

ICSCRM 2026 Technical Program

Sunday, September 27

Tutorial (9:30-17:30, 4th Floor, G403+G404)

09:30-9:40

Tutorial Introduction

○ Yoshiyuki Yonezawa

National Institute of Advanced Industrial Science and Technology (AIST) (Japan)

09:40-10:40 Tut-01

Fundamentals of SiC Power Semiconductors: Material and Device Physics

○ Tsunenobu Kimoto

Kyoto University (Japan)

10:40-11:00 Break

11:00-12:00 Tut-02

How SiC Power Devices Can Re-Shape Modern Power Electronics

○ Peter Friedrichs

Infineon Technologies (Germany)

Lunch

13:30-14:30 Tut-03

Next Generation SiC Power Devices

○ Shinsuke Harada

National Institute of Advanced Industrial Science and Technology (AIST) (Japan)

14:30-14:50 Break

14:50-15:50 Tut-04

From Material Perturbation to Device Degradation in SiC

○ Ulrike Grossner

ETH Zürich (Switzerland)

15:50-16:10 Break

16:10-17:10 Tut-05

SiC Power Modules : From the Basics to the Latest Trends

○ Yoshikazu Takahashi

Tohoku University (Japan)

17:10-17:30

Wrap up

Welcome Reception (18:00-20:00, 1st Floor)

Opening (9:00-9:10, 1st Floor)

Plenary Lectures and Invited Poster Short Presentations (9:10-11:10, 1st Floor)

Session Chair: Hidekazu Tsuchida (Central Research Institute of Electric Power Industry, Japan), Hiroshi Yano (University of Tsukuba, Japan)

09:10 Mo-PL-01 (Invited)

From Wafer to Inverter: The MIRISE Power Device Journey

○ Yoshifumi Kato¹

1.MIRISE Technologies Corp. (Japan)

09:55 Mo-PL-02 (Invited)

Point Defects in Silicon Carbide: From the Characterization of Dopants and Deep Traps to Quantum Systems and F.A.I.R. Research Data

○ Michael Krieger¹

1.Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany)

10:40 IP-01 (Invited)

Development of n-type Epitaxial Growth on 300 mm 4H-SiC Wafers

○ Weining Qian^{1, 2}, Feihong Huang¹, Kai Yang¹, Gan Feng¹, Yongqiang Sun¹, Junyong Kang², Jianhui Zhao^{1, 2}

1.Epiworld International Co., Ltd. (China), 2.Xiamen University (China)

10:45 IP-02 (Invited)

Thermal response of threading dislocations in SiC substrates using UV-excited lock-in thermography

○ JUHYEONG Sun¹, Ryohei Fujita¹, Michio Kawase², Hosei Nagano¹, Masashi Kato³, Kenta Murayama⁴, Kentaro Kutsukake^{1, 2}, Toru Ujihara^{1, 2}, Shunta Harada^{1, 2}

1.Nagoya university (Japan), 2.Inst. of Materials and Systems for Sustainability (IMaSS) (Japan), 3.Nagoya Institute of Technology (Japan), 4.Mipox Corporation (Japan)

10:50 IP-03 (Invited)

Gate-Oxide Protection for Enhanced Single-Event Robustness in SiC Power MOSFETs

○ Heng WANG^{1, 2}, Yun XIA¹, LyuZhang PENG³, ChangWei Zheng¹, SiRui FENG¹, XinPeng LIN¹, Pengwei ZHOU², YingChen YANG², Gang CHEN¹, YuXi WAN¹, Gang Lyu³, Kevin Jing CHEN²

1.Shenzhen Pinghu Lab. (China), 2.The Hong Kong Univ. of Sci. and Tech. (Hong Kong), 3.Beihang Univ. (China)

10:55 IP-04 (Invited)

Evolution of color centers at SiO₂/SiC interfaces during repeated thermal annealing tracked in pre-defined observation windows

○ Kentaro Onishi¹, Masahiro Hara¹, Heiji Watanabe¹, Takuma Kobayashi¹

1.The University of Osaka (Japan)

11:00 Announcement

Lunch

Poster Session (13:00-15:00, 1st & 4th Floors)

Invited Poster (1st Floor)

13:00 Mo-IP (Invited)

Development of n-type Epitaxial Growth on 300 mm 4H-SiC Wafers

○ Weining Qian^{1, 2}, Feihong Huang¹, Kai Yang¹, Gan Feng¹, Yongqiang Sun¹, Junyong Kang², Jianhui Zhao^{1, 2}

1.Epiworld International Co., Ltd. (China), 2.Xiamen University (China)

Detailed poster program is provided in the following pages.

Oral Sessions (15:10-16:40)

Mo-1A: MOS Interface Processing <i>Oral-A(1st Floor, G7+G8) (15:10-16:40)</i> <i>Session Chair: Fabrizio Roccaforte (CNR-IMM, Italy), Hirohisa Hirai (National Institute of Advanced Industrial Science and Technology, Japan)</i>	Mo-1B: Bulk Growth I <i>Oral-B(3rd Floor, G303+G304) (15:10-16:40)</i> <i>Session Chair: Didier Chaussende (CNRS / Université Grenoble Alpes, France), Chao Gao (SICC, China)</i>
15:10 Mo-1A-01 (Invited) Advanced interface design through two-step hydrogen annealing for high-reliability SiC MOS devices ○ Takuma Kobayashi ¹ , Masahiro Hara ¹ , Heiji Watanabe ¹ 1.UOsaka	15:10 Mo-1B-01 (Invited) Development of fast 4H-SiC Bulk Crystal Growth by high-temperature gas-source method ○ Takeshi Okamoto ¹ , S. Sakakibara ¹ , D. Uematsu ¹ , H. Uehigashi ¹ , T. Kanda ¹ 1.MIRISE Technologies Corp. (Japan)
15:40 Mo-1A-02 The vital role of pre-deposition annealing in diluted hydrogen for achieving high-quality SiC MOS structures ○ Shoto Sawada ¹ , Takuma Kobayashi ¹ , Hiroki Fujimoto ¹ , Masahiro Hara ¹ , Heiji Watanabe ¹ 1.Univ. of Osaka	15:40 Mo-1B-02 Scaling Laws for Stress-Driven Prismatic Slip Activation in 2-inch to 18-inch SiC Boules Kevin Kayang ¹ , Zeyu Chen ¹ , Balaji Raghothamachar ¹ , Michael Dudley ¹ , ○ Dilip Gersappe ¹ 1.Stony Brook University
16:00 Mo-1A-03 Enhanced Interface Properties and Channel Mobility in ALD SiO₂/4H-SiC MOS Devices via High-Temperature Surface Pretreatment in Hydrogen Ambient ○ Mustafa Akif YILDIRIM ¹ , Vishal Ajit Shah ¹ , Hidekazu Tsuchida ² , Koichi Murata ² , Nikolaos Iosifidis ¹ , Peter Gammon ¹ , Marina Antoniou ¹ , Arne Benjamin Renz ¹ 1.Univ. of Warwick, 2.Central Research Institute of Electric Power Indus. (CRIEPI)	16:00 Mo-1B-03 Realistic Simulation of SiC Crystal Growth with Hybrid Molecular Dynamics and Monte Carlo Approaches ○ Alexander Reichmann ¹ , Lorenz Romaner ¹ 1.Montanuniversität Leoben

16:20 Mo-1A-04 Insights on the role of NO annealing in the Dit generation in lateral MOSFETs during Gate Switching stress ○ Patrick Fiorenza ¹ , Marco Zignale ¹ , Simone Milazzo ¹ , Cateno Marco Camalleri ² , Laura Scalia ² , Mario Saggio ² , Marilena Vivona ¹ , Filippo Giannazzo ¹ , Fabrizio Roccaforte ¹ <i>1.CNR-IMM, 2.STMicroelectronics</i>	16:20 Mo-1B-04 Efficient and interpretable optimization of cooling conditions for dislocation density reduction in SiC crystal growth ○ Ryo Fukasawa ¹ , Toru Asahi ¹ , Fumihiro Fujie ² , Hidekazu Tsuchida ² <i>1.Waseda Univ., 2.Central Res. Inst. of Electric Power Indus.</i>
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Oral Sessions (17:00-18:30)	
Mo-2A: Metal Contacts and Interface Engineering <i>Oral-A(1st Floor, G7+G8) (17:00-18:30)</i> <i>Session Chair: Shin-Ichiro Kuroki (Hiroshima University, Japan), Arash Salemi (Navitas Semiconductor, USA)</i>	Mo-2B: Emerging Quantum Color Centers <i>Oral-B(3rd Floor, G303+G304) (17:00-18:30)</i> <i>Session Chair: Takuma Kobayashi (The University of Osaka, Japan), Vytautas Žalandauskas (University of Oslo, Norway)</i>
17:00 Mo-2A-01 (Invited) Status and Prospects for Reduced Specific On-Resistance in Planar and Trench 4H-SiC MOSFETs ○ Dallas Morissette ¹ , Koushik Ramadoss ¹ , James A Cooper ¹ <i>1.Purdue Univ.</i>	17:00 Mo-2B-01 (Invited) Quantum Sensing from 2-nm Shallow Divacancy-related Qubits in 4H-SiC Pei Li ^{2, 3, 1} , Ji-Yang Zhou ⁴ , Song Li ¹ , Péter Udvardhelyi ¹ , Jin-Shi Xu ⁴ , Chuan-Feng Li, Guang-Can Guo ⁴ , Bing Huang ^{3, 6} , ○ Adam Gali ^{1, 5, 7} <i>1.HUN-REN Wigner Research Centre for Physics, 2.Tianjin University of Technology, 3.Beijing Computational Science Research Center, 4.University of Science and Technology of China and Hefei National Laboratory, 5.Budapest University of Technology and Economics, 6.Beijing Normal University, 7.MTA-WFK "Lendület" Momentum Semiconductor Nanostructures Research Group</i>
17:30 Mo-2A-02 Surface Morphology Evolution During Hydrogen Etching of 4H-SiC (0001) in limited regions ○ Alfio Samuele Mancuso ^{1, 2} , Francesco La Via ² , Marco Mauceri ³ , Massimo Camarda ⁴ , Corrado Bongiorno ² , Salvatore Pannitteri ² , Simona Boninelli ² <i>1.Univ. of Catania, 2.Inst. of CNR-IMM, 3.Manufac. of ASM International, 4.Res. of STLab</i>	17:30 Mo-2B-02 Chlorine-Related Defects in 4H-SiC as a Platform for Telecom Quantum Memories ○ Andrei N. Anisimov ¹ , Ashin Varghese Mathews, Kalliopi Mavridou, Manfred Helm, Georgy V. Astakhov <i>1.Helmholtz-Zentrum Dresden-Rossendorf</i>
17:50 Mo-2A-03 Processing and characterization of Mo-nitride Schottky contacts on 4H-SiC ○ Marilena Vivona ¹ , Davide Schiera ^{1, 2} , Simone Milazzo ¹ , Marco Zignale ¹ , Valerio Votadoro ¹ , Salvatore Di Franco ¹ , Markus Italia ¹ , Raffaella Lo Nigro ¹ , Giuseppe Greco ¹ , Isodiana Crupi ² , Patrick Fiorenza ¹ , Fabrizio Roccaforte ¹ <i>1.CNR-IMM, 2.Univ. of Palermo</i>	17:50 Mo-2B-03 Quantum Emitters at the Telecom C-band ○ Danial Shafizadeh ¹ , Misagh Ghezellou ¹ , Viktor Mihaly Bobal ² , Lasse Vines ² , Jawad UlHassan ¹ , Valdas Jokubavicius ^{1, 3} , Nguyen Tien Son ¹ , Ivan Gueorguiev Ivanov ¹ <i>1.Linköping University, 2.University of Oslo, 3.TekSiC</i>
18:10 Mo-2A-04 A Novel Non-Alloyed Sc-Based Low Work-Function Metal Scheme for Ohmic Contacts to N-type 4H-SiC ○ Abdul Hannan Yeo ^{1, 2} , Jay Sin Jie Liew ¹ , Yu-Chieh Chien ¹ , Qin Gui Roth Voo ¹ , Zijie Zheng ^{1, 2} , Xiaolin Wang ^{1, 2} , Leming Jiao ^{1, 2} , Runze Wang ¹ , Liyuan Liu ¹ , Lakshmi Kanta Bera ¹ , Shiv Kumar ¹ , Umesh Chand ¹ , Navab Singh ¹ , Xiao Gong ^{1, 2} , Yee Chia Yeo ^{1, 2} <i>1.Inst. of Microelectronics (IME), A*STAR, 2.National Univ. of Singapore</i>	18:10 Mo-2B-04 First-principles strain engineering of telecom V4+ in 4H-SiC for quantum devices ○ Petros Panagis Filippatos ¹ , Gergő Thiering ¹ , Adam Gali ^{1, 2} <i>1.hun-ren wigner research centre for physics, 2.Budapest University of Technology and Economics, Budapest, Hungary</i>

Industrial Sessions (18:50-20:20)	
Industrial Session-A <i>Oral-A(1st Floor, G7+G8) (18:50-20:20)</i>	Industrial Session-B <i>Oral-B(3rd Floor, G303+G304) (18:50-20:20)</i>

Oral Sessions (08:40-10:20)	
Tu-1A: Novel Architectures <i>Oral-A(1st Floor, G7+G8) (08:40-10:20)</i> <i>Session Chair: Mario Giuseppe Saggio (STMicroelectronics, Italy), Victor Veliadis (PowerAmerica, USA)</i>	Tu-1B: Bulk Growth II <i>Oral-B(3rd Floor, G303+G304) (08:40-10:10)</i> <i>Session Chair: Seong-Min Jeong (Korea Institute of Ceramic Engineering and Technology, Korea), Elif Balkas (Wolfspeed, USA)</i>
08:40 Tu-1A-01 Low Negative Bias Temperature Instability in Vertical 4H-SiC FinFETs ○ Hitoshi Fujioka ¹ , Eiji Kagoshima ¹ , Teruaki Kumazawa ¹ , Masahiro Kumita ¹ , Yuta Furumura ¹ , Tsuyoshi Nishiwaki ¹ , Hirokazu Fujiwara ¹ , Qian Wang ² , Tsunenobu Kimoto ³ , Florin Udrea ² <i>1.MIRISE Technologies Corp., 2.Univ. of Cambridge, 3.Kyoto Univ.</i>	08:40 Tu-1B-01 (Invited) Continuous Quality Enhancement of P-type 4H-SiC Substrates through Solution Growth ○ Yifan Dang ¹ , Can Zhu ¹ , Penglei Chen ¹ , pengfei Liu ¹ , Huiqin Zhou ¹ , Tianyu Shu ¹ , Chao Gao ¹ <i>1.SICC Co. Ltd.</i>
09:00 Tu-1A-02 Investigation and Improvement of the Trade Off Between Reverse Recovery and Conduction Performance in SiC MOSFETs ○ Jeff Joohyung Kim ¹ , Jae-Hyung Park ¹ , Arman Ur Rashid ¹ , Sei-Hyung Ryu ¹ <i>1.Wolfspeed, Inc.</i>	09:10 Tu-1B-02 Growth and Defect Analysis of Low-Doped 4H-SiC Bulk Crystals Grown by High-Temperature CVD ○ Satoshi Matsuzawa ^{1, 2} , Fumihiro Fujie ¹ , Satoshi Asada ¹ , Dai Kutsuzawa ¹ , Tomohiro Shonai ² , Hidekazu Tsuchida ¹ <i>1.Central Res. Inst. of Electric Power Indus., 2.Resonac Corp.</i>
09:20 Tu-1A-03 Improving Conduction-Switching Correlation by Split-Gate Structure in 4H-SiC Hexagonal MOSFETs ○ Chih-Yen Teng ¹ , Kung-Yen Lee ^{1, 2} , Pei-Chun Liao ³ , Jung-Chieh Chen ¹ , Lu-Heng Wang ² , Yen-Lin Chiu ¹ , Ruei-Ci Wu ³ <i>1.Department of Engineering Science and Ocean Engineering, National Taiwan University, 2.Graduate School of Advanced Technology, National Taiwan University, 3.SiCEV Electronics Co., Ltd</i>	09:30 Tu-1B-03 Dynamics of step morphology evolution during SiC solution growth under switching flow conditions ○ Zhicheng Guan ¹ , Xin Liu ² , Kentaro Kutsukake ^{1, 3} , Shunta Harada ^{1, 3} , Toru Ujihara ^{1, 2, 3} <i>1.Graduate School of Engineering, Nagoya University, 2.D-center, Nagoya University, 3.Institute of Materials and Systems for Sustainability (IMaSS), Nagoya University</i>
09:40 Tu-1A-04 Investigation of Saturation Current Characteristics and Short-Circuit Behavior of Monolithically Integrated 1.2 kV SiC Bi-Directional MOSFETs ○ Seung Yup Jang ^{1, 4} , Stephen A Mancini ¹ , Daixin Chen ² , Andrew Binder ³ , Richard Floyd ³ , Robert Kaplar ³ , Jack Flicker ³ , Stan Atcitty ³ , Adam J Morgan ⁴ , Xiaoqing Song ² , Woongje Sung ¹ <i>1.Univ. at Albany, 2.Univ. of Arkansas, 3.Sandia National Labs., 4.NoMIS Power Corp.</i>	09:50 Tu-1B-04 Application of Close Space Physical Vapor Transport for Large Area Growth of n-type 4H-SiC Thin Crystals using a TableTop Setup ○ Peter J Wellmann ¹ , Philipp Wunder ¹ , Ole Schneider ¹ , Cristina Grazzi ¹ <i>1.Universität Erlangen-Nürnberg (FAU)</i>
10:00 Tu-1A-05 Host element (Si) deep implanted 1.2kV 4H-SiC UMOSFET without bipolar degradation ○ Kensuke Takenaka ^{1, 2} , Takeshi Tawara ¹ , Shinichiro Matsunaga ¹ , Shinsuke Harada ¹ <i>1.AIST, 2.Fuji Electric Co., Ltd.</i>	

Oral Sessions (10:40-12:30)	
Tu-2A: FinFET and Trench Interfaces <i>Oral-A(1st Floor, G7+G8) (10:40-12:30)</i> <i>Session Chair: Edward Robert Van Brunt (onsemi, USA), Takuji Hosoi (National Institute for Materials Science, Japan)</i>	Tu-2B: Extended Defects I <i>Oral-B(3rd Floor, G303+G304) (10:40-12:30)</i> <i>Session Chair: Nadeemullah A. Mahadik (United States Naval Research Laboratory, USA), Soon-Ku Hong (Chungnam National University, Korea)</i>
10:40 Tu-2A-01 (Invited) Unique Threshold-Voltage Behavior in SiC n-Channel FinFETs with Fin Widths from 26 to 530 nm ○ Eiji Kagoshima ¹ , Aiko Ichimura ¹ , Hitoshi Fujioka ¹ , Jun Saito ¹ , Tsuyoshi Nishiwaki ¹ , Hirokazu Fujiwara ¹ , Tsunenobu Kimoto ² <i>1.MIRISE Technologies Corp., 2.Kyoto Univ.</i>	10:40 Tu-2B-01 (Invited) Interactions between point defects/impurities and extended defects during 4H-SiC crystal growth ○ Noboru Ohtani ¹ <i>1.Kwansei Gakuin University, Japan</i>
11:10 Tu-2A-02 Demonstration of a SiC P-Channel FinFET with Enhanced Mobility ○ Shion Toshimitsu ¹ , Eiji Kagoshima ² , Hirokazu Fujiwara ² , Kyota Mikami ¹ , Mitsuki Kaneko ¹ , Tsunenobu Kimoto ¹ <i>1.Kyoto Univ., 2.MIRISE Technologies Corp.</i>	11:10 Tu-2B-02 Synchrotron X-ray Topography Observation of BPD Loops in Thick 4H-SiC Epilayers (60um-110um) Originating from Prismatic Slip Dislocations in 4H-SiC Substrates Kaixuan Zhang ¹ , Zeyu Chen ¹ , Jianpei Zhang ¹ , Haochi Wang ¹ , Jaehyun Suh ¹ , Alecsander Imhof ² , Nadeem Mahadik ² , ○ Balaji Raghothamachar ¹ , Michael Dudley ¹ <i>1.Stony Brook University, 2.U.S. Naval Research Laboratory</i>
11:30 Tu-2A-03 Separated Source Sum-Difference (S3D) Extraction Method for Accurate Trench Sidewall Mobility Evaluation in SiC Trench MOSFETs ○ Leming Jiao ^{1, 2} , Yu-Chieh Chien ¹ , Zijie Zheng ^{1, 2} , Xiaolin Wang ^{1, 2} , Runze Wang ¹ , Weijie Wang ¹ , Abdul Hannan Yeo ¹ , Qin Gui Voo ¹ , Liyuan Liu ¹ , Xinghua Wang ¹ , Umesh Chand ¹ , Xiao Gong ^{1, 2} , Navab Singh ¹ , Yee Chia Yeo ^{1, 2} <i>1.Inst. of Microelectronics (IME), A*STAR, 2.National Univ. of Singapore</i>	11:30 Tu-2B-03 Wafer-scale characterization of threading mixed dislocations in 4H-SiC using commercial X-ray topography and polarized light microscopy ○ Shunta Harada ^{1, 2} , Kosei Takahashi ¹ , Kota Tsujimori ² , Michio Kawase ¹ , Kenta Shimamoto ³ , Yuya Mizutani ⁴ , Seiya Mizutani ⁴ , Seiji Mizutani ⁴ , Kenta Murayama ⁴ <i>1.Nagoya Univ., 2.SSR Corp., 3.Rigaku Corp., 4.Mipox Corp.</i>
11:50 Tu-2A-04 Unveiling Face-Dependent Mobility-Limiting Scattering Mechanisms in 4H-SiC Trench Sidewall Channels ○ Xiaolin Wang ^{1, 2} , Yu-Chieh Chien ¹ , Leming Jiao ^{1, 2} , Zijie Zheng ^{1, 2} , Weijie Wang ¹ , Runze Wang ¹ , Xinghua Wang ¹ , Abdul Hannan Yeo ¹ , Qin Gui Voo Roth ¹ , Liyuan Liu ¹ , Umesh Chand ¹ , Xiao Gong ^{1, 2} , Navab Singh ¹ , Yee Chia Yeo ^{1, 2} <i>1.Inst. of Microelectronics (IME), A*STAR, 2.National Univ. of Singapore</i>	11:50 Tu-2B-04 Analysis of Defect Configurations in 4H-SiC Epilayers Obtained by Multi-Epitaxial Process by Synchrotron Monochromatic Beam X-ray Topography ○ Zeyu Chen ¹ , Balaji Raghothamachar ¹ , Reza Ghandi ² , Stacey Kennerly ² , Michael Dudley ¹ <i>1.Stony Brook University, 2.GE Research</i>
12:10 Tu-2A-05 Mobility Enhancement Mechanism of 4H-SiC Trench Sidewall MOS Channels Evaluated by 3D-VDP ○ Kana Hiramatsu ¹ , Hirohisa Hirai ¹ , Eiji Kagoshima ² , Mitsuru Sometani ¹ , Keisuke Nagaya ¹ , Jun Saito ² , Takaya Shiono ² , Tsuyoshi Nishiwaki ² , Hirokazu Fujiwara ² , Mitsuo Okamoto ¹ <i>1.National Inst. of Advanced Indus. Science and Technology (AIST), 2.MIRISE Technologies Corp.</i>	12:10 Tu-2B-05 Estimation of Dislocation Structures at Both Ends of Short Basal Plane Dislocations in 4H-SiC Epitaxial Layers by Multi-Photon Excited Photoluminescence ○ Johji Nishio ¹ , Yuto Sasaki ¹ , Jeongseung Pak ² , Keisuke Kurashima ¹ <i>1.NuFlare Technology, Inc., 2.Nikon Corp.</i>

Lunch

Oral Sessions (14:00-15:50)	
Tu-3A: Implantation and Trench Process Optimization <i>Oral-A(1st Floor, G7+G8) (14:00-15:50)</i> <i>Session Chair: Michael Robert Jennings (Swansea University, UK), Mathias Rommel (Fraunhofer IISB, Germany)</i>	Tu-3B: Rad-Hard Devices and High-Temp. ICs <i>Oral-B(3rd Floor, G303+G304) (14:00-15:50)</i> <i>Session Chair: Sang-Mo Koo (Kwangju University, Korea), Mitsuaki Kaneko (Kyoto University, Japan)</i>
14:00 Tu-3A-01 (Invited) Dopant activation and compensation in P+-implanted n-type layers formed in a V-doped semi-insulating 4H-SiC substrate ○ Yuki Yoshimura ¹ , Kyoto Mikami ¹ , Tsunenobu Kimoto ¹ , Mitsuaki Kaneko ¹ <i>1.Kyoto University</i>	14:00 Tu-3B-01 (Invited) Reliability of SiC Power Devices in Space and Atmospheric Radiation Environments ○ Corinna Martinella ¹ <i>1.Institute of Electronics and Systems (IES) - University of Montpellier</i>
14:30 Tu-3A-02 Geometrical Engineering of Trench Corners via High Temperature Annealing: Mitigating Field Crowding and Enhancing Dielectric Reliability in 8 Inch SiC Trench MOSFETS ○ Minghua Zhu ¹ , Cen Tang ¹ , Da Wang ¹ , Tianlin Yang ¹ , Ziting Tan ¹ , Zijing Huang ¹ , Bin Hu ¹ , Yuting Tang ¹ , Wentao Yang ¹ , Jin Rao ¹ <i>1.Huawei Technologies Co., Ltd., Shenzhen, China</i>	14:30 Tu-3B-02 Effects of Cosmic Ray Irradiation on Commercial-Grade Silicon Carbide Power Devices ○ Niamh Claire Arnold ¹ , Virendra Malin Kotagama ^{1, 2} , Arne Benjamin Renz ^{1, 5} , Gabriel Scott Parkinson ³ , Kimmo H Niskanen ⁴ , James Gott ⁵ , Christopher Frost ⁶ , Maria Kastriotou ⁶ , Carlo Cazzaniga ⁶ , Peter Michael Gammon ^{1, 5} <i>1.School of Engineering, Univ. of Warwick, 2.Radtest Ltd., 3.PEMC, Univ. of Nottingham, 4.Accelerator Lab., Univ. of Jyväskylä, 5.Warwick Manufacturing Group, Univ. of Warwick, 6.ISIS Neutron and Muon Source, Rutherford Appleton Lab.</i>
14:50 Tu-3A-03 XPS Evaluation of Etch Damage and Nitrogen Incorporation in 4H-SiC Trenches ○ Runze Wang ¹ , Mingsheng Zhang ² , Hwee Leng Seng ² , Rong Ji ² , Jisheng Pan ² , Zijie Zheng ^{1, 3} , Yu-Chieh Chien ¹ , Xiaolin Wang ^{1, 3} , Leming Jiao ^{1, 3} , Liyuan Liu ¹ , Abdul Hannan Yeo ¹ , Qin Gui Voo ¹ , Umesh Chand ¹ , Xiao Gong ^{1, 3} , Navab Singh ¹ , Yee Chia Yeo ^{1, 3} <i>1.Inst. of Microelectronics (IME), A*STAR, 2.Inst. of Materials Res. and Eng. (IMRE), A*STAR, 3.National Univ. of Singapore</i>	14:50 Tu-3B-03 Investigation of Microdose Effects on Device Characteristics of 4H-SiC Trench MOSFET under Heavy-Ion Irradiation ○ Tomoya Kimura ¹ , Takahiro Suzuki ¹ , Eiji Kagoshima ¹ , Kiyoka Yuge ¹ , Tsuyoshi Nishiwaki ¹ , Hirokazu Fujiwara ¹ , Hiroyuki Shindou ² <i>1.MIRISE Technologies Corp., 2.Japan Aerospace Exploration Agency</i>
15:10 Tu-3A-04 Optical Critical Dimension Metrology for Monitoring High-Volume Manufacturing of SiC Trench MOSFETs ○ Emeric Balogh ¹ , Boglárka Dikó ¹ , Julien Körfer ² , Oleg Rusch ² , Alfréd Hajtman ¹ , Zsófia Kiss ¹ , Bence Nagy ¹ , Attila Sütő ¹ , Péter Basa ¹ <i>1.Semilab Semiconductor Physics Laboratory, 2.Fraunhofer Institute for Integrated Systems and Device Technology IISB</i>	15:10 Tu-3B-04 Demonstration of Higher-Current 500 °C Durable 4H-SiC JFET Chips ○ Philip Neudeck ¹ , David Spry ¹ , Robert Macdonald ² , Robert Gossman ² , Christopher Collazo-Davila ³ , Stacey Kennerly ² , Liangyu Chen ³ , Carl Chang ⁴ , Mohamed Lababidi ⁴ , Sean McDarby ⁵ <i>1.NASA Glenn Research Center, 2.GE Aerospace, 3.Ohio Aerospace Institute, 4.HX5 LLC, 5.E Street Technologies</i>
15:30 Tu-3A-05 Comparative Study of Orthogonal P+ Implant Frequencies with Co-optimization of N+ and P-well Profiles in 1.2 kV 4H-SiC MOSFETs ○ Dinuth Chamila Yapa Bandara Yapa Mudiyansele ¹ , Skylar deBoer ¹ , Stephen A. Mancini ¹ , Justin Lynch ² , Seung Yup Jang ² , Adam J. Morgan ² , Woongje Sung ¹ <i>1.State Univ. of New York, Univ. at Albany, 2.NoMIS Power Corp.</i>	15:30 Tu-3B-05 Demonstration of 500°C non-volatile Memory of AlScN Ferroelectric Capacitors Controlled by SiC Lateral MOSFET ○ Emad Andarawis ¹ , Collin Hitchcock ¹ , Lucy Broderick ¹ , Robert Gossman ¹ , Tammy Johnson ¹ , Shubhdeep Goswami ¹ , Mehrgar Aghayan ¹ , Brendan Hanrahan ² , Daniel Drury ² , Nastazia Moshirfatemi ² <i>1.GE Aerospace Res., 2.Army Res. Lab.</i>

Poster Session (16:00-18:00, 1st & 4th Floors)

Invited Poster (1st Floor)

16:00 Tu-IP (Invited) Thermal response of threading dislocations in SiC substrates using UV-excited lock-in thermography ○ JUHYEONG Sun ¹ , Ryohei Fujita ¹ , Michio Kawase ² , Hosei Nagano ¹ , Masashi Kato ³ , Kenta Murayama ⁴ , Kentaro Kutsukake ^{1, 2} , Toru Ujihara ^{1, 2} , Shunta Harada ^{1, 2} <i>1.Nagoya university (Japan), 2.Inst. of Materials and Systems for Sustainability (IMaSS) (Japan), 3.Nagoya Institute of Technology (Japan), 4.Mipox Corporation (Japan)</i>

Detailed poster program is provided in the following pages.

Oral Sessions (08:40-10:10)	
We-1A: Robustness <i>Oral-A(1st Floor, G7+G8) (08:40-10:00)</i> <i>Session Chair: Dominique Planson (Institute National des Sciences Appliquées de Lyon, France), Donald Gajewski (Wolfspeed, USA)</i>	We-1B: Optimizing Access to Si Vacancies <i>Oral-B(3rd Floor, G303+G304) (08:40-10:10)</i> <i>Session Chair: Takeshi Ohshima (National Institutes for Quantum Science and Technology, Japan), Rachael L. Myers-Ward (United States Naval Research Laboratory, USA)</i>
08:40 We-1A-01 Influence of Cell Design on Short-Circuit Robustness of SiC MOSFETs with Measurements and Simulations ○ Madhu Lakshman Mysore ¹ , Rahul Vijaybhai Chavda ¹ , Josef Lutz ¹ , Thomas Basler ¹ <i>1.Chemnitz University of Technology</i>	08:40 We-1B-01 (Invited) Spin and Charge Properties and Quantum Functionalities of SiC Color Centers ○ Naoya Morioka ^{1, 2} <i>1.Institute for Chemical Research, Kyoto Univ., 2.Center for Spintronics Research Network, Institute for Chemical Research, Kyoto Univ.</i>
09:00 We-1A-02 Differentiating the Impact of Device Design, Circuit Layout and Components on the Stability of Multichip SiC Power MOSFET Modules ○ Ivana Kovacevic-Badstuebner ¹ , Alessandro Ilardi ¹ , Michel Nagel ¹ , Anja Brandl ¹ , Ulrike Grossner ¹ <i>1.APS-ETH Zurich</i>	09:10 We-1B-02 Oxide-based Surface Passivation for Silicon Vacancy Colour Centres in Silicon Carbide ○ Jonah Heiler ^{1, 2} , Leonard Kurt Sidney Zimmermann ^{1, 2} , Nien-Hsuan Lee ^{1, 2} , Kevin Menguelti ¹ , Stephan Kucera ¹ , Jean-Nicolas Audinot ¹ , Wolfgang Knolle ³ , Jawad Ul-Hassan ⁴ , Florian Kaiser ^{1, 2} <i>1.Luxembourg Inst. of Sci. and Tech., 2.Univ. of Luxembourg, 3.Leibniz Inst. of Surface Engineering, 4.Linköping Univ.</i>
09:20 We-1A-03 Investigating Thermal and Degradation Effects in Parallel SiC-MOSFETs Using Differential Kelvin-Source-Current Measurements ○ Jonas Müller ¹ , Hauke Lutzen ¹ , Kazune Ide ² , Wataru Saito ² , Nando Kaminski ¹ <i>1.Univ. Bremen, 2.Univ. Kyushu</i>	09:30 We-1B-03 Generation of Single Solid-state Defects within 4H-SiC Solid Immersion Lenses through Femtosecond Laser Writing Alexander Jones ¹ , Xingrui Cheng ² , Shravan Kumar Parthasarathy ³ , Muhammad Junaid Arshad ¹ , Pasquale Cilibrizzi ¹ , Roland Nagy ³ , Patrick Salter ² , Jason Smith ² , Cristian Bonato ¹ , ○ Christiaan Bekker ¹ <i>1.Heriot-Watt Univ., 2.Univ. of Oxford, 3.Friedrich-Alexander-Univ. Erlangen-Nürnberg</i>
09:40 We-1A-04 Electro-thermal Stress on 3.5 kV SiC Diodes with Different Transition Layer between Active and Termination Regions ○ Philippe Godignon ¹ , Romain Lavieville ¹ , Jérôme Biscarrat ¹ , Cyrille Le Royer ¹ <i>1.CEA-Leti</i>	09:50 We-1B-04 Optical polarization characterization of silicon vacancies in 4H-SiC ○ Tetsuri Nishikawa ^{1, 2} , Naoya Morioka ^{1, 2} , Hiroshi Abe ³ , Takeshi Ohshima ^{3, 4} , Noriokazu Mizuochi ^{1, 2, 5} <i>1.Institute for Chemical Resarch, Kyoto Univ., 2.Center for Spintronic Resarch Network, Kyoto Univ., 3.National Institutes of Quantum Science and Technology (QST), 4.Depeartment of Materials Science, Tohoku Univ., 5.International Center for Quantum-field Measurement Systems for Studies of the Universe and Particles, KEK</i>

Oral Sessions (10:30/10:40–12:40)	
We-2A: MOSFETs <i>Oral-A(1st Floor, G7+G8) (10:30-12:40)</i> <i>Session Chair: Kungyen Lee (National Taiwan University, Taiwan), Hiroki Niwa (Mitsubishi Electric, Japan)</i>	We-2B: Stacking Fault Expansion <i>Oral-B(3rd Floor, G303+G304) (10:40-12:30)</i> <i>Session Chair: Ulrike Grossner (ETH Zürich, Switzerland), Tsunenobu Kimoto (Kyoto University, Japan)</i>
10:30 We-2A-01 (Invited) Column Design for High Avalanche Withstanding Capability in 1.2kV-class SiC Superjunction MOSFET ○ Shinichiro Matsunaga ¹ , Takeshi Tawara ¹ , Kensuke Takenaka ² , Shunki Narita ² , Shinsuke Harada ¹ <i>1.AIIST, 2.Fujielctric. Co, Ltd</i>	10:40 We-2B-01 (Invited) The Role of Temperature and Carrier Lifetime in Electronically-induced Expansion of Single Shockley Stacking Faults in 4H-SiC ○ Koji Maeda ¹ , Satoshi Asada ¹ , Koichi Murata ¹ , Hidekazu Tsuchida ¹ <i>1.CRIEPI</i>
11:00 We-2A-02 1200V SiC Trench-Gate Superjunction MOSFET: Design Considerations for different Applications ○ Andreas Korzenietz ¹ , Caspar Leendertz ¹ , Martin Weidl ¹ , Kristijan Luka Mletschnig ² , Paolo Paletti ² , Andreas Vörckel ² , Matteo Dainese ² , Walia Sandeep ² , Nico Fontana ² , Markus Beninger-Bina ¹ , Frank Hille ¹ <i>1.Infineon Technologies AG, Germany, 2.Infineon Technologies AG, Austria</i>	11:10 We-2B-02 Investigation of Extended Defects and Electrical Performance of 6.5 kV SiC IGBTs Fabricated on P-type SiC Substrate ○ Nadeemullah A Mahadik ¹ , Alecsander N Imhof ¹ , James C Gallagher ¹ , Youngsang Kim ² , Justin Lynch ³ , Seung Yup Jang ³ , Woongje Sung ³ , Adam Morgan ³ , Michael Owen ² , Douglas Dukes ⁴ , Anant A Agarwal ³ <i>1.US Naval Research Laboratory, 2.Defense Microelectronics Activity, 3.NoMIS Power, 4.Pallidus Inc.</i>
11:20 We-2A-03 Impact of Distributed Gate Resistance on Switching Dynamics in a Segmented 4H-SiC MOSFET Model ○ Jae-Hyung Jeremiah Park ¹ , Arman Rashid ¹ , Toby Schaffer ¹ , Jeff Joohyung Kim ¹ , Sei-Hyung Ryu ¹ <i>1.Wolfspeed Inc.</i>	11:30 We-2B-03 Atomic and Electronic View of Stacking Fault Expansion and Its Suppression Recipes in 4H-SiC ○ Kenji Shiraishi ^{2, 6} , Masaki Sano ¹ , Yuansheng Zhao ^{2, 3, 4} , Takashi Yoda ⁵ , Takayuki Oba ⁵ , Jun Kojima ² , Shoichi Onda ² , Atsushi Oshiyama ^{2, 6} <i>1.Graduate School of Engineering, Nagoya University, 2.Institute of Materials and Systems for Sustainability, Nagoya University, 3.Quemix Inc., 4.Department of Physics, The University of Tokyo, 5.WOW Alliance, Institute of Science Tokyo, 6.Center for Innovative Integrated Electronic Systems, Tohoku University</i>
11:40 We-2A-04 Safe Operating Area for Reverse Recovery of SiC MOSFET Body Diodes in Single and Parallel Operation ○ Abhishek Maitra ¹ , Marius Lößner ¹ , Christian Bäuml ¹ , Christoph Hornstein ² , Toni Zimmermann ² , Olga Siwak ² , Josef Lutz ¹ , Thomas Basler ¹ <i>1.Chemnitz Univ. of Tech., 2.Vitesco Technologies GmbH</i>	11:50 We-2B-04 Characterization of Triangular Defect Stacking Faults in 180 um Thick SiC Epitaxial Layers ○ Alecsander Imhof ¹ , Nadeemullah Mahadik ² , Shanthi Subramanian ³ , Srujana Prayakara ³ , Dong Lee ³ <i>1.NRC Post Doc at U.S. Naval Res. Lab., 2.U.S. Naval Res. Lab., 3.Coherent Corp.</i>
12:00 We-2A-05 Quantitative Extraction of Channel and JFET Resistances in SiC MOSFETs and Their Impact on the Ron-SCWT Trade-off ○ So Uchiyama ¹ , Noriyuki Iwamuro ¹ , Hiroshi Yano ¹ <i>1.Univ. of Tsukuba</i>	12:10 We-2B-05LN Moved to We-P-98LN (Poster)

12:20 We-2A-06LN Transition of Mobility-Limiting Mechanism from Trench to Fin MOS Channels Observed by Systematic Scaling in 4H-SiC FinFETs ○ Tomoka Suematsu ^{1,2,3} , Hirohisa Hirai ¹ , Mitsuru Sometani ¹ , Mitsuo Okamoto ¹ , Shinsuke Harada ¹ , Haruka Shimizu ² , Naoki Watanabe ² , Yuki Mori ² , Akio Shima ² , Tsunenobu Kimoto ³ <i>1. National Institute of Advanced Industrial Science and Technology (Japan), 2. Hitachi, Ltd. (Japan), 3. Kyoto Univ. (Japan)</i>	
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Lunch

Oral Sessions (14:00-15:50)	
We-3A: High Voltage Devices <i>Oral-A(1st Floor, G7+G8) (14:00-15:50)</i> <i>Session Chair: Yoshiyuki Yonezawa (National Institute of Advanced Industrial Science and Technology, Japan), Andrea Irace (University of Naples Federico II, Italy)</i>	We-3B: SiC and Related Material Epitaxy <i>Oral-B(3rd Floor, G303+G304) (14:00-15:50)</i> <i>Session Chair: Rachael L. Myers-Ward (United States Naval Research Laboratory, USA), Jawad Ul Hassan (Linköping University, Sweden)</i>
14:00 We-3A-01 (Invited) High Voltage MOS Devices in 4H-SiC: From Lab to Reality ○ Sei-Hyung Ryu ¹ <i>1. Wolfspeed, Inc.</i>	14:00 We-3B-01 (Invited) Thick Epitaxy on 200mm Silicon Carbide for Ultra-High Voltage Devices ○ Thomas A. Kuhr ¹ , Lianghong (Ryan) Liu ¹ , Derrick Kamber ¹ , Denis Tsvetkov ¹ , Scott Ustin ¹ <i>1. Wolfspeed, USA</i>
14:30 We-3A-02 Optimization of JFET Implantation Profiles for 12-kV 4H-SiC JBSFETs and JBS Diodes Using Shallow and Deep Designs ○ Soo Young Moon ¹ , Stephen A. Mancini ¹ , Justin Lynch ¹ , Miguel Hinojosa ² , Aivars Lelis ² , Woongje Sung ¹ <i>1. Univ. at Albany, State Univ. of New York, 2.U.S. Army Research Laboratory (ARL)</i>	14:30 We-3B-02 Investigation of Nitrogen Incorporation under High HCl/SiH₄ Ratios during CVD Trench Filling Growth ○ Shiyang Ji ¹ , Kazutoshi Kojima ¹ , Mitsuru Sometani ¹ , Shinsuke Harada ¹ , Yasunori Tanaka ¹ <i>1. AIST</i>
14:50 We-3A-03 A Novel 6.5kV 4H-SiC Split-Gate One-Channel JBSFET with Superior Third-Quadrant and Dynamic Performance ○ Mohamed Torky ¹ , Justin M Lynch ¹ , Stephen A Mancini ¹ , Adam J Morgan ² , Woongje Sung ¹ <i>1. University at Albany, State University of New York, 2.NoMIS Power Corporation</i>	14:50 We-3B-03LN Enhanced Carrier Lifetime in Thick 4H-SiC Epitaxial Layers Grown by Close-Spaced Sublimation on A p-Type Substrate ○ Sota Uoya ¹ , Heiji Kitano ² , Shuto Sugimoto ³ , Tsutomu Sonoda ³ , Daisuke Nakamura ⁴ , Toru Ujihara ^{2,3} , Masashi Kato ¹ <i>1. Nagoya Inst. of Tech. (Japan), 2. Nagoya Univ. (Japan), 3. Inst. of Materials and Systems for Sustainability (Japan), 4. TOYOTA CENTRAL R&D LABS., INC. (Japan)</i>
15:10 We-3A-04 Short-Circuit Robustness in SiC MOSFETs: Discrepancy Between Stepwise and Single-Shot Measurements ○ Madhu Lakshman Mysore ¹ , Rahu Vijaybhai Chavda ¹ , Josef Lutz ¹ , Thomas Basler ¹ <i>1. Chemnitz University of Technology</i>	15:10 We-3B-04 Void-Free 3C-SiC by Single 2-Temperature Heteroepitaxy Process ○ Gerard Colston ¹ , Vishal A Shah ¹ <i>1. Univ. of Warwick</i>
15:30 We-3A-05 Design and Experimental Demonstration of 20 kV Rated SiC MOSFETs ○ Yun Xia ¹ , ChangWei Zheng ¹ , Wei Liu ¹ , Yitian Jiang ¹ , Zheng Ye ¹ , Ying Dai ¹ , Jinliang He ² , Zhongqing Peng ² , Zhijie Xue ² , Jinwang Bai ² , Kaiju Liao ² , Shangqian Tan ² , Rudai Quan ¹ , Hongyao Zhu ¹ , Qin Hu ¹ , Gang Chen ¹ , Menglong Zhang ¹ , Yuxi Wan ¹ <i>1. Shenzhen Pinghu Lab., 2. Shenzhen Pengjin High-Tech Co., Ltd.</i>	15:30 We-3B-05 Low-Temperature Epitaxial Growth of Boron Carbide (B₄C) on Si-Face 4H-SiC by Direct Growth Process ○ Darole Alida MEKOAGNE SOUOP ¹ , Laurent AUVRAY ¹ , François CAUWET ¹ , Stephane COINDEAU ² , Jean-Marie BLUET ³ , Gabriel FERRO ¹ <i>1. Univ. of Lyon 1, CNRS, lab. LMI, UMR 5615, 2. Univ. of Grenoble Alpes, CNRS, Grenoble INP, lab. SIMAP, 3. Univ. of Lyon 1, CPE Lyon, Ecole Centrale Lyon, INSA Lyon, CNRS, lab. INL, UMR 5270</i>

Poster Session (16:00-18:00, 1st & 4th Floors)

Invited Poster (1st Floor)

16:00 We-IP (Invited) Gate-Oxide Protection for Enhanced Single-Event Robustness in SiC Power MOSFETs ○ Heng WANG ^{1, 2} , Yun XIA ¹ , LyuZhang PENG ³ , ChangWei Zheng ¹ , SiRui FENG ¹ , XinPeng LIN ¹ , Pengwei ZHOU ² , YingChen YANG ² , Gang CHEN ¹ , YuXi WAN ¹ , Gang Lyu ³ , Kevin Jing CHEN ² <i>1. Shenzhen Pinghu Lab. (China), 2. The Hong Kong Univ. of Sci. and Tech. (Hong Kong), 3. Beihang Univ. (China)</i>

Detailed poster program is provided in the following pages.

Plenary Lecture (8:40-9:25, 1st Floor)

Session Chair: Hidekazu Tsuchida (Central Research Institute of Electric Power Industry, Japan), Hiroshi Yano (University of Tsukuba, Japan)

08:40 Th-PL-01 (Invited)

Emerging Applications of Silicon Carbide Power Devices in Medium Voltage Power Conversion

o Rajib Datta¹, Samir Soua²

1.GE Vernova Advanced Research Center (USA), 2.GE Vernova Electrification (France)

Oral Sessions (09:50-12:00)

Th-1A: Reliability <i>Oral-A(1st Floor, G7+G8) (09:50-12:00)</i> <i>Session Chair: Shiori Idaka (Mitsubishi Electric Europe, Japan), Sangwon Yoon (Seoul National University, Korea)</i>	Th-1B: Point Defects and Material Properties <i>Oral-B(3rd Floor, G303+G304) (09:50-12:00)</i> <i>Session Chair: Hrishikesh Das (Indichip Semiconductors, USA), Masashi Kato (Nagoya Institute of Technology, Japan)</i>
09:50 Th-1A-01 (Invited) Bipolar Degradation in SiC Power Devices: Still an Issue? Recent Findings and Perspectives for Applications and Standardization o Thomas Basler ¹ , Clemens Herrmann ¹ 1.Chemnitz University of Technology, Germany	09:50 Th-1B-01 (Invited) Impact of Pre-Oxidation on Intrinsic Point Defect Formation in Electron-Irradiated 4H-SiC o Kotaro Yamanaka ¹ , Kyota Mikami ¹ , Tsunenobu Kimoto ¹ , Mitsuki Kaneko ¹ 1.Kyoto Univ.
10:20 Th-1A-02 Bipolar Degradation in 1.2 kV SiC MOSFETs under Microsecond Pulsed Stress: Influence of Accumulated Injected Charge and Thermal Boundary Condition Md Hasibul Hasan ¹ , o Rijuta Bagchi ¹ , Lukas Farnbacher ¹ , Jürgen Leib ¹ , Bernd Eckardt ¹ , Martin März ² 1.Fraunhofer IISB, 2.FAU Erlangen-Nürnberg	10:20 Th-1B-02 Evaluation of sub-nanosecond carrier lifetimes in 4H-SiC crystals using time-resolved photoluminescence o Koichi Murata ¹ , Satoshi Asada ¹ , Hidekazu Tsuchida ¹ 1.Central Research Institute of Electric Power Industry (CRIEPI)
10:40 Th-1A-03 Body Diode Reliability Studies of SiC-MOSFETs Containing Micropipe Defects o Lucile C. Teague Sheridan ¹ , Callie M. Woods ¹ , Michael Pannone ¹ , Ayan Biswas ¹ , Brett Hull ¹ , Jared Langan ¹ , Keith Boom ¹ , Keval Patel ¹ , Don Gajewski ¹ , Elif Balkas ¹ 1.Wolfspeed, Inc	10:40 Th-1B-03 Quantitative Evaluation of Stacking Fault-Induced Non-Linear Resistance in Schottky Barrier Diodes Do Yeon Park ^{1, 2} , o Moonkyong Na ¹ , Taswar Iqbal ³ , Soon-Ku Hong ³ , Sung Yun Woo ² , Hyundon Jung ⁴ , Dohyung Kim ⁴ , In Ho Kang ¹ , Jae Hwa Seo ¹ , Byoung Hoon Noh ⁵ , Kyung Seok Oh ⁵ 1.Korea Electrotech. Res. Inst., 2.Kyungpook National Univ., 3.Chungnam National Univ., 4.Horiba STEC Korea, 5.ARCHE Co., Ltd.
11:00 Th-1A-04 Recombination-Enhanced Interface State Generation in SiC-MOSFETs under AC Gate Stress Evaluated by Charge Pumping o Tsuyoshi Hidaka ¹ , Noriyuki Iwamuro ¹ , Hiroshi Yano ¹ 1.Univ. of Tsukuba	11:00 Th-1B-04 Revealing the Origin of Boron-related Deep Levels in 4H-SiC o Rishi Kupper ¹ , Manuel Belanche ¹ , Helton Goncalves de Medeiros ¹ , Natalija Für ¹ , Ulrike Grossner ¹ 1.APS - ETH Zurich
11:20 Th-1A-05 High-Dose Total Ionizing Dose Effects in Commercial 4H-SiC MOSFETs and Alternative Power Devices Virendra Kotagama ¹ , Sami Kibal ² , Rachel A Oliver ² , Arne B Renz ¹ , Vishal A Shah ¹ , Marina Antoniou ¹ , o Peter M Gammon ¹ 1.University of Warwick, 2.University of Cambridge	11:20 Th-1B-05 Optical-Pump Terahertz-Probe Spectroscopy of Carrier Lifetimes in 4H-SiC o Nikolaos Iosifidis ¹ , Arne Benjamin Renz ¹ , Mustafa Akif Yildirim ¹ , Kyrylo Melnyk ¹ , Vishal Shah ¹ , Qizhe Cao ¹ , Jack Woolley ¹ , James Lloyd-Hughes ¹ , Peter Michael Gammon ¹ 1.Univ. of Warwick
11:40 Th-1A-06 Discern Failure Mechanisms in Dynamic HV-H³TRB Testing o Jan-Hendrik Peters ¹ , Felix Hoffmann ² , Stefan Schmitt ² , Nando Kaminski ¹ 1.University of Bremen, 2.Semikron Danfoss Elektronik GmbH & Co. KG	11:40 Th-1B-06 Analysis of Deep-Level Effects on Switching Characteristics of SJ-MOSFETs o Takeshi Tawara ¹ , Kensuke Taknaka ² , Shinichiro Matsunaga ¹ , Shinsuke Harada ¹ 1. National Inst. of Advanced Industrial Science and Technology (AIST), 2.Fuji Electric Corp., Ltd.

Lunch

Oral Sessions (13:30-14:50)

Th-2A: Interface Charge <i>Oral-A(1st Floor, G7+G8) (13:30-14:50)</i> <i>Session Chair: Hirohisa Hirai (National Institute of Advanced Industrial Science and Technology, Japan), Patrick Fiorenza (CNR-IMM, Italy)</i>	Th-2B: Si Vacancies towards Quantum Applications <i>Oral-B(3rd Floor, G303+G304) (13:30-14:50)</i> <i>Session Chair: Takeshi Ohshima (National Institutes for Quantum Science and Technology, Japan), Michael Krieger (Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany)</i>
13:30 Th-2A-01 Quantum Mechanical Effects on Threshold Voltage in 4H-SiC MOSFETs o Ryuta Kajiwara ¹ , Shion Toshimitsu ¹ , Kyota Mikami ¹ , Mitsuki Kaneko ¹ , Tsunenobu Kimoto ¹ 1.Kyoto Univ.	13:30 Th-2B-01 Defects in silicon carbide for quantum reservoir computing o Tien Son Nguyen ¹ , Danial Shafizadeh ¹ , Oscar Bulancea-Lindvall ¹ , Jawad Ul-Hassan ¹ , Hiroshi Abe ² , Takeshi Ohshima ^{2, 3} , Igor Abrikosov ¹ , Ivan Ivanov ¹ 1.Linköping University, 2.National Institutes for Quantum Science and Technology, 3.Tohoku University
13:50 Th-2A-02 Breaking trade-off relationship between channel mobility and threshold voltage in SiC MOSFETs by shallow counter doping o Kyota Mikami ¹ , Ryuta Kajiwara ¹ , Mitsuki Kaneko ¹ , Tsunenobu Kimoto ¹ 1.Kyoto Univ.	13:50 Th-2B-02 High electric field detection in a SiC power device by silicon vacancy-based quantum sensor o Yuichi Yamazaki ¹ , Akira Kiyoi ² , Naoyuki Kawabata ² , Yuki Watanabe ² , Ryosuke Akashi ¹ , Shunsuke Daimon ¹ , Nobumasa Miyawaki ¹ , Yu-ichiro Matsushita ^{1, 3, 4} , Makoto Kohda ^{1, 5, 6} , Takeshi Ohshima ^{1, 5} 1.QST, 2.Mitsubishi Electric Corporation, 3.The University of Tokyo, 4.Quemix Inc., 5.Tohoku University, 6.University of Washington
14:10 Th-2A-03 Split C-V Measurements for the Separate Extraction of Interface Trap Density and Fixed Charge in (0001) 4H-SiC MOSFETs o Shane Stein ¹ , Daniel Lichtenwalner ¹ , Sei-Hyung Ryu ¹ 1.Wolfspeed	14:10 Th-2B-03 Spectator-transition crosstalk in a spin-3/2 silicon-vacancy qubit in silicon carbide revealed by broadband Ramsey interferometry o Seung-Jae Hwang ¹ , Jun-Jae Choi ¹ , Seoyoung Paik ¹ , Juhwan Kim ² , Jawad Ul-Hassan ³ , Nguyen Tien Son ³ , Hiroshi Abe ⁴ , Takeshi Ohshima ^{4, 5} , Jaekwon Suk ⁶ , Hyeon-Ho Jeong ² , Dong-Hee Kim ¹ , Sang-Yun Lee ¹ 1.Department of Physics and Photon Sci., Gwangju Inst. of Sci. and Tech., 2.Department of Electrical Eng., Gwangju Inst. of Sci. and Tech., 3.Department of Physics, Chemistry and Biology, Linköping Univ., 4.National Inst. for Quantum Sci. and Tech. (QST), 5.Department of Materials Sci., Tohoku Univ., 6.Korea Multi-purpose Accelerator Complex, Korea Atomic Energy Res. Inst.

14:30 Th-2A-04

Decoupling Effective Field, Screening, and Temperature Dependencies of Inversion Layer Mobility in SiC MOSFETs: Physical Insight into Dominant Scattering Mechanisms

○ Tetsuo Hatakeyama¹, Hirohisa Hirai², Mitsuru Sometani², Mitsuo Okamoto², Shinsuke Harada²
1.Toyama Prefectural Univ., 2.AIST

14:30 Th-2B-04

Magnetometry using Dressed States with Silicon Vacancies in 4H-SiC

○ Ignas Lekavicius¹, Samuel White², Daniel Pennachio¹, Jenifer Hajzus³, Andrew Purdy¹, Rachael Myers-Ward¹

1.US Naval Research Laboratory, 2.) NRC Research Associate at the US Naval Research Laboratory, 3.ASEE Research Associate at the US Naval Research Laboratory

Poster Session (15:00-17:00, 1st & 4th Floors)

Invited Poster (1st Floor)

15:00 Th-IP (Invited)

Evolution of color centers at SiO₂/SiC interfaces during repeated thermal annealing tracked in pre-defined observation windows

○ Kentaro Onishi¹, Masahiro Hara¹, Heiji Watanabe¹, Takuma Kobayashi¹

1.The University of Osaka (Japan)

Detailed poster program is provided in the following pages.

Banquet (18:00-21:30, Osanbashi Yokohama International Terminal)

Oral Sessions (08:40-10:20)	
Fr-1A: SiC Epitaxy <i>Oral-A(1st Floor, G7+G8) (08:40-10:10)</i> <i>Session Chair: Bernd Thomas (Robert Bosch, Germany), Kazutoshi Kojima (National Institute of Advanced Industrial Science and Technology, Japan)</i>	Fr-1B: Super-Junction Process Technology <i>Oral-B(3rd Floor, G303+G304) (08:40-10:20)</i> <i>Session Chair: Navab Singh (A*STAR IME, Singapore), Shin-Ichiro Kuroki (Hiroshima University, Japan)</i>
08:40 Fr-1A-01 (Invited) Statistical Correlation Between Substrate Dislocations and Stacking Faults in SiC Epitaxial Growth ○ Fumihiro Fujie ¹ , Yugo Yamagishi ² , Yuichiro Mabuchi ² , Hidekazu Tsuchida ¹ <i>1. Central Research Institute of Electric Power Industry, 2. Resonac Corporation</i>	08:40 Fr-1B-01 Channeling Ion Implantation in 4H-SiC: A Comprehensive Raman Study of Damage, Recovery, and Dopant Activation ○ Dhruva Das ¹ , Jerome Biscarrat ¹ , Max Pujade ¹ , Philippe Godignon ¹ , F. Torregrossa ² , A. Llopez ² , S. Morata ² , G. Grosset ² <i>1. Univ. Grenoble Alpes, CEA, Leti, F-38000 Grenoble, France, 2. IBS - Ion Beam Services, Z.I. de Peynier-Rousset, 13790 Peynier, France</i>
09:10 Fr-1A-02 Comparative Epitaxy of 4H-SiC on Prismatic and Basal Planes: Morphology, Doping, and Defect Incorporation ○ Misagh Ghezellou ¹ , Robert Karsthof ² , Lasse Vines ³ , Vadim Vorobyov ³ , Florian Kaiser ⁴ , Jörg Wrachtrup ³ , Jawad Ul-Hassan ¹ <i>1. Linköping University, 2. University of Oslo, 3. University of Stuttgart, 4. Luxembourg Institute of Technology</i>	09:00 Fr-1B-02 Manufacturability of Single Epi Step 1200V SiC Superjunction Pillars Using Channeling Ion Implantation ○ Christopher Lamontagne ¹ , Fulvio Mazzamuto ¹ , Jan Prominski ¹ , Leonard Rubin ¹ , Atul Gupta ¹ , Shioh-Hwei Hwang ² , Beniyam Woldekidan ² , Dénes Ullrich ³ , ⁴ , Zoltán Bozók ³ , János Szivós ³ , László Balogh ³ , Enrico Sangregorio ⁵ , Francesco La Via ⁵ , Simona Boninelli ⁵ , Corrado Bongiorno ⁵ <i>1. Axcelis Technologies Inc., 2. Veeco Instruments Inc., 3. Semilab Semiconductor Physics Lab. Ltd., 4. Department of Atomic Physics, Inst. of Physics, 5. CNR-IMM</i>
09:30 Fr-1A-03 Suppression of Stacking Fault Expansion in SiC Epitaxial Layers via Substrate Implantation ○ Rachael L. Myers-Ward ¹ , Alec N. Imhof ¹ , Nadeemullah A. Mahadik ¹ , Benjamin J. Sekely ¹ , Jenifer R. Hajzus ¹ , Atul Gupta ² , Hank Chen ² , Fulvio Mazzamuto ² , Christopher Lamontagne ² <i>1. U.S. Naval Research Laboratory, 2. Axcelis Technologies</i>	09:20 Fr-1B-03 Optical Characterization of Channeling Angles in 4H-SiC ○ Helton Goncalves de Medeiros ¹ , Manuel Belanche Guadas ¹ , Rene Heller ² , Ulrike Grossner ¹ <i>1. APS - ETH Zurich, 2. Helmholtz-Zentrum Dresden-Rossendorf</i>
09:50 Fr-1A-04 Correlative Multi-Channel Defect Evolution of 200 mm SiC Epitaxial Layers Under Various Thicknesses ○ Cristiano Calabretta ¹ , Nicolò Piluso ¹ , Chiara Nania ¹ , Fabiana Vento ¹ , Domenica Raciti ¹ , Romain Mermet-Guyenet ¹ , Alice Lombardo ¹ , Nicoletta Spampinato ¹ , Giuseppe Arena ¹ , Andrea Severino ¹ , Dmitrii Rusakov ³ , Federico Giuffrida ³ , Matteo Salamone ³ , Kaushik Sah ³ , Parikshit Sharma ³ , Paolo Parisi ³ , Corrado Bongiorno ² <i>1. Indus. STMicroelectronics, 2. CNR-IMM, 3. KLA Corporation</i>	09:40 Fr-1B-04 Deep SiC Superjunction Doping Profiles Enabled by Single-Step Energy-Filtered Ion Implantation ○ Christian T. Plass ¹ , Manuel Belanche ² , Constantin Csato ¹ , Yoshiyuki Yonezawa ³ , Ulrike Grossner ² , Michael Rüb ¹ , ⁴ <i>1. mi2-factory, 2. Advanced Power Semiconductor Lab., ETH Zurich, 3. National Inst. of Advanced Indus. Sci. and Tech., Tsukuba, 4. Ernst-Abbe-Hochschule Jena</i>
	10:00 Fr-1B-05 Sensitivity of SiC Superjunction MOSFET Performance to High-Energy Implantation of p-Pillars Jan Prominski ¹ , ○ Fulvio Mazzamuto ¹ , Christopher Lamontagne ¹ , Atul Gupta ¹ , David Green ² , Alexandros Kyrtos ² , Andreas Scholze ² <i>1. Axcelis Technologies Inc., 2. Silvaco Inc.</i>

Oral Sessions (10:40/10:50–12:30)	
Fr-2A: Bipolar Devices <i>Oral-A(1st Floor, G7+G8) (10:40-12:30)</i> <i>Session Chair: Peter Friedrichs (Infineon Technologies, Germany), Sei-Hyung Ryu (WolfSpeed, USA)</i>	Fr-2B: Extended Defects and Si Vacancies II <i>Oral-B(3rd Floor, G303+G304) (10:50-12:30)</i> <i>Session Chair: Isaho Kamata (Central Research Institute of Electric Power Industry, Japan), Michael Dudley (Stony Brook University, USA)</i>
10:40 Fr-2A-01 (Invited) Ultra-high Voltage SiC Bipolar Devices: Empowering the Green Power Grids ○ Naoki Watanabe ¹ , Haruka Shimizu ¹ , Akio Shima ¹ <i>1. Hitachi, Ltd.</i>	10:50 Fr-2B-01 Spontaneous Formation of Interfaces and Atomic Interfacial Mechanisms Mediated by Regular Array of Stacking Faults and Dislocations at 4H/3C-SiC Vertical Interfaces in Polytype Transition ○ Soon-Ku Hong ¹ , Taswar Iqbal ¹ , Moonkyong Na ² , Jeong Eun Chae ³ <i>1. Chungnam National Univ., 2. Korea Electrotech. Res. Inst., 3. Gumi Electronics & Info. Tech. Res. Inst.</i>
11:10 Fr-2A-02 Stable operation of 3.3 kV SiC PiN Diodes at Extreme Pulsed Current Densities >3000 A/cm² with Engineered Buffer Layer ○ Tolen Nelson ¹ , Nadeem Mahadik ² , Alesander Imhof ¹ , Andrew Koehler ² , Rachael Myers-Ward ² , Youngsang Kim ³ , Michael Owen ³ , Justin Lynch ⁴ , Woongje Sung ⁴ , Karl Hobart ² , Michael Mastro ² <i>1. National Research Council Postdoctoral Fellow Residing at U.S. Naval Research Laboratory, 2. U.S. Naval Research Laboratory, 3. Defense Microelectronics Activity, 4. NoMIS Power</i>	11:10 Fr-2B-02 Complexity and Multiple Transformation of Unexplored Shockley-type Stacking Faults with Emission Wavelengths of 500 ~ 540 nm in 4H-SiC Epitaxial Layer ○ Moonkyong Na ¹ , Soon-Ku Hong ² , Taswar Iqbal ² , Hyundon Jung ³ , Dohyung Kim ³ , Chanyoung Oh ³ , Donghyun Jang ³ , Jeong Eun Chae ⁴ , Hye Ran Kim ⁴ <i>1. Korea Electrotech. Res. Inst., 2. Chungnam National Univ., 3. Horiba STEC Korea, 4. Gumi Electronics & Info. Tech. Res. Inst.</i>
11:30 Fr-2A-03 Experimental Evaluation of 15 kV SiC IGBTs and PNDs with Thick Epitaxial Layers for High Voltage Power Conversion Kumiko Konishi ¹ , Naoki Watanabe ¹ , ○ AKIO SHIMA ¹ , Giovanni Alfieri ² , Boksteen Boksteen ² , Tobias Keller ² <i>1. Hitachi, Ltd., 2. Hitachi Energy, Ltd.</i>	11:30 Fr-2B-03 Dislocation dynamics analysis to elucidate the mechanism of BPD contraction near the surface in 4H-SiC ○ Atsuo Hirano ¹ , Noboru Takahashi ¹ , Akiyuki Takahashi ¹ <i>1. Tokyo University of Science</i>
11:50 Fr-2A-04 Gate Design Impact on (6.5-kV-Class) Optically Triggered 4H-SiC Thyristors with Etched Junction Termination Extension Kamil Kotra ^{1, 3} , ○ Ralf Hassdorf ¹ , Sigo Schamholz ¹ , Milan Zuvic ¹ , Rabej Barhoumi ² , Dominique Planson ² , Klaus Hoffmann ³ <i>1. French-German Res. Inst. of Saint-Louis (ISL), 2. Univ. Lyon, INSA Lyon, Ampere, 3. Helmut-Schmidt Univ. Hamburg</i>	11:50 Fr-2B-04LN Experimental Determination of the Silicon-Vacancies Negative Charge States in 4H-SiC ○ Ivan G. Ivanov ¹ , Danial Shafizadeh ¹ , Jayanta Bauri ¹ , Takeshi Ohshima ^{2, 3} , Igor A. Abrikosov ¹ , Tien Son Nguyen ¹ <i>1. Linköping Univ. (Sweden), 2. National Inst. for Quantum Science and Technology (Japan), 3. Tohoku Univ. (Japan)</i>

12:10 Fr-2A-05 Static Characteristics and Area Scaling Effects of ~15 kV 4H-SiC IGBTs ◦ Hojung Lee ¹ , Justin Lynch ¹ , Stephen Mancini ¹ , Dinuth Yapa Mudiyansele ¹ , Miguel Hinojosa ² , Aivars Lelis ² , Reza Ghandi ³ , Robert Gossman ³ , Adam Morgan ⁴ , Youngsang Kim ⁵ , Stephanie Wasmuth ⁵ , Michael Owen ⁵ , Woongje Sung ¹ <i>1.Univ. at Albany, 2.US Army Res. Labs., 3.GE Aerospace Res., 4.Nomis Power Corp., 5.Defense Microelectronics Activity</i>	12:10 Fr-2B-05LN Investigating Modified Silicon Vacancies in 4H-SiC via Temperature-Dependent Photoluminescence Spectroscopy ◦ Linus Hollnagel ¹ , Helton Goncalves de Medeiros ¹ , Markus Kirchbaumer ¹ , Efe Eden ¹ , Agatha Ulibarri ² , Ulrike Grossner ¹ <i>1. APS - ETH Zurich (Switzerland), 2. School of Physics - Univ. of Melbourne (Australia)</i>
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Lunch

Oral Sessions (14:00-15:30)	
Fr-3A: Mobility and Vth Drift <i>Oral-A(1st Floor, G7+G8) (14:00-15:30)</i> <i>Session Chair: Chih-Fang Huang (National Tsing Hua University, Taiwan),</i> <i>Takuji Hosoi (National Institute for Materials Science, Japan)</i>	Fr-3B: Materials and Wafer Processing <i>Oral-B(3rd Floor, G303+G304) (14:00-15:20)</i> <i>Session Chair: Shunta Harada (Nagoya University, Japan),</i> <i>Takeshi Mitani (National Institute of Advanced Industrial Science and Technology, Japan)</i>
14:00 Fr-3A-01 (Invited) MOS Channel Mobility Enhancement and Hole Trap Reduction in 4H-SiC (0-33-4) beyond (0-33-8) ◦ Hirohisa HIRAI ¹ , Mitsuru SOMETANI ¹ , Mitsuo OKAMOTO ¹ , Shinsuke HARADA ¹ <i>1.AIST</i>	14:00 Fr-3B-01 Engineered 4H-SiC Wafers via Mechanical Spalling Process ◦ Connor Horn ¹ , Xella Doi ¹ , Kazuo Doi ¹ , Sagar Kumar Seth ² , Supratik Guha ² <i>1.K1 Semiconductor, Inc., 2.Univ. of Chicago</i>
14:30 Fr-3A-02 Temperature-Dependent Gated Hall Measurements of 4H-SiC Planar MOSFETs and Coulomb Scattering Effects on Mobility Daniel Jenner Lichtenwalner ¹ , Shane R Stein ¹ , ◦ Sei-Hyung Ryu ¹ <i>1.WolfSpeed, Inc.</i>	14:20 Fr-3B-02 Using multi-spectral linear absorption imaging for volumetric defect tracking and classification in optically transparent 4H-SiC wafers at industrial scale. ◦ Jimmy Thörnberg ¹ , Torben L. Purz ² , Anton Vakulenko ² , Eric W. Martin ² , Björn Magnusson ¹ <i>1.STMicroelectronics Silicone Carbide AB, 2.MONSTR Sense Technologies</i>
14:50 Fr-3A-03 Evaluation of CO2 Post-nitridation Annealing Effects on SiC-MOS Interface Using a Mass-Production-Compatible Hot-Wall Furnace ◦ Mitsuru Sometani ^{1, 2} , Hirohisa Hirai ¹ , Naoki Kumagai ¹ , Hiroshi Yano ³ , Takanori Isobe ³ , Takuji Hosoi ^{2, 4} , Heiji Watanabe ² <i>1.AIST, 2.The University of Osaka, 3.Univ. of Tsukuba, 4.NIMS</i>	14:40 Fr-3B-03 Quantitative Modelling of Hot-Zone Degradation and Its Impact on PVT Growth of SiC Crystal ◦ Andrey Smirnov ¹ , Laura Ristić ¹ , Aleksa Crnobrnja ¹ , Maxim Bogdanov ¹ , Daria Zimina ² , Łukasz Kantor ³ <i>1.STR Europe, 2.STR US, Inc., 3.ON Semiconductor Czech Republic, s.r.o.</i>
15:10 Fr-3A-04 Suppression of the Long-Term Component of Threshold Voltage Shift under AC Stress in 4H-SiC DMOSFETs by CO2 Post-Nitridation Annealing ◦ Ryuki Momota ¹ , Mitsuru Sometani ² , Hirohisa Hirai ² , Heiji Watanabe ³ , Takanori Isobe ¹ , Noriyuki Iwamuro ¹ , Hiroshi Yano ¹ <i>1.Univ. of Tsukuba, 2.AIST, 3.Univ. of Osaka</i>	15:00 Fr-3B-04 Bayesian Optimisation for SiC Polishing Simulations Using SSIM ◦ Roberto Iaconi Iaconi ¹ , Kevin Richard G. Operiano ¹ , Susumu Maeda ¹ , Fumiya Kawate ¹ , Saeed Sepasy ² , Yoshifumi Watanabe ² <i>1.Aixtal, 2.Mipox</i>

Plenary Lecture (15:30-16:15, 1st Floor)
<i>Session Chair: Hidekazu Tsuchida (Central Research Institute of Electric Power Industry, Japan), Hiroshi Yano (University of Tsukuba, Japan)</i>
15:30 Fr-PL-01 (Invited) Pioneering Next-Generation Power Devices in AIST ◦ Yasunori Tanaka ¹ <i>1.National Institute of Advanced Industrial Science and Technology (AIST) (Japan)</i>

Closing (16:15-16:45, 1st Floor)

Detailed Poster Program

Monday, September 28

Track 01 Bulk Growth and Wafer Processing (Poster-A, 1st Floor)

Mo-P-01

Ultra-High Resistivity 4H-SiC Bulk Crystal Grown by HTCVD with Extremely Low Impurity Incorporation

Zhenzhou Yuan¹, ○ Yuchen Shi², Xu Pang², Xinyu Liu², Qiangqiang Wang¹, Shengping He¹

1.Chongqing University, 2.Hypersics Corp. Ltd.

Mo-P-02

A New Understanding of Sublimation Growth in SiC and a Proposed Furnace Structure Based on Si-C Phase Relations

○ Takehisa Minowa¹, Taichi Abe²

1.Minowa Material Inspiring, 2.National Inst. for Materials Sci. (NIMS)

Mo-P-03

Effect of off-axis seed orientation on surface morphology during physical vapor transport growth of 4H-SiC crystals

○ Shunta Sueda¹, Noboru Ohtani¹

1.Kwansei Gakuin University

Mo-P-04

Withdrawn

Mo-P-05

Rapid Assessment of Threading Screw Dislocation Suppression During 4H-SiC Growth Initiation Using Few-Millimeter Boules

John M. Woods¹, Jiuan Wei¹, Ever Velasco¹, James Fischer¹, ○ Xueping Xu¹, Rajan Rengarajan¹

1.Coherent Corp.

Mo-P-06

Distinctive photoluminescence properties of the as-grown surface of physical vapor transport-grown 4H-SiC crystals

○ Daichi Iijima¹, Shugo Kawakami¹, Noboru Ohtani¹

1.Kwansei Gakuin University

Mo-P-07

Dislocation-Induced local property modifications in 4H-SiC crystals grown by physical vapor transport

○ Mitsuki Saragai¹, Daito Kamikawa¹, Noboru Ohtani¹

1.Kwansei Gakuin University

Mo-P-08

Effect of stress on warpage of 4H-SiC substrate

○ Hiromasa Suo¹, Masato Ito¹, Tamotsu Yamashita¹, Rimpei Kindaichi¹

1.Resonac Corp.

Mo-P-09

Effect of dual-zone heat treatment on residual stress and defect conversion in bare 4H-SiC wafers

○ Chan-Ho Park¹, Sang-Jin Bae¹, Ho-Gyun Yun¹, Mi-Seon Park¹, Kwang-Hee Jung¹, Jong-Gon Kim¹, Kap-Ryeol Ku², Yun-Ji Shin³, Seong-Min Jeong³, Won-Jae Lee¹

1.Dong-Eui University, 2.Ein Crystal, 3.Korea Institute of Ceramic Engineering and Technology (KICET)

Mo-P-10

Numerical Modeling of Residual Stress-Induced Wafer Warpage in 4H-SiC Substrates

○ Magdalena Lang¹, Paul Wimmer¹, Marc Hainke¹, Christian Kranert¹, Jochen Friedrich¹

1.Fraunhofer Inst. for Integrated Systems and Device Technology IISB

Mo-P-11

Influence of Residual Stress on Dislocation Behavior in 4H-SiC during High-Temperature Annealing

○ Paul Wimmer¹, Philip Keller², Christian Kranert¹

1.Fraunhofer IISB, 2.PVA Technology Hub GmbH

Mo-P-12

Investigation of Graphite Etching by SiC Vapors in the PVT Process

○ Yann Gallou^{1, 2}, Fernanda Leite de Azevedo², Abdelmagid El Bakali², Alexandre Potier¹, Andy Covac³, Megan Kephart³, Didier Chaussende²

1.Mersen France, 2.Univ. Grenoble Alpes, CNRS, Grenoble INP, SIMaP, 3.Mersen US

Mo-P-94

Refurbishment of TaC-Coated Wafer Carriers by Parasitic Deposit Removal and Restorative Recoating

Jeff Lennartz¹, ○ Wei Fan¹, Yani Sun¹, Jon Leist¹, Bowen Dong¹

1.Momentive Technologies

Track 02 Epitaxial and Thin-Film Growth (Poster-A, 1st Floor)

Mo-P-13

Comparative Study of Warm-Wall Batch and Hot-Wall Single-Wafer Platforms for 4H-SiC Homoepitaxy on 200 mm Wafers for 1200 V Trench-MOSFETs

○ Daniel Baierhofer¹, Frank Staiger¹, Bernd Thomas¹, Christian Bierhoff¹, Udo Bischof¹

1.Robert Bosch GmbH

Mo-P-14

Thick SiC Epitaxial Layers grown on Engineered Substrates

○ Rachael L. Myers-Ward¹, Nadeemullah A. Mahadik¹, Alec N. Imhof¹, Benjamin J. Sekely¹, Jenifer R. Hajzus¹, Walter Schwarzenbach², Alexis Drouin²

1.U.S. Naval Research Laboratory, 2.Soitec

Mo-P-15

Optimization of Closed Sublimation Growth for Thick and Smooth Fluorescent 4H-SiC Epilayers

○ Aoto Hashiguchi¹, Ryuya Matsumoto¹, Shoki Ohara¹, Kyoya Okawa¹, Motoaki Iwaya¹, Tetsuya Takeuchi¹, Atsushi Suzuki¹, Eri Akazawa², Weifang Lu³, Satoshi Kamiyama¹

1.Meijo Univ. , 2.E&E Evolution Ltd., 3.Xiamen Univ.

Mo-P-16

Alternative Silicon and Carbon Precursors for 4H-SiC Epitaxy

○ Maximilian Titl¹, Christian Wissgott¹, Michael Pfeffer², Johannes Koehler², Kevin Albrecht², Birgit Kallinger¹

1.Fraunhofer Inst. for Integrated Systems and Device Technology IISB, 2. AIXTRON SE

Mo-P-17

Epitaxial Thickness and Surface Roughness Process Control as Enablers for Zero Defect Automotive SiC Power Devices

○ Nicolo Piluso¹, Cristiano Calabretta¹, Fabiana Vento¹, Andrea Severino¹, Antonio Rossitto¹, Alice Lombardo¹, Nicoletta Spampinato¹, Antonio Criscuolo¹, Simone Rosin¹, Anna Martiniello¹, Antonio Volzone¹, Dmitrii Rusakov², Sah Kaushik², Pauline Begoc², Federico Buja², Matteo Salamone², Federico Giuffrida², Parikshit Sharma², Paolo Parisi², Giuseppe Arena¹, Salvatore Ethan Panasci³, Marco Zignale³, Patrick Fiorenza³, Fabrizio Roccaforte³

1.Indus. STMicroelectronics, 2.Indus. KLA Corporation, 3.CNR-IMM, VIII Strada, 5, 95121 Catania, Italy

Mo-P-18

Defect Reduction in 8-inch 4H-SiC Wafers by Integrated Multi-Wafer Dynamic AGE-ing® Etching/Growth Process

○ Taizo Fujiwara¹, Kohei Toda¹, Daichi Dojima¹, Hiroshi Mihara¹, Tadaaki Kaneko¹, ²

1.QureDA Research, Inc., 2.Kwansei Gakuin University

Mo-P-19

Comparative Study of Hydrogen Etching Kinetics on Si (0001) and C (000-1) Terminated 4° Off-Cut 4H-SiC

○ An Min Amanda Lee^{1, 2}, Shiv Kumar¹, Eng Soon Tok², Umesh Chand¹, Tanmay Ghosh¹, Xuan Sang Nguyen¹, Xiao Gong¹, Navab Singh¹, Yee-Chia Yeo¹, ³

1.Inst. of Microelectronics (IME), A*STAR, 2.Department of Physics, National Univ. of Singapore, 3.Department of Electrical and Computer Eng., National Univ. of Singapore

Mo-P-20

Towards Thick and Highly p-Doped 4H-SiC Epitaxial Structures

○ Marco Mauceri¹, Mario Lizzio¹, Vincent Lafage¹, Chiara Cuccia¹, Maria Luisa Alonzo¹, Silvio Preti¹, Marco Zignale², Patrick Fiorenza², Fabrizio Roccaforte²

1.ASM International, 2.CNR-IMM

Mo-P-86

Enabling Next Generation High Voltage Power Applications Through Thick 4HSiC Epitaxy

Tawhid Rana¹, ○ Dong Lee¹, Taye Tarekegn¹, Srujana Prayakara¹, Nadeemullah Mahadik², Alecsander Imhof², Shanthi Subramanian¹

1.Coherent Corp., 2.US Naval Res. Lab.

Track 04 Point Defects and Material Properties (Poster-A, 1st Floor)

Mo-P-21

DFT-validated machine-learning potential for predictive SiC polytype, surface and deformation simulations

○ Mohammed Hassan¹, Christopher Kunneth², Alfred Kersch¹

1.Munich University of Applied Sciences, 2.University of Bayreuth

Mo-P-22

Defect Study of Polycrystalline SiC supporting wafer for SiC engineered substrates

Qiang Wan¹, ○ Shengjie Yu¹, Jiahao Liao¹, Jiabao Liu¹

1.Hunan Dezhi New Material Co., Ltd.

Mo-P-23

Polarity-Driven Phase Transformation and Giant Stress Divergence in UV Nanosecond Laser-Irradiated 4H-SiC

○ Ping-Yu Lin¹, Hsiang-En Weng¹, Chiao-Yang Cheng¹, Yi-Chi Lee², Yi-Chang Wu³, Zi-Hao Wang¹, Yan-Kuin Su¹

1.National Cheng Kung Univ., 2.Indus. Technology and Research Inst., 3.GeChi Compound Semiconductor Corp. Ltd

Mo-P-24

Semi-Insulating 4H-SiC: Can V4+ Photoluminescence Be Used as a Characterization Tool for V Concentration?

○ Harmke Dorien van Dijk¹, Matthieu Pailliet¹, Marcin Zielinski², Rafal Jakiela³, Ahmed Azmi Zahab¹, Jean Roch Huntzinger¹, Hervé Peyre¹, Sandrine Juillaguet¹, Thomas Cohen¹, Olivier Briot¹

1.L2C CNRS Université de Montpellier, 2.Soitec S.A., 3.Inst. of Physics of the Polish Academy of Sciences

Mo-P-25

Withdrawn

Mo-P-26

Annihilation and Local Unfaulting Inside a Triangular Double Shockley-type Stacking Fault in 4H-SiC Epitaxial layer

Soon-Ku Hong¹, Moonkyong Na², Dohyung Kim³, Hyundon Jung³, Natsuko ASANO Asano⁴, ○ shunsuke asahina⁴, ⁵

1.Chungnam National University, 2.Korea Electrotechnology Research Institute, 3.Horiba STEC Korea, 4.JEOL Ltd, 5.Tohoku University

Mo-P-27

Low-Temperature Cathodoluminescence Characterization of Residual Defects in High-Dose Al-Implanted 4H-SiC

○ Tomoyuki Uchida¹, Shinya Honda¹, Ryuichi Sugie²

1.Toray Research Center, Inc., 2.Univ. of Ritsumeikan

Mo-P-87

Evaluation of Thermal Conductivity in Single-Crystal Silicon Carbide

Abdullah Khan¹, ○ Xueping Xu¹, Rajan Rengarajan¹, Ilya Zwieback¹, Elijah Allridge¹

1.Coherent Corp.

Track 05 MOS Gate Stack Processing and Characterization (Poster-C, G403+G404)

Mo-P-62

Simultaneous reduction of SiC/SiO₂ interface states near the conduction and valence band edges by NO annealing

○ Shuya Hiraiwa¹, Kyota Mikami¹, Mitsuaki Kaneko¹, Tsunenobu Kimoto¹

1.Kyoto Univ.

Mo-P-63

Effects of Post-Oxidation Annealing in N₂ and Ar on the SiO₂/4H-SiC interface properties

○ Patrick Fiorenza¹, Valerio Votadoro¹, Salvatore Ethan Panasci¹, Salvatore Di Franco¹, Marilena Vivona¹, Simone Milazzo¹, Marco Zignale¹, Filippo Giannazzo¹, Fabrizio Roccaforte¹

1.CNR-IMM

Mo-P-64

Impact of Nitrogen Profiles on Interface Passivation, Charge Trapping, and Breakdown Reliability in Thermal and Deposited Gate Oxides

○ Runze Wang¹, Yu-Chieh Chien¹, Zijie Zheng^{1, 2}, Xiaolin Wang^{1, 2}, Leming Jiao^{1, 2}, Liyuan Liu¹, Abdul Hannan Yeo¹, Qin Gui Voo¹, Weijie Wang¹, Umesh Chand¹, Xiao Gong^{1, 2}, Navab Singh¹, Yee Chia Yeo^{1, 2}

1.Inst. of Microelectronics (IME), A*STAR, 2.Electrical and Computer Engineering, National University of Singapore (NUS)

Mo-P-65

High Quality SiO₂ Growth on SiC using Pulsed Rapid Thermal Oxidation

○ Max Pujade¹, Jérôme Biscarrat¹, Jean-Manuel Decams², Philippe Godignon¹

1.CEA-Leti, 2.AnnealSys

Mo-P-66

Wafer-Scale Reliability of SiC MOSCAPs With Post-Oxidation NO Rapid Thermal Processing

○ Hyeon-Do Kang², Xiaofan Ma¹, Efe Akman¹, Mattias Ekström¹, Ye-Jin Kim², Per-Erik Hellström¹, Sang-Mo Koo², Carl-Mikael Zetterling¹

1.KTH Royal Inst. of Tech., 2.Kwangwoon Univ.

Mo-P-67

Physical insight into the channel mobility in 4H-SiC MOSFETs with different post-oxidation annealing steps based on experiments

○ QIAN WANG¹, Nazareno Donato¹, Florin Udrea¹, Kyota Mikami², Tsunenobu Kimoto²

1.University of Cambridge, 2.University of Kyoto

Mo-P-68

Investigation of the Two-stage Annealed Al-doped HfO₂/SiO₂/SiC MOS Interfaces for Enhanced MOSFET Short Circuit Robustness

○ XINKAI TIAN¹, Arne Benjamin Renz¹, Mustafa Akif Yildirim¹, James Andrew Gott¹, Marina Antoniou¹, Nereus Agbo², Paul Taylor², Philip Andrew Mawby¹, Peter Michael Gammon¹

1.Univ. of Warwick, 2.Dynex Semiconductor Ltd.

Mo-P-69

Polysilicon Gate and Silicon Nitride Dielectric Interactions in SiC Power MOSFETs: Implications for Reliable Operation

○ Sami Bolat¹, Pooria Asadollahi¹, Edoardo Ceccarelli¹, Marco Pocaterra¹, Giovanni Alfieri¹, Arne Benjamin Renz², Mustafa Akif Yildirim², Marina Antoniou², Elizabeth Buitrago¹

1.Hitachi Energy, 2.Univ. of Warwick

Mo-P-90LN

Defect removal mechanisms in SiC MOS structures by two-step hydrogen annealing

○ Satoshi Iga¹, Takuma Kobayashi¹, Masahiro Hara¹, Heiji Watanabe¹

1. The University of Osaka (Japan)

Mo-P-91LN

Visualization of multiple interface states in n-ch and p-ch 4H-SiC MOSFETs by time-domain charge-pumping technique.

○ Yoshiki Yokoyama¹, Masahiro Hori², Yukinori Ono², Mitsuru Sometani², Hiroshisa Hirai³, Bunta Shimabukuro¹, Heiji Watanabe⁴, Takahide Umeda¹

1. Univ. of Tsukuba (Japan), 2. Shizuoka Univ. (Japan), 3. AIST (Japan), 4. Univ. of Osaka (Japan)

Track 06 Implantation, Contacts, Etching, and Other Processes (Poster-B, G401+G402)

Mo-P-37

Impact of Process Simulation and Analytical Doping Profile Simulation for 6.5 kV 4H-SiC JBS Diodes

○ Xiangzhen Li¹, Yumeng Cai¹, Xiaoguang Wei², Zhibin Zhao^{1, 2}, Guang Zeng³, Feng Yu³, Arne Renz⁴, Kyrylo Melnyk⁴, Zhaoxue Yuan⁴, Marina Antoniou⁴

1.North China Electric Power University, 2.Huaiyou Laboratory, 3.Greenel Semiconductor Co., 4.University of Warwick

Mo-P-38

Process Integration Strategies for High-Yield Manufacturing of Large-Area 6.5-kV SiC MOSFETs

○ Youngsang Kim¹, Chris Wu¹, Benjamin Wang¹, Justin Lynch², Alecsander N Imhof³, Nadeemullah A Mahadik³, Rachael L Myers-Ward³, Seung-Yup Jang², Adam J Morgan², Woongje Sung², Michael Owen¹, Anant A Agarwal²

1.Defense Microelectronics Activity (DMEA), 2.NoMIS Power, 3.U.S. Naval Research Lab.

Mo-P-39

TCAD-Based Optimization and Experimental Validation of a 3.3kV 4H-SiC MOSFET Utilizing an Epitaxially Grown Current-Spreading Layer

○ Stephen A Mancini¹, Seung Yup Jang^{1, 3}, Andrew Binder², Richard Floyd², Robert Kaplan², Jack Flicker², Stan Attcity², Adam Morgan³, Woongje Sung¹

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Mo-P-40

Dual Densification Routes for Additively Manufactured Silicon Carbide Components Used in Semiconductor Processing Equipment

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Mo-P-41

Thermal History Driven PEB Behavior on Si and 4H SiC Substrates in a KrF Lithography Process Using a Production Coater Developer Track

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Mo-P-42

Improving Surface Roughness and Internal Stress by UV Nanosecond Laser Treatment for Laser-Structured 4H-SiC with Micro Pin-Fin Arrays

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Mo-P-43

Evaluation of Processing Stability and Kerf Width Reduction in BPD-free Dicing of SiC Wafer Using Water Jet Guided Laser

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Mo-P-44

Characterization of 6-inch 4H-SiC Non-Epitaxial Engineered Substrates

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Mo-P-45

Mitigation of bipolar degradation in 4H-SiC power devices using SmartSiC™ engineered substrates

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Mo-P-46

Trade-Off Between Forward Conduction and Reverse Leakage in O₂ Annealed Ga₂O₃/SiC Schottky Barrier Diodes

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Mo-P-47

Sequential surface engineering using UV/O₃ and O₂ plasma for defect control in Ga₂O₃/4H-SiC Heterojunctions

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Mo-P-48

Effects of N2 Post-Annealing on the Electrical Characteristics of p-Cu2O/ β -Ga2O3 Heterojunction Diodes

○ Tae-Yeong Yoon¹, Jin-Woo Choi¹, Minseok Kim¹, Sabeen Hwang¹, Chang-Jun Park¹, JuHyeon Son¹, Sang-Mo Koo¹

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Track 07 Power Devices (Poster-B, G401+G402)

Mo-P-49

Structural Origin of Inversion Layer Formation via Stacking-Fault-Mediated Hole Transport in 3C/4H-SiC MOS Structures

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Mo-P-50

Analytical Method for Parameter Extraction From Hall Measurement Data in Aluminum Implanted SiC Test Structures

○ Edmund K Banghart¹, Daniel J Lichtenwalner¹, Hemant Dixit¹, Sei-Hyung Ryu¹

1.Wolfsped

Mo-P-51

Dual-Path Current in Accumulation-Type SiC MOSFETs

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Mo-P-52

Measurement of Temperature-Dependent Large-Signal Hysteresis in Output Capacitance of SiC MOSFETs

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Mo-P-53

Curve Tracer Approach for Accurate Characterization of Output Characteristics of SiC MOSFETs in 1st and 3rd Quadrant

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Mo-P-54

Impact of P+ Body Layout on Capacitance and Third Quadrant Characteristics of Tri-Gate SiC MOSFETs

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Mo-P-55

Variation of Dynamic Characteristics in SiC MOSFETs induced by Edge Termination Topology

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Mo-P-56

Dynamic C-V Characterization of Commercial SiC Power MOSFETs

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Mo-P-57

Miller Capacitance Characterization of SiC Power MOSFETs Beyond Datasheets

○ Michel Nagel¹, Ivana Kovacevic-Badstuebner¹, Ulrike Grossner¹

1.APS - ETH Zurich

Mo-P-58

3D vs. 2D TCAD: The Right Choice for Simulating 4H-SiC MOSFETs?

○ Hemant Dixit¹, Jae Park¹, Jeff Joohyung Kim¹, Sei-Hyung Ryu¹

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Mo-P-59

Physics-based Compact Model of SiC Power MOSFET for Process Corner Analysis

○ Arman Ur Rashid¹, Jeff Joohyung Kim¹, Edmund Banghart¹, Sei-Hyung Ryu¹

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Mo-P-60

Robust and Universal SPICE Model Structure for Variable Capacitance with Negative-Feedback Configuration

○ Yuichiro Nanen¹

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Mo-P-61

A Modified Coupled Charge-driven Reverse Recovery SPICE Model for Describing the Dynamic Behavior of SiC MOSFETs' Intrinsic Body Diode

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Mo-P-88LN

Simulation of Reverse Recovery Characteristics in SiC PiN Diodes with a Carrier-Trapping Layer Formed in the Anode Region

○ Satoshi Asada¹, Koich Murata¹, Hidekazu Tsuchida¹

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Mo-P-89LN

An Efficient Quasi-Static Electrothermal TCAD Modeling Method for Pulsed I-V Prediction of SiC Power Devices

○ Xiran Chen¹, Handoko Linewih¹, Xiaoshuang Yang¹, Peng Cui¹, Yu Zhong¹, Jisheng Han¹

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Track 08 RF, High-Temp., and Rad-Hard Devices and ICs (Poster-C, G403+G404)

Mo-P-70

Dual-functional Ni/4H-SiC Schottky interfaces: Robust UV and X-ray detection, imaging in extreme environments

○ Chowdam Venkata Prasad¹, Sunjae Kim², Beomjun Park³, Geon-Hee Lee¹, Jin-Woo Choi¹, Jeongho Kim⁴, Wan Sik Hwang¹, Jong-Min Oh¹, Sang-Mo Koo¹

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Mo-P-71

Modelling and Verification of Silicon Carbide-based Neutron Detectors

Asim Mumtaz¹, ○ Ibtisam Alanazi¹, Julien Bordes¹, Jamie Brown¹, Pankaj Joshi¹, David Jenkins¹, Vlado Lazarov¹

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Mo-P-72

Temperature-Dependent Output Characteristics of Ni-63-Driven 4H-SiC Betavoltaic Cells

○ Young Jo Kim¹, Ha Bin Jeong¹, Jeong Hyun Moon¹, Sung Yun Woo², Young Jun Yoon³, Jae Hwa Seo¹

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Mo-P-73

VNA S-Parameter-Derived Capacitance of SiC MOSFETs Under 900 V Bias Over Temperature

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Mo-P-74

Asymmetric Dynamic CGD During Turn-on and Turn-off of p-GaN HEMTs

○ Taehyun Jang¹, Hyemin Kang¹

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Mo-P-75

Investigation of π -gate AlGaIn/GaN High Electron Mobility Transistor for Enhanced Breakdown Voltage: A Simulation Study

○ Ju-Hwan JEONG¹, Young-Hyun Won¹, Hyun-Seok Kim¹

1.Dongguk Univ.-Seoul

Mo-P-76

Impact of p-GaN Back Barrier Thickness on DC Performance in GaN-on-SiC HEMTs: A Simulation Study

○ Young-Hyun Won¹, Ju-Hwan Jeong¹, Hyun-Seok Kim¹

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Mo-P-77

AlGaIn/GaN HEMTs on 3C-SiC/Si-substrates with all TiN contact system

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Track 09 Device and Module Reliability, Packaging, and Applications (Poster-C, G403+G404)

Mo-P-78

Electric Field Concentration Analysis and Design Optimization of Double-Sided Cooling SiC MOSFET Power Modules via Gaussian Process Regression - Bayesian Optimization Workflow

○ Jeong Hun Song¹, Sang Won Yoon¹

1.Seoul National Univ.

Mo-P-79

Impact of Surge Current Stress on Asymmetric Trench SiC MOSFETs under Positive Gate Bias

○ Wangchen Li¹, Qihong Feng¹, Shuiyou Zheng¹, Huaxing Jiang¹

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Mo-P-80

Comparative Evaluation of Switching Performance and dV/dt Robustness in 1.2 kV SiC MOSFETs with Embedded SBDs and Cascode JFET Devices

○ Gyuhyeok Kang¹, seungwan Jung¹, Jinwoo Park¹, Jonghyeon Ryu¹, Ogyun Seok¹

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Mo-P-81

Reliability Analysis and Test Results of Novel Die-Attach Technologies for SiC Baseless Power Modules in EV Charging Application

○ Stefano Carboni¹, Andrea Bianchi¹

1.ABB e-Mobility s.p.a.

Mo-P-82

Electrothermal Stability of SiC DMOSFET Under High-Frequency Half-Bridge Operation

○ Geon-Hee Lee¹, Jin-Woo Choi¹, Jin-Woo Kim^{2, 1}, Sang Gi Kim², Weon Chan Kim², Gwon Je Kim², Sang-Mo Koo¹

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Mo-P-83

Impact of the AI Variable Load Profile on SiC MOSFETs Reliability

○ Elena Mengotti¹, Enea Bianda¹, Till Riemenschneider¹

1.ABB Switzerland Ltd.

Mo-P-84

Thermal Structure Analysis of SiC JFETs Using Gate-Source Voltage Measurements

○ Su Ik Park¹, Joosun Yun², Byongjin Ma³, Guesuk Lee³, Tae-Hee Jung³, Yu-Na Jung¹, Gyu-Hyung Cho¹, Youngbeom Kim¹, Hyundon Jung¹

1.HORIBA STEC KOREA Ltd., 2.ComPhysics, 3.Korea Electronics Tech. Inst.

Mo-P-85

GaN/SiC Hybrid Switch with Synchronous-Gate-Control Technique for High-Frequency and High-Reliability Applications

○ Weihao Lu¹, Sheng Li¹, Yanfeng Ma¹, Mingfei Li¹, Siyang Liu¹, Weifeng Sun¹

1.Univ. of Southeast

Mo-P-92LN

HV-H3TRB Reliability and Failure Analysis of 13 kV SiC Devices

○ Kohei Ebihara¹, Kazuya Konishi¹, Yukiyasu Nakao¹, Katsutoshi Sugawara¹, Tatsuro Watahiki¹

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Mo-P-93LN

Reliability Enhancement of 1.7 kV SiC MOSFETs Through Optimized Passivation Process

○ Vamsi Mulpuri¹, Vishank Talesara¹, Jaehoon Park¹, Siddarth Sundaresan¹

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Track 10 Quantum Applications and Sensors (Poster-A, 1st Floor)

Mo-P-28

PL6 centers in 4H-SiC for spin-based quantum technologies

○ Raphaël Wörnle^{1, 2, 3}, Jonathan Körber^{1, 2}, Timo Steidl^{1, 2}, Georgy Astakhov⁴, Durga Dasari^{1, 2}, Vadim Vorobyov^{1, 2}, Florian Kaiser^{5, 6}, Jörg Wrachtrup^{1, 2, 3}

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Mo-P-29

Withdrawn

Mo-P-30

Toward Scalable Telecom-Band Quantum Emitters: Integration of Chlorine-Defect Centers in 4H-SiC Nanostructures

○ Ashin Varghese Mathews^{1, 2}, Andrei N. Anisimov¹, Kalliopi Mavridou¹, Ulrich Kentsch¹, Manfred Helm^{1, 2}, Georgy V. Astakhov¹

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Mo-P-31

Theory of Strained Quantum Emitters

○ Vytautas Žalandauskas¹, Rokas Silkinis², Lukas Razinkovas², Ali Tayefeh Younesi³, Minh Tuan Luu², Ronald Ulbricht³, Ulrike Grossner⁴, Lasse Vines¹, Marianne Etzelmüller Bathen^{1, 4}

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Mo-P-32

High-Fidelity Nuclear Spin Quantum Control in Silicon Carbide Color Centers

○ Irene Carrión López¹, Pierre Kuna¹, Erik Hesselmeier-Hüttman¹, Jawad Ul-Hassan², Vadim Vorobyov¹, Jörg Wrachtrup^{1, 3}

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Mo-P-33

Finite-Time Photoluminescence Readout for Spin-3/2 Ground States in 4H-SiC Silicon Vacancies

○ Jun-Jae Choi¹, Seung-Jae Hwang¹, Seoyoung Paik¹, Sang-Yun Lee¹

1. Gwangju Inst. of Sci. and Tech.

Mo-P-34

Structural Relaxation and Aggregation of Vacancy Defects in Monolayer Silicon Carbide

○ Peter Udvarhelyi¹

1. National Inst. for Materials Sci.

Mo-P-35

Photoluminescence study of Vanadium in 4H- and 6H- Silicon Carbide

Ibrahim Boulares¹, Jeremy L Smith¹, ○ Brenda VanMil¹

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Track 01 Bulk Growth and Wafer Processing (Poster-A, 1st Floor)

Tu-P-01

Growth and Characterization of Heavily Nitrogen-Doped 150 mm 4H-SiC Wafers with Resistivity Near 0.01 $\Omega\cdot\text{cm}$

○ Xueping Xu¹, Ever Velasco¹, Rajan Rengarajan¹

1.Coherent Corp.

Tu-P-02

Enhanced Doping Uniformity and Morphological Stability in 8-inch 4H-SiC Single Crystal Growth via Hot-Zone Structural Modification

○ SUHO KIM¹, Jung Gyu Kim¹, Myung Ok Kyun¹, Yeon Suk Jang¹, Kap Ryeol Ku¹, Jung Gon Kim², Mi Seon Park², Won Jae Lee²

1.EINCRYSTAL Co.,Ltd., 2. Univ. of Dong-Eui

Tu-P-03

Growth of thick Al-doped 4H-SiC layers using Close Space Physical Vapor Transport Growth

Ole Schneider¹, Cristina Grazi¹, Lucrezia Tana¹, Mikael Syväjärvi², ○ Peter J Wellmann¹

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Tu-P-04

Evaluation of Defect Generation in P-type 4H-SiC PVT Growth under Al-N Co-Doping Conditions

○ Kazuma Eto¹, Shigeyuki Kuboya¹, Takeshi Mitani¹, Tomohisa Kato¹

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Tu-P-05

Growth of High-quality P-type Substrates by TSSG Method

○ Yu Guo¹, Chunjun Liu¹, Yuxin Li¹, Xu Sui¹, Yue Shi¹, Yuhui liu¹, Tonghua Peng¹, Jian Yang¹

1.TanKeBlue Semiconductor Co., Ltd

Tu-P-06

Cross-Sectional Analysis of Macrostep Evolution Leading to Solvent Inclusion Formation in Al-Doped Solution-Grown 4H-SiC

Takahiro Ito¹, Kentaro Kutsukake¹, Shunta Harada¹, ○ TORU UJIHARA¹

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Tu-P-07

Optimization of temperature distribution for suppressing SiC inclusions during SiC solution growth

○ Kazuki Shibayama¹, Takeshi Mitani², Tsukasa Washio¹, Daisuke Tahara¹, Shigeyuki Kuboya², Kazuma Eto², Tomohisa Kato²

1.Sumitomo Metal Mining Co., Ltd., 2.National Institute of Advanced Industrial Science and Technology

Tu-P-08

Thermodynamic Evaluation of the Al-C-Cr-Si System for SiC Solution Growth

○ Kazuhisa Kurashige¹, Yoshihisa Abe¹, Akihisa Kawabe¹, Junya Osada¹, Hideo Nakanishi¹, Hiroyuki Ishibashi¹, Toru Ujihara²

1.OXIDE Power Crystal Corporation, 2.Nagoya University

Tu-P-09

Carbon/Graphite: The Hot Zone Hero

○ Joe Abrahamson Abrahamson¹, Fernando Vallejos-Burgos¹, Ievgen Izvarin¹, Patrick Rondonmansi¹, Linsea Foster¹, Mathias Yost^{1, 2}, Thomas Connolly¹, Anirban Phukan², Randy Vander Wal², Dave Fecko², Adri van Duin², Josh Robinson²

1.Morgan Advanced Materials, 2.Penn State University

Tu-P-10

High Temperature Emissivity Measurement Of Metal Carbide Coating

Bowen Dong¹, Creighton Tomek¹, Jeffrey Lennartz¹, ○ Wei Fan¹, Jon Leist¹

1.Momentive Technologies

Tu-P-12

TEM Analysis of Process-Induced Subsurface Damage in β -Ga₂O₃ (001) Substrates for Kerf-Loss Reduction

○ Taekyung Lee¹, Hanchul Cho¹

1.Korea Institute of Industrial Technology

Track 02 Epitaxial and Thin-Film Growth (Poster-A, 1st Floor)

Tu-P-13

Characterization of High Quality Thick Epitaxial SiC Wafers for High kV Applications

○ Dong Seung Lee¹, Tawhid Rana¹, Kirby Schmidt¹, Srujana Prayakara¹, Shanthi Subramanian¹

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Tu-P-14

Kinetic Modeling and Simulation of 4H-SiC Trench Growth

○ Angela Garofalo^{1, 2}, Kelly Turner³, Gerard Colston³, Vishal Shah³, Roberto Bergamaschini¹, Stefano Sanguinetti¹

1.Univ. of Milano-Bicocca, 2.Indus. Vishay Semiconductors Italiana, 3.Univ. of Warwick

Tu-P-15

n-p and p-n Junctions Grown in a Single Epitaxy Process

○ Philip Hens¹, Michael Pfeffer¹, Johannes Koehler¹, Felix Beier², Birgit Kallinger², Jürgen Erlekamp¹

1.AIXTRON SE, 2.Fraunhofer IISB

Tu-P-16

Influence of Technological Surface Structures for Super Junction Devices on 4H SiC Epitaxial Overgrowth

○ Nikolas Schabert¹, Janina Engelhardt¹, Rupert Ullmann², Philip Hens², Birgit Kallinger¹, Oleg Rusch¹

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Tu-P-17

Influence of Ion Implantation and Epitaxial Overgrowth on the Charge Carrier Lifetime in 4H-SiC Epilayer Stacks

○ Christian Wißgott¹, Birgit Kallinger¹, Mauro Emilio Keck¹, Norman Böttcher¹

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Tu-P-18

Unlocking the Polycrystalline to Monocrystalline Phase Transition in Heteroepitaxial Cubic Silicon Carbide Compound Semiconductor

○ Behzad Jazizadeh¹, Maksym Myronov¹

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Tu-P-19

3C-SiC formation by solid state reaction of Si and C multilayers deposited on silicon substrates

Dwarakesh Sudhahar^{1, 2}, Joachim Döll³, Marc Pezoldt⁴, Deepshikha Shekhawat¹, Joerg Pezoldt¹

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Tu-P-20

In-situ surface preparation of various alpha-SiC surfaces for 3C-SiC growth

Gabriel Ferro¹, Ahmed Jabbouja¹, François Cauwet¹

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Track 03 Extended Defects (Poster-A, 1st Floor)

Tu-P-21

Multiphoton-excited photoluminescence analysis of micropipes and related defect structures in 4H-SiC substrates

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Tu-P-22

Physical Revelation and Analysis of Dislocation Densities in Sub-Micron SmartSiC™ Substrates and Direct Correlation with Donor Bulk Crystals

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Tu-P-23

Impact of Buffer Thickness on Bipolar Degradation in SiC Power MOSFETs and Diodes under Transient Surge Current Pulses

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Tu-P-24

Photoluminescence characterization of Shockley Stacking Faults triggered in high power 4H-SiC devices

Nicolo Piluso¹, Cristiano Calabretta¹, Fabiana Vento¹, Salvatore Adamo¹, Ketty Bottari¹, Beatrice Carbone¹, Giovanni Maira¹, Enzo Fontana¹, Angela TERRACINA¹, Laura ANOLDO¹, Giuseppe TOSTO¹, Santina BEVILACQUA¹, Marco IACOBUCCI¹, Santi ALESSANDRINO¹, Giuseppe Arena¹, Andrea Severino¹

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Tu-P-25

Conversion of Substrate Dislocations to Stacking Faults and Influence of Aluminum Implantation on Stacking Faults

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Tu-P-26

Influence of annealing temperature and orientation of basal plane dislocations on their conversion to threading edge dislocations in a 4H-SiC substrate

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Tu-P-27

Carrier-induced reduction in basal-plane slip barriers in 4H-SiC

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Track 04 Point Defects and Material Properties (Poster-A, 1st Floor)

Tu-P-28

Differences in the Distribution of Nonradiative Recombination in PVT- and Solution-Grown SiC Wafers by Laser Heterodyne Photothermal Displacement Method

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Tu-P-29

Improving of Lithium-Ion Battery Capacity with Heteroepitaxial 3C-SiC

Jade Croft¹, Gerard Colston¹, Nicholas Grant¹, Claire Hurley¹, Luke Wilkins¹, Vishal Shah¹

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Tu-P-30

Quantitative Photoelastic Imaging of Residual Strains in Commercial Off-Axis SiC Wafers

Naoto Tsuji¹, Ryoya Watanabe¹, Masayuki Fukuzawa¹

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Tu-P-32

Enhanced Emission of Silicon Vacancy in SiC Thin Film by Al₂O₃ Passivation

Yurong Ren¹, Shuangyou Zhang¹, Mingjun Chi¹, Karsten Rottwitt¹, Haiyan Ou¹

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Tu-P-33

Carrier Lifetime Observation in 4H-SiC PiN Diodes Evaluated by Time-Resolved Electroluminescence

Tong Li¹, Masashi Kato¹

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Tu-P-34

Detailed μ -PCD Decay Curve Characterization for Defect-Related Recombination in 4H-SiC Epitaxial Layers

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Tu-P-35

Enhanced methodology for minority charge carrier lifetime measurements using EBID and frequency-dependent EBIC

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Tu-P-86LN

Carrier Lifetime Enhancement by Channeled Ion Implantation in 4H-SiC

Ben J. Sekely¹, Christopher Lamontagne², Youngsang Kim³, Alecsander N Imhoff¹, Nadeemullah Mahadek¹, Jenifer R Hajzus¹, Rachael L Myers-Ward¹, Atul Gupta², Hank Chen², Fulvio Mazzamuto²

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Tu-P-87LN

Thermal-Response PL/TR-PL Fingerprinting of B/Al-Dependent Lifetime Stability in n-Type 4H-SiC Wafers

○ Rio Kishimoto¹, Koji Ashida², Daichi Dojima², Hiroshi Mihara², Tadaaki Kaneko^{1,2}

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Tu-P-99LN

Substrate-Integrated Point-Defect Engineering by Dynamic AGE-ing for Suppressing Bipolar Degradation and Reverse-Recovery Loss in 4H-SiC MOSFETs

○ Koji Ashida¹, Daichi Dojima¹, Kohei Toda¹, Hiroshi Mihara¹, Tadaaki Kaneko^{1,2}

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Track 05 MOS Gate Stack Processing and Characterization (Poster-C, G403+G404)

Tu-P-62

Interface Engineered ALD SiO₂ / SiC MOS oxide stack using PEALD-enabled controlled nitridation

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Tu-P-63

Enhanced electrical characteristics of 4H-SiC MOSFETs with atomic layer deposited SiO₂ gate dielectrics via ultrathin interfacial passivation

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Tu-P-64

Process Optimization of SiO₂/AlON Gate Stack for Reliable 4H-SiC MOS-Channel Devices

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Tu-P-65

Impact of Atomic Layer Etching Surface Pretreatment on ALD SiO₂/4H-SiC MOS Interface and Channel Transport Properties

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Tu-P-66

Impact of nitrogen-based pre-ALD treatments and post-deposition annealing on SiO₂/4H-SiC and Al₂O₃/4H-SiC MOS capacitors

○ Emanuela Schilirò¹, Raffaella Lo Nigro¹, Marco Zignale¹, Patrick Fiorenza¹, Giuseppe Greco¹, Valerio Votadoro¹, Salvatore Di Franco¹, Filippo Giannazzo¹, Arpita Saha², Yi Shu², ○

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Tu-P-67

Enhancing Performance of 4H-SiC CMOS Integrated Circuits via Atomic Layer Deposition Gate oxide

○ Po-Han Wang¹, I-Chen Tsai¹, Cheng-Shu Chang¹, Yun-Ting Huang¹, Nai-Quan Sun¹, Bing-Yue Tsui¹

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Tu-P-68

Effects of Wet and Nitric Oxide Post-Deposition Annealing on the Interface Quality and Long-term Reliability of LPCVD SiO₂ on 4H-SiC

○ I-Chen Tsai¹, Bing-Yue Tsui¹, Shih-Lung Tsai², Kuan-Wei Chu², Tien-Min Yuan²

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Tu-P-69

Reducing Cover Wafer Effect in Dry Oxidation of 4H-SiC in Thermal Oxidation Furnace

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Tu-P-95LN

TCAD Validation of C–V Interface-Trap Extraction in 4H-SiC MOS Capacitors Across Four Gate Oxide Processes

○ Michael Mawby¹, Philip Mawby¹, David Mawby¹, Arne Renz², Miriam John², Peter Gammon²

1. *KuasaSemi Ltd. (UK)*, 2. *Warwick Univ. (UK)*

Tu-P-96LN

Interface Trap Density Estimation by Forward Modelling of Quasi-Static and High Frequency C–V characteristics in 4H-SiC MOS Capacitors

○ James Lobry¹, Rhys Washer¹, Jon Evans¹, Owen Guy¹, Saptarsi Ghosh¹, Tim Mottram², Mike Jennings¹

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Track 06 Implantation, Contacts, Etching, and Other Processes (Poster-B, G401+G402)

Tu-P-37

Predicting Electronic Stopping Powers along 4H-SiC <11-23> Direction

○ Kazuhiro Mochizuki¹, Tomoaki Nishimura¹, Tomoyoshi Mishima¹, Fumimasa Horikiri¹, Hiroshi Ohta^{1,2}

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Tu-P-38

Damage Accumulation During High-energy Channeling Implantation of Phosphorus into 4H-SiC

○ Manuel Belanche Guadas¹, Helton Goncalves de Medeiros¹, René Heller², Hitesh Jayaprakash¹, Ulrike Grossner¹

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Tu-P-39

Process Simulations of Channeling Implantation for Silicon Carbide Superjunction Power Devices

○ Enrico Sangregorio¹, Francesco La Via¹

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Tu-P-40

Effect of Intermediate Annealing on Channeling Implantation in 4H-SiC

○ Takeyoshi Masuda^{1,2}, Yu Saito¹, Heiji Watanabe²

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Tu-P-41

Multilayer Metallization Strategies for Low-Resistivity Ohmic Contacts to n and p-type 4H-SiC

○ Alisha Arora¹, Adrian Holm Dubré¹, Haiyan Ou¹

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Tu-P-42

n-Type 4H-SiC contact engineering by implantation-annealing co-optimization

Pierre-Edouard Raynal¹, sami bolat¹, Giovanni Alfieri¹, Pooria Asadollahi¹, Fulvio Mazzamuto², Mike Ameen², Dwight Roh²

1.Hitachi Energy, 2.Axcelis

Tu-P-43

Comparison of Laser-Annealed Ni and Ti Silicide Ohmic Contacts and Device Performance in 4H-SiC SBDs

Gyunseo Kim¹, Marko Seifert³, Volker Franke³, Sungwook Jang⁴, Naksun Sung⁴, Beomsang Kim⁴, Tae-Yong Park¹, Seong-Min Jeong¹, Youngjae Park⁵, Minjae Kang⁵, Seongjun Kim⁵, Yun-Ji Shin¹

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Tu-P-44

Comparison of Nanosecond and Femtosecond UV Laser Annealing for Ohmic Contact Formation of Ni/4H-SiC

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Tu-P-45

High-Stability Low-on-resistance 4H-SiC Power Devices by Warpage Control and Roughness-Engineered Backside Contacts

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Tu-P-46

Doping- and Annealing-Dependent Evolution of Transport Mechanisms in Ti/n-4H-SiC Contacts from Rectifying to Ohmic Behavior

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Tu-P-47

High-Temperature Stability of Silicide-Free Mo/SiCA Ohmic Contacts and SBDs on 4H-SiC

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Tu-P-48

WN Diffusion Barrier for Low Gate Leakage Current GaN HEMT Device

Paolo Badalà¹, Antonino Parisi¹, Santo Reina¹, Cristina Tringali¹, Anna Bassi¹, Brunella Cafrà¹, Ferdinando Iucolano¹

1.STMicroelectronics

Track 07 Power Devices (Poster-B, G401+G402)

Tu-P-49

Impact of Substrate Dislocations on the Leakage Characteristics of 650V SiC Power MOSFETs

Fabiana Vento¹, Giovanni Maira¹, Andrea Russo¹, Nicolo Piluso¹, Enzo Fontana¹, Cristiano Calabretta¹, Nicoletta Spampinato¹, Alice Lombardo¹, Damiana Spagnuolo¹, Giuseppe Arena¹, Andrea Severino¹

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Tu-P-50

Impact of micro-pits defects on the low temperature electrical characteristics of 650 V 4H-SiC power MOSFETs

Marco Zignale¹, Patrick Fiorenza¹, Salvatore Ethan Panasci¹, Alberto Catena², Francesco Maria Fiorino², Filippo Giannazzo¹, Fabrizio Roccaforte¹

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Tu-P-51

Mitigation of process-induced variations in highly-scaled trench MOSFETs

Rajni K Sah¹, Dallas T Morisette¹, James A Cooper¹

1.Purdue University

Tu-P-52

Impact of Double-Epitaxial Drift Layer on JFET-Width-Dependent Characteristics in 1.2-kV 4H-SiC MOSFETs

Junki Jung¹, Sumin Park¹, Seungri Yang¹, Hyun Park², Sangik Cheon², Yehwan Kang², Jaejin Song³, Derek D. Lee³, Ogyun Seok¹

1.Pusan National University, 2.SK Powertech, 3.SK Keyfoundry

Tu-P-53

Non-Monotonic Reverse Recovery Behavior in 1.2 kV SBD-Embedded SiC MOSFETs with Different SBD-P-well Ratios

Wonyoung Shin¹, Gyuhyeok Kang¹, Jeongtae Kim¹, Jinwoo Park¹, Juhui Kim¹, Sihyun Kwon¹, Hyojoon Seo², Soontak Kwon², Ogyun Seok¹

1.Pusan National University, 2.TRinno Technology Co., Ltd

Tu-P-54

Design optimization for switching performance characteristics in 1.2kV SiC trench MOSFET

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1.onsemi

Tu-P-55

Short-Circuit and Surge-Current Robustness Limit of SiC MOSFETs at Negative and Elevated Temperatures

Mohamed Alaluss¹, Dominik-Tommi Suszek¹, Madhu Lakshman Mysore¹, Maximilian Goller¹, Josef Lutz¹, Thomas Basler¹

1.Chemnitz Univ. of Tech.

Tu-P-56

Investigation of Drain-Induced Threshold Voltage Shifts in 1200V SiC MOSFETs

Woongsun Kim¹, Naeem Islam¹, Shane Stein¹, Sei-Hyung Ryu¹, Adam Barkley¹, Elif Balkas¹

1.Wolfsped Inc.

Tu-P-57

Enhanced High-Temperature Body Diode Stability and Low Switching Losses in 1.2 kV 4H-SiC Planar MOSFETs via Optimized Current Spreading Layer (CSL)

Yeongeun Park¹, Sangik Cheon², Kyungeun Park², In-Hwan Ji¹, Derek D Lee¹

1.SK Keyfoundry, 2.SK Powetech

Tu-P-58

Cell Pitch Optimization for Ron,sp < 2 mΩ-cm² for 1200V Planar SiC MOSFETs

Aditi Agarwal¹, Rahul Potera¹, Bohee Kang¹, David Sheridan¹

1.Alpha and Omega Semiconductors

Tu-P-59

Investigation of the Short-Circuit Failure Mechanisms in 1700 V 4H-SiC VDMOSFETs

Yu-Jen Chen¹, ○ Shih-Chiang Shen¹, Chih-Ming Tzeng¹, Chih-Ming Lai¹, Tao-Chih Chang¹

1.Indus. Tech. Res. Inst.

Tu-P-60

Comprehensive Experimental Analysis on SmartSiCTM On-state Benefits for 1700V Power Components from Room to High temperature

Francesco Serra di Santa Maria¹, Cyrille Le Royer¹, Jérôme Biscarrat¹, Romain Lavieville¹, Walter Gonçalves Filho¹, Walter Schwarzenbach², Frédéric Allibert², ○ Philippe Godignon¹

1.CEA-Leti, 2.Soitec

Tu-P-61

Design Study of Asymmetric Pillar for Robustness Enhancement in 4H-SiC Semi-Superjunction Geometry

○ Yuzuki Hayakawa¹, Daisuke Iizasa¹, Seigo Mori¹, Yuki Nakano¹

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Tu-P-88LN

Experimental Demonstration of a Self-Aligned Shielding-Gate 1.2 kV 4H-SiC VDMOSFET with Low Reverse Transfer Capacitance

○ Fu-Chen Liang¹, Wei-Jhe Liao¹, Han-Wei Chen¹, Li-Jung Lin², Chun-Hao Lai², Shih-Lung Tsai³, Chien-Chih Lu³, Bing-Yue Tsui¹

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Track 08 RF, High-Temp., and Rad-Hard Devices and ICs (Poster-C, G403+G404)

Tu-P-70

Device-to-Circuit Stability of SiC CMOS Current Mirrors Under 15 MeV Proton Irradiation and 180 °C Operation

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Tu-P-71

Radiation Hardness of implanted 4H-SiC LGADs after 23 MeV protons

Francesco Moscatelli^{1, 2}, Arianna Morozzi², Valentina Sola^{3, 8}, Daniele Passeri^{4, 2}, Peter Svihra^{5, 6}, Radek Novotny⁵, Vojtech Krcmar⁵, Jiri Kroll⁶, Alexander Dierlamm⁷, Brendan Regnery⁷, Robert White⁸, Marco Ferrero⁸, Sebastian Onder⁸, Thomas Bergauer⁹, ○ Adam Klimsza¹⁰

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Tu-P-72

Design of 650 V Multi-Channel SiC LMOSFET with Enhanced Radiation Hardness

○ Subin Choi¹, Hyerin Ju¹, Sihyun Kwon¹, Jeemin Hyun¹, Ogyun Seok¹

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Tu-P-73

4H-SiC Active Pixel Sensors with a 4-pixel Sharing Circuit Structure

○ Sho Suzuki¹, Tatsuya Meguro¹, Akinori Takeyama², Takeshi Ohshima², Kazutoshi Kojima³, Yasunori Tanaka³, Shin-Ichiro Kuroki¹

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Tu-P-74

4H-SiC Neutron Sensors Based on Active Pixel Sensing Structure for Boron Neutron Capture Therapy

○ Vu Thi Ha¹, Tatsuya Meguro¹, Kazutoshi Kojima², Hiroki Tanaka³, Shin-Ichiro Kuroki¹

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Tu-P-75

Logic Circuit Designs, Processes, and Characterization toward 6-inch 4H-SiC CMOS Platform

○ Chihon Saito¹, Shunto Higashi¹, Kota Shimizu¹, Kosuke Muraoka¹, Tatsuya Meguro¹, Tomonori Maeda^{1, 2}, Hiroshi Sezaki^{1, 2}, Akinori Takeyama³, Takeshi Ohshima³, Kazutoshi Kojima⁴, Yasunori Tanaka⁴, Shin-Ichiro Kuroki¹

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Tu-P-76

Memory Characteristics of 4H-SiC Floating-Gate MOS Capacitors

○ Ryosuke Namba¹, Kosuke Muraoka¹, Takeyama Akinori², Takeshi Ohshima^{3, 2}, Kazutoshi Kojima³, Yasunori Tanaka³, Shin-Ichiro Kuroki¹

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Tu-P-77

Impact of Single-Stage Amplifier Load Resistance on Regenerative Characteristics of Monolithically Integrated SiC JFET NOT Gates

○ Haizhao Zhi¹, Sirui Feng¹, Ling Li¹, Rongxin Du¹, Xinpeng Lin¹, Jinghan Xu¹, Xinyue Dai¹, Xiaoping Wang¹, Yuxi Wan¹

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Track 09 Device and Module Reliability, Packaging, and Applications (Poster-C, G403+G404)

Tu-P-78

Distance-Metric-Based Evaluation of Charge-Trap-Induced Degradation in Id–Vgs Characteristics of SiC MOSFETs

○ Sanshiro Yoichi¹, Koichi Endo², Hiroki Nagasawa¹, Junji Senzaki², Shinji Yokogawa¹

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Tu-P-79

Experimental and Theoretical Study of P-Channel Mobility Including Temperature and Active Body Bias Effects in 4H-SiC MOSFETs

○ Hemant Dixit¹, Daniel J. Lichtenwalner¹, Sei-Hyung Ryu¹

1.Wolfspeed

Tu-P-80

Revealing AC-BTI Mechanisms in SiC MOSFETs through Bias-, Geometry-, and Process-Dependent Characterization

○ Jack Chien¹, Weijie Wang¹, Zijie Zheng^{1, 2}, Xiaolin Wang^{1, 2}, Leming Jiao^{1, 2}, Runze Wang¹, Abdul Hannan Yeo¹, Qin Gui Roth Voo¹, Liyuan Liu¹, Xinghua Wang¹, Umesh Chand¹, Xiao Gong^{1, 2}, Navab Singh¹, Yee Chia Yeo^{1, 2}

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Tu-P-81

High-Frequency Gate Switching Stress-Induced Threshold Voltage Drift in DMOS and UMOS Devices for Accelerated Reliability Assessment

○ Koichi Endo¹, Asuka Yaguchi¹, Masaki Hasegawa¹, Junji Senzaki¹

1.National Institute of Advanced Industrial Science and Technology (AIST)

Tu-P-82

Influence of Gate Oxide Nitridation on Vth Instability under Gate Switching Stress in SiC Trench MOSFETs

○ Ryoya Takemura¹, Kaito Miyashita¹, Katsuhisa Tanaka¹, Takuma Suzuki¹

1.Toshiba Electronic Devices & Storage Corp.

Tu-P-83

The Impact of Static and Dynamic Gate Stress on Switching Behavior of 1.2 kV SiC MOSFETs

○ Rajrupa Paul¹, Hua Shen¹

1. Hitachi Energy Research, Hitachi Energy Ltd.

Tu-P-84

Long-term H-Bridge Switching Operation of 1.2 kV SiC MOSFETs Under High VDS Bias, Load Current, and Temperature

○ Sara Kuzmanoska¹, Nirali Patel¹, Jaume Roig¹, Sotirios Maslougkas¹

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Tu-P-85

Withdrawn

Tu-P-97LN

Comparative Repetitive Short-Circuit Degradation of Commercial 650V SiC MOSFETs

○ Haiyong Wan¹, Nikolaos Iosifidis¹, Olayiwola Alatise¹, Peter Michael Gammon¹

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Tu-P-98LN

Negative Threshold Voltage Shifts in 4H-SiC MOSFETs under Bipolar AC Gate Stress: Influence of Channel Length and Nitridation Time

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Track 10 Quantum Applications and Sensors (Poster-B, G401+G402)

Tu-P-89LN

Oxygen-vacancy origin of spin centers with surface-robust charge stability in 4H-SiC

○ Yu Chen^{1,2}, Qi Zhang^{1,3,4}, Mingzhe Liu¹, Junda Wu^{1,3}, Jinpeng Liu^{1,3}, Xin Zhao¹, Jingyang Zhou¹, Pei Yu¹, Shaochun Lin¹, Yuanhong Teng¹, Wancheng Yu⁵, Ya Wang^{1,2,6}, Chang-Kui Duan^{1,2,6}, Fazhan Shi^{1,2,3,6}

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Tu-P-90LN

Insights into local atomic environment of color centers at SiO₂/SiC interfaces

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Tu-P-91LN

Frequency-Resolved Nanoscale Noise Spectroscopy of the SiC/SiO₂ Interface Using Individual Quantum Sensors

○ Jinpeng Liu¹, Yuanhong Teng¹, Yu Chen¹, Qi Zhang¹, Fazhan Shi¹

1. Univ. of Sci. and Tech. of China (China)

Tu-P-92LN

Room-Temperature Optical Charge State Control of Native Defects in HPSI 4H-SiC for Power Electronics Device Diagnostics

○ Agatha C. Ulibarri^{1,2}, Brett C. Johnson³, Helton G. de Medeiros², Daniel J. McCloskey¹, Nikolai Donschuk¹, Alexander A. Wood¹, Ulrike Grossner²

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Tu-P-93LN

Cathodoluminescence mapping of band bending effects from different 4H-SiC Schottky diodes for defect spin control

○ Aurora Teien¹, Maria Martins², Andreas Gottscholl³, Axel Erlebach², Erlend Lemva Ousdal¹, Augustinas Galeckas¹, Ulrike Grossner², Corey Cochrane³, Hannes Kraus³, Lasse Vines¹, Marianne Etzelmüller Bathen¹

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Tu-P-94LN

Quantum Magnetometry and Optimized Near Zero Field Magnetoresistance in SiC Devices

○ Patrick M Lenahan¹, Nicholas A Keggan¹, Dustin T Hassenmayer¹, Corey J Cochrane²

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Track 01 Bulk Growth and Wafer Processing (We-P-57–We-P-60: Poster-B, G401+G402; remaining posters: Poster-C, G403+G404)

We-P-57

Significant Reduction of Crystallographic Defects in 8-inch 4H-SiC Crystals via Optimization of Seed-Adhesion Interface Structure

○ SUHO KIM¹, Jung Gyu Kim¹, Myung Ok Kyun¹, Yeon Suk Jang¹, Kap Ryeol Ku¹, Jung Gon Kim², Gwang Hee Jung², Won Jae Lee²

1.EINCRYSTAL Co.,Ltd., 2.Univ. of Dong-Eui

We-P-58

Optimization of SiC Bulk Growth via the PVT Process with a Physics-Informed Approach Combining Multi-Agent Design and Bayesian Optimization

○ Tae-Yong Park¹, Chang-Jae Yoon¹, Hoang-Linh Nguyen¹, Yun-Ji Shin¹, Yeon-Suk Jang², Kap-Ryeol Ku², Seong-Min Jeong¹

1.Korea Institute of Ceramic Engineering and Technology, 2.EIN Crystals Co. Ltd.

We-P-59

Optimization of Process Condition Sequences for Long-Duration SiC Solution Growth under Time-Evolving Physical Fields

Takanao Sakamoto, Kentaro Kutsukake, Shunta Harada, ○ TORU UJIHARA¹

1.Nagoya Univ.

We-P-60

Advancing the SiC Roadmap: Achieving 200mm Volume Production and 300mm Development

○ Chunjun Liu¹, Yanfang Lou¹, Yu Guo¹, Liwei Fan¹, Jing Yao¹, Jian Yang¹

1.TanKeBlue Semiconductor Corp., Ltd.

We-P-61

SiC Growth Rate Profile Using Multi-Wafer Close-Space Sublimation

○ Hiroyuki Nagasawa¹

1.CUSIC Inc.

We-P-62

Novel approaches for volumetric information in 4H-SiC wafers and boules at an industrial scale in a production environment.

○ Jimmy Thörnberg¹, Torben L. Purz², Anton Vakulenko², Eric W. Martin², Björn Magnusson¹

1.STMicroelectronics Silicon Carbide AB, 2.MONSTR Sense Technologies

We-P-64

Multiscale Atomistic Investigation of Polytype Stability and Growth Kinetics in SiC PVT Growth

Kevin Kayang¹, Aakash Kumar¹, Zeyu Chen¹, Balaji Raghothamachari¹, Michael Dudley¹, ○ Dilip Gersappe¹

1.Stony Brook University

We-P-65

PVT-Reactor Structure Optimization through a Comprehensive Parameter Sweep by High-Precision Surrogate Models

○ Kenji Hayashida¹, Yohei Fujikawa²

1.Research Center for Computational Science and Informatics, Resonac Corp., 2.Resonac Corp.

We-P-66

Utilization of Anisotropic Graphite for Thermal Distribution Control toward SiC Sublimation Growth with Higher Growth Rate

○ Shigeyuki Kuboya¹, Kazuma Eto¹, Yukio Nagahata², Takeshi Mitani¹, Shunsuke Noguchi², Yohei Fujikawa², Kenji Momose², Tomohisa Kato¹

1.National Institute of Advanced Industrial Science and Technology (AIST), 2.Resonac Corporation

We-P-67

Elucidating the Effects of CeO₂ on the PVT Growth of 4H-SiC

○ Katherine Thompson^{1, 2}, Riasat Islam^{1, 2}, Mathias Yost^{1, 2, 3}, Anirban Phukan^{1, 2}, Stanislav Udovenko^{1, 2}, Ian Binnie^{1, 2}, Yuan Xuan^{1, 2}, Adri van Duin^{1, 2}, Randy Vander Wal^{1, 2}, Darren Pagan^{1, 2}, Joshua Robinson^{1, 2}

1.The Pennsylvania State Univ., 2.Silicon Carbide Innovation Alliance, 3.Morgan Advanced Materials

We-P-68

Sparse Sensing-Based Response-Surface Modeling of PVT Reactor Characteristics: Methods and Use Cases

○ Lorenz Taucher¹, Zaher Ramadan¹, Shaikat Lone², Ben Depuydt², Lorenz Romaner¹

1.Montanuniversität Leoben, 2.EEMCO GmbH

We-P-90LN

Porous TaC Filter for SiC PVT Crystal Growth

Riasat Islam^{1, 2}, Yuan Xuan^{1, 2}, Katherine Thompson^{1, 2}, Yani Sun³, Jeff Lennartz, Jon Leist³, ○ Wei Fan³

1. The Pennsylvania State University (USA), 2. Silicon Carbide Innovation Alliance (USA), 3. Momenite Technologies (USA)

We-P-91LN

Thermodynamics of SiC sublimation in PVT crystal growth

○ Fernando Vallejos-Burgos¹, Mathias Yost¹, Joe Abrahamson¹, Ievgen Izvarin¹, Patrick Rondomanski¹, Jesse Gill¹, Linsea Foster¹, Ron Sherant¹, Thomas Connolly¹

1. Morgan Advanced Materials (USA)

We-P-92LN

Withdrawn

Track 03 Extended Defects (Poster-C, G403+G404)

We-P-69

Unveiling a New Class of Triangular Defects in 4H-SiC Through Multi Scale Analysis

○ Cristiano Calabretta¹, Beatrice Carbone¹, Corrado Bongiorno², Nicolò Piluso¹, Cettina Bottari¹, Fabiana Vento¹, Giuseppe Arena¹, Mario Santi Alessandrino¹, Andrea Severino¹

1.Indus. STMICROELECTRONICS, 2.Inst. CNR-IMM

We-P-70

Toward Multiscale Evaluation of 4H-SiC Wafer Quality by Integrating Wafer-Scale Signatures and Microscopic Defect Inspection

○ Koji Ashida¹, Daichi Dojima¹, Mariko Takahara¹, Shota Fujiki³, Kohei Toda¹, Hiroshi Mihara¹, Mari Yamamoto³, Tadaaki Kaneko^{1, 2}

1.QureDA Research, Inc., 2.Kwansei Gakuin University, 3.Lasertec Corporation

We-P-71

Reducing Annotation Cost in Semiconductor Wafer Defect Classification through Self-Supervised Domain Pre-Training

○ Alvin Kiptoo Chirchir¹, Matt Roach¹, Owen Guy¹, Mike Jennings¹, Jacob Mitchell², Justin Lach²

1.Swansea University, 2.KLA Corp.

We-P-72

Rapid Evaluation of Threading Dislocations during Initial-Stage PVT Growth of 4H-SiC Crystals

Govindhan Dhanaraj¹, ○ Xueping Xu¹, Rajan Rengarajan¹

1.Coherent Corporation

We-P-73

Multi-channel defect inspection of 4H-SiC epitaxial wafers by using a single convolutional neural network trained on composite images from different inspection techniques

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1.Nat. Inst. of Adv. Indus. Sci. and Tech.

We-P-74

Scan-Based UV Wafer Screening of Bipolar-Degradation Susceptibility in 4H-SiC via Practical Irradiance-Threshold Mapping

○ Takuya Morita¹, Kaoru Sugihara¹

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We-P-75

Demonstration of Synchrotron X-ray Topography over an Entire 200-mm 4H-SiC Wafer

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We-P-76

Whole-Wafer Imaging of 6-inch 4H-SiC Wafers using Synchrotron X-ray Topography and Automated Defect Classification

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We-P-77

Investigation of the Formation and Propagation of Polytype Inclusions in PVT-Grown 4H-SiC Crystals by Synchrotron X-ray Topography

○ Jianpei Zhang¹, Zeyu Chen¹, Haochi Wang¹, Kaixuan Zhang¹, Jaehyun Suh¹, Balaji Raghothamachari¹, Evan Moe², Yafei Liu², Michael Dudley¹

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We-P-78

Algorithm for automated multimodal characterization of dislocations in 4H-SiC wafers using X-ray topography and polarized light microscopy

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1.Nagoya Univ., 2.SSR Corp., 3.Mipox Corp., 4.Rigaku Corp.

We-P-93LN

Basal Plane Dislocation Mapping and Conversion on 200mm Silicon Carbide Epitaxial Wafers

○ Thomas A. Kuhr¹, Scott A. Ustin¹, Howard Sin², YuChang Wang², Leo Jin²

1. Wolfspeed (USA), 2. Visiontec (Singapore)

We-P-94LN

Correlation Photoluminescence and 3D Raman Imaging Analysis of Threading Dislocations in Free-standing HVPE GaN Substrate

○ Olga Milikofu¹, Toshihiro Asada¹

1. NISSAN ARC LTD. (Japan)

We-P-98LN

Ion-Species Effects on Implantation-Induced Lattice Damage for Bipolar Degradation Suppression in 4H-SiC PiN Diodes

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Track 04 Point Defects and Material Properties (Poster-C, G403+G404)

We-P-79

Impact of Material Crystal Point Defects and Technology Generation on Switching Losses of 3.3kV SiC MOSFETs

○ Nadja Isabelle Desiree Klipfel¹, Clement Bongini¹, Giovanni Alfieri¹, Eduardo Ceccarelli¹, Sami Bolat¹, Moritz Wehrle¹, Elizabeth Buitrago¹, Matthieu Lecroq², Walter Schwarzenbach², Eric Guiot

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We-P-80

Electrical characterization of a 15 kV 4H-SiC p+-i-n diode

○ Giovanni Alfieri¹, Nadja Klipfel¹, Marco Pocaterra¹, Boni Boksteen¹, Stephanie Fernandez¹, Pierre-Edouard Raynal¹, Nazareno Donato², Martin Kah², Giulio Pellegrini³, Luis Figueras³, Adolf Schöner⁴

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We-P-81

Impact of High-Energy Proton-Irradiation on Charge Carrier Dynamics in 4H-SiC

○ Natalija Für¹, Rishi Kupper¹, Helton Goncalves de Medeiros¹, Efe Eden¹, Ulrike Grossner¹

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We-P-82

Characterization of defects induced by heavy ion irradiation in 4H-SiC with low-energy muon spin spectroscopy

○ Maria Mendes Martins¹, Helton Goncalves de Medeiros¹, Gianluca Janka², Natalija Für¹, Efe Eden¹, Thomas Prokscha², Ulrike Grossner¹

1.APS - ETH Zurich, 2.PSI CNM Sci.

We-P-83

Deep-Level Characterization of Electron-Irradiated Diamond Device Using Alpha-Particle Charge Transient Spectroscopy

shin-ichiro Sato¹, ○ Naoya Iwamoto², Yuji Sone¹, Tsubasa Matsumoto³

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We-P-84

Conduction-band-side interface states at the wet-oxidized 4H-SiC(0001)/SiO₂ interface revealed by Electrically-Detected-Magnetic-Resonance (EDMR) spectroscopy

○ Bunta Shimabukuro¹, Keigo Adachi¹, Mitsuru Sometani², Hirohisa Hirai², Heiji Watanabe², Takahide Umeda¹

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We-P-85

Quantitative Ab Initio Determination of Interface State Density Induced by Carbon Defects at SiC/SiO₂ Interfaces

Yu Zhou¹, Gunnar Russberg², ○ Giovanni Alfieri³, Emil Håkansson²

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We-P-95LN

Novel Approach to Electrical Classification of Killer Defects in Epitaxial 4H-SiC

Joanna Wincukiewicz¹, ○ Marshall Wilson¹, Ivan Shekerov¹, Carlos Almeida¹, Jacek Lagowski¹

1. *Onto Innovation (USA)*

We-P-97LN

Advanced Raman Metrology Platform for Wide-Bandgap Power Semiconductors: Submicron Homoepitaxial Uniformity and High-Resolution Thermal Analysis

○ Jung-Hoon Song¹, Youngboo Moon^{2,3}, Seungyoung Lim², GyeongEun Choi², Jaesun Kim²

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Track 05 MOS Gate Stack Processing and Characterization (Poster-B, G401+G402)

We-P-29

Characterization of Trench Sidewall Channel Mobility in 4H-SiC using Lateral Trench MOSFETs

○ Woongsun Kim¹, Naeem Islam¹, Shane Stein¹, Sei-Hyung Ryu¹, Adam Barkley¹, Elif Balkas¹

1. *Wolfspeed*

We-P-30

Sidewall Orientation Effects on Channel Mobility in SiC Vertical Trench Power MOSFETs Extracted by Four-Terminal Transcharacteristic Method

○ Luca Zumbo¹, Mattia Rossetti¹, Luca Oldani¹, Melanie Micali¹, Edoardo Zanetti¹, Marco Camalleri¹, Laura Scalia¹, Andrea Severino¹, Alfio Guamera¹, Mario Saggio¹

1. *STMicroelectronics*

We-P-31

An investigation of m-face SiC loss rate on thermal oxidation process

○ Youngbin Im¹, Helen Jeong¹, Bokyun Seo¹, Junghye Lee¹, Youngkwon Kang¹, MK Ko¹

1. *onsemi*

We-P-32

Crystal-Orientation-Dependent Electrical Characteristics and Bias-Stress Reliability of 4H-SiC Trench MOSFETs

○ Zijie Zheng^{1, 2}, Yu-Chieh Chien¹, Xiaolin Wang^{1, 2}, Leming Jiao^{1, 2}, Runze Wang¹, Liyuan Liu¹, Weijie Wang¹, Xinghua Wang¹, Abdul Hannan Yeo¹, Qin Gui Voo¹, Umesh Chand¹, Xiao Gong^{1, 2}, Navab Singh¹, Yee Chia Yeo^{1, 2}

1. *Agency for Sci., Tech. and Res.*, 2. *National Univ. of Singapore*

We-P-33

Impact of NO Annealing on Gate Switching Instability of SiC Trench MOSFETs

○ Matteo Nigris¹, Dick Scholten¹, Johannes Ziegler¹, Ingmar Kallfass²

1. *Indus. of Robert Bosch GmbH*, 2. *Univ. of Stuttgart*

We-P-34

Pulsed gate voltage transfer characteristic of SiC MOSFETs for improved VTH extraction

○ Enea Bianda¹, Elena Mengotti¹, Gerd Schlottig¹

1. *ABB Corporate Research*

We-P-35

Influence of Interface Traps on Gate-Capacitance Peak Under Drain Bias in SiC Trench MOSFET

○ Ilaria Maticena¹, Luca Maresca¹, Andrea Irace¹, Santolo Daliento¹

1. *University of Naples Federico II*

We-P-36

High Sensitivity Temperature Sensors with SiC MOS Capacitors Fabricated Using Grown Polyoxides

○ Razvan Pascu¹, Gheorghe Pristavu², Gheorghe Brezeanu², Mihaela Kusko¹

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Track 06 Implantation, Contacts, Etching, and Other Processes (Poster-B, G401+G402)

We-P-37

4H-SiC Deep Trench Development for Superjunction Devices

○ Oleg Rusch¹, Stephan Kuehn², Maximilian Szabo¹

1. *Fraunhofer IISB*, 2. *Chair of Electron Devices, University of Erlangen-Nuremberg*

We-P-38

Corners shaping of low dimension SiC trenches by plasma processing

Katarzyna Izabela Stokeley¹, ○ Zareena Hassanbee Mohammed Sheikh Allawudeen¹

1. *Oxford Instruments Plasma Technology*

We-P-39

CD-SEM Enabled Measurement of Etched Trench Sidewall Roughness

○ Paul Smith¹, Daniel Fischer¹, Shimon Levi², Oleg Rusch³, Alesa Fuchs³

1. *Applied Materials GmbH*, 2. *Applied Materials Ltd.*, 3. *Fraunhofer IISB*

We-P-40

Multi-Scale Modeling and Experimental Analysis of SiC Gate Trench Profile Control in ICP-RIE Chamber

○ Yury Shustrov¹, Ivan Petras¹, Andrey Smirnov¹, Oleg Rusch²

1. *Semiconductor Technology Research d.o.o. Beograd*, 2. *Fraunhofer IISB*

We-P-41

Damage-free Dicing of SiC Substrate Using High-Pressure SF6 Plasma – Effect of bias voltage on etching characteristics –

○ Yuken Matsumura¹, Takeshi Ishikawa¹, Nene Yoshimi¹, Daisetsu Toh¹, Jumpei Yamada¹, Yasuhisa Sano¹

1. *Univ. of Osaka*

We-P-42

Effect of Sputter Gas O2 Ratio on the Electrical Characteristics of (In0.1Ga0.9)2O3/4H-SiC Heterojunction Diodes

○ Sabeen Hwang¹, Chang-Jun Park¹, Hyeon-Do Kang¹, Minseok Kim¹, Tae-yeong Yoon¹, Chowdam Venkata Prasad¹, Sang-Mo Koo¹

1. *Kwangwoon Univ.*

We-P-43

Plasma power-dependent O2-plasma recovery of dry-etch-induced damage in β-Ga2O3 Schottky barrier diodes

○ Ye-Jin Kim¹, Minseok Kim¹, Hyeon-Do Kang¹, Jin-Woo Choi¹, Sabeen Hwang¹, Chowdam Venkata Prasad¹, Sang-Mo Koo¹

1. *Kwangwoon Univ.*

We-P-44

Enhanced Anodic Oxidation Behavior in 4H-SiC by Pulsed Voltage Control with Negative Base Bias

○ Shoki Ohara¹, Ryuya Matsumoto¹, Aoto Hashiguchi¹, Kyoya Okawa¹, Motoaki Iwaya¹, Tetsuya Takeuchi¹, Atsushi Suzuki², Eri Akazawa², Yiyu Ou³, Haiyan Ou³, Satoshi Kamiyama¹
1.Meijo Univ., 2.E&E Evolution Ltd., 3.Technical Univ. of Denmark

We-P-45

Effects of pulsed anodic oxidation conditions on the optical properties of porous fluorescent 4H-SiC

○ Ryuya Matsumoto¹, Shoki Ohara¹, Aoto Hashiguchi¹, Kyoya Okawa¹, Motoaki Iwaya¹, Tetsuya Takeuchi¹, Satoshi Kamiyama¹, Eri Akazawa², Atsushi Suzuki², Yiyu Ou³, Haiyan Ou³
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We-P-46

Effect of Facet on Electrochemical Etching Behavior of n-type 4H-SiC

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We-P-47

Surface Modifications in Silicon Carbide by Electrochemical Etching

○ Athul Rathnakar¹, Sofia Bekau², G Colston¹, P M Gammon¹, A B Renz¹, M A Antoniou¹, Vishal A Shah¹
1.University of Warwick, School of Engineering, 2.University of Warwick, Nanofabrication RTP

We-P-48

Influence of SiC consumption on SiC MOSFET electrical parameter

dario tenaglia¹, ○ massimo davide pirnaci¹
1.STMicroelectronics

Track 07 Power Devices (Poster-A, 1st Floor)

We-P-01

Demonstration of 4H-SiC JBSFETs with Split-Gate Architecture for Improved High Voltage Performance

○ Anas Malek Moumani¹, Justin Lynch¹, Stephen Mancini¹, Woongje Sung¹, Miguel Hinojosa², Ronald Green², Aivars Lelis²
1.Univ. at Albany, SUNY, 2.US Army Res. Lab

We-P-02

Suppression of Forward Bias Degradation in 3.3kV DMOSFET Fabricated on 4H-SiC Bonded Substrates

○ Seiji Ishikawa¹, Yuta Higashi², Motoki Kobayashi³, Mitsuo Okamoto¹, Kazutoshi Kojima¹, Shinsuke Harada¹
1.Advanced Power Electronics Research Center, National Institute of Advanced Industrial Science and Tech., 2.PHENITEC SEMICONDUCTOR Corp., 3.Sumitomo Metal Mining Co., Ltd.

We-P-03

Experimental Demonstration of Improved On-State Performance in 3.3 kV 3D Quasi-Planar Trench SiC MOSFET

○ Mansha Kansal¹, Munaf Rahimo², Kyrylo Melnyk³, Giuseppe Capasso¹, Alessandro Borghese¹, Michele Riccio¹, Arne Benjamin Renz³, Giovanni Breglio¹, Neophytos Lophitis⁴, Andrea Irace¹, Marina Antoniou³, Iulian Nistor², Luca Maresca¹
1.University of Naples Federico II, 2.mQsemi AG, 3.University of Warwick, Warwick, UK, 4.Cyprus University of Technology

We-P-04

Demonstration of a 3.3 kV-rating VDMOSFET with Ultra-low Specific on-Resistance

○ Han-Wei Chen¹, Yun-Ting Huang¹, I-Chen Tsai¹, Yu-Xin Wen¹, Bing-Yue Tsui¹
1.Univ. of National Yang Ming Chiao Tung

We-P-05

3.3 kV-Class 4H-SiC TMBS Diodes and TMBS-Embedded UMOSFETs

○ Jun-Kai Huang¹, Jia-Wei Hu¹, Te-Jui Lee¹, Chih-Chun Ouyang¹, Guan-Min Kang¹, Chih-Fang Huang¹
1.National Tsing Hua Univ.

We-P-06

Characterization and Modeling of Third Quadrant Operation in High Voltage 4H-SiC Superjunction DMOSFET

Zhaowen He¹, Collin Hitchcock², Stacey Kennerly², Reza Ghandi², ○ Tat-sing Paul Chow¹
1.Rensselaer Polytechnic Institute, 2.GE Aerospace

We-P-07

Multi-Epitaxy with Channeling Implantation and Deep Trench Design for 3.3 kV Semi-Superjunction MOSFET

○ Kyrylo Melnyk¹, Arne Benjamin Renz¹, Mustafa Akif Yildirim¹, Vishal Ajit Shah¹, Peter Michael Gammon¹, Marina Antoniou¹
1.University of Warwick

We-P-08

Design Considerations for 3.3 kV and 6.5 kV 4H-SiC MOSFETs

Justin Lynch¹, ○ Seung Yup Jang¹, Adam J. Morgan¹, Woongje Sung¹, Youngsang Kim², Michael Owen², Nadeemullah A. Mahadik³, Alecsander N. Imhof³, Rachel L. Myers-Ward³
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We-P-09

Robust 4H-SiC 6.5 kV Edge Termination Based on Floating Field Rings and JTE Termination Design and Optimization

○ Zhaoxue Yuan¹, Arne Renz¹, Nikolaos Iosifidis¹, Xinghua Wang², Xiao Gong^{2, 3}, Umesh Chand², Abhishek Mishra², Xiaolin Wang^{2, 3}, Marina Antoniou¹, Peter Gammon¹
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We-P-10

Comparison of On-State and Switching Performance of High-Voltage 4H-SiC n-Channel IGBTs and DMOSFETs

Thomas Gonzaga¹, ○ Dallas Morissette¹, James Cooper²
1.Purdue Univ., 2.Sonrisa Res.

We-P-11

Wafer-Level Testing of SiC Power Devices > 10 kV: Methods, Limitations and Challenges

○ Marcel Dinse¹, Nadja Klipfel², Nazareno Donato³, Jan-Hendrik Peters¹, Giovanni Alfieri², Marco Pocater², Sami Bolat², Nando Kaminski¹
1.Univ. of Bremen, 2.Hitachi Energy Ltd., 3.Univ. of Cambridge

We-P-12

OBIC Measurements On 4H-SiC Thyristors Protected by Etched Junction Termination Extension

○ Rabei Barhoumi¹, Luong-Viet Phung¹, Camille Sonnevill¹, Sigo Schamholz², Milan Zuvic², Ralf Hassdorf², Dominique Planson¹
1.Univ. of Lyon, 2.French-German Research Institute of Saint-Louis (ISL)

We-P-86LN

Design of the Robust Edge Termination Applied to 10 kV SiC SBD Embedded MOSFET Against Humidity

○ Tetsuya Abe¹, Toshikazu Tanioka¹, Daichi Dansako¹, Minoru Matsuoka¹, Yasuhiro Kagawa¹, Tetsuya Nitta¹
1. Mitsubishi Electric Corp. Power Device works (Japan)

We-P-87LN

Normally-Off 1.2-kV-Class β -Ga2O3 LDMOS with an N-Implanted Current-Blocking Layer and a NiO-Assisted Pseudo-RESURF Structure

○ Seungwon Son¹, Taeun Lee¹, Sola Woo¹

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Track 08 RF, High-Temp., and Rad-Hard Devices and ICs (Poster-A, 1st Floor)

We-P-13

Electrical Response and SEB of Trench-MOSFETs after Heavy-Ion Irradiation

○ Axel Erlebach¹, Helton Goncalves de Medeiros¹, Natalija Für¹, Manuel Belanche¹, Ulrike Grossner¹

1.APS - ETH Zurich

We-P-14

3D Investigation of Heavy Ion Induced Single Event Effects in a Double RESURF SiC Power Device

○ Zhaoxue Yuan¹, Bailing Zhou¹, Peter Gammon¹, Marina Antoniou¹

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We-P-15

Influence of Buffer Profile on the Single Event Immunity of 4H-SiC Epitaxial Stacks under Heavy-Ion Irradiation

○ Gabriel Scott Parkinson¹, Peter Gammon², Niamh Arnold², Virendra Kotagama², Rishad Ahmed¹, Paul Evans¹, Neophytos Lophitis³

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We-P-16

Single Event Transient Suppression in 4H-SiC MOSFETs on V-doped Semi-Insulating Substrates

○ Taisei Ozaki¹, Takahiro Makino², Kazutoshi Kojima³, Takeshi Ohshima², Shin-Ichiro Kuroki¹

1.Hiroshima Univ., 2.QST, 3.AIST

We-P-17

Leakage current instability of Gamma-ray-irradiated SiC junction field effect transistors

○ Akinori Takeyama¹, Takahiro Makino¹, Yasunori Tanaka², Shin-Ichiro Kuroki³, Takeshi Ohshima¹

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We-P-18

Effect of gamma-ray irradiation on the I-V characteristics of level shifting diodes in SiC JFET analog circuits

○ Masayuki Yamamoto^{1, 2}, Ryuya Hirose^{1, 2}, Daisuke Watanabe^{1, 2}, Akinori Takeyama³, Hitoshi Umezawa¹, Takahide Sato², Takahiro Makino³, Takeshi Ohshima³, Shin-ichiro Kuroki⁴, Yasunori Tanaka¹

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We-P-19

A Monolithically Integrated SiC JFET Differential Amplifier: From MPW Fabrication and Low-Voltage Verification to Common-Mode Rejection Optimization

○ Haizhao Zhi¹, Sirui Feng¹, Ronxin Du¹, Ling Li¹, Xinpeng Lin¹, Mengqi Fan¹, Xinyue Dai¹, Xiaoping Wang¹, Yuxi Wan¹

1.Shenzhen Pinghu Laboratory

We-P-88LN

From lab to fab: Wafer-scale fabrication of SiC ion-implantation-based side-gate p- and n-JFETs toward CJFET ICs

○ Mitsunori Kaneko¹, Yoshimori Okamura², Kunihide Oozono², Tetsuro Akasaki², Kazuki Ariura², Kyota Mikami¹, Tsunenobu Kimoto¹

1. Kyoto Univ. (Japan), 2. Phenitex Semiconductor Corp. (Japan)

We-P-89LN

Total Ionizing Dose Effects of SiC MOSFETs with Different Gate Oxidation Post-treatments

○ Yeonjun Kim^{1,2}, Junhyuk Lee², Dong-Seok Kim^{1,3}, Hyemin Kang²

1. Korea Atomic Energy Research Institute (KAERI) (Korea), 2. Korea Institute of Energy Technology (KENTECH) (Korea), 3. University of Science and Technology (UST) (Korea)

Track 09 Device and Module Reliability, Packaging, and Applications (Poster-A, 1st Floor)

We-P-20

Thermal Degradation Behavior in a Double-Sided Cooling SiC Power Module Revealed by Structure Function Analysis

○ Jonghyeon Ryu¹, Gyuhyeok Kang¹, Yeonghyeon Kim¹, Jeongwoo Choi², Junho Lee², Ogyun Seok¹

1.Pusan National University, 2.JMJ Korea

We-P-21

Comparative Study of Gate Oxide Screening With Adjustment Pulse Technique using Commercial and In-House 4H-SiC MOSFETs

○ Monikuntala Bhattacharya¹, Michael Jin², Marvin H White², Atsushi Shimbori², Anant K Agarwal²

1.L&T Semiconductor Technologies, 2.The Ohio State University, 3.Ford Motor Company

We-P-22

Achieving Extrinsic-Free Gate Oxide Reliability in 1200 V SiC MOSFETs: A Large-Scale Statistical Study Validating the Thermo-Chemical E-Model at 175 °C

○ DAHUI YOO¹, Chang-Heon Yang¹, Wonchul Baek², Soochang Kang², Lorenzo Marchesi³, Alessandro Polpetta³, In-Hwan Ji², Derek Lee²

1.SK-powertech Inc., 2.SK-Keyfoundry Inc., 3.EDA Indus.

We-P-23

Gate Oxide Integrity and Lifetime Prediction of 1.2 kV SiC MOSFETs under Step-Wise Increased Gate Bias

○ Roman Boldyrjew-Mast¹, Thomas Basler¹

1.Chemnitz Univ. of Technology

We-P-24

Experimental Identification of Continuous Field-Driven Degradation Mechanism Transition in SiC MOSFETs under DC TDDDB Stress

○ Sota Sugimori¹, Shuhei Nakata¹

1.Kanazawa Institute of Technology

We-P-25

Investigation of Electro-Thermal TDDDB Degradation in 1.2 kV SiC MOSFETs

Ahmed A. Ibrahim¹, Mohammad Monfared¹, Saeed Jahdi², Mohamed Amer Karout³, Craig Fisher¹, ○ Mike Jennings¹

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We-P-26

A New Charge-to-breakdown-based Lifetime Prediction Model for Thermally Grown Gate Oxides in SiC Power MOSFETs

○ Jiashu Qian¹, Hengyu Yu¹, Limeng Shi¹, Michael Jin¹, Monikuntala Bhattacharya¹, Atsushi Shimbori², Marvin H. White¹, Anant K. Agarwal¹

1.The Ohio State University, 2.Ford Auto Co.

We-P-27

Impact of Gate-Voltage Rise Time on AC-TDDDB Lifetime Statistics in SiC MOSFETs

○ Kosei Yokoyama¹, SHUHEI NAKATA¹

¹.Kanazawa Institute of Technology

Track 10 Quantum Applications and Sensors (Poster-B, G401+G402)

We-P-49

Focused Ion Beam Nanopillar Milling to Enhance Light Collection Efficiency from Color Centers in 4H-SiC

○ Efe Eden¹, Helton Goncalves de Medeiros¹, Sarah Sofia Saldanha Faria¹, Joakim Reuteler², Ulrike Grossner¹

¹.APS - ETH Zurich, ².ScopeM - ETH Zurich

We-P-50

Integrated Entangled Photon Source with On-Chip Filtering on Silicon-Carbide-on-Insulator

○ Lijun Ma¹, Wenhan Sun², Anouar Rahmouni¹, Oliver Slattery¹, Qing Li²

¹.National Institute of Standards and Technology, ².Carnegie Mellon University

We-P-51

High-Efficiency Photonic Interfaces for Colour Centres in Silicon Carbide

○ Nien-Hsuan Lee^{1, 2}, Erlend Ousdal¹, Jonas Schmid^{1, 2}, Leonard Zimmermann^{1, 2}, Berke Demiralp³, Felix David³, Stephan Kucera¹, Kevin Menguelti¹, Eva Weig^{3, 4, 5}, Florian Kaiser^{1, 2}

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We-P-52

Design and Fabrication of SiC Flat Optics for Scalable Sensors

○ Matthew Traub¹, Behrooz Behrooz¹, John Viane¹, Petr Siyushev^{1, 2}, Iakov Goldberg¹, Xavier Rottenberg¹

¹.imec, ².University of Hasselt

We-P-53

A High-Throughput Technique for Color Center Quantification with Neural Networks and its Practical Application in a Surface Passivation Study

Christian Gobert¹, Glenn Held¹, Oskar Reichenberger¹, Sarah Saarmann¹, Marina Scharin-Mehlmann¹, Patrick Berwian¹, Peter Evanschitzky¹, Michael Krieger², ○ Jochen Friedrich¹, Jörg Schulze^{1, 3}

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We-P-54

Photoluminescence Properties of Patterned Ion-Implanted Vanadium Centers in 4H-SiC

○ Yoshitaro Uchida¹, Shinichiro Sato², Hidetsugu Tsuchida^{1, 3}

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We-P-55

The Role of Fermi-level Tuning on the Charge Stabilization of Heavy-Ion Induced Color Centers in 4H-SiC

○ Sarah Sofia Saldanha Faria¹, Helton Goncalves de Medeiros¹, Efe Eden¹, Ulrike Grossner¹

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We-P-56

FIB fabrication and integration of NIR quantum emitters in 4H-SiC

○ Elena Nieto Hernandez¹, Matteo Ziino^{2, 3}, Alessandro Cian¹, Gioele Piccoli¹, Elia Scattolo¹, Greta Andrini³, Paolo Olivero^{2, 3}, Jacopo Forneris^{2, 3}, Damiano Giubertoni¹

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Track 01 Bulk Growth and Wafer Processing (Th-P-58–Th-P-61: Poster-B, G401+G402; remaining posters: Poster-C, G403+G404)

Th-P-58

Study and Optimisation of Electrical Resistivity of Chemically Vapour Deposited Polycrystalline SiC

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1.Univ. Grenoble Alpes, CNRS, Grenoble INP, SIMaP, 2.Mersen Gennevilliers, 3.Univ. Grenoble Alpes, Univ. Savoie Mont Blanc, CNRS, Grenoble INP, CROMA, 4.GEMaC CNRS, Université Paris-Saclay, Université de Versailles St-Quentin (UVSQ)

Th-P-59

Unified Planarization and Thinning of Extracted 4H-SiC Layers for Engineered Substrate Applications

◦ Hitesh Jayaprakash^{1, 2, 3}, Masum SM^{3, 2}, Michael Rueb^{2, 3}, Sileno Carmine⁴

1.Freidrich Alexander Univ., Erlangen, 2.mi2-factory GmbH, 3.Ernst-Abbe-Hochschule, Jena, 4.Meister Abrasives

Th-P-60

Influence of Plasma Activation on Surface Chemistry and Wafer Bonding of 4H-SiC

◦ Jimmy Thörnberg¹, Peter Kerepsi², Joseph Halim¹, Michael Dornetshumer², Björn Magnusson¹

1.STMicroelectronics Silicone Carbide AB, 2.EV Group

Th-P-61

The influence of surface properties on poly 3C-SiC to mono 4H-SiC wafer bonding using covalent- and fusion-bonding, with and without plasma activation.

◦ Jimmy Thörnberg¹, Peter Kerepsi², Cristiano Calabretta³, Kouya Shimizu⁴, Michael Dornetshumer², Björn Magnusson¹

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Th-P-62

The stripe growth of heteroepitaxial 3C-SiC crystals on 4H-SiC substrate using Gibbs-Thomson solvent and the focused laser irradiation

◦ Yoya Tsuji¹, Yasunari Koeda¹, Masanori Suzuki¹, Masashi Nakamoto¹, Kazuhito Kamei¹, Takeshi Yoshikawa¹

1.The Univ. of Osaka

Th-P-63

Simulation of Ablation Phenomena in Laser Processing -Proposal of a New Method:the Normalization Group MD for SiC Wafers-

◦ Mariko Tachibana¹, Daiji Ichishima¹, Ryunosuke Kitahara¹, Hirotaka Miyazaki¹, Shuji Miyazaki¹, Sachi Yawaka¹, Yoshiyuki Tomita¹

1.Sumitomo Heavy Industries, Ltd.

Th-P-64

Dopant-selective Photoelectrochemical Etching of 4H-SiC

◦ Michael Seidel¹, Martin Hofmann¹, Carlos Hansen¹, Maximilian Titl¹, Patrick Berwian¹, Jochen Friedrich¹

1.Fraunhofer Inst. for Integrated Systems and Device Technology IISB

Th-P-65

Exploring CMP Machine Parameters via a U-Net model and Genetic Algorithm

◦ Kevin Operiano¹, Roberto Iaconi¹, Fumiya Kawate¹, Saeed Sepasy², Yoshifumi Watanabe²

1.Aixtal Corp., 2.Mipox Corp.

Th-P-66

Voltage-Controlled Anodic Oxidation and CMP Removal Characteristics of 4H-SiC Substrates in K₂CO₃ Electrolyte

◦ Jiyeon Oh¹, Doyeon Kim¹

1.Korea Institute of Industrial Technology (KITECH)

Th-P-67

Improved SiC Wafering Process Sequence featuring Advanced Chemical Etching (ACE) and an Optimized CMP Process

Norbert Bay¹, Catherine Bullock², Oliver Whear¹, ◦ Franck Delahaye¹

1.RENA Technologies GmbH, 2.ASM America Inc.

Th-P-68

Development of Electrochemical Oxidation-Assisted SiC Grinding Process

◦ Shinya Hirano¹, Tomohisa Kato¹, Takeshi Mitani¹

1.National Institute of Advanced Industrial Science and Technology (AIST)

Th-P-69

Subsurface Damage Generation and Control during SiC Polishing

◦ Michael A Robison^{1, 2}, William Gemmill³, Caroline Wattinez³, Evan Krohn^{1, 2}, Matthew Krohn^{1, 2}, Joshua A Robinson^{1, 2}

1.The Pennsylvania State Univ., 2.Silicon Carbide Innovation Alliance, 3.Pureon Inc.

Th-P-87

Electronic Structure Theory for Polytype Nucleus Stability

◦ Kenji Hayashida¹

1.Research Center for Computational Science and Informatics, Resonac Corp.

Th-P-89LN

Thermal Field Optimization toward Improved Crystal Quality of 12-inch n-type 4H-SiC Single Crystals Grown by PVT

◦ Chengjin Qin¹, Xianglong Yang¹, Xiufang Chen¹, Guanglei Zhong¹, Xuejian Xie¹, Zhenxing Fu¹, Xixi Xiong¹, Wenhao Han¹, Guojian Yu², Xiangang Xu¹

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Track 02 Epitaxial and Thin-Film Growth (Poster-C, G403+G404)

Th-P-70

Evaluation of the Effective C/Si ratios during Thermal Etching and Growth on 4H-SiC(0001) Based on Macrostep Morphology

◦ Kohei Toda¹, Hibiki Tanaka², Riku Maeda², Koji Ashida¹, Daichi Dojima¹, Hiroshi Mihara¹, Tadaaki Kaneko^{1, 2}

1.QureDA Research, Inc., 2.Kwansei Gakuin university

Th-P-71

Elucidating Differing Crystal Growth Mechanisms for On-Axis and Off-Axis CVD-Grown SiC on 4H-SiC Substrate Through Photoluminescence Cartography

◦ Harmke Dorien van Dijk¹, Rafał Jakiela², Matthieu Paillet¹, Ahmed Azmi Zahab¹, Jean Roch Huntzinger¹, Sandrine Juillaguet¹, Hervé Peyre¹, Thomas Cohen¹, Olivier Briot¹, Marcin Zielinski³

1.L2C CNRS Université de Montpellier, 2.Inst. of Physics of the Polish Academy of Sciences, 3.Soitec S. A.

Th-P-72

Short Basal Plane Dislocations in 4H-SiC Epilayers and Their Relationship to the Growth Mode at the Upstream Part of the Step-Flow

○ Johji Nishio^{1, 2}, Yuto Sasaki¹, Yohei Harada¹, Chiharu Ota², Keisuke Kurashima¹

1.NuFlare Technology, Inc., 2.Toshiba Corp.

Th-P-73

Systematic Investigation and Reduction of Triangle-Shaped Defects (TriDs) in Thick SiC Epitaxial Layers

○ Bumjoon Kim¹, Michael Coco¹, Hyun-Don Jung², Soo Min Lee¹, Drew Hanser¹

1.Veeo Instruments Inc., 2.HORIBA STEC KOREA, Ltd.

Th-P-74

Epitaxial Wafer Engineering for Free-Standing 4H-SiC Membrane Beam Monitors and Harsh-Environment Detector Platforms

○ Marco Mauceri¹, Gabriele Trovato^{5, 3, 6, 4}, Mario Lizzio¹, Maria Luisa Alonzo¹, Silvio Preti¹, Massimo Camarda^{2, 5, 4}

1.ASM International, 2.Sensic, 3.INFN, 4.IMM-CT, 5.STlab, 6.Dipartimento di Fisica e Astronomia “Ettore Majorana”

Th-P-75

High-aspect ratio CVD coating of TaC reaching deep recesses and channels in graphite components used in SiC- and GaN-epitaxy

○ Charles Wijayawardhana¹

1.SGL Carbon GmbH

Th-P-76

Scalable Large Area Diamond Growth with High Uniformity for Thermal Management Applications

○ Tasya Muhamad Yasser¹, Alexandre Fiori¹, Satoshi Ihida¹, Masami Shibagaki¹, Kazuo Tsugawa¹, Manabu Ikemoto¹

1.Seki Diamond Systems, Cornes Technologies Ltd.

Th-P-90LN

Development of ultra-thick and heavily p-type-doped SiC epitaxial wafers for SiC IGBTs

○ Yoshikazu Umeta¹, Yugo Yamagishi¹, Naoto Ishibashi¹, Yuichiro Mabuchi¹

1. Resonac Corporation (Japan)

Th-P-91LN

Influence of CVD conditions on N incorporation on 4H-SiC(000-1) with surface steps: Ab initio-based approach

○ Wataru Ota¹, Akira Kusaba¹, Yoshihiro Kangawa¹, Keisuke Kurashima², Ichiro Mizushima², Kenji Shiraishi³

1. Kyushu Univ. (Japan), 2. NuFlare Technology, Inc. (Japan), 3. Tohoku Univ. (Japan)

Th-P-92LN

Advancing Silicon Carbide Nanosheets: From Growth and Characterization to Device Fabrication

Nishan Shrestha², ○ Sakineh Chabi¹

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Track 03 Extended Defects (Poster-C, G403+G404)

Th-P-77

Dislocation Engineering of Basal Plane Dislocations in 4H-SiC Substrates using High-Temperature Annealing

Jae-Hwan Kim^{1, 2}, Gyeong-Mi Hwang¹, Shunta Harada³, Kotaro Ishiji⁴, Won-Jae Lee⁵, Chan-Ho Park⁵, Jung-Gyu Kim⁶, Yeon-Suk Jang⁶, Seong-Min Jeong¹, ○ Yun-Ji Shin¹

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Th-P-78

Formation Mechanism of Duple-Basal Plane Dislocations in 4H-SiC Epitaxial Layers

○ Lin Dong¹, Valeria Dellien Roempler¹, Stefan Nufer¹

1.Robert Bosch GmbH

Th-P-79

Structural Analysis of Unconverted Basal Plane Dislocations at 4H-SiC Epitaxial/Substrate Interface

○ Hideki Sako¹, Shohei Hayashi¹, Ohira Kentaro², Daisuke Bizen², Kenji Kobayashi², Noriyuki Hasuie³, Toshiyuki Isshiki³

1.Toray Research Center, Inc., 2.Hitachi High-Tech Corp., 3.Kyoto Institute of Technology

Th-P-80

On the Critical Threshold for the Expansion of a Single Shockley-Type Stacking Fault in n-Type 4H-SiC

○ Yasuyuki Igarashi¹, Hiroumi Matsui¹

1.ITES Co., Ltd.

Th-P-81

Structural Analysis of Stacking Fault Complexes with Different Characteristics in 4H-SiC Epitaxial Wafer

○ Shohei Hayashi¹, Junji Senzaki²

1.Toray Research Center Inc., 2.AIST

Th-P-82

Half-loop Arrays Induced by the Close-up Micropipe-Twins Including a-component in 4H-SiC Substrate

○ Ryo Hattori¹, Tomoyuki Uchida², Ryuichi Sugie³

1.Ceramic Forum, Inc., 2.Toray Reaserach Center, Inc., 3.Ritsumeikan University

Th-P-83

Dislocation Strain Energy and Micropipe Formation by MD Simulation

○ Georg Holub^{1, 2}, Lorenz Romaner^{1, 2}

1.Technical Univ. of Leoben, 2.Christian Doppler Lab. for Advanced Computational Design of Crystal Growth

Th-P-84

Thermal Annealing Induced Dislocation Phenomena in 4H-SiC Substrates Using 2D&3D XRT Analysis

Gyeong-Mi Hwang¹, Jae-Hwan Kim^{1, 2}, Shunta Harada³, Paul Wimmer⁴, Christian Kranert⁴, Won-Jae Lee⁵, Jung-Gyu Kim⁶, Yeon-Suk Jang⁶, Seong-Min Jeong¹, ○ Yun-Ji Shin¹

1.KICET, 2.Pusan National Univ., 3.Nagoya Univ., 4.Fraunhofer IISB, 5.Dong-Eui Univ., 6.EINCRYSTAL Co.,Ltd.

Th-P-85

Comparative Study of Crystal Defect Imaging in 4H-SiC Wafers Using Synchrotron X-ray Topography, Optical Inspection, and Multiphoton Photoluminescence

○ Jiayi Liang¹, Yuhui Huang¹, Hirofumi Hoshida², Shota Fujiki², Takayoshi Shimura^{1, 3}

1.Waseda Univ., 2.Lasertec Corp., 3.RIKEN SPring-8 Center

Th-P-86

A SWB-XRT study of defects within trench refill epitaxy for 4H-SiC superjunctions

Robin Scales², Gerard Colston¹, Arash Estiri¹, Athul Rathnakar¹, Oliver Fox³, Tamzin Lafford⁴, Kelly Turner¹, Marina Antoniou¹, Arne Ben Renz¹, Peter M Gammon¹, Dong Lilly Liu², ○ Vishal Ajit Shah¹

1.University of Warwick, 2.University of Oxford, 3.Diamond Light Source, 4.Bruker Ltd

Th-P-93LN

Effect of Post Epi Processing on Changes in Lattice Distortion in Thick 4H-SiC Epitaxial Wafers for High-Voltage Power Devices

Kaixuan Zhang¹, Zeyu Chen¹, Jianpei Zhang¹, Haochi Wang¹, Jaehyun Suh¹, Alecsander Imhof², Nadeem Mahadik², Ryan Branco³, Dong Lee³, Shanthi Subramanian³, Mehrnegar Aghayan⁴, Robert Gossman⁴, ^o Balaji Raghothamachar¹, Michael Dudley¹

1. Stony Brook University (USA), 2. U. S. Naval Research Laboratory (USA), 3. Coherent Corporation (USA), 4. GE Aerospace (USA)

Th-P-94LN

Contrasting Effects of Stopped and Through-Wafer Proton Implantation on Shockley Stacking-Fault Expansion in 4H-SiC

^o Kazumi Takano¹, Yasuyuki Igarashi¹, Yohsuke Matsushita¹, Takuya Morita¹, Hiroumi Matsui¹

1. ITES (Japan)

Track 05 MOS Gate Stack Processing and Characterization (Poster-A, 1st Floor)

Th-P-01

A Correction Method for Interface-State Analysis in TCAD Modeling of 4H-SiC MOSFET Transfer Characteristics

^o Sozo Kanie¹, Shunsuke Asaba¹, Rintaro Miyata¹, Katsuhisa Tanaka¹

1. Toshiba Electronic Devices & Storage Corporation

Th-P-02

TCAD Modelling of the SiO₂/4H-SiC Interface and Threshold-Voltage Degradation in SiC Planar MOSFETs

Xiao Xiong¹, Huang Zhongtian², Konstantinos Zaoskoufis¹, Solon A. Christodoulou¹, Asad Fayyaz², Paul Evans², Ke Li², Munaf Rahimo³, Iulian Nistor³, ^o Neophytos Lophitis¹

1. Cyprus Univ. of Tech., 2. The Uni. Of Nottingham, 3. mqSemi AG

Th-P-03

TCAD Simulations of 4H-SiC MOS Transistors: Dependence on Oxide Interface and Temperature

^o Axel Hartmann¹, Christophe Pixius¹, Mathias Rommel¹

1. Fraunhofer IISB

Th-P-04

Conduction-Band-Side Interface States and Their Reactions with NO Post-Oxidation Anneal Revealed by Electrically-Detected -Magnetic-Resonance (EDMR) Spectroscopy

^o Keigo Adachi¹, Bunta Shimabukuro¹, Mitsuru Sometani², Hirohisa Hirai², Heiji Watanabe³, Takahide Umeda¹

1. Univ. of Tsukuba, 2. National Inst. for Advanced Indus. Sci. and Tech., 3. The Univ. of Osaka

Th-P-05

Surface Sensitive Raman and Photoluminescence Study of the SiO₂/SiC Interface

^o Immo Erdmann¹, Helton Goncalves de Medeiros¹, Pietro Marabotti², Marianne Etzelmüller Bathen³, Sebastian Heeg², Ulrike Grossner¹

1. APS - ETH Zurich, 2. Humboldt-Universität zu Berlin, 3. University of Oslo

Th-P-06

Non-contact Electrical Characterization of Oxidized p-type 4H SiC Using Corona C-V Metrology

^o Marshall Wilson¹, Robin Karhu², Mathias Rommel², Jannik Schwarberg³, Bradley Wilson¹, Joanna Wincukiewicz¹, Adam Wincukiewicz¹, Ivan Shekerov¹

1. Onto Innovation, 2. Fraunhofer IISB, 3. Friedrich-Alexander-Universität

Th-P-07

Capacitive response of deep traps in implanted p-MOS by frequency-dependent and quasi-static measurements at low temperature or under UV illumination

Marco Zignale¹, ^o Patrick Fiorenza¹, Valeria Puglisi², Paola Mancuso², Simone Rascunà², Mario Saggio², Marilena Vivona¹, Filippo Giannazzo¹, Fabrizio Roccaforte¹

1. CNR-IMM, 2. STMicroelectronics

Th-P-08

Fabrication and Characterization of p-Channel MOSFETs on a Solution-Grown 4H-SiC Wafer

^o Kota Mano¹, Taisei Ozaki², Shunto Higashi², Yu Matsuda¹, Tomonori Umezaki¹, Shin-ichiro Kuroki²

1. Central Glass Corp. Ltd., 2. Hiroshima Univ.

Track 06 Implantation, Contacts, Etching, and Other Processes (Poster-A, 1st Floor)

Th-P-09

High-Voltage 4H-SiC PiN Diodes: Ion Implantation vs. Epitaxial Growth for Wide-Temperature Operation

^o Alfio Samuele Mancuso^{1, 2}, Saverio De Luca², Enrico Sangregorio², Annamaria Muoio², Erik Gallo³, Eleonora Quadri³, Silvia Vanellone³, Antonio Trotta³, Marco Mauceri⁴, Salvatore Tudisco⁵, Francesco La Via²

1. Univ. of Catania, 2. Inst. of CNR-IMM, 3. Corp. of ENI S.p.A., 4. Manufac. of ASM International, 5. Inst. of INFN-LNS

Th-P-10

Optimization of Ion Implantation for Suppressing Stacking Fault Expansion in 4H-SiC

^o Tong Li¹, Hitoshi Sakane², Shunta Harada³, Masashi Kato¹

1. Nagoya Inst. of Tech., 2. SHI-ATEX Co., Ltd., 3. Nagoya Univ.

Th-P-11

Structural and Electrical Characterization of He Ion Implanted 4H-SiC

^o Ben J. Sekely¹, Cory D. Cress¹, Jeffery M. Woodward¹, Daniel J. Pennachio¹, Ignas Lekavicius¹, Jenifer R. Hajzus¹, Rachael L. Myers-Ward¹

1. U.S. Naval Research Lab.

Th-P-12

Implant Annealing of 4H SiC Using a Standard RTP Platform System

^o Peter Benkart¹, David Mendler², Thorsten Hülsmann³, Philipp Fricker³, Michael Storek³

1. Mattson International GmbH, 2. Infineon Technologies Austria AG, 3. Mattson Thermal Products GmbH

Th-P-13

Medeor™ Non-Uniform Ion Implantation for Device Performance and Yield Enhancement in SiC Power Devices

^o Nan Zheng¹, Supakit Charnvanichborikarn¹, Tyler Wills¹, Scott Oleson¹, Hans Gossmann¹, Xiangdong He¹, Shan Tang¹, William Bogiages¹, Pratim Palit¹, Jonathan Lowder¹, Shardul Patel¹, Wei Zou¹, Jay Scheuer¹

1. Applied Materials, Inc.

Th-P-14

Technology Development of Implantation Masks for a Multi Epitaxy, Multi Implant Approach for 4H-SiC Superjunction Drift Zones

^o Janina Engelhardt¹, Oleg Rusch¹, Volker Häublein¹, Nikolas Schabert¹, Rupert Ullmann², Philip Hens², Birgit Kallinger¹, Michael Jank¹

1. Fraunhofer Inst. for Integrated Systems and Device Technology IISB, 2. Aixtron SE

Th-P-15

Monitoring Low-Dose Ion Implantation in 4H-SiC Wafers Using Photomodulated Reflectance Technique

^o Laszlo Balogh¹, Denes Ullrich^{1, 2}, Janos Szivos¹, Zoltan Bozoki¹, Gaszton Vizsnyiczai¹, Bence Mate Kovacs¹, Ors Seps¹, Jeong Hyun Moon³

1. Semilab Corp., 2. Budapest University of Technology and Economics, 3. Korea Electrotechnology Research Inst.

Th-P-16

Effect of Sputter-Deposited Carbon Capping on Surface Stability and Interface Trap Suppression in 4H-SiC

○ Jaeyoon Kim¹, Yehwan Kang¹, Junghyun Moon², Denes Ullrich³, Janos Szivos³, Laszlo Balogh³, Zoltan Bozoki³, Changheon Yang¹

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Th-P-17

Formation of highly doped p-type junctions in SiC via laser-assisted implantation, followed by microsecond (μ s) UV laser annealing

Zeinab CHEHADI¹, ○ Shintaro Hirano², Tae-Hoon Huh², Akichika Oono², Anthony Albanese¹, Yoshiaki Inda², Junichiro Mitsui², Abderazek Talbi¹, Yoji kawasaki², Louis Thuries¹

1.Sumitomo (SHI) Material Solutions Europe SASU, 2.Sumitomo Heavy Industries Material Solutions Co., Ltd.

Th-P-18

Effect of Ion Implantation on Thermal Oxidation in n-Type 4H-SiC

○ An Min Amanda Lee^{1, 2}, Jinlong Liu^{2, 1}, Zirui Tan^{2, 1}, Shiv Kumar¹, Eng Soon Tok², Umesh Chand¹, Woo Bin Song¹, Xiao Gong¹, Navab Singh¹, Yee-Chia Yeo^{1, 3}

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Th-P-19

Thermal Probe (TP) Measurements for Ion Implantation Monitoring on Silicon Carbide Substrates

○ Sedat Dogan¹, Axel Koenig¹, Martin Haberjahn^{2, 3}, Tetyana Shapoval³, Refat Soliman³, Jie Zhu⁴

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Th-P-88LN

Withdrawn

Track 07 Power Devices (Poster-B, G401+G402)

Th-P-30

A Novel Process for Fabricating Thick Bottom OXide (TBOX) UMOSFET on 4H-SiC

○ An-Ching Li¹, Li-Tien Hsueh¹, Bing Yue Tsui¹, Chia-Lung Hung², Yi-Kai Hsiao²

1.National Yang Ming Chiao Tung Univ., 2.Hon Hai Research Inst.

Th-P-31

Interface Engineering of 4H-SiC Schottky Barrier Diodes using Molecular Surface Modification for Superior Electrical Performance

○ Shivansh Tiwari¹, Tejas R. Naik¹, Kamlesh Bhatt¹, Manish Singh Rautela¹, Satwik Mahasha¹, Rajendra Singh¹

1.Indian Institute of Technology Delhi

Th-P-32

Edge Termination Optimization in 1200V 4H-SiC Devices

○ Naem Islam¹, Jae-Hyung Park¹, Woongsun Kim¹, Jeff Joohyung Kim¹, Ayan Biswas¹, Sei-Hyung Ryu¹

1.WolfSpeed Inc.

Th-P-33

A Robust Trench Ring-Assisted Junction Termination Extension on a PN Multi-Epitaxial Layer for 6.5 kV-class SiC PiN Diodes

○ Jeongtae Kim¹, Sumin Park¹, Wonyoung Shin¹, Juhui Kim¹, Sihyun Kwon¹, Ogyun Seok¹

1.Univ. of Pusan

Th-P-34

Fabrication of a 6.5 kV Robust SiC JBS Diode Using a Dose-Insensitive A Novel Structure Hybrid-CPG Termination

Sang-Gi Kim¹, Sung Mo Koo¹, Won-Chan Kim¹, Dong-Ju Kang¹, ○ Dong-Hoon Lee¹, Myung Hwan Lee¹, Gwon-Je Kim¹

1.EYEQLAB

Th-P-35

Correlation Between Forward Voltage Drift and 1SSF in 4H-SiC Power Diodes

○ Cristiano Calabretta¹, Camille Vuylstecker¹, Adrien Marchadier¹, Alice Lombardo¹, Nicolò Piluso¹, Giuseppe Arena¹, Andrea Severino¹

1.Ind. STMICROELECTRONICS

Th-P-36

Performance Optimization and Tradeoffs of 30kV-rated 4H-SiC Epitaxial-Anode and Implanted-Anode PiN Junction Diodes

○ Giorgian Borca-Tasciuc¹, Zhaowen He¹, Collin Hitchcock¹, Nick LaBry¹, T. Paul Chow¹

1.Rensselaer Polytechnic Inst.

Th-P-37

First Demonstration of 200mm Wafer Level 6.5 kV-Class 4-H SiC PiN Diodes

○ Xinghua Wang¹, Zhaoxue Yuan², Xiaolin Wang^{1, 3}, Abhishek Mishra¹, Yu-Chieh Chieh¹, Peter Gammon², Marina Antoniou², Weijie Wang¹, Nikolaos Iosifidis², Zijie Zheng^{1, 3}, Arne Renz², Qin Gui Voo¹, Shiv Kumar¹, Umesh Chand¹, Leming Jiao^{1, 3}, Runze Wang¹, Arvind Sundaram¹, Liyuan Liu¹, Xiao Gong^{1, 3}, Navab Singh¹, Yee Chia Yeo^{1, 3}

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Th-P-38

Bevel Angle Design Method Based on Fabrication Limits of Vertical GaN PIN Diodes

○ Hee Jin Kim¹

1.Pusan National University

Th-P-39

Si-content effects on aerosol-deposited Ga₂O₃/4H-SiC Schottky diodes

Chang-Jun Park¹, ○ Geon-Hee Lee¹, Jin-Woo Choi¹, Hyeon-Do Kang¹, Sabeen Hwang¹, Tae-Yeong Yoon¹, Sang-Mo Koo¹

1.Kwangwoon Univ.

Th-P-40

Effects of Powder Sintering Temperature and Tin (Sn) Ratio on Electrical Characteristics and Leakage Mechanism in Vertical Ga₂O₃/4H-SiC Schottky Diodes Fabricated by Aerosol Deposition

○ Jin-Woo Choi¹, Minseok Kim¹, Hyeon-Do Kang¹, Chang-Jun Park¹, Sa-Been Hwang¹, Chowdam Venkata Prasad¹, Sang-Mo Koo¹

1.Kwangwoon Univ.

Th-P-41

Annealing-Driven Interface Engineering of Ni/(Al_{0.4}Ga_{0.6})₂O₃/4H-SiC Heterojunction Power Diodes

○ Minseok Kim¹, Chowdam Venkata Prasad¹, Hyeon-Do Kang¹, Jin-Woo Choi¹, Chang-Jun Park¹, Geon-Hee Lee¹, Kung-Yen Lee², Sang-Mo Koo¹

1.Kwangwoon Univ., 2.National Taiwan Univ.

Th-P-42

Optically-Switched 4H-SiC Power Bipolar Junction Transistor (BJT) - Influence of the device design

○ Dominique Planson¹, Camille Sonnevill¹, Pascal Bevilacqua¹, Enora Vuillermet¹, Luong Viet Phung¹, Pierre Brosselard¹, Mihai Lazar², Bertrand Vergne³, Sigo Scharnholz³, Herve Morel¹

1.Lab. Ampere, 2.Lab. L2n, 3.Inst. Saint-Louis

Track 08 RF, High-Temp., and Rad-Hard Devices and ICs (Poster-B, G401+G402)

Th-P-43

Radiation Hardening of 4H-SiC Photodiode by Dummy Interconnects

○ Taketo Yamamoto¹, Tatsuya Meguro¹, Akinori Takeyama², Takeshi Ohshima², Kazutoshi Kojima³, Yasunori Tanaka³, Shin-Ichiro Kuroki¹

1.Hiroshima university, 2.QST, 3.AIST

Th-P-44

Towards the development of SiC Low-Gain Avalanche Diodes for fast timing applications in harsh environment

○ Stephanie Cancelli¹, Giovanni Paternoster¹, Matteo Centis Vignali¹, Maurizio Boscardin¹, Oscar Ariel Marti Villareal¹, Giancarlo Pepponi¹, Francesco Moscatelli², Arianna Morozzi³, Daniele Passeri⁴, Valentina Sola⁵, Mara Bruzzi⁶

1.Fondazione Bruno Kessler, 2.National Res. Council, 3.National Inst. of Nuclear Physics, 4.Univ. of Perugia, 5.Univ. of Torino, 6.Univ. of Firenze

Th-P-45

256-Pixel 4H-SiC UV CMOS Image Sensor for Harsh Environment Applications

○ Tatsuya Meguro¹, Taketo Yamamoto¹, Tomonori Maeda^{1, 2}, Hiroshi Sezaki^{1, 2}, Akinori Takeyama³, Takeshi Ohshima³, Kazutoshi Kojima⁴, Yasunori Tanaka⁴, Shin-Ichiro Kuroki¹

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Th-P-46

On-Wafer 25 °C Comparison Study of IC-Processed 4H-SiC Extreme Environment Resistive Sensor Bridge Designs

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Th-P-47

773 K Operation Characteristics of 4H-SiC Phorodiodes

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Th-P-48

400oC High Temperature and 125 hours Operation of 4H-SiC CMOS Operational Amplifier Circuits

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Th-P-49

Suppression of short channel effects by the LDD structure in 4H-SiC n-MOSFETs up to 500 °C environments

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Track 09 Device and Module Reliability, Packaging, and Applications (Poster-B, G401+G402)

Th-P-50

Evolution of Bipolar Degradation over Time and Its Influence on Short Circuit Behavior

○ Clemens Herrmann¹, Jonas Prenzel¹, Christian Bäuml¹, Rudolf Elpelt², Larissa Wehrhahn-Kilian², Thomas Basler¹

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Th-P-51

Combining Optical Binning and Engineered SmartSiCTM Substrates for Superior MOSFET Ruggedness to Bipolar Degradation

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Th-P-52

Short Circuit of Bipolar Degraded Devices: Lateral Temperature Profile, Metallization Imprint, and Saturation-Current Decrease

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Th-P-53

Accurate Temperature-Dependent SiC MOSFET Model for Short Circuit Simulation of Parallel Devices

○ Giuseppe Strollo¹, Anja Brandl¹, Michel Nagel¹, Ivana Kovacevic¹, Ulrike Grossner¹

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Th-P-54

Comparison of Ruggedness of Surge-, Unclamped Inductive Switching- and Short Circuit-Stress in 4H-SiC MOSFETs

○ Philipp Steinmann¹, Ramona Buckreus¹, Sabrina Ulmer¹, Tugrul Sahin¹

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Th-P-55

Reliability Impact of Laser-Sawing-Induced Sidewall Damage and Backside Recast Residue in SiC MOSFET Packaging

○ Pei-Huan Lee¹, Hong-Rui Huang¹, Chien-Hsiung Huang¹, Cheng-Yen Lin¹, Yu-Hsien Lai¹, Hsin-Chung Tsai¹, Hyper Chang¹

1.ACTRON TECHNOLOGY Corp.

Th-P-56

A Novel 4H-SiC-Based ESD NPN Protection Circuit with Reduced Trigger Voltage and Improved Second breakdown Current

○ bobae Song¹, youngchul Kim¹, jongmin Kim¹, hyunchul Nah¹, heebae Lee¹, sanggi Lee¹

1.DB Hitek

Th-P-57

Surface Features Associated with Body Diode Current

○ Sujitra Pookpanratana¹, Muhammad Waqas Khaliq^{1, 2}, Andrew J. Winchester¹, Valerie Hoang^{1, 3}, Tyler Gervasio¹, Michael Lloyd¹, Gelu Comanescu¹, Albert Davydov¹, Behrang Hamadani¹

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Track 10 Quantum Applications and Sensors (Poster-A, 1st Floor)

Th-P-20

Large Area 4H-SiC Schottky Barrier Diodes for the Detection of Fast Neutrons

○ Jarod Remy¹, Ethan Schieb¹, Raymond Cao¹

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Th-P-21

Integrated $\Delta E/E$ detector realization and testing for nuclear physics experiments

○ Francesco La Via¹, G. M. Falciglia², Alfio Samuele Mancuso¹, Carmen Altana², Saverio De Luca¹, Enrico Sangregorio¹, Giuseppe Sapienza², Marco Mauceri³, Salvatore Tudisco²

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Th-P-22

Multi-Source Reverse-Bias Study of a 100- μm 4H-SiC P-i-N Detector: From UV-TCT to D-T Neutron Response

○ Alfio Samuele Mancuso^{1, 2}, Ivan Lopez Paz³, Matteo Hakeem Kushoro^{4, 5}, Saverio De Luca², Erik Gallo⁶, Marcio Jiménez³, Neil Moffat³, Annamaria Muoio², Giulio Pellegrini³, Martín Pérez^{7, 8}, Eleonora Quadri⁶, Enrico Sangregorio², Antonio Trotta⁶, Salvatore Tudisco⁹, Silvia Vanellone⁶, Francesco La Via²

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Th-P-23

Transient Charge Collection in Ultra-Thin SiC Membranes for Single-Ion Detection

○ Enrico Sangregorio¹, Alfio Samuele Mancuso², Saverio De Luca¹, Annamaria Muoio¹, Lucia Calcagno², Francesco La Via¹

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Th-P-24

Heteroepitaxial 3C-SiC for MEMS Applications

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Th-P-25

Design, Fabrication and Characterization of Vertical Mesa 4H-SiC LGADs

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Th-P-26

Characterization of Fluence-Dependent Defect Formation in Diamond Toward Fluorescence-Based Fast-Neutron Dosimetry

○ Luke Shoen¹, Andrew Tong², Jack Lanza¹, Jennifer Choy², Raymond Cao¹

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Th-P-27

Magnetic Field Imaging of Electrical Signals using quantum SiC microscope (QSiCM)

○ Andrei N. Anisimov¹, Ayisha Suhana, Tatiana Aureliia Uaman Svetikova, Christof Schneider, Manfred Helm, Georgy V. Astakhov

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Th-P-28

Optically Detected Magnetic Resonance of Silicon Vacancies in 4H-SiC Formed by High Fluence Electron Irradiation

○ Akinori Nishimoto^{1, 2}, Shin-ichiro Sato², Koichi Murata³, Masafumi Hanawa³, Hidekazu Tsuchida³, Seiichi Saiki², Yuichi Yamazaki², Takeshi Ohshima^{2, 4}, Yasuto Hijikata¹

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