphous Indium Gallium Zinc Oxide Thin-Film Transistor** Han-Sang Kim[1], Jae-Yun Lee[1], Fei Shan[1], Hong-Bo Guo[1], Hao-Zhou Sun[1], Anvar Tukhtaev[1], SheraliJaynarov[1], Erdene Oyu Erdenebat[1], Eundo Kim[2], GeunhoKim[2], and Sung-JinKim[1] *[1]College of Electrical and Computer Engineering, Chungbuk National University, [2]R&D Center, TheONE SCIENCE*
FP1-021	**Ultrafast Recrystallization of Perovskite by Inducing Flash for Flexible Light-emitting Diodes** Chobi Kim, Dong Hun Jung, and Sang Ouk Kim *Department of Materials Science and Engineering, KAIST*
FP1-022	**Morphological Difference in Amorphous Indium Gallium Zinc Oxide Thin-Films based on the Oxygen Plasma Treatment** Han-Sang Kim[1], Jae-Yun Lee[1], Fei Shan[1], Hong-Bo Guo[1], Hao-Zhou Sun[1], Anvar Tukhtaev[1], Jaynarov Sherali[1], Erdene Oyu Erdenebat[1], Hyeon-Su Mun[1], U-Ju Choe[2], and Sung-Jin Kim[1] *[1]College of Electrical and Computer Engineering, Chungbuk National University, [2]College of Agriculture, Life & Environment Sciences, Chungbuk National University*
FP1-023	**Study on the Vacuum Post-vacuum Annealing Process for Improving IZO Channel Layer-based Transistor Electrical Performance** Jae-Yun Lee[1], Han-Sang Kim[1], Fei Shan[1], Hong-Bo Guo[1], Hao-Zhou Sun[1], Anvar Tukhtaev[1], SheraliJaynarov[1], Erdene Oyu Erdenebat[1], and Sung-JinKim[1] *[1]College of Electrical and Computer Engineering, Chungbuk National University*
FP1-024	**Optimizing the TiO_2-ZrO_2 Dielectric Structure Using Atomic Layer Deposition Technique for the DRAM Capacitor Application** Dong Hee Han, Eui Young Jung, and Woojin Jeon *Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University*
FP1-025	**Oxidation Mechanism of WS_2 by Water and Alcohol** Sungmin Lee[1], Yo Han Choi[1], Seunggi Seo[2], Hyungjun Kim[2], and Bonggeun Shong[1] *[1]Chemical Engineering, Hongik University, [2]Electrical and Electronic Engineering, Yonsei University*

FP1-026	**Implementation of Pseudo n-type Ternary Analog to Digital Converter Using ZnO Nanosheet Stack Channel Field-effect-transistor** Ho-In Lee, So-Young Kim, Seung-Mo Kim, Yongsu Lee, Hyeon Jun Hwang, and Byoung Hun Lee *School of Material Science and Engineering, GIST*
FP1-027	**Threshold Switching Characteristics of Amorphous Ga_2Te_3 Thin Film Deposited by RF Sputtering** Dayoon Lee, Taeho Kim, and Hyunchul Sohn *Department of Materials Science and Engineering, Yonsei University*
FP1-028	**Effect of Rapid Thermal Annealing on Forming Voltage Reduction in Ge-As-Te Selector Devices** Taeho Kim, Dayoon Lee, Jimin Lee, and Hyunchul Sohn *Department of Materials Science and Engineering, Yonsei University*
FP1-029	**Conductivity Dependence on Thickness of LaNiO3 Thin Film Deposited by RF Co-Sputtering System** Inwoo Kim, Taeho Kim, Youlee Song, and Hyunchul Sohn *Department of Materials Science and Engineering, Yonsei University*
FP1-030	**A Comparative Study on the Adsorption of Silicon Tetrahalides toward Low-temperature Thermal Atomic Layer Deposition of Silicon Nitride** Neung-Kyung Yu[1], Jong Woo Shin[2], Chan Hui Moon[2], Han-Bo-Ram Lee[2], and Bonggeun Shong[1] *[1]Chemical Engineering, Hongik University, [2]Materials Science and Engineering, Incheon National University*
FP1-031	**Computational Screening for Metal Oxide Precursors toward Area-selective Atomic Layer Deposition (AS-ALD)** Tran Thi Ngoc Van, Miso Kim, Yo Han Choi, and Bonggeun Shong *Chemical Engineering, Hongik University*
FP1-032	**은-페이스트 전극의 표면처리 및 특성변화** 김성완, 라만 셰이크 압둘, 양윤숙, 김우영 *제주대학교 전자공학과*
FP1-033	**ALD를 이용하여 증착한 ZrO_2에서의 O3 pulse Duration에 따른 Antiferro Polarization 특성 연구** 소남우, 정주영, 한유근, 손현철 *연세대학교 공과대학 신소재공학과*
FP1-034	**Flexible Deep-Ultraviolet-Selective Photodetector Using Amorphous GaOx Thin Films Grown by Atomic Layer Deposition** Se Eun Kim, Kang min Lee, Heung yoon Choi, and Sang Woon Lee *Ajou University*

FP1-035	**Atomic Layer Deposition of Ru Thin Films Using Novel Ru(II) Precursor** Hanuel Yang, Jungmin Hwang, Seungmin Yeo, Taeyong Eom, Gun Hwan Kim, Bo Keun Park, and Taek-Mo Chung *Division of Advanced Materials, KRICT*
FP1-036	**TEM 을 활용한 고유전 게이트 절연막의 소자 특성 분석 및 신뢰성 평가** 이상길, 유승조, 이지현, 장재혁 *한국기초과학지원연구원 연구장비운영부*
FP1-037	**Fabrication of Highly Integrated a-IGZO BEOL Logic Devices Using Single Type Channel and Channel Offset** Min-Soo Kang, Sung-Hun Kim, and Won-Ju Cho *Department of Electronic Materials Engineering, Kwangwoon University*
FP1-038	**Improvement of Field-Effect Transistors and Inverters based on IGZO Nanofiber Channels by O_2 Plasma Treatment** Sung-Hun Kim and Won-Ju Cho *Department of Electronic Materials Engineering, Kwangwoon University*
FP1-039	**Oxide Semiconductor Based Photonic Memristors by Atomic Layer Deposition** Chae Rim Lee, Hee Ju Yun, Jeong Hwan Han, and Byung Joon Choi *Department of Materials Science and Engineering, SEOULTECH*
FP1-040	**Effects of Carrier Gas Flow Rate on Properties of SiCOH Low Dielectric Constant Films in Plasma Enhanced Chemical Vapor Deposition Process Using the Octamethylcyclotetrasiloxane Precursor** Yoonsoo Park[1], Hyuna Lim[1], Namwuk Baek[1], Seunghun Park[1], Sungwoo Lee[2], Jeayoung Yang[2], and Donggeun Jung[1] *[1]Department of Physics, Sungkyunkwan University, [2]Advanced Research Laboratory, TES Co., Ltd.*
FP1-041	**Effect of Low-Frequency Plasma on Polymerized SiCOH Low-*k* Films in 13.56 MHz and 370 kHz Dual-Frequency Inductively Coupled Plasma System Using the Octamethylcyclotetrasiloxane Precursor** Hyuna Lim[1], Yoonsoo Park[1], Namwuk Baek[1], So-Yeon Jun[1], Sungwoo Lee[2], Jeayoung Yang[2], and Donggeun Jung[1] *[1]Department of Physics, Sungkyunkwan University, [2]Advanced Research Laboratory, TES CO. Ltd.*
FP1-042	**Highly Improved Growth and Electrical Properties of Pt Thin Films by Atomic Layer Deposition Using Dimethyl(N,N-Dimethyl-3-Buten-1Amine-N) Platinumand O_2 Reactant** Woo-Jae Lee, Susanta Bera, and Se-Hun Kwon *School of Materials Science and Engineering, Pusan National University*
FP1-043	**Thickness Dependent Work Function Variation of Pt-Ru Bimetallic Alloy prepared via Atomic Layer Deposition** Hyun Gu Kim[1,2], Chang-Min Kim[2], Jihu Baek[2], and Se-Hun Kwon[2] *[1]National Core Research Center for Hybrid Materials Solution, Pusan National University, [2]School of Materials Science and Engineering, Pusan National University*

FP1-044	**Electrical and Optical Properties of Ti-ZnO Films Grown on Glass Substrate by Atomic Layer Deposition** Eun-Kyong Koh and Se-Hun Kwon *School of Materials Science and Engineering, Pusan National University*
FP1-045	**Layer-Controlled Spalling Technique for Selective Interface Separation of Epitaxial Structures** Heungsup Won, Honghwi Park, Chang-Ju Lee, Jaedong Jung, and Hongsik Park *School of Electronics Engineering, Kyungpook National University*
FP1-046	**Investigation of Electrical Characteristics of Flexible CMOS Devices Fabricated with Thickness-Controlled Spalling Process** Honghwi Park, Changhee Lim, Yeho Noh, and Hongsik Park *School of Electronics Engineering, Kyungpook National University*
FP1-047	**Potassium Disulfitopalladate(II)-coated Polyester Fabric-based Carbon Monoxide Colorimetric Sensor** Junyeop Lee[1,2], Jae Keon Kim[1,2], Namgon Do[1,2], Yeong Sam Kim[1], Hee Kyung An[1], Seong Ho Kong[2], and Daewoong Jung[1] *[1]KITECH, [2]School of Electronics Engineering, Kyungpook National University*
FP1-048	**Polarization Switching and Discharging Behaviors of Hafnium Zirconium Oxide Based Ferroelectric Capacitors Connected with Paraelectric Capacitors** Yong Bin Lee, Hyeon Woo Park, Young Hwan Lee, Seung Dam Hyun, Bum Yong Kim, Hyun Ho Kim, and Cheol Seong Hwang *Department of Materials Science and Engineering and Inter-University Semiconductor Research Center, College of Engineering, Seoul National University*
FP1-049	**Effect of Post Annealing on the Crystallinity and Polarization of Ga-doped HfO_2 Films, Deposited by ALD** Ju-young Jeong, Yoogeun Han, and Hyunchul Sohn *Department of Materials Science and Engineering, Yonsei University*
FP1-050	**Ferroelectricity in Ge Doped HfO_2 Thin Films Deposited by ALD** Yoogeun Han, Ju-Young Jeong, and Hyunchul Sohn *Department of Materials Science and Engineering, Yonsei University*
FP1-051	**Optoelectronic Properties of the Transparent and Flexible IGZO Thin Film Transistors for Deep Ultraviolet (DUV) Sensing** Jongwon Yoon[1], Ga-Young Bae[2], Seonggwang Yoo[2], Jung Il Yoo[2], Woong-Ki Hong[1], and Heung Cho Ko[2] *[1]Jeonju Center, KBSI, [2]GIST*
FP1-052	**Low Temperature Microwave Anneal for Monolithic 3-D Integration** Jiyeon Yoon, Manh Cuong Nguyen, An Hoang Thuy Nguyen, Nam-Hun Kim, Yeongcheol Seok, Hyewon Kim, Sangwoo Kim, Seong Yong Cho, and Rino Choi *Department of Materials Science and Engineering, Inha University*

FP1-053	**Effect of Annealing Ambient on Solution-processed $AlZrO_X$ Gate Dielectric for a-IGZO TFTs** Kyoung-Rae Kim, Jonsu Oh, Kyung-Mo Jung, and Yong-Sang Kim *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-054	**Area-Selective Atomic Layer Deposition of Ru Thin Films Using a Vapor-Phase Surface Moderator** Jeong-Min Lee, Ji Won Han, Tae Joo Park, and Woo-Hee Kim *Department of Material Science and Chemical Engineering, Hanyang University*
FP1-055	**Electrical Properties of AlGaN Thin Films Grown by Thermal Atomic Layer Deposition** Seok Choi, Hee Ju Yun, Won Hee Jeong, Jeong Hwan Han, and Byung Joon Choi *Department of Materials Science and Engineering, SEOULTECH*
FP1-056	**Coating Characteristics on the Thermoelectric Powder Materials by Two Types of Atomic Layer Deposition Reactor** Jae Wook Lee[1], Myeong Jun Jung[1], Seung Chul Shin[1], Ju-Yeon Han[1], Myeong Jun Ji[1], Seung Hee Ko[2], Jong Min Byun[1,3], Jeong Hwan Han[1,3], Young-In Lee[1,3], Doh-Hyung Riu[1,2], Sung-Tag Oh[1,3], and Byung Joon Choi[1,3] *[1]Department of Material Science and Engineering, SEOULTECH, [2]The Research Institute for Future Convergence Materials, SEOULTECH, [3]The Institute of Powder Technology, SEOULTECH*
FP1-057	**Synthesis of a Hybrid Nanostructure of ZnO-Decorated MoS_2 by Atomic Layer Deposition** Jinseon Lee[1], Il-Kwon Oh[2,3], Bonggeun Shong[4], Stacey F. Bent[2,3], and Woo-Hee Kim[1,2] *[1]Department of Materials Science and Chemical Engineering, Hanyang University, [2]Department of Chemical Engineering, Stanford University, [3]School of Electrical and Electronic Engineering, Yonsei University, [4]Department of Chemical Engineering, Hongik University*
FP1-058	**Comparative Study of $(Me_5Cp)Ti(OMe)_3$ and $CpTi(OMe)_3$ as the Ti Precursors for the High-temperature Atomic Layer Deposition of TiO_2** Yeongchan Choi, Jaemin Kim, Hye-Lee Kim, Jongwan Jung, and Won-Jun Lee *Department of Nanotechnology and Advanced Materials Engineering, Sejong University*
FP1-059	**상압플라즈마 화학 기상 증착법의 고속 증착 특성 원인 탐구** 박형규[1], 심건호[1], 송창훈[2], 오훈정[2], 백승재[1] *[1]Department of Electrical, Electronic, and Control Engineering, Hankyong National University, [2]Yonsei University*
FP1-060	**Effect of Insertion Layer on the Electrical Characteristics of Phase Change Memory** Hee Ju Yun, Seok Choi, Ha Young Lee, and Byung Joon Choi *Department of Materials Science and Engineering, SEOULTECH*

FP1-061	**The Effect of Oxygen Defects in Plasma-Enhanced ALD Hafnia on Electrical Properties of a-IGZO Thin-Film Transistors** Cheol Hee Choi, Min Hoe Cho, Min Jae Kim, and Jae Kyeong Jeong *Department of Electronic Engineering, Hanyang University*
FP1-062	**Properties of Beryllium Oxide Thin Films Prepared by Plasma-enhanced Atomic Layer Deposition** Yoonseo Jang[1], Seung Min Lee[1], Jung Hwan Yum[2], Eric S. Larsen[2,3], Christopher W. Bielawski[2,3], and Jungwoo Oh[1] *[1]School of Integrated Technology, Yonsei Institute of Convergence Technology, Yonsei University, [2]Center for Multidimensional Carbon Material, IBS, [3]Department of Chemistry, UNIST*
FP1-063	**Solution-Processed PMMA-ZrA Hybrid Gate Dielectric for Low Temperature, High Performance In-Ga-Sn-O Thin-Film Transistors** Jae Min Jung, Hyeon A Kim, Jae Seok Hur, Jeong Oh Kim, and Jae Kyeong Jeong *Department of Electronic Engineering, Hanyang University*
FP1-064	**Characterization on Mechanical Flexibility of the Memory Transistors Using Organic Ferroelectric Gate Insulator on Ultra-Thin Polyimide Film** Jin-Ju Kim, Hye-Won Jang, So-Jung Yoon, and Sung-Min Yoon *Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University*
FP1-065	**Effects of Sputtered-TiN Electrode on Ferroelectric HfO_2 Thin Film in MFM Capacitors** Hyun-Seop Kim[1], Min-Woo Kong[2], Su-Keun Eom[2], Myoung-Jin Kang[2], Kwang-Seok Seo[2], and Ho-Young Cha[1] *[1]School of Electronic and Electrical Engineering, Hongik University, [2]Department of Electrical Engineering and Computer Science, Seoul National University*
FP1-066	**Plasma Processing Method for Enhanced Low-Temperature SiON Film** Minwoo Park, Suin Kim, Chang Gyu Song, Young Chul Choi, and Young Soo Kwon *WONIK IPS Co., Ltd.*
FP1-067	**Tunnel Electroresistance Variations in Ferroelectric Tunnel Junctions Using Atomic-Layer-Deposited Al-doped HfO_2 Thin Films** Soo-Hyun Bae, So-Jung Yoon, Dae-Hong Min, and Sung-Min Yoon *Department of Advanced Materials Engineering for Information and Electronics, Kyung Hee University*
FP1-068	**Defect Curing Effects on High-k Gate Stack ($Al/Al_2O_3/Si$-sub) by Using H_2 Plasma Treatment and Rapid Thermal Anneal** Jehyun An[1], Kyeong-keun Choi[2], Bohyeon Kang[1], and Rock-Hyun Baek[1] *[1]Department of Electrical Engineering, POSTECH, [2]NINT, POSTECH*
FP1-069	**Study on Channel Length Modulation of Low Temperature Poly-Si TFT** Jungmin Park[1,2] and Byoungdeog Choi[2] *[1]Yield Enhancement team, Foundry Business, Samsung Electronics Co., Ltd. [2]Department of Semiconductor and Display Engineering, Sungkyunkwan University*

FP1-070	**Investigation of Phases and Chemical States of Tin Titanate Films Grown by Atomic Layer Deposition** Hong Keun Chung[1,2], Jung Joon Pyeon[1,3], In-Hwan Baek[1,4], Ga-Yeon Lee[5], Hansol Lee[6], Sung Ok Won[6], Jeong Hwan Han[7], Taek-Mo Chung[5], Tae Joo Park[2], and Seong Keun Kim[1] *[1]Center for Electronic Materials, KIST, [2]Department of Materials Science and Chemical Engineering, Hanyang University, [3]KU-KIST Graduate School of Converging Science and Technology, Korea University, [4]Department of Materials Science and Engineering and Inter-University Semiconductor Research Center, Seoul National University, [5]Division of Advanced Materials, KRICT, [6]Advanced Analysis Center, KIST, 7Department of Materials Science and Engineering, SEOULTECH*
FP1-071	**비정질 산화물 반도체 박막 트렌지스터의 X-ray 조사 영향** 박솔아[1,2], 권장연[1,2] *[1]School of Integrated Technology, Yonsei University, [2]Yonsei Institute of Convergence Technology*
FP1-072	**Demonstration of TiO_2 Based Ultra High-k (k=30) MIS Capacitor and Its Electrical Properties** Bohyeon Kang[1], Kyeong-keun Choi[2], Jehyun An[1], and Rock-Hyun Baek[1] *[1]Department of Electrical Engineering, POSTECH, [2]NINT, POSTECH*
FP1-073	**Low Energy Ion Beam Treatment for the Removal of Native Oxide Layers** Jung Hyuk Kim, Keunyong Lim, Hong-Hee Kim, and Donghee Park *GCenter for Opto-Electronic Materials, KIST*
FP1-074	**Electrical Characteristics of Multi-Stacked $Al_2O_3/TiO_2/Al_2O_3$ Films Depending on Annealing Temperature** Bohyeon Jeon and Byoungdeog Choi *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-075	**Plasma-Enhanced Atomic Layer Deposition of Artificially-Designed $(Hf,Si)O_2$ Thin Films** Jiwon Oh, Jaehwan Kim, Heesu Hwang, Hyunbae Lee, and Jin-Ha Hwang *Department of Materials Science and Engineering, Hongik University*
FP1-076	**Analysis of Electrical Properties of Poly-Si TFT by Implant Energy for Channel Doping** Hyojung Kim[1,2], Jungmin Park[2], Soonkon Kim[3], JangKun Song[3], and Byoungdeog Choi[3] *[1]Technology Reliability, OLED Business Samsung Display Co., Ltd., [2]Department of Semiconductor and Display Engineering, Sungkyunkwan University, [3]Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-077	**Impacts of Film Thickness and Rapid Thermal Annealing on the Ferroelectric Properties of Nano-Laminated ALD $Hf_xZr_{1-x}O_2$ Thin Film** Youngjun Lee, Boncheol Ku, Ma Yue, Yuncheol Shin, and Changhwan Choi *Division of Materials Science and Engineering, Hanyang University*

FP1-078	**Improvement in Carrier Mobility of ZnON Transistor by Tantalum Encapsulation** 김민재, 정재경 *Department of Electronic Engineering, Hanyang University*
FP1-079	**The Impact of Hydrogen Peroxide and Stirring Temperature of Solution Processed $LaZrO_x$ Gate Dielectric on Low Voltage Operated IGO Thin Film Transistors** Su Eon Lee and Jae Kyeong Jeong *Department of Electronics and Computer Engineering, Hanyang University*
FP1-080	**Effective Work Function Modulation of ALD TaN/HfO_2 MOS Devices with Different Capping Materials** Minhyuk Kim, Moonsuk Choi, Juhyeon Lee, Jin Wei Nan, and Changhwan Choi *Division of Materials Science and Engineering, Hanyang University*
FP1-081	**Influence of Plasma Treated Al_2O_3 Dielectric on Sol-gel IGZO Transistor Performance** Seyoung Oh and Byungjin Cho *Department of Advanced Material Engineering, Chungbuk National University*
FP1-082	**Effect of Contact Barrier Engineering on Off-state Leakage of Amorphous Indium-Gallium-Zinc-Oxide thin-film Transistors** Sunjin Kim[1], Gunwoo Lee[2], Hyoungbeen Ju[2], Jiyoung Bang[2], Onejae Sul[3], Jae-Kyeong Jeong[1,2], and Seung-Beck Lee[1,2,3] *[1]Department of Electronic Engineering, Hanyang University, [2]Department of Nanoscale Semiconductor Engineering, Hanyang University, [3]INST, Hanyang University*
FP1-083	**Fabrication of Nanoscale ALD SnS_2 FETs** Jiyoung Bang[1], Gunwoo Lee[1], Hyoungbeen Ju[1], Sunjin Kin[2], Namgue Lee[1], Onejae Sul[4], Hyeongtag Jeon[1,3], and Seung-Beck Lee[1,2,4] *[1]Department of Nanoscale Semiconductor Engineering, Hanyang University, [2]Department of Electronic Engineering, Hanyang University, [3]Division of Materials Science and Engineering, Hanyang University, [4]INST, Hanyang University*
FP1-084	**Switching Characteristics of Nanoscale IGZO Thin Film Transistor** Hyoungbeen Ju[1], Gunwoo Lee[1], Sunjin Kim[2], Jiyoung Bang[1], Onejae Sul[3], Jae-Kyeong Jeong[1,2], and Seung-Beck Lee[1,2,3] *[1]Department of Nanoscale Semiconductor Engineering, Hanyang University, [2]Department of Electronic Engineering, Hanyang University, [3]INST, Hanyang University*

E. Compound Semiconductors	
FP1-085	**The Effect of the Anode Voltage on the UV A Light Source by Cathodeluminescence** Minhyuk Lee, Nakwon Jang[1], SangKyun Shim[2,3], June Mo Park[3], and June Key Lee[2] *[1]Korea Maritime and Ocean University, [2]Chonnam National University, [3]SBK Materials Co.*

FP1-086	**Thermal Behavior of AlGaN/GaN-based Schottky Barrier Diode on Diamond and Silicon Substrate** Zin-Sig Kim, Hyung-Seok Lee, Sung-Bum Bae, Hokyun Ahn, Sang-Heung Lee, Jong-Won Lim, and Dong Min Kang *ICT Materials & Components & Research Laboratory, ETRI*
FP1-087	**고속 스위칭용 탄화규소 기반 전력모듈의 기생 인덕턴스 측정 방법** 정동윤[1], 장현규[1], 박종문[1], 서동우[1], 배정환[2], 최윤화[3] *[1]한국전자통신연구원, [2]㈜큐아이티, [3]제엠제코㈜*
FP1-088	**Effects of Schottky Barrier Modulation of β-Ga_2O_3 with Various Metal Contacts by the Confined Magnetic Field-based Sputtering Method** Ha Won Lee[1], Sinsu Kyoung[2], Taiyoung Kang[2], and You Seung Rim[1] *[1]School of Intelligent Mechatronics Engineering, Sejong University, [2]Research and Development, Powercubesemi Inc.*
FP1-089	**W-band Image Rejection Mixer Using GaAs 0.1 μm MHEMT Process** Woojin Chang, Byoung-Gue Min, Sungjae Chang, Hyun-Wook Jung, Hyung-Sup Yoon, Jong-Min Lee, and Dong-Min Kang *ETRI*
FP1-090	**InGaAs CMP 공정 중 발생하는 오염물 제거를 위한 Post-CMP 세정 용액 연구** 이준우, 임상우 *Department of Chemical and Biomolecular Engineering, Yonsei University*
FP1-091	**Wet Passivation을 통한 InGaAs Wafer 표면 산화 억제 및 Defect 저감 기술 연구** 이진훈, 나지훈, 임상우 *연세대학교 화공생명공학과*
FP1-092	**X-band Microstrip Isolator for Aircraft/Ship Radar Application** Ho-Kyun Ahn[1], Dong-Young Kim[1], Hyun-Wook Jung[1], Haecheon Kim[1], Sung-Il Kim[1], Jong-Won Lim[1], Jung-Gu Lim[2], Oh-Gon Chun[2], and Dong-Min Kang[1] *[1]ICT Creative Research Laboratory, ETRI, [2]ADMOTECH*
FP1-093	**Ohmic Contacts with Recess-etched and TMAH-treated Nanometer-scale Patterns for Improved Performance and Reliability in AlGaN/GaN HEMTs** Hyun-Wook Jung[1], Jae-Won Do[2], Sung-Jae Chang[1], Ho-Kyun Ahn[1], Haecheon Kim[1], Jong-Won Lim[1], and Dong-Min Kang[1] *[1]RF/Power Component Research Group, ETRI, [2]Company K Partners Limited*
FP1-094	**75~110 GHz Resistive Mixer MMIC with 6.5~7.5 dB Conversion Loss** Woojin Chang, Byoung-Gue Min, Sungjae Chang, Hyun-Wook Jung, Hyung-Sup Yoon, Jong-Min Lee, and Dong-Min Kang *ETRI*

FP1-095	**Epitaxial Lift-off Technology for Large Scale InGaAs-on-insulator Transistors** Seong Kwang Kim[1], Subin Lee[2], JaeHoon Han[2], Jin Dong Song[2], Dong-Hwan Jun[3], and Sanghyeon Kim[1] *[1]School of Electrical Engineering, KAIST, [2]KIST, [3]Korea Advanced Nano Fab Center*
FP1-096	**The Effect of Si Backside Doped GaN Channel Layer on AlGaN/GaN:Si/AlN Double-hetero Structure HEMT** Donghyeop Jung, Uiho Choi, Minho Kim, Taehoon Jang, Yongjun Nam, and Okhyun Nam *Department of Nano-Optical Engineering, Korea Polytechnic University*
FP1-097	**환원제를 이용한 IGZO 산화물 반도체의 도체화 방법** 성태훈, 권장연 *연세대학교*
FP1-098	**0.13μm SiGe HBT를 이용한 94 GHz PA MMIC 설계** 김성일, 이상흥, 장우진, 이종민, 김동영, 강동민 *한국전자통신연구원 ICT창의연구소*
FP1-099	**Growth and Optimization of High Resistivity C-doped GaN by Metal-organic Chemical Vapor Deposition** Jeong-Gil Kim[1], Sung-Beom Bae[2], Seung-Hyeon Kang[1], Jun-Hyeok Lee[1], Hyung-Seok Lee[2], Kyung-Wan Kim[1], Woo-Hyun Ahn[1], Yong-Soo Lee[1], and Jung-Hee Lee[1] *[1]School of Electronics Engineering, Kyungpook National University, [2]ETRI*
FP1-100	**Sub-60 mV/decade Subthreshold Swing in Normally-off AlGaN/GaN MIS-FinFETs with Steep Sidewall Channel** Quan Dai, Ryun-Hwi Kim, Jun-Hyeok Lee, Jeong-Gil Kim, Terirama Thingujam, Seung-Hyeon Kang, Hyeon-Su Lee, Kyung-Wan Kim, Woo-Hyun Ahn, Sindhuri Vodapally, and Jung-Hee Lee *School of Electronics Engineering, Kyungpook National University*
FP1-101	**Microdisk Laser with Multiple Bias Voltages for Mode Selection** Sehwan Chang[1,2], Jin Dong Song[1], and Hong-Gyu Park[2,3] *[1]Center for Opto-electronic Convergence Systems, KIST, [2]Department of Physics, Korea University, [3]KU-KIST Graduate School of Converging Science and Technology, Korea University*
FP1-102	**Diode Characteristic of Quantum Dot Laser Transferred by Epitaxial Lift-off Technique on Si** Jae-Hoon Han[1], GeunHwan Ryu[1,2], Seung-Yeop Ahn[1,3], DaeHwan Jung[1], SangHyeon Kim[3], Han-Youl Ryu[2], Jin-Dong Song[1,4], and Won Jun Choi[1] *[1]Center for Opto-electronic Materials and Devices, KIST, [2]Inha University, [3]KAIST, [4]University of Science and Technology (UST)*
FP1-103	**Current Collapse-free AlGaN/GaN HEMT with Excellent AlN Buffer Layer** Ryun-Hwi Kim[1], Uiho Choi[2], Vodapally Sindhuri[1], Hyeon-Su Lee[1], Ok-Hyun Nam[2], and Jung-Hee Lee[1] *[1]School of Electronics Engineering, Kyungpook National University, [2]Nano-optical Engineering, Korea Polytechnic University*

FP1-104	**Study on GaN-based MISHEMTs with *in-situ* SiN Gate Dielectric Grown by MOCVD** Jun-Hyeok Lee[1], Kyung-Wan Kim[1], Seung-Hyeon Kang[1], Woo-Hyun Ahn[1], Jeong-Gil Kim[1], Sangmin Lee[2], and Jung-Hee Lee[1] *[1]School of Electronics Engineering, Kyungpook National University, [2]Wavice Inc.*
FP1-105	**Capacitance-voltage (C - V) and Current Density-voltage (J - V) Characteristics of AlN on n-GaN with Various Surface Treatments Using NH_3, N_2 Gases** Il-Hwan Hwang[1], Ho-Young Cha[2], and Kwang-Seok Seo[1] *[1]Inter-University Semiconductor Research Center (ISRC) and Department of Electrical and Computer Engineering (ECE), Seoul National University, [2]Electronic and Electrical Engineering, Hongik University*
FP1-106	**ZnO 양자점을 이용한 AlGaN/GaN 이종접합 광트렌지스터의 광반응도 개선 연구** Won-Ho Jang[1], J.-H. Choi[1], Dac Duc Chu[1], Chang-Yeol Han[2], Hee-Sun Yang[2], and Ho-Young Cha *[1]School of Electrical and Electronic Engineering, Hongik University, [2]Department of Materials Science and Engineering, Hongik University*
FP1-107	**GaN on GaN 기판을 이용한 수직형 PN 다이오드의 엣지터미네이션 연구** 김정진[1], 최준행[2], 차호영[1,2], 임종원[3], 강동민[3], 배성범[3], 이형석[3] *[1]홍익대학교 메타물질전자소자연구센터, [2]홍익대학교 전자전기공학부, [3]한국전자통신연구원 RF/전력부품연구실*
FP1-108	**Temperature-dependent Characteristics of Vertical InGaAs TFETs** Ji-Min Baek[1], Tae-Woo Kim[2], and Dae-Hyun Kim[1] *[1]School of Electronics Engineering, Kyungpook National University, [2]University of Ulsan*
FP1-109	**Scaling Behavior of Transconductance in InGaAs HEMTs: From Mobility Relevant to Velocity Saturation** Hyeon-Bhin Jo, Do-Young Yun, Jun-Gyu Kim, and Dae-Hyun Kim *School of Electronics Engineering, Kyungpook National University*
FP1-110	**Improved Virtual-Source Modeling for $In_{0.7}Ga_{0.3}As$ Quantum-well HEMTs** Do-Young Yun and Dae-Hyun Kim *School of Electronics Engineering, Kyungpook National University*
FP1-111	**Impact of Output-conductance on Current-gain Cut-off Frequency** Tae-Beom Rho, Hyeon-Bhin Jo, and Dae-Hyun Kim *School of Electronics Engineering, Kyungpook National University*

G. Device & Process Modeling, Simulation and Reliability	
FP1-112	**Compact Model for P-type L-shaped Tunneling Field-effect-transistor** Faraz Najam and Yun Seop Yu *Department of Electrical and Control Engineering and IITC, Hankyong National University*
FP1-113	**High Performance Graphene Photodetector with Van Der Waals Heterostructure through Tuning Carrier Tunneling** Kye Whan Cho and Woo Jong Yu *Department of Electronic and Electrical Engineering, Sungkyunkwan University*
FP1-114	**Development of High Performance SCR-based ESD Protection Device with High Holding Voltage for 0.18um BCD Technology** Youngbum Eom, Myoungchul Lim, Sanghyun Lee, Sangwook Nam, Jaehee Lee, and Young Chung *R&D Center, SK Hynix*
FP1-115	**Study of 3D TCAD Simulation on CMOS-compatible Avalanche Photodetectors** Won-Yong Ha[1], Woo-Young Choi[1], and Myung-Jae Lee[2] *[1]Department of Electrical and Electronic Engineering, Yonsei University, [2]Post-silicon Semiconductor Institute, KIST*
FP1-116	**Analysis of the Evolution of Internal Bias Field and Dopants Effects of Ferroelectric HfO_2 by First-order Reversal Curve Diagrams** SeungHyeon Hong, Yoseop Lee, Dante Ahn, WooRi Ham, Sungmun Song, and Seung-Eon Ahn *Department of Nano-Optical Engineering, Korea Polytechnic University*
FP1-117	**Electrical Analysis of NC Effect based on Equivalent Circuit for Silicon Doped HfO_2 Thin Film** Dante Ahn, Yoseop Lee, Seunghyeon Hong, Woori Ham, Sungmun Song, and Seung-Eon Ahn *Department of Nano-Optical Engineering, Korea Polytechnic University*
FP1-118	**TCAD Study of Uniaxial Stress Effect on the Threshold Voltage of MOSFET** Dongyean Oh, Seong-Dong Kim, Seokkiu Lee, and Jinkook Kim *Research and Development Division, SK Hynix*
FP1-119	**충돌 이온화를 이용한 Underlap 피드백 트랜지스터의 전기적 특성 연구** 손재민, 임두혁, 우솔아, 김상식 *고려대학교 전기전자공학과*
FP1-120	**Highly Reliable Gate Driver Circuit to Prevent Ripple Voltage Using AC-driven Method** Jungwoo Lee[1], Jongsu Oh[1], Eun Kyo Jung[1], KeeChan Park[2], and Yong-Sang Kim[1] *[1]Department of Electrical and Computer Engineering, Sungkyunkwan University, [2]Department of Electronics Engineering, Konkuk University*

FP1-121	**Investigation of the High-k Gate Dielectric Sidewall Effect in Gate-all-around Structure** Donghyun Ryu, Munhyeon Kim, and Byung-Gook Park *Inter-University Semiconductor Research Center (ISRC) and Department of Electrical and Computer Engineering (ECE), Seoul National University*
FP1-122	**First Principles Study on the Ferroelectricity in $(AlN)_m/(ScN)_n$ Superlattices** Kun Hee Ye[1,2], Gyuseung Han[1,2], In Won Yeu[1,2], Beom Yong Kim,[2] Cheol Seong Hwang[2], and Jung-Hae Choi[1] *[1]Center for Electronic Materials, KIST, [2]Department of Materials Science and Engineering, and Inter-University Semiconductor Research Center, Seoul National University*
FP1-123	**A Development of High Voltage P-type Isolated GGNMOS for LCD Driver Ics** Jungwoo Han, Jowoon Lee, Wonsuk Park, Youngchul Kim, and Joontae Jang *TEDS Team, DB HiTek*
FP1-124	**Deterministic Wigner Equation Solver based on Spherical Harmonics Expansion** Kyoung Yeon Kim and Byung-gook Park *Seoul National University*
FP1-125	**Reliable Deep Learning Method of Neuromorphic Systems based on Non-ideal Synapse Device** Jae-Eun Lee, ChulJun Lee, Dong-Wook Kim, DaeSeok Lee, and Young-Ho Seo *Department of Electronic Materials Engineering, Kwangwoon University*
FP1-126	**Retention Time Improvement in a BCAT-Based DRAM Core-Cell by Adopting MIS Contact Structure of Source and Drain** Muyeong Son, Seung Geun Jung, Seung Hwan Kim, June Park, Seung Geun Kim, and Hyun-yong Yu *School of Electrical Engineering, Korea University*
FP1-127	**높은 전류 구동능력을 갖는 4H-SCR기반 ESD보호회로에 관한연구 및 제작** 도경일, 서정주, 이병석, 구용서 *단국대학교 전기전자공학부*
FP1-128	**Influence of Interfacial SiO_2 Layer on PBS-induced Instability in Amorphous InGaZnO TFTs with Low Temperature ALD Gate Insulator** Shinyoung Park, Jun Tae Jang, Dongyeon Kang, Dong Myong Kim, Sung-jin Choi, and Dae Hwan Kim *School of Electrical Engineering, Kookmin University*
FP1-129	**Positive and Negative Bias-induced Instability in MOS_2 Field-effect Transistors with CYTOP Passivation** Ga Won Yang[1], Sungju Choi[1], Seung Gi Seo[2], Dong Myong Kim[1], Sung-jin Choi[1], Sung Hun Jin[2], and Dae Hwan Kim[1] *[1]School of Electrical Engineering, Kookmin Univresity, [2]Department of Electronic Engineering, Incheon National University*

FP1-130	**Nanosheet FET의 구조에 따른 Self-Heating Effect 분석** Ju Hwan Lee[1] and So Young Kim[2] *[1]Department of Electronic and Computer Engineering, Sungkyunkwan University, [2]Department of Semiconductor Systems Engineering, Sungkyunkwan University*
FP1-131	**Requirements of Electric Field Distribution to Secure BV Characteristics in Super Junction MOSFET** Jaehyun Kim[1], Jongmin Kim[1], Jieun Lee[1], Youngkwon Kim[1], Myoengbum Pyun[2], Youngsuk Kim[2], Youngchul Kim[1], and Joontae Jang[1] *[1]Technology Enabling Design Support Team, DB HiTek, [2]Specialized Device Development Part, DB HiTek*

H. Display and Imaging Technologies	
FP1-132	**(YOLOv3 + Deep Sort Tracker) NVIDIA AGX Xavier Performance Evaluation** Ali A. Al-hamid and Hyung Won Kim *MSIS LAB., Chungbuk National University*
FP1-133	**2D MoS_2 High Performance Phototransistor for Photo Inverter and Image Sensor** Hyun Soo Ra, Jongtae Ahn, Hyun Tae Choi, and Do Kyung Hwang *Center of Opto-electronic Materials and Devices, Post-silicon Semiconductor Institute, KIST*
FP1-134	**Analysis and Enhancement of Computation Time for Deep Neural Networks on GPU Hardware** Ali A. Al-hamid, Phong Phu Ninh, and Hyung Won Kim *MSIS LAB., Chungbuk National University*
FP1-135	**Confined Magnetic Field-Based Sputtering 기반 IGZO TFT의 공정압력과 투입전력에 따른 신뢰성 특성** 김다솔, 임유승 *세종대학교 지능기전공학부*
FP1-136	**Cross-linking and Patterning of Perovskite Nanocrystal Assembly for Electroluminescence Applications** Seung Ki Shin, Yoon Kyu Kim, and Nuri Oh *Division of Materials Science and Engineering, Hanyang University*
FP1-137	**Effect on the Stress Stability of Polyimide-based Flexible IGO Thin-film Transistors under Physical Stress Condition** 박준희, 임유승 *세종대학교 지능기전공학부*

FP1-138	**Effects of Proton Irradiation on p-type Polycrystalline Thin-film Transistors** Min-gyu Shin, Ha-yun Jeong, Hyo-jun Joo, Hwan-seok Jeong, Dae-hwan Kim, Hyun-seok Cha, and Hyuck-in Kwon *School of Electrical and Electronics Engineering, Chung-Ang University*
FP1-139	**Ethanedithiol Treatment on Zinc Oxide Films for Highly Efficient Quantum Dot Light-emitting Diodes by Reducing Exciton Quenching** Cheyoon Lee[1], Jeon Eun Hwa[1], and Heeyeop Chae[1,2] *[1]School of Chemical Engineering, Sungkyunkwan University, [2]SAINT, Sungkyunkwan University*
FP1-140	**Gate Bias Stability of Solution Processed Indium Zinc Oxide Thin-film Transistors by Doping Aluminum Fluoride** Donghee Choi and Byoungdeog Choi *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-141	**Incorporation of Donor and Accepter Quantum Dots to Understand the Charge Carrier Dynamics in Quantum Dot Light Emitting Diodes** Ji-hyoun Roh, Namyoung Gwak, and Nuri Oh *Division of Materials Science and Engineering, Hanyang University*
FP1-142	**Laser Induced Crystallization of Organic/Inorganic Halide Perovskite Light Emitting Diodes** Jinwoo Byun, Sung Jin Kim, and Sang Ouk Kim *Department of Materials Science and Engineering, KAIST*
FP1-143	**Optical Analysis on Light Outcoupling of Perovskite Light-emitting Diodes relying on the Thicknesses and Refractive Indexes of Indium-tin-oxide and Emitting-layer** Young-jin Jung, Seung-taek Lee, Jee-won Jung, and Jeong-hwan Lee *Department of Materials Science and Engineering, Inha University*
FP1-144	**Optimization of On-chip Convolutional Neural Network for Compact Size with High Accuracy** Muhammad Usman, Phong Phu Ninh, and Hyung Won Kim *MSIS LAB., Chungbuk National University*
FP1-145	**The Role of Carrier Suppressors in Solution-Processed InZnO Thin Film Transistors** Sangmin Lee, Pyungho Choi, and Byoungdeog Choi *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-146	**Vertically Stacked Complementary Inverter Using p-type SnO and n-type IGZO Thin-film Transistors for Logic and Photo-sensor Operation** Hyo-jun Joo, Min-gyu Shin, Hyun-seok Cha, and Hyuck-in Kwon *School of Electrical and Electronics Engineering, Chung-Ang University*

FP1-147	**Gasket Doped Double EML Structured Red PHOLED** Seung-chan Kim and Dong Pil Park *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-148	**Optimizing Lifetime of Blue PHOLED by Managing Hole Transport Layer and Host Materials** Seung-chan Kim, Dong Pil Park *Department of Electrical and Computer Engineering, Sungkyunkwan University*

I. MEMS & Sensors Systems	
FP1-149	**CAB 물질을 이용한 유연한 습도 센서 제작에 관한 연구** Gyu-ri Lim[1,2], Yong Suk Yang[1], Ahreum Kim[1], Mi-hyun Kim[1], Hyun You Kim[2], and Sung-Hoon Hong[1] *[1]Intelligent Sensor Research Laboratory, ETRI, [2]Department of New Material Engineering, Chungnam National University*
FP1-150	**Capillary Electrophoresis-Amperometric Detection of DNA Amplification Using PCR Microfluidic Devices** Hyo Eun Kim[1], Ariadna Schuck[1], Hang-beum Shin[2], and Yong-sang Kim[1] *[1]Department of Electrical and Computer Engineering, Sungkyunkwan University, [2]Corporate R&D, LG Chem, Ltd.*
FP1-151	**Development of Thermal Convection-type High Sensitivity Multi-axis Acceleration and inclinometer Sensor Using MEMS Process** Soon Yeol Kwon, Dong Geon Jung, Young Chan Choi, Jae Yong Lee, Seung Deok Kim, Yu Seong Kim, Seong Mo Koo, and Seong Ho Kong *School of Electronics Engineering, Kyungpook National University*
FP1-152	**Effect of Magnesium Sulfate in the Clot Formation Process Using a Solution-Gate Field-Effect Transistor** Ariadna Schuck, Hyo Eun Kim, and Yong-sang Kim *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-153	**Flexible Branched Electromyography Sensors for Small-area EMG Signal Detection** Bong Jun Choi, Woo Jin Yang, Ju Hwan Kim, Dong-wook Park *School of Electrical and Computer Engineering, University of Seoul*
FP1-154	**Flexible Chipless RFID Resonator for Temperature Sensor** Jong Chan Choe, Joong Hoon Lee, Tae-min Jang, and Suk-won Hwang *KU-KIST Graduate School of Converging Science and Technology, Korea University*

FP1-155	**Flexible Microdevices for Drug Delivery Implanted on Cerebral Cortex** Hoon Namkung, Sanghyun Sung, and Keon Jae Lee *Department of Materials Sciences and Engineering, KAIST*
FP1-156	**Hands-free User Interface for VR Headset by IR-based Facial Gesture Sensing** Jinhyuk Kim, Jaekwang Cha, Dohyun Kim, Ashutosh Mishra, and Shiho Kim *Yonsei University*
FP1-157	**High SNR and Wide Dynamic Range Digital MEMS Microphone ROIC** Yi-gyeong Kim, Min-hyung Cho, Chun-gi Lyuh, and Woo Seok Yang *ICT Creative Research Laboratory, ETRI*
FP1-158	**Hydrogen and Nitrogen Dioxide Gas Sensor based on Pd-AlGaN/GaN HEMT** Cuong Van Nguyen and Hyungtak Kim *School of Electronic and Electrical Engineering, Hongik University*
FP1-159	**Hydrogen Gas Sensor Based Pd-Ni Alloy Decorated MWCNT Sheet** Jae Keon Kim[1,2], Junyeop Lee[1,2], Namgon Do[1,2], Yeong Sam Kim[1], Hee Kyung An[1], Seong Ho Kong[2], and Daewoong Jung[1] *[1]KITECH, [2]Kyungpook National University*
FP1-160	**IGZO Channel Thin Film Transistor-based Biosensor With Monolithic 3-Dimension Integration** Hongrae Cho, Minhyun Jung, and Sanghun Jeon *Department of Electrical Engineering, KAIST*
FP1-161	**IGZO TFT-based Fully Transparent and Sensitivity Programmable Bio-sensor Platforms with Resistance Tunable Layer** Eun-ki Hong and Won-ju Cho *Department of Electronic Materials Engineering, Kwangwoon University*
FP1-162	**Mercury Ion Setection Using DNA-funtionalized Microparticles in DEP System** Kang In Yeo, Sang Hyun Lee, Seungyeop Choi, and Sang Woo Lee *Department of Biomedical Engineering, Yonsei University*
FP1-163	**Microfluidic-based Patterning for Solution-processed Carbon Nanotube Transistors** Se-hwa Lee, Sang-chan Park, Min-seok Kang, and Jae-hyuk Ahn *Department of Electronic Engineering, Kwangwoon University*

FP1-164	**Multi-Gated IGZO TFT-Based High Sensitivity Urea EnFETs Point-of-care Biosensing Platform** Jin-hyeok Jeon and Won-ju Cho *Department of Electronic Materials Engineering, Kwangwoon University*
FP1-165	**Normalized Difference Based Intelligent Gas Monitoring** Ashutosh Mishra, Rakesh Shrestha, and Shiho Kim *Yonsei Institute of Convergence Technology, Yonsei University*
FP1-166	**Self-Powered Pressure Sensor with Silk-based Piezoelectric Film for Wearable Electronics** Minhyun Jung[1], Kwang-jae Lee[2], Jae-wook Kang[2], and Sanghun Jeon[1] *[1]School of Electrical Engineering, KAIST, [2]Department of Flexible and Printable Electronics, Chonbuk National University*
FP1-167	**Sensing Characteristics of the MOSFET-type Gas Sensor with Sputtered WO_3 Sensing Layer** Yujeong Jeong[1], Seongbin Hong[1], Gyuweon Jung[1], Dongkyu Jang[1], Wonjun Shin[1], Jinwoo Park[1], Seung-Ik Han[2], Hyungtak Seo[2], and Jong-Ho Lee[1] *[1]Department of Electrical Engineering, and Inter-University Semiconductor Research Center, Seoul National University, [2]Department of Energy Systems Research, Ajou University*
FP1-168	**Skin Deformation Detection Sensor for the AR Headset Hands-free Interface** Jaekwang Cha, Jinhyuk Kim, and Shiho Kim *School of Integrated Technology, and Yonsei Institute of Convergence Technology, Yonsei University*
FP1-169	**The Construct of RF Dielectrophoretic System for Observing Cellular Behavior above a Few Hundreds MHz** Sang Hyun Lee, Kang In Yeo, Seungyeop Choi, and Sang Woo Lee *Department of Biomedical Engineering, Yonsei University*
FP1-170	**Time-of-flight Sensor 시스템 구축 및 성능 평가** Eunsung Park[1,2], Woo-young Choi[1], and Myung-jae Lee[2] *[1]Department of Electrical and Electronic Engineering, Yonsei University, [2]Post-silicon Semiconductor Institute, KIST*
FP1-171	**Waveguide Piezoelectric Micromachined Ultrasonic Transducers (PMUTs) Using Single-crystalline PMN-PZT Thin Film for Ultrasonic Fingerprint/vein Co-recognition** Jin Soo Park[1,2], Soo Young Jung[3,4], Seung-hyub Baek[3], and Byung Chul Lee[1] *[1]Center for BioMicrosystems, KIST, [2]Department of Electrical Engineering, Korea University, [3]Center for Electronic Materials, KIST, [4]Department of Material Science and Engineering, Seoul National University*
FP1-172	**Wireless, Skin-mountable Wearable EMG Sensor for Human-Machine Interface** Sunggu Kang, Minsu Song, and Jeonghyun Kim *Department of Electronic Convergence Engineering, Kwangwoon University*

FP1-173	**고에너지 이온주입을 이용한 35μm 단위 픽셀 크기를 갖는 실리콘 광증배 (SiPM)소자** 원종일[1], 박건식[1], 조두형[1], 고상춘[1], 이성현[1], 최병건[2], 박성모[2], 박경환[2] *[1]ETRI 반도체융합부품연구실, [2]ETRI 초경량지능형반도체연구실*
FP1-174	**금속 나노파티클이 기능화된 브랜치 형태 나노와이어의 가스센싱 특성 향상** Hyoun Woo Kim[1,2], Myung Sik Choi[1], Jae Hoon Bang[1], Seungmin Han[1], Ha Young Lee[1], and Han Gil Na[1] *[1]Division of Materials Science and Engineering, Hanyang University, [2]The Research Institute of Industrial Science, Hanyang University*
FP1-175	**마이크로폰 적용을 위한 스프링 타입에 따른 실리콘 나노와이어 Deflection 및 응력 변화 분석** Ailian Jin, 장보배로, 김태엽, 이승현, 조동일 *서울대학교 전기정보공학부, 자동화시스템연구소 (ASRI), 서울대학교 반도체공동연구소 (ISRC)*
FP1-176	**압력센서에 적용하기 위한 혈압감지 방식에 따른 실리콘 나노와이어 응력변화 분석** 장보배로, 김태엽, 이승현, Ailian Jin, 조동일 *서울대학교 전기정보공학부, 자동화시스템연구소 (ASRI), 서울대학교 반도체공동연구소 (ISRC)*
FP1-177	**이온의 가열을 감소시키기 위한 경사진 로딩 슬롯 구조의 MEMS 평면 이온트랩 설계 및 제작** 정창현[1], 홍석준[1,2], 정준호[1], 이민재[1], 박윤재[1], 김태현[3], 조동일[1] *[1]ASRI/ISRC and Department of Electrical and Computer Engineering, Seoul National University, [2]Department of Physics and Astronomy, University of Sussex, [3]Department of Computer Science and Engineering, Seoul National University*
FP1-178	**화학적 도핑 방법을 이용한 그래핀/p-Si 쇼트키 접합 조절 연구** 유태진, 김소영, 김시현, 권민규, 황현준, 이병훈 *Center for Emerging Electric Devices and Systems, School of Material Science and Engineering, GIST*

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FP1-179	**2D MoS_2/p-Si Heterojunction Photodetector Using H_2S Reactive Sputtering** Hye Yeon Jang, Jae Hyeon Nam, and Byungjin Cho *Department of Advanced Material Engineering, Chungbuk National University*
FP1-180	**3T1R Cell Architecture for Binarized Neural Network** Do-Wan Kwon and Kee-Won Kwon *College of Information and Communication Engineering, Sungkyunkwan University*

FP1-181	**Amorphous Molybdenum Sulfide Decorated Graphene Liquid Crystalline Fiber for Improved Hydrogen Evolution Reaction** Ho Seong Hwang, Kyung Eun Lee, and Sang Ouk Kim *Department of Materials Science and Engineering, KAIST*
FP1-182	**Bi-functional Performance of Chalcogenides-based Nanomaterials in An Alkaline Electrolyte** Seung Hwan Jo, Keon Beom Lee, Prakash Ramakrishnan, and Jung Inn Sohn *Division of Physics and Semiconductor Science, Dongguk University*
FP1-183	**Cobalt Phosphosulfide Nanoparticles Embedded Reduced Graphene Oxide Aerogel for Hydrogen Evolution Reaction** Sung Hwan Koo and Sang Ouk Kim *Department of Materials Science and Engineering, KAIST*
FP1-184	**Compliant Thermoelectric Generators with Soft Heat Conductors and Interconnection for Self-powered Wearable Applications** Hyeon Cho[1,2], Byeongmoon Lee[2], Kyung Tae Park[1], Seongkwon Hwang[1], Inho Jeong[1], Junho Bae[1], Hyun Joo Cho[1], Heesuk Kim[1], Yongtaek Hong[2], and Seungjun Chung[1] *[1]Photo-electronic Hybrid Research Center, KIST, [2]Department of Electronic and Computer Engineering, Seoul National University*
FP1-185	**Contact Metal에 따른 WS_2 광검출기의 암전류 감소에 관한 연구** 권민규, 유태진, 김시현, 황현준, 이병훈 *Center for Emerging Electric Devices and Systems and School of Material Science and Engineering, GIST*
FP1-186	**Controllable Chloride Molecule Doping for MoS_2 Filed-effect Transistors by Solution Method** Tae Young Kim, Yoon Sok Kim, and Eun Kyu Kim *Department of Physics, Hanyang University*
FP1-187	**Core-Position Controlled CdSe/CdS Dot-in-Rod Heterostructure for Photocatalytic Hydrogen Evolution** Gui-Min Kim and Doh C. Lee *Department of Chemical and Biomolecular Engineering and KAIST Institute for the Nanocentury, KAIST*
FP1-188	**Dielectric/Photocatalytic Properties of Cu_2O/TiO_2/Epoxy Resin Nanocomposites** Hyun Kim[1], Young Baek Kim[2], and Bee Lyong Yang[1] *[1]Kumoh National Institute of Technology, [2]IPTEC Co., Ltd*
FP1-189	**Dipole Orientation of Semiconductor Nanorods/Conducting Polymer Blend Film via Flow-Induced Alignment** Do Joong Shin and Doh C. Lee *Department of Chemical and Biomolecular Engineering, KAIST Institute for the Nanocentury, KAIST*

FP1-190	**Direct CVD Growth and Optoelectronics of MoSe2/Nb doped Wse2 p-n Junctions** Ji Eun Kim and Woo Jong Yu *Korea College of Information and Communication Engineering (CICE), Sungkyunkwan University*
FP1-191	**Effective Enhancement of Mechanical Strength and Electrical Conductivity of Adhesive Polydopamine Enforced Graphene Liquid Crystalline Fibers** Jun Beom Kim, In Ho Kim, and Sang Ouk Kim *KAIST*
FP1-192	**Electrical Characteristics of the Molecular Junctions with Inverted Self-assembled Monolayer** Wang-Taek Hwang, Yeonsik Jang, Minwoo Song, and Takhee Lee *Department of Physics and Astronomy, Seoul National University*
FP1-193	**Enhanced Thermal Stability of InP-Based Quantum Dots by Al-Doping: Implication in Electroluminescence Devices** Sungjun Koh, Hyeonjun Lee, Taemin Lee, and Doh C. Lee *Department of Chemical and Biomolecular Engineering and KAIST Institute for the Nanocentury, KAIST*
FP1-194	**Fabrication of Transparent and Stretchable Indium-Tin Oxide Nanofiber Electrode Using High Efficiency Microwave Calcination and Ar Plasma Surface Treatment** Joong-Won Shin and Won-Ju Cho *Department of Electronic Materials Engineering, Kwangwoon University*
FP1-195	**Facile and Spontaneous Self-Assembly of Reduced Graphene Oxide by Gelation for Supercapacitors** Jun Tae Kim, Uday Narayan Maiti, and Sang Ouk Kim *Department of Material Science and Engineering, KAIST*
FP1-196	**Facile Ball Milling Process to Fabricate Nano Bentonite by Adding MoS_2** Sung Hyun Hong[1] and Soo Young Kim[2] *[1]School of Chemical Engineering and Materials Science, Chung-Ang University, [2]School of Material Science and Engineering, Korea University*
FP1-197	**Facile Synthesis of Highly Crystalline Semiconducting Graphene Nanoribbons via Unzipping Nitrogen-Doped Carbon Nanotubes** Ho Jin Lee, Joonwon Lim, and Sang Ouk Kim *Department of Materials Science and Engineering, KAIST*
FP1-198	**Free-standing Artificial Synapse based on Ferroelectric Organic Field-effect Transistor for Wearable Neuromorphic Computing Systems** Seonghoon Jang[1], Sukjae Jang[2], Eun-Hye Lee[2], Minji Kang[2], Tae-Wook Kim[2], and Gunuk Wang[1] *[1]KU-KIST Graduate School of Converging Science and Technology, Korea University, [2]Applied Quantum Composites Research Center and Institute of Advanced Composite Materials, KIST*

FP1-199	**Gate-Tunable Rectification in $PdSe_2$ Heterostructure FETs** Dongwook Seo, Jae Eun Seo, Tanmoy Das, and Jiwon Chang *UNIST*
FP1-200	**Healing Layer for Recycled Usage of Photoelectrode** Pan Lu and Dor Chang Lee *Department of Chemical and Biomolecular Engineering and KAIST Institute for the Nanocentury, KAIST*
FP1-201	**Highly Active Hydrogen Evolution Catalysis by Uniquely Designed Amorphous/Metal Interface of Core–shell Phosphosulfide/N-Doped CNTs** Gang San Lee, Dong Jun Li, and Sang Ouk Kim *Departmetn of Materials Science and Engineering, KAIST*
FP1-202	**Highly Aligned Graphene Oxide Aerogel Fabrication by Liquid Crystallinity** Jin Goo Kim, Kyung Eun Lee, and Sang Ouk Kim *KAIST*
FP1-203	**How Microstructure of Donor-Acceptor Polymers Affects the Synaptic Plasticity of the Ion-gel Gated Synaptic Transistors** Naryung kim[1], Chun Yan Gao[2], Yeongjun Lee[1], Hea-Lim Park[1], Wanhee Lee[3], Hoichang Yang[2], YunHi Kim[2], and Tae-Woo Lee[1] *[1]Department of Materials Science and Engineering, Seoul National University, [2]Department of Chemical Engineering, Inha University, [3]Department of Chemistry, Gyeongsang National University*
FP1-204	**Identification of Quantum Transport through Metal Cations in Particle-on-film System** Jihye Lee, Deok-Jin Jeon, Sang-Heon Park, and Jong-Souk Yeo *School of Integrated Technology and Yonsei Institute of Convergence Technology, Yonsei University*
FP1-205	**Improvement of Hole Injection on InP Quantum Dot-Based Light-Emitting Diodes** Hyeonjun Lee and Doh C. Lee *Department of Chemical and Biomolecular Engineering, KAIST*
FP1-206	**Increased Electrical Conductivity of Electron Transport Layer of InP Quantum Dot-Based Light-Emitting Diodes** Taemin Lee, Hyeonjun Lee, and Doh C. Lee *Department of Chemical and Biomolecular Engineering and KAIST Institute for the Nanocentury, KAIST*
FP1-207	**Investigation of Structural and Electrical Properties in Core-shell VO_2@Al_2O_3 Nanobeams** Ki Hoon Shin[1], Jongwon Yoon[2], Min-kyu Seo[1], Eun Min Kim[1], Woong-Ki Hong[2], and Jung Inn Sohn[1] *[1]Division of Physics and Semiconductor Science, Dongguk University, [2]Jeonju Center, Korea Basic Science Institute*

FP1-208	**Low-Power Complementary Inverter Using Polymer Electrolyte Gated n- and p-type Graphene Field-Effect Transistors** Myungwoo Son[1], Hanggyu Kim[2], and Moon-ho Ham[2] *[1]Photonic Energy Research Center, KOPTI, [2]School of Materials Science and Engineering, GIST*
FP1-209	**MOS 커패시터가 내장된 그래핀/Ge 쇼트키 접합 광소자** 김시현, 유태진, 권민규, 이용수, 김승모, 황현준, 이병훈 *Center for Emerging Electronic Devices and Systems and School of Materials Science and Engineering, GIST*
FP1-210	**New Type of Transient System Triggered by Chemically Gas-producing Reaction** Jeong-Woong Shin, Jong-Chan Choi, and Suk-Won Hwang *KU-KIST Graduate School of Converging Science and Technology, Korea University*
FP1-211	**Nitrogen Doping Porous Carbon materials as a Zn-Br Battery Electrode** Gyoung Hwa Jeong, and Sang Ouk Kim *National Creative Research Initiative (CRI) Center for Multi-Dimensional Directed Nanoscale Assembly, Department of Materials Science and Engineering, KAIST*
FP1-212	**Non-volatile, Rewritable Magneto-interactive Electroluminescent Display** Seung Won Lee, Soyeon Baek, and Cheolmin Park *Yonsei University*
FP1-213	**Omnidirectional Deformable CNT-PANI Hybrid Textile for Human Joint Movement Compatible Wearable Supercapacitors** Seung-Bo Ko, Joonwon Lim, and Sang Ouk Kim *National Creative Research Initiative Center for Multi-Dimensional Directed Nanoscale Assembly and Department of Materials Science & Engineering, KAIST*
FP1-214	**One-step Nanocasting of TiO_2 Nanoparticle Based Metasurfaces** Kwan Kim[1], Gwanho Yoon[2], Seungho Baek[1], Hojung Kang[1], Jaemin Park[1], Junsuk Rho[2], and Heon Lee[1] *[1]Department of Materials Science and Engineering, Korea University, [2]Department of Mechanical Engineering, POSTECH*
FP1-215	**Open Porous Graphene Nanoribbon Hydrogel via Interfacial Self-Assembly for High-Performance Biosensing and Energy Storage** Hee-Ro Chae[1], Joonwon Lim[2], and Sang Ouk Kim[1] *[1]KAIST, [2]LG Chem, Ltd.*
FP1-216	**Orientation Engineering of Two-Dimensional Perovskite for Optoelectronic Device Applications** Junwoo Kim, Woocheol Lee, Jae-Keun Kim, Heebeom Ahn, Jonghoon Lee, Keehoon Kang, and Takhee Lee *Department of Physics and Astronomy, Seoul National University*

FP1-217	**Pd-coated Carbon Nanotube Composite Based Hydrogen Gas Sensor** Jae Keon Kim[1,2], Junyeop Lee[1,2], Yeil Choi[3], Namgon Do[1,2], Yeong Sam Kim[1], Hee Kyung An[1], Gil Sik Lee, Seong Ho Kong[2], and Daewoong Jung[1] *[1]KITECH, [2]Kyungpook National University, [3]The University of Texas at Dallas*
FP1-218	**Photothermal Reduction of Janus Graphene Liquid Crystalline Fiber for Humidity Sensors** In Ho Kim and Sang Ouk Kim *Department of Materials Science and Engineering, KAIST*
FP1-219	**Polarity Modulation of $PdSe_2$ FETs through Contact Engineering** Jae Eun Seo, Dongwook Seo, Tanmoy Das, and Jiwon Chang *School of Electrical and Computer Engineering, UNIST*
FP1-220	**Polymerization of Polyaniline Chains-CNTs from N-doped Sites of Carbon Nanotubes** Yong Park[1], Atta Ul Haq[2], Joonwon Lim[1], and Sang Ouk Kim[1] *[1]Department of Materials Science & Engineering, KAIST, [2]NIBEC*
FP1-221	**Rapid Interfacial Assembly of Electrochemically Exfoliated Graphene Flakes into Graphene Films for Transparent and Flexible Optoelectronic Applications** Yunho Kang[1], Jongwon Shim[2], Taeyeong Yun[1], and Sang Ouk Kim[1] *[1]KAIST, [2]Dongduk Women's University*
FP1-222	**Self-gating Diode Using Graphene as an Electrode Reach to Ideality Factor** Minji Lee and Woojong Yu *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-223	**Size Selection of Graphene Oxide Using Liquid Crystal Property** Hong Ju Jung, Kyung Eun Lee, and Sang Ouk Kim *KAIST*
FP1-224	**Specific Reactive Oxygen Species (ROS) Generation of Bandgap Engineered Quantum Dots (QDs) for Drug-resistant Bacteria Killing** Ilsong Lee and Doh C. Lee *Korea Department of Chemical and Biomolecular Engineering, KAIST Institute for the Nanocentury, KAIST*
FP1-225	**Sputtering Based Electrocatalyst WSe_2 Layered Nanomaterials for Hydrogen Evolution Reactions** Jae Hyeon Nam, Hye Yeon Jang, Woojin Park, and Byungjin Cho *Department of Advanced Material Engineering, Chungbuk National University*

FP1-226	**Study on Solar-driven H_2 Evolution from Biomass with Surface-modified Cd-free Colloidal Quantum Dots** Nianfang Wang and Doh Chang Lee *Department of Chemical and Biomolecular Engineering (BK21+ Program), KAIST Institute for the NanoCentury, KAIST*
FP1-227	**Study on the Effect of Surface Charge Transfer Doping on Charge Transport of WSe_2** Jae-Keun Kim, Kyungjune Cho, Youngrok Kim, Junseok Seo, Jiwon Shin, Keehoon Kang, and Takhee Lee *Department of Physics and Astronomy, Seoul National University*
FP1-228	**Synthesis of $Cd_xZn_{1-x}Se/ZnS$ Heterostructured Nanoplatelets via Cation Exchange** Da-Eun Yoon and Doh C. Lee *Department of Chemical and Biomolecular Engineering and KAIST Institute for the Nanocentury, KAIST*
FP1-229	**Synthesis of Efficient Blue Emitting $CsPb(Br/Cl)_3$ Nanoparticles via Post-Treatment with Non-coordination Anions and Divalent Metal Ion Doping** Kyung Yeon Jang, Jinwoo Park, and Tae-Woo Lee *Department of Materials Science and Engineering, Institute of Engineering Research, Research Institute of Advanced Materials, Nano Systems Institute (NSI), BK21 PLUS SNU Materials Division for Educating Creative Global Leaders, Seoul National University*
FP1-230	**Synthesis of MoSx/ Ni-MOF-74 Core-Shell Structure for Efficient Hydrogen Evolution Reaction** Ha Huu Do[1] and Soo Young Kim[2] *[1]School of Chemical Engineering and Materials Science and Integrative Research Center for Two-dimensional Functional Materials and Institute of Interdisciplinary Convergence Research, Chung- Ang University, [2]Department of Materials Science and Engineering, Korea University*
FP1-231	**Tailoring the Charge Transport at ZnO/Oxide Interfaces for High Performance of Field-effect-transistor** Hyungjin Kim and Woo Jong Yu *Department of Electrical and Computer Engineering, Center for Integrated Nanostructure Physics (CINAP), Institute for Basic Science (IBS), Sungkyunkwan University*
FP1-232	**Towards a Reliable and Controllable Deposition of Organic-Inorganic Halide Perovskite Materials by Single-Source Flash Evaporation** Jonghoon Lee, Woocheol Lee, Heebeom Ahn, Junwoo Kim, Youngrok Kim, Daekyoung Yoo, Keehoon Kang, and Takhee Lee *Department of Physics and Astronomy, Seoul National University*
FP1-233	**Ultra-Highly-Integrated Waveguide based on Active Meta-Materials** Byoungsu Ko[1,2], Sung-hoon Hong[1], and Junsuk Rho[2] *[1]ETRI, [2]POSTECH*
FP1-234	**ZrO2/SiO2 Multilayered Daytime Passive Radiative Cooling Device** Soomin Son, Jaemin Park, Pil-Hoon Jung, Yong Hoon Sung, Dongwoo Chae, Yuting Liu, Junho Jun, and Heon Lee *Korea University*

FP1-235	**흑린 기반 인체삽입형 일시동작 트랜지스터** Min-Kyu Song[1,2], Seok Daniel Namgung[4], Ki Tae Nam[4], Yoon-Sik Lee[3], and Jang-Yeon Kwon[1,2] *[1]School of Integrated Technology, Yonsei University, [2]Yonsei Institute of Convergence Technology, [3]School of Chemical and Biological Engineering, Nano Systems Institute, Seoul National University, [4]Department of Materials Science and Engineering, Seoul National University*
FP1-236	**Directed Self-Assembly via Topological Confinement for Block Copolymer Phase Engineering** 신진용, 정성준 *숭실대학교, 정보통신 소재융합학과*
FP1-237	**강자성체/중금속 이중층에서 강자성층 두께에 따른 Unidirectional Spin Hall Magnetoresistance에 대한 연구** 장희찬[1], 박은강[1], 이년종[1,2], 유천열[2], 김상훈[1] *[1]울산대학교 물리학과, [2]대구경북과학기술원 신물질과학전공*
FP1-238	**Spin Logic Devices based on the Magnetic Domain Wall Motion** Geun-Hee Lee, Kyoung-Hoon Kim, Jae-Hyeon Park, and Kab-Jin Kim *Department of Physics, KAIST*
FP1-239	**Topological Guiding of Magnetic Skyrmions for Skrymion Racetrack Memory** Moojune Song[1], Ji-Ho Park[1], Hyeon-Kyu Kim[1], Kyoung-Woong Moon[2], Chanyong Hwang[2], and Kab-Jin Kim[1] *[1]Department of Physics, KAIST, [2]Spin Convergence Research Team, KRISS*
FP1-240	**2차원 자성체 Fe_5GeTe_2에서의 자기저항과 열적 안정성** 김광수[1,2], 안효빈[3], 송경미[2], 이창구[3], 박태언[2], 김상훈[1] *[1]Depertment of Physics, University of Ulsan, [2]Center for Spintronics, KIST, [3]School of Mechanical Engineering, Sungkyunkwan University*

O. System LSI Design	
FP1-241	**0.18 μm CMOS 공정 Autometical Temperature Compensation Circuit** 김창현, 전호진, 김성진, 이강윤 *성균관대학교 전자전기컴퓨터공학과*
FP1-242	**15-60MHz Low Power RC Oscillator Design with 0.18μm CMOS Process for Wireless Power Transfer System** Seok HwangBo, Mu Geun Shin, and Kang Yoon Lee *Department of Electrical and Computer Engineering, Sungkyunkwan University*

FP1-243	**80 MHz 12 Bit Current Steering DAC for WAVE Application** Hyun-Jae Lee, Sung-Jin Kim, and Kang-Yoon Lee *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-244	**A Hardware Accelerator without Multipliers for Convolutional Deep Neural Networks Oriented to Embedded Systems** Dohyun Kim, Yeong-kyo Kim, Hyunbin Park, and Shiho Kim *School of Integrated Technology, Yonsei University*
FP1-245	**ADPLL 위상 차 검출을 위한 Vernier 기반의 10ps 해상도를 가지는 TDC** Gunho Park, Muhammad Basim, and Kang-Yoon Lee *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-246	**Analysis and Optimization of FFT Data Paths with SNR and Cost Tradeoff** TaeGeon Lee, YongSeok Na, and HyungWon Kim *Department of Electronic Engineering, College of Electrical Engineering, Chungbuk National University*
FP1-247	**Boost Converter for Energy Harvesting Application** Beak-Hwan Kim, Reza E. Rad, Mu-Guen Shin, and Kang-Yoon Lee *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-248	**Constant on Time Control DC-DC Converter with Fast Transient Response Time** Min-Yeong Kim, Young-Woo Park, and Kang-Yoon Lee *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-249	**DSRC 어플리케이션을 위한 가변 PA Ramp 디지털 컨트롤러** Joon-Hong Park and Kang-Yoon Lee *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-250	**Low Power Sensing Single Detector based on Shared Memory Correlator** Mohammed E. Elbtity and HyungWon Kim *MSIS Lab, Chungbuk National University*
FP1-251	**MASNN: Spiking Neural Network for Multiclass Classification of Moving Objects** DongHyung Yoo, Vladimir Kornijcuk, JeongBae Son, and Doo Seok Jeong *Divison of Materials Science and Engineering, Hanyang University*

FP1-252	**Online Training Scheme for Hardware-Based Neural Networks Using Non-Ideal Synaptic Devices** Dongseok Kwon, Sung-Tae Lee, Hyeong-Su Kim, Gyuho Yeom, and Jong-Ho Lee *Department of Electrical and Computer Engineering and Inter-University Semiconductor Research Center, Seoul National University*
FP1-253	**Phase Interpolator with Skewed Quadrature Clock Input** Hyungrok Do and Deog-kyoon Jeong *Seoul National University*
FP1-254	**Quadruple-Mode Active Rectifier that Supports Four Wireless Charging Standard Modes with One Single Chip** Jae Bin Kim, Tae Young Yoon, Sang Gyu Jeon, and Kang-Yoon Lee *College of Information and Communication Engineering, Sungkyunkwan University*
FP1-255	**Rapid SCADA를 사용한 PV 및 ESS 전력 정보 수집/제어 시스템** 박용희, 최성곤 *충북대학교 정보통신공학부*
FP1-256	**STV 영역에서 작동하는 IoT EISC 프로세서의 성능향상** 박상현, 황병진, 김창현, 김선욱 *School of Electrical and Computer Engineering, Korea University*
FP1-257	**Unsupervised Learning of Features in Spiking Convolutional Neural Networks** Seongbin Oh, Sung Yun Woo, Soochang Lee, Jangsaeng Kim, Byung-Gook Park, and Jong-Ho Lee *Department of Electrical and Computer Engineering, Seoul National University*
FP1-258	**Wide Input Range Controlable RF-DC Converter Using Adaptive Matching** Won-Seok Choi, Sol-Hee In, and Kang-Yoon Lee *Department of Electrical and Computer Engineering, Sungkyunkwan University*
FP1-259	**멤리스터 어레이를 이용한 인공신경망 회로의 음의 가중치 표현 방법** Jaeheum Lee and Kyoungrok Cho *Chungbuk National University*
FP1-260	**생활소음 분류를 위한 딥러닝 기반 환경 적응형 임베디드 시스템 설계** 박선영[1], 김현지[1], 변우석[2], 김지훈[1] *[1]이화여자대학교, [2]충남대학교*

FP1-261	**저지연 물리계층보안 기술을 위한 AES+Hash 통합 베이스밴드 시스템** 홍승우, 이영주 *포항공과대학교 전자전기공학과*
FP1-262	**전력 데이터의 스케줄링을 통한 ESS의 최적 SoC 유지 시스템** 이수호, 최성곤 *충북대학교 전파통신공학과*
FP1-263	**전송 선로를 공유하는 20Gbps 16-QAM 인터페이스 송신 회로 설계** Min-Young Jeong, Ju-Young Mun, and Kyoung-Rok Cho *Chungbuk National University*
FP1-264	**신축성 은 나노와이어 전극 제작 및 연신 능력 분석** Jonghyung Jeong and Jaewook Jeong *School of Information and Communication Engineering, Chungbuk National University*
FP1-265	**Ecoflex 유연 기판상에 제작한 고 신축성 은 전극의 특성 분석** Daehoon Park and Jaewook Jeong *School of Information and Communication Engineering, Chungbuk National University*
FP1-266	**Road Centerline Detection Using Hough Transform and Color Segmentation** Salem Ahmed, Ibrahem Hatem, and Kang Hyun Soo *Chungbuk National University*
FP1-267	**차량 공유 서비스를 위한 커뮤니티 질의응답 시스템** 육대범, 윤준영, 이재성 *Chungbuk National University*

P. Device for Energy (Solar Cell, Power Device, Battery, etc	
FP1-268	**Ag_2Se 나노입자 박막과 Si 나노선 복합구조체의 열전도도** 양승건, 조경아, 김상식 *고려대학교 전기전자공학과*

FP1-269	**Atomic-layer-confined Quantum Wells for Efficient 2D Light Emitters** Yoon Seok Kim[1], Sojung Kang[3], Japil So[2], Kangwon Kim[4], Seunghoon Yang[1], Yongjun Shin[4], Seongwon Lee[2], Hyeonsik Cheong[5], Hong-Gyu Park[1,2], Gwang-Hyoung Lee[3,4], and Chul-Ho Lee[1] *[1]KU-KIST Graduate School of Converging Science and Technology, Korea University, [2]Department of Physics, Korea University, [3]Department of Materials Science and Engineering, Yonsei University, [4]Department of Materials Science and Engineering, Seoul National University, [5]Department of Physics, Sogang University*
FP1-270	**Bendable n-type Ag_2Se 나노입자 박막의 열전 특성** 박태호, 조경아, 양승건, 김상식 *고려대학교 전기전자공학과*
FP1-271	**Characterization of Perovskite Solar Cell with Bilayer SnO_2/WO_3 Based Electron Transporting Layer** Maro Kim, Sangmo Kim, Shinkyu Lee, Yoseop Kim, JaeGwon Roh, and Chung Wung Bark *Gachon University*
FP1-272	**Charge Transport Effect and Photovoltaic Conversion of Two-dimensional CdSeS Quantum Dot Monolayer in Inverted Polymer Solar Cells** Guh-hwan Lim, Kyu Seung Lee, Park Young Jae, and Dong Ick Son *Institute of Advanced Composite Materials, KIST*
FP1-273	**Continuous Bandgap Engineering of Wafer-Scale Monolayer $WS_{2x}Se_{2(1-x)}$ Alloys** Hee Seong Kang, Do Hyoung Koo, and Chul-Ho Lee *KU-KIST Graduate School of Converging Science and Technology, Korea University*
FP1-274	**Control of Metal Oxide Crack for Metal Mesh Pattern** Noeul Kim and Hak Ki Yu *Department of Materials Science and Engineering & Department of Energy Systems Research, Ajou University*
FP1-275	**Design of Highly Efficient Catalytic Layers for Alkali Metal Batteries** Jin Hwan Kwak[1], Seong Bak Moon[2], Seung Uk Yoon[2], Sunwoo Park[2], Beom Jin Oh[2], Hyo Won Kwak[3], Hyoung-Joon Jin[2], and Young Soo Yun[4] *[1]Department of Chemical Engineering, Kangwon National University, [2]Department of Polymer Science and Engineering, Inha University, [3]Department of Forest Sciences, Seoul National University, [4]KU-KIST Graduate School of Converging Science and Technology, Korea University*
FP1-276	**Effective Charge Separation of Inverted Polymer Solar Cells Using Versatile MoS2 Nanosheets as Electron Transport Layer** Kyu Seung Lee, Park Young Jae, Guh-hwan Lim, and Dong Ick Son *Institute of Advanced Composite Materials, KIST*

FP1-277	**Fast Analysis Method to Estimate Physical Limits of Super Junction Considering Rsp, BV, and Process Margin Using 2D TCAD** Jieun Lee[1], Jong Min Kim[1], Myeong Bum Pyun[2], Young Seok Kim[2], Youngchul Kim[1], and Joontae Jang[1] *[1]Technology Enabling Design Support Team, DB HiTek Co., Ltd., [2]Specialized Device Development Part, DB HiTek Co., Ltd.*
FP1-278	**Growth of WSe_2 by Control Reaction and Diffusivity of Selenium for Various Application** Eun Yeong Jang and Hak Ki Yu *Department of Materials Science and Engineering & Department of Energy Systems Research Ajou University*
FP1-279	**Interface-Confined High Crystalline Growth of Semiconducting Polymers at Graphene Fibers for Wearable Energy Storage Devices** Syed Ali Salman Hassan, Suchithra Padmajan Sasikala, and Sang Ouk Kim *Department of Materials Science & Engineering, KAIST*
FP1-280	**Mechanical Property of VO_2 Single-crystal Grown on Position Selective Reduction from V_2O_5 Using Thin Carbon Layer** Hyeonho Cho and Hak Ki Yu *Department of Materials Science and Engineering & Department of Energy Systems Research, Ajou University*
FP1-281	**Monolithic Interface Band Engineering to Boost Optoelectronic Performances of 2D Semiconductor p-n Heterojunctions via Enhancing Charge Extraction** Seunghoon Yang[1], Janghwan Cha[2], Jong Chan Kim[3], Yoon-Seok Kim[1], Seung Won Lee[6], Hong-Hyu Park[1,6], Hu Young Jeong[6], Suklyun Hong[2], Gwan-Hyoung Lee[5], and Chul-Ho Lee[1] *[1]KU-KIST Graduate School of Converging Science and Technology, Korea University, [2]Department of Physics and Graphene Research Institute, Sejong University, [3]School of Materials Science and Engineering, UNIST, [4]UNIST Central Research Facilities (UCRF), UNIST, [5]Department of Materials Science and Engineering, Seoul National University, [6]Department of Physics, Korea University*
FP1-282	**N-type $Bi_2Te_{2.7}Se_{0.3}$를 이용한 슈퍼커패시터의 충전 연구** 박윤범, 조경아, 김상식 *고려대학교 전기전자공학과*
FP1-283	**Output Detection Circuit을 이용한 향상된 Load Transient을 갖는 LDO 레귤레이터** 권상욱, 도경일, 우제욱, 구용서 *단국대학교 전기전자공학부*
FP1-284	**Quantitative Analysis of Pseudocapacitance on Nanocarbons** Jong Chan Hyun[1], Son Ha[1], Ji Seon Yoo[2], Min Eui Lee[2], Se Youn Cho[2], and Young Soo Yun[3] *[1]Department of Chemical Engineering, Kangwon National University, [2]Carbon Composite Materials Research Center, KIST, [3]KU-KIST Graduate School of Converging Science and Technology, Korea University*

FP1-285	**Spectrally Selective Multilayer Emitter for Passive Daytime Radiative Cooling** Dongwoo Chae, Pil-Hoon Jung, Soomin Son, Yuting Liu, Hojung Kang, HANGYU LIM, and Heon Lee *Korea University*
FP1-286	**Surface Texturing of Conductive Electrodes for Front-illuminated Devices via Metal-assisted Chemical Etching** Haekyun Bong, Kyunghwan Kim, and Jungwoo Oh *School of Integrated Technology and Yonsei Institute of Convergence Technology, Yonsei University*
FP1-287	**Surfactant-assisted Wafer-scale Growth of High Quality Tungsten Disulfides Using Metal-organic Chemical Vapor Deposition** Do Hyoung Koo, Hee Seong Kang, and Chul-Ho Lee *KU-KIST Graduate School of Converging Science and Technology, Korea University*
FP1-288	**전력반도체용 Cu/C 복합재료의 제조 및 방열특성 평가** 이재성[1], 이윤재[2], 이동주[1] *[1]충북대학교 신소재공학과, [2]제이비에이치*
FP1-289	**화학적 도핑에 따른 대면적 그래핀 열전 소자 특성 분석** 황현준, 김소영, 이상경, 이병훈 *Center for Emerging Electric Devices and Systems, School of Material Science and Engineering, GIST*
FP1-290	**고전압에 특화된 Si기반 Super Junction IGBT의 Planar Gate와 Trench Gate Type구조의 전기적 특성 및 장단점** Geon Hee Lee, Byoung Sub Ahn, and Ey Goo Kang *Far East University*
FP1-291	**1,200V Trench Gate Field-Stop IGBT 전계 특성 연구** Hae Seock Lee, Chang Hyun Jo, Byoung Sup Ahn, and Ey Goo Kang *Department of Energy IT, Far East University*
FP1-292	**900 V Super Junction Trench Power MOSFET의 최적화 특성에 관한 연구** Youn Young Huh, Chun Qing Li, Byoung Sup Ahn, and Ey Goo Kang *Department of Energy IT, Far East University*
FP1-293	**Gate 구조에 따른 60V POWER MOSFET에 대한 실험과 분석** Hyeong Seong Jo, Li Chao, Byoung Sup Ahn, and Ey Goo Kang *Department of Energy IT, Far East University*

FP1-294	**Electrical Characteristics According to 1,200 V Reverse Conducting-IGBT** Se-Young Kim, Chang Hyeon Jo, Byoung Sup Ahn, and Ey-Goo Kang *Department of Energy IT, Far East University*

Q. Metrology, Inspection, and Yield Enhancement	
FP1-295	**Development of Scanning-Element Mueller-Matrix Ellipsometer** Jae Wan Kim[1] and Jong-Ahn Kim[2] *KRISS*
FP1-296	**Numerical Investigation of the Feasibility of Through-focus Scanning Optical Microscopy (TSOM) Based Defect Inspection of NAND Trench Structure** Shin-Woong Park[1], Byeong Geon You[2], Junho Lee[2], and Hwi Kim[1] *[1]Korea University, [2]Kongju National University*
FP1-297	**Raman Spectroscopy로 측정한 실리콘 전자 렌즈의 특성 변화** 이영복, 김형우, 유용진, 이건우, 김대욱, 안승준, 김호섭 *선문대학교 나노과학과, 차세대반도체기술연구소*
FP1-298	**Strain Visualization in Nanoscale-triangular SiGe Patterns by Dark-field Electron Holography** Jun-Mo Yang, Kyung Jin Park, Yun Chang Park, and Jung Ho Yoo *Department of Measurement and Analysis, National Nanofab Center*
FP1-299	**Study of Non-destructive Test for Reliability of Power Devices** You-Cheol Jang[1], Min-Woo Ha[2], and Yong-Sang Kim[1] *[1]Sungkyunkwan University, [2]Myongji University*
FP1-300	**Study on Highly Anisotropic Dielectric Function of α-SnS at 27 K by Spectroscopic Ellipsometry** V. L. Le[1,3], D.C. Do[2], X.A. Nguyen[1], H. T. Nguyen[1], H. G. Park[1], M. H. Nguyen[2], S.-L. Cho[2], H. M. Cho[3], Y. J. Cho[3], W. Chegal[3], D. H. Kim[3], S. H. Rhim[2], S. C. Hong[2], T. J. Kim[1], and Y. D. Kim[1] *[1]Department of Physics, Kyung Hee University, [2]Department of Physics and Energy Harvest-Storage Research Center, University of Ulsan, [3]Semiconductor Integrated Metrology Team, KRISS*
FP1-301	**반도체 웨이퍼 표면 금속성 불순물 이온 자동화 검출 및 분석 설비 시스템 개발** 오문식, 전혁, 김태형, 정광환, 이동춘, 김정환 *㈜엔비스아나*

FP1-302	**저전압 SEM을 이용한 MoS_2 박막의 층수와 결함 측정연구** 박병천[1], 라케쉬[1], 홍성구[1], 강영호[2] *[1]한국표준과학연구원 산업표준본부, [2]전남대학교 물리교육과*
FP1-303	**광학 검사 장비를 이용한 미세 Particle 검사 방법 개발** Seuri Jeong, Kyuyoung Kim, Deokin Kim, Changhwan Lee, Jinhee Han, Seongmin Ma, and Byoungho Lee *SK Hynix*

P. Device for Energy (Solar Cell, Power Device, Battery, etc	
FP1-304	**Ultrasensitive Plasmon-free Surface-enhanced Raman Spectroscopy with Femtomolar Detection Limit from 2D van der Waals Heterostructure** Jihyung Seo, Junghyun Lee, Yongchul Kim, Donghwan Koo, Geunsik Lee, and Hyesung Park *UNIST*
FP1-305	**Highly Efficient and Stable Perovskite Solar Cells produced via Incorporation of Semiconducting Acceptor as Efficient Chemical Additive** Donghwan Koo, Yongjoon Cho, Changduk Yang, and Hyesung Park *Department of Energy Engineering, School of Energy and Chemical Engineering, Low Dimensional Carbon Materials Center, Perovtronics Research Center, UNIST*
FP1-306	**Multifaceted Role of a Dibutylhydroxytoluene Processing Additive in Enhancing the Efficiency and Stability of Planar Perovskite Solar Cells** Sujit Kumar[1], Yunseong Choi[1], So-Huei Kang[1], Nam Khen Oh[1], Junghyun Lee[1], Jihyung Seo[1], Mingyu Jeong[1], Hyoung Woo Kwon[2], Sang Il Seok[2], Changduk Yang[1], and Hyesung Park[1] *[1]Department of Energy Engineering, School of Energy and Chemical Engineering, Low Dimensional Carbon Materials Center, Perovtronics Research Center, UNIST, [2]Department of Energy Engineering, School of Energy and Chemical Engineering, Perovtronics Research Center, UNIST*
FP1-307	**Suppressed Interdiffusion and Degradation in Transparent Metal Electrode-Based Flexible Perovskite Solar Cells Using Graphene Interlayer** Gyujeong Jeong, Donghwan Koo, Seungon Jung, Yunseong Choi, Junghyun Lee, Jihyung Seo, and Hyesung Park *UNIST*
FP1-308	**Zwitterion Functionalization of Graphene with pH Independent Dispersion Stability: Efficient Electron Mediator for Oxygen Evolution Reaction in Acidic Medium** Ungsoo Kim[1], Yongjoon Cho[1], Dasom Jeon[2], Yongchul Kim[3], Sanghyeon Park[1], Jihyung Seo[1], Junghyun Lee[1], Nam Khen Oh[1], Geunsik Lee[3], Jungki Ryu[2], Changduk Yang[1], and Hyesung Park[1] *[1]Department of Energy Engineering, School of Energy and Chemical Engineering, Low Dimensional Carbon Materials Center, Perovtronics Research Center, UNIST, [2]Department of Energy Engineering, School of Energy and Chemical Engineering, UNIST, [3]Department of Chemistry, UNIST*