Advanced Power Semiconductor Subcommittee 8th Lecture

The 8th Meeting on Advanced Power Semiconductors

Sponsored by: Japan Society of Applied Physics, Advanced Power Semiconductor Subcommittee

Venue: Online

Program (Technical Program)

Thursday, December 9th

time	Main venue	Poster venue	Exchange space
9:55-10:00	Opening speech		freely Please use it
10:00-11:30	Session I Keynote speech Yoshiyuki Sankai (University of Tsukuba), Akira Yabe (NEDO)		
11:30-12:30	industrial session		
12:30-13:30	lunch break		
13:30-15:00	Session II Invited Lecture (Application) Tomoya Inoue (IHI), Hiroshi Fujimoto (University of Tokyo), Makoto Takamiya (University of Tokyo)		
15:00-15:20	break		
15:20-16:00	Session ÿ Last year's Encouragement Award Commemorative Lecture Jun Tsunoda (Waseda University), Daiki Sakata (University of Tsukuba)		
16:00-16:20	break		
16:20-17:20		Poster session IA	
17:20-18:20		poster session IB	

Friday, December 10th

time	Main venue	Poster venue	Exchange space
9:00-9:45	Session ÿ Keynote speech Yasuhiko Onishi (Fuji Electric)		freely Please use it
9:45-10:00	break		
10:00-12:00	Session ÿ Invited lecture (devices) Takehiro Kato (Mirise Technologies), Kenru Sudo (Hitachi) Heiji Watanabe (Osaka University), Makoto Kakazu (Saga University)		
12:00-13:00	lunch break		
13:00-14:00		Poster session IIA	
14:00-15:00		Poster session IIB	
15:00-15:20	break		
15:20-16:50	Session ÿ Invited Lecture (Crystals) Tadaaki Kaneko (Kwansei Gakuin University), Toru Ujihara (Nagoya University) Tsukasa Ota (Yano Research Institute)		
16:50-17:10	Encouragement Award Ceremony closing		
18:00-20:00			online Social gathering

Thursday 9 December

Opening 9:55-10:00 [Main venue]

9:55-10:00 Opening remarks

Secretary General Atsushi Suda (Nagoya University)

Session I: Keynote speech 10:00-11:30 [Main venue]

10:00-10:45 Expectations for advanced power semiconductors and power electronics in the cybernics/robot field

I-1 [Keynote speech] The Promise and Hope for Advanced Power Semiconductors and Power Electronics in the Fields of Cybernics and Robotics

Yoshiyuki Sankai (University of Tsukuba, Cyberdyne)

10:45-11:30 Next-generation power electronics research and development trends and contribution to technological development towards realizing a sustainable society

I-2 [Keynote speech] Research and Development of Advanced Power Electronics and Their Contributions to Realize the Sustainable Society Akira

Yabe (New Energy and Industrial Technology Development Organization)

Industrial session 11:30-12:30 [Main venue]

11:30-12:30 Industrial session

(Lunch break 12:30-13:30)

Session II: Invited lecture (applied) 13:30-15:00 [Main venue]

13:30-14:00 Trends in the aircraft industry and the future of electrification solutions towards a decarbonized society

II-1 [Invited lecture] Trends in the Aviation Industry for Decarbonization and Future Perspectives of Electrification

SolutionsTomoya Inoue (IHI)

14:00-14:30 Development of in-wheel motor compatible with wireless power supply while driving

II-2 Development of Wireless In-Wheel Motors for Dynamic Charging

[Invited Lecture] Hiroshi Fujimoto (University of Tokyo)

14:30ÿ15:00 Gate ICs for the digitalization of power electronics: Digital gate drivers and sensing via gate terminals

II-3

[Invited Lecture] Gate IC for Digitalized Power Electronics: Digital Gate Driver and Sensing via Gate Terminal Makoto Takamiya

(University of Tokyo)

(Break: 15:00-15:20)

Session III: Last year's Encouragement Award Commemoration Lecture 15:20-16:00 [Main venue]

15:20ÿ15:40 High breakdown voltage and low on-resistance of vertical two-dimensional hole gas diamond power MOSFET

III-1 [Invited lecture] High Breakdown Voltage and Low On-Resistance of Vertical-Type Two-Dimensional Hole Gas (2DHG) Diamond Power MOSFET with Trench Structure Jun

Tsunoda, Naoya Niikura, Kosuke Ota, Atsushi Hiraiwa, Hiroshi Kawaharada (Waseda University)

15:40-16:00 NBTI evaluation of SiC MOSFET using improved high-speed on-the-fly method

III-2 NBTI Evaluation in SiC MOSFETs by Improved Fast On-the-fly Method

[Invited Lecture] Daiki Sakata 1, Yukihiro Hirai 3, Mitsuo Okamoto 3, Shinsuke Harada 3, Okamoto University 2 Mitsuru Sometani 3 Tetsuo Hatakeyama 2 Noriyuki Iwamuro 1 (1. University of Tsukuba, 2. University of Toyama, 3. National,

Yuji Yano1, Institute of Advanced Industrial Science and Technology)

(Break: 16:00-16:20) **Poster**

Session I 16:20-18:20 [Poster venue]

16:20-17:20 First half (IA)

17:20-18:20 Second half (IB)

Friday 10 December

Session IV: Keynote speech 9:00-9:45 [Main venue]

9:00-9:45 Technology trends in power semiconductor devices
IV-1 Technical Trend of Power Semiconductor Devices
[Keynote speech] Yasuhiko Onishi (Fuji Electric)

(Break: 9:45-10:00)

Session V: Invited lecture (device) 10:00-12:00 [Main venue]

10:00ÿ10:30 FinFET effect in narrow body SiC-MOSFET
V-1 FinFET Effect in Ultra-Narrow-Body Silicon Carbide MOSFETs
[Invited lecture] Takehiro Kato1 , Kaloyan Naydenov3 , Hyemin Kang3 , Eiji Kagoshima1Tsuyoshi Nishiwaki1TsunenobuHirokazu Fujiwara1 ,
Kimoto2Florin Udrea3 (1.Mirise Technologies, 2.Kyoto University, 3.University of Cambridge)

10:30-11:00 Development of TED-MOS® for achieving both high performance and high reliability
V-2 Development of TED-MOS for High Performance and Reliability
[Invited lecture] Kenru Sudo, Naoki Watanabe, Chika Suematsu, Yuki Mori, Dai Hisamoto, Akio Shima (Hitachi, Ltd.)

11:00ÿ11:30 Similarities and differences in wide bandgap semiconductor MOS interface characteristics
V-3 Similarities and Differences in the MOS Interface Properties of Wide Bandgap Semiconductors
[Invited lecture] Heiji Watanabe (Osaka University)

- 2-Inch Recent Progress of Diamond Semiconductor Devices
Heteroepitaxial Wafer Growth - 2-Inch Heteroepitaxial Wafer Growth and Fabrication of Selectively Doped
Power Devices - V-4 [Invited Talk] and Modulation-Doped Power Device - Makoto
Kakazu 1 Kin Seiyu 2 (1. Saga University, 2. Adamant Namiki Precision Jewelry)

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(Lunch break 12:00-13:00)

Poster Session II 13:00-15:00 [Poster venue]

13:00-14:00 First half (IIA)
14:00-15:00 Second half (IIB)

(Break: 15:00-15:20)

Session VI: Invited lecture (crystal) 15:20-16:50 [Main venue]

15:20-15:50 ~A Development of SiC wafer process using Dynamic AGE-ing® method
VI-1 new high-temperature thermal process that integrates the removal of a strained layer and the formation of an epi-buffer layer~
[Invited Lecture] The Development of Dynamic AGE-ing® as a Contactless New Thermal SiC Wafering Process
Integrated with the Function of Epitaxial Buffer LayerTadaaki
Kaneko (Kwansei Gakuin University)

15:50-16:20 Growth of 6-inch SiC crystal by solution method and process informatics technology utilized for it
VI-2 Process Informatics for 6 inch SiC Solution Growth
[Invited lecture] Toru Ujihara (Nagoya University, National Institute of Advanced Industrial Science and Technology, UJ-Crystal)

16:20-16:50 (Focusing Current status and prospects of wide bandgap semiconductor single crystals
VI-3 on SiC, which will be the core for the practical application of next-generation power semiconductors)
[Invited Talk] Current Situation and Future Outlook of Wide-Bandgap Semiconductor Single Crystals
(With a Focus on SiC as Core for Practical Application of Next-Generation Power Semiconductors) Tsukasa Ota (Yano
Research Institute)

Encouragement Award Ceremony/Closing 16:50-17:10 [Main Venue]

16:50-17:10 Encouragement Award
Ceremony Closing

Online social gathering 18:00-20:00 [Communication venue]

18:00-20:00 Online social gathering

poster lecture

(The ÿ in front of the speaker indicates that the presentation is an application for the Encouragement Award.)

[IA] (12/9 first half 16:20-17:20)

IA-1 Search for step growth model on 4H-SiC(0001) surface using quantum chemical calculations

Searching for Step Growth Models in 4H-SiC(0001) Surface using Quantum Chemical Calculations

Shinnosuke Nakatsuji, Daisuke Yano, Teppei Ogura (Kwansei Gakuin University)

IA-2 4H-SiC CMOS well formation by epitaxial growth

4H-SiC CMOS Well Formation by Epitaxial Growth

ÿTouya Kai 1 , Kazusato Kojima 2, Takuma Shima1, Takeshi Oshima 3, Yasunobu Tanaka 2, Shinichiro Kuroki1 (1.Hiroshima University, 2.National Institute of Advanced Industrial Science and Technology) Joint Research Institute, 3.National Institute for Quantum Science and Technology)

IA-3 Contribution of components with slow carrier lifetime in GaN epilayer to electrical characteristics

Contribution to Electrical Properties of Slow Component of Carrier Lifetime in GaN Epilayers

ÿTakuto Maeda 1 , Takato Asada1 , Kenji Ito 2 , Kazuyoshi Tomita 2, Tetsuo Narita 2 , Toru Kaji 3 , Masashi Kato 1,3 (1. Nagoya Institute of Technology, 2. Yutaka Tanaka Lab, 3. Nagoya University)

IA-4 Evaluation of carrier lifetime in the drift layer required to suppress 4H-SiC bipolar deterioration

Evaluation of Carrier Lifetime in the Drift Layer to Suppress Bipolar Degradation for 4H-SiC

ÿToshiki Mitsui, Masashi Kato (Nagoya Institute of Technology)

IA-5 Potential barrier formed by various stacking faults in the conduction band of n-type 4H-SiC epilayer

Potential Barriers in Conduction Band Induced by Various Stacking Faults in n-type 4H-SiC Epilayers

ÿSatoshi Asada, Koichi Murata, Shuichi Tsuchida (Central Research Institute of Electric Power Industry)

IA-6 Origin of electron mobility anisotropy in 4H-SiC

Origin of Electron Mobility Anisotropy in 4H-SiC

Ryoya Ishikawa1, Seidai Hara 1, Hajime Tanaka1,2, Mitsuaki Kaneko1, Tsunenobu Kimoto1 (1. Kyoto University, 2. Osaka University)

IA-7 Study on reducing temperature and pressure of ultra-high pressure annealing for Mg ion implantation p-type GaN activation

Reduction of Temperature and Pressure in Ultra-High-Pressure Annealing for Activation of Mg-Implanted p-type GaN

ÿKensuke Tsunoda1, Toshi Akikawa 1, Hideki Sakurai1, Masahiro Hotta1, M. Bockowski1,2, Toru Kaji1 , Jun Suda1 (1.Nagoya University, 2.Polish Academy of Sciencesÿ

Optimal design study and operation analysis of IA-8 4H-SiC Schottky pn diode

Optimization and Analysis of Device Structure in 4H-SiC Schottky pn Diode

ÿKaito Mori, Ryo Kamewada, Noriyuki Iwamuro, Yuji Yano (University of Tsukuba)

IA-9 Body layer impurity density of channel mobility in 4H-SiC n/p channel MOSFET subjected to NO annealing

Dependence

Dependence of Channel Mobility on Body Doping Concentration in NO-Annealed 4H-SiC n- and p-channel MOSFETs

ÿKyota Mikami, Kaoru Tachiki, Koji Ito, Tsunenobu Kimoto (Kyoto University)

IA-10 Characteristic deterioration of NO-nitride SiC MOS devices due to excimer ultraviolet light irradiation

Degradation of Electrical Characteristics in NO Nitrided SiC MOS Devices by Excimer UV Irradiation

ÿHiroki Fujimoto1 , Takuma Kobayashi1, Mitsuru Someya 2, Mitsuo Okamoto 2, Takuji Hosoi1 , Shimura Koko 1, Heiji Watanabe1 (1.Osaka University, 2. National Institute of Advanced Industrial Science and Technology)

IA-11 Effect of post-deposition heat treatment on gate dielectric film reliability in SiO2/GaN MOS structure

Effect of Post-Deposition Annealing on Gate Dielectric Reliability of SiO2/GaN MOS Structures

ÿBunichiro Mikake, Hidetoshi Mizobata, Mikito Nozaki, Takuma Kobayashi, Takako Shimura, Heiji Watanabe (Osaka University)

IA-12 SiC p-, n-JFET device that reproduces the static and dynamic characteristics of SiC complementary JFET inverters up to 573 K

model building

Device Modeling of SiC p- and n-JFETs Reproducing the Static and Dynamic Characteristics of a SiC Complementary JFET Inverter up to 573K

ÿNorio Maeda1 , Kaneko Koken 1, Hajime Tanaka1,2, Tsunenobu Kimoto1 (1. Kyoto University, 2. Osaka University)

IA-13 Design method of solid-state circuit breaker using N parallel SiC MOSFETs based on UIS experiment

A Design Method for Solid-State Circuit Breakers Using N Parallel-Connected SiC MOSFETs Based on UIS Test

ÿLou Zaiqi, Wataru Saito, Shinichi Nishizawa (Kyushu University)

[IB] (12/9 second half 17:20-18:20)

IB-1 Observation of step shape evolution using temperature swing modulation doping in 4H-SiC solution growth

Observation of Step Bunching Development using Temperature Swing Modulation Doping in 4H-SiC Solution Growth

Kohei Kagotani, Futaki Naruse, Daichi Dojima, Tadaaki Kaneko (Kwansei Gakuin University)

IB-2 Surface processing of gallium oxide using PCVM (Plasma Chemical Vaporization Machining)

Etching Ga2O3 by PCVM

Yasuki Choi, Genta Nakagami, Kazuto Yamauchi, Yasuhisa Sano (Osaka University)

IB-3 Carrier lifetime evaluation in 4H-SiC SJ-UMOSFET created by ion implantation

Carrier Lifetime Evaluation of 4H-SiC SJ-UMOSFET Fabricated by Ion Implantation

ÿTakuya Fukui1 , Tatsuya Ishii1 , Takeshi Tawara 2 , Masashi Kato 1 (1. Nagoya Institute of Technology, 2. National Institute of Advanced Industrial Science and Technology)

IB-4 Polarization characteristics of a single photon source formed on the thermally oxidized SiC semiconductor surface

Polarization Characteristics of Single Photon Sources Formed on the Surface of Thermally Oxidized SiC Semiconductor

Shota Komori, Yasuto Hijikata (Saitama University)

IB-5 Observation of diamond threading dislocations with different reverse leakage currents

Observation of Diamond Threading Dislocations Having Reverse Leakage Current Difference

ÿMarika Takeuchi 1 , View Naoki 1 , Kozen Ichikawa 2, Noriyuki Terachi 2, Noboru Otani 1, Shinichi Shikata1 (1.Kwansei Gakuin University, 2.Materials/ National Institute for Materials Science)

IB-6 Formation of S ion-implanted n-type SiC layer and evaluation of ionization energy of S donor

Formation of Sulfur-Implanted n-type SiC Layers and Estimation of Ionization Energy of Sulfur Donors

ÿTaiga Matsuoka, Mitsuaki Kaneko, Tsunenobu Kimoto (Kyoto University)

IB-7 Origin of hysteresis in reverse current-voltage characteristics of GaN mesa type pn junction diode

Origin of Hysteresis in Reverse Current-Voltage Characteristics of GaN pn Junction Mesa Diodes

ÿTakuto Ohashi, Shoichi Kanechika, Ken Kondo, Tsutomu Uesugi, Kazuyoshi Tomita, Masahiro Hotta, Jun Suda (Nagoya University)

IB-8 Electrical property evaluation and physical analysis of SiO2/4H-SiC(1-100) interface with NO-POA

Electrical and Physical Characterizations of NO-Annealed SiO2/4H-SiC(1-100) Interfaces

ÿAsato Suzuki 1 , Takasumi Nakanuma 1 , Yu Iwakata 1 , Takuma Kobayashi1 , Mitsuru Someya 2 , Mitsuo Okamoto 2 , Takuji Hosoi1 , Shimura Koko 1 , Watanabe Heiji 1 (1. Osaka University, 2. National Institute of Advanced Industrial Science and Technology)

IB-9 Electrical characteristics evaluation of SiO2/GaN MOS capacitor formed on GaN(000-1) surface

Electrical Properties of SiO2/GaN MOS Capacitors Fabricated on GaN(000-1) Substrates

ÿKazuki Tomigahara 1 , Yuhei Wada1 , Hidesato Mizobata 1 , Mikito Nozaki 1 , Akitaka Yoshikoshi 2 , Takuji Hosoi1 , Takuma Kobayashi1 , Shimura Koko 1 , Heiji Watanabe1 (1.Osaka University, 2.Japan Atomic Energy Agency)

IB-10 Inversion layer mobility evaluation of GaN-MOSFET using Hall effect measurement

Evaluation of Hall Mobility in Inversion Layer of GaN-MOSFETs

ÿShota Sato, Daichi Ikuta, Masato Omori (Oita University)

IB-11 Characteristic evaluation of 4H-SiC CMOS inverter using n/p well structure by epitaxial growth

4H-SiC CMOS Inverters on n/p-epitaxial Well Structures

ÿTakuma Shima1 , Kai Touya 1 , Kazusato Kojima 2 , Yasunobu Tanaka 2 , Takeshi Oshima 3 , Shinichiro Kuroki1 (1.Hiroshima University, 2.National Institute of Advanced Industrial Science and Technology) Joint Research Institute, 3.National Institute for Quantum Science and Technology)

IB-12 Study on optimal design of 4H-SiC RESURF p-MOSFET for monolithic complementary power converter

Structural Optimization of 4H-SiC RESURF p-MOSFET for Monolithic Complementary Inverter

ÿTomoya Saijo, Noriyuki Iwamuro, Yuji Yano (University of Tsukuba)

[IIA] (12/10 first half 13:00-14:00)

IIA-1 Quality evaluation of ÿ150mm 4H-SiC wafer grown at 1.5mm/h by gas method

Quality Evaluation of 150-mm 4H-SiC Wafers Grown at a Growth Rate of 1.5 mm/h Using a High-Temperature Chemical Vapor Deposition Method

Takeshi Okamoto1 , Hideyuki Johigashi1 , Takahiro Kanda1 , Nobuyuki Oya 1 , Keisho Horiai1 , Satoshi Sakakibara 1 , Takashi Kanemura1 , Norihiro Hoshino 2 , Other role Kiyoshi 2 , Isao Kamata 2 , Shuichi Tsuchida2 (1.Mirise Technologies, 2.Central Research Institute of Electric Power Industry)

IIA-2 Nitrogen-boron codoped 4H-SiC crystal growth using boron-doped SiC raw material

Nitrogen and Boron Co-doped 4H-SiC Growth with Using Boron Doped SiC Powders

Kazuma Eto 1 , Kaori Horiguchi 2 , Naoto Nakai2 , Tsuyoshi Akedo2 , Kenta Masuda 2 , Tomohisa Kato1 (1. National Institute of Advanced Industrial Science and Technology, 2. Taihei Western cement)

IIA-3 Detection of BPD on SiC substrate using mirror electronic inspection device and evaluation of conversion efficiency to TED

Detection of BPD in SiC Substrates by using Mirror Electron Inspection System and Evaluation of Conversion Efficiency of BPD to TED

Keiko Masumoto, Junji Senzaki, Hiroshi Yamaguchi (National Institute of Advanced Industrial Science and Technology)

IIA-4 Origin structure analysis of stacking fault complexes existing in 4H-SiC epiwafers

Structural Analysis of Stacking Fault Complex Origin in 4H-SiC Epitaxial Wafer

Shohei Hayashi 1 , Hideki Sako1 , Junji Senzaki2 (1. Toray Research Center, 2. National Institute of Advanced Industrial Science and Technology)

IIA-5 Re-evaluation of high quality Auger recombination coefficient of 4H-SiC crystal

Revisit of Auger Recombination Coefficient in 4H-SiC Using a High-quality Crystal

Kazuhiro Tanaka, Keisuke Nagaya, Masashi Kato (Nagoya Institute of Technology)

IIA-6 Improvement of electrical characteristics by heat treatment of Au/Ni/n-GaN Schottky electrodes with different surface treatments

Improvement of Electrical Characteristics by Heat Treatment of Au/Ni/n-GaN Schottky Contacts with Different Surface treatments

Hiroki Imabayashi1 , Ryo Tanaka 2 , Shinya Takashima 2 , Katsunori Ueno 2 , Masaharu Edo 2 , Kenji Shioshima1 (1. University of Fukui, 2. Fuji Electric)

IIA-7 Study on suppressing Mg segregation in a high concentration Mg injection layer in GaN

Suppression of Mg Clusters in High-concentration Mg Implanted Layer into GaN

Ryo Tanaka 1 , Ashutosh Kumar2 , Shinya Takashima1 , Masaharu Edo 1 , Atsushi Umehashi 2 , Tadakatsu Okubo 2 , Kazuhiro Takarano2 (1.Fuji Electric, 2. National Institute for Materials Science)

IIA-8 Electrical characteristics evaluation of p-type GaN MOS devices using Mg ion-implanted GaN subjected to ultra-high pressure activation heat treatment

Electrical Properties of p-GaN MOS Devices Fabricated on Mg-Implanted GaN Activated by Ultra-High-Pressure Annealing

Hidesato Mizobata 1 , Yuhei Wada1 , Mikito Nozaki 1 , Takuma Kobayashi1 , Takuji Hosoi1 , Toru Kaji 2 , Shimura Koko 1 , Heiji Watanabe1 (1.Osaka University, 2. Nagoya University)

IIA-9 Study of the correlation between SiC nitridation rate and oxide film growth rate in N2 atmosphere in 4H-SiC(0001)/SiO2 structure

Considerations on the Relationship between SiC Nitridation Rate and Oxide Growth Rate for 4H-SiC(0001)/ SiO2 Structure in N2 Ambient

Tianlin Yang, Koji Kita (The University of Tokyo)

IIA-10 Body layer concentration dependence of channel mobility in phosphorous-treated SiC MOSFET

Dependence of Channel Mobility on Doping Concentration of p-body in Phosphorus-Treated SiC MOSFETs

Kouji Ito1 , Masahiro Hotta1,2, Jun Suda1,2, Tsunenobu Kimoto1 (1. Kyoto University, 2. Nagoya University)

IIA-11 Effect of mechanical stress on the mobility of 4H-SiC(0001) trench MOSFET

Effects of Mechanical Stress on Mobility of 4H-SiC(0001) Trench MOSFETs

Naotoshi Hikosaka1 , Wakana Takeuchi 1 , Eiji Kagoshima 2 , Shigehisa Shibayama 3 , Mitsuo Sakashita 3 , Hideki Tomita 2 , Tsuyoshi Nishiwaki 2 , Hirokazu Fujiwara 2 , Nakatsuka Science 3 (1.Aichi Institute of Technology, 2.Mirise Technologies, 3.Nagoya University)

IIA-12 Operating characteristics of 4H-SiC MOSFET amplifier at 500ÿ after long-term aging at 400ÿ

Operation Characteristics at 500o C of 4H-SiC MOSFET Amplifier After Long Time Aging at 400o C

Vuong Van Cuong, Tatsuya Meguro, and Shin-Ichiro Kuroki (Hiroshima University)

[IIB] (Last half of 12/10 14:00-15:00)

IIB-1 Suppression of 3C inclusion in 4H-SiC on-axis epitaxial growth

Suppression of 3C-Inclusion in 4H-SiC on-axis Epitaxial Growth Keiko Masumoto, Kazusato Kojima, Yasunobu Tanaka, Hiroshi Yamaguchi (National Institute of Advanced Industrial Science and Technology)

IIB-2 3C-SiC with low mixing of rotational variants grown by CVD on the carbon polar surface of 4H-SiC

3C-SiC with Less Rotational Variants Mixing Grown on 4H-SiC C-face Substrate by CVD Hiroyuki Sazawa, Hirotaka Yamaguchi, Kazusato Kojima, Hiroshi Yamaguchi (National Institute of Advanced Industrial Science and Technology)

IIB-3 Improving SiC wafer processing quality using mirror electron microscopy analysis

Improvement of Polishing Surface Quality for SiC Bulk Wafer by Mirror Projection Electron Microscope Takahiro Ikeuchi, Masanori Murakami, Hiroaki Ito, Yusuke Kawaoka, Osamu Taki, Hidemori Kobayashi (Rokko Electronics)

IIB-4 Single Shockley stacking fault extending from a threading basal plane dislocation toward the substrate/epi interface

Single Shockley Stacking Faults Expanding toward Substrate/Epilayer Interface from Penetrating BPDsJoji Nishio, Chiharu Ota, Ryosuke Iijima (Toshiba)

IIB-5 Structural evaluation of surface topography defects with stacking fault complex-like structure existing in 4H-SiC epitaxial substrates

Characterization of Surface Defects having Similar Structures to Stacking Fault Complex in 4H-SiC Epitaxial WaferHideki Sako1KenjiKobayashi2 , Kentaro Ohira 2 , , Toshiyuki Isshiki 3 (1. Toray Research Center, 2. Hitachi High-Tech, 3. Kyoto Tech) Geisha University)

IIB-6 In-plane uniformity evaluation of wide-gap semiconductor/metal Schottky contact interface using interfacial microphotoresponse method

Uniformity Characterization of Wide-gap Semiconductor / Metal Schottky Contact Interfaces using Scanning Internal Photoemission MicroscopyKenji Shioshima1Hiroki Imabayashi1Cuse , Yuko Kawazumi 1 , , Fumimasa Horikiri 2 , Noboru Fukuhara 2 , Tomoyoshi Mishima 3 , Takashi Shito 4 (1. University of Fukui, 2. Sci-O 3.Hosei University, 4.FLOSFIA)

IIB-7 Electric field of carrier transport mechanism in SiC Schottky barrier diodes with various doping densities

strength dependence

Electric Field Dependence of Carrier Transport Mechanism in SiC Schottky Barrier Diodes with Various Doping Concentrations

Seidai Hara 1 , Hajime Tanaka1,2, Mitsuaki Kaneko1 , Tsunenobu Kimoto1 (1. Kyoto University, 2. Osaka University)

IIB-8 Depth distribution evaluation of defects and Mg+ ions in channeled ion-implanted GaN

Evaluations of Defects and Mg+ Depth Profile for GaN by Channeled Implantation Hitoshi Kawanowa, Atsushi Suyama, Hideki Minamikawa, Masahiko Aoki (AEON Techno Center)

IIB-9 Optimal design of SiC van der Pauw and Hall bar elements

Optimal Design of SiC van der Pauw and Hall Bar DevicesRyo Moriyama, Dai Okamoto, Tetsuo Hatakeyama (Toyama Prefectural University)

IIB-10 Effect of oxidation process on MOS interface scattering on 4H-SiC nonpolar surface

Impact of Oxidation Process on Electron Scattering at 4H-SiC Non-Polar MOS InterfacesYuhisa Mitsuru Someya 1 , Hirai1 , Mitsuo Okamoto1 , Tetsuo Hatakeyama1,2, Shinsuke Harada1 (1. National Institute of Advanced Industrial Science and Technology, 2. University of Toyama Prefecture)

IIB-11 Visualization of local strain in 4H-SiC(0001) trench MOSFET using synchrotron nanobeam X-ray diffraction

Visualization of Local Strain in 4H-SiC Trench MOSFET using Synchrotron Nanobeam X-Ray Diffraction Nishiwaki Wakana Takeuchi 1st , Eiji Kagoshima , Kazushi Sumiya 3 , Yasuhiko Imai3 , Shigehisa Shibayama 4 , Mitsuo Sakashita 4 , Shigeru Kimura 3 , Hideki Tomita 2 , year , Hirokazu Fujiwara 2 , 2 Osamu Nakatsuka 4 (1.Aichi Institute of Technology, 2.Mirise Technologies, 3.High Brightness Photon Science Research Center) 2nd year, 4th year Nagoya University)

IIB-12 Interfacial recombination emission and gate threshold shift in 4H-SiC(000-1) MOSFET

Light Emission from Recombination at Interface Traps and Gate Threshold Voltage Shift in 4H-SiC MOSFET on (000-1) Face Naoki Kumagai 1 , Shun Matsumoto 2 , Manabu Takei 1 , Hiroshi Kimura1 (1.Fuji Electric, 2.University of Yamanashi)

V2G application of IIB-13 SiC-PowerMOSFET (22kW bidirectional DC/DC and AC/DC converter)

V2G Application of Silicon Carbide Power MOSFET

Noriaki Mukaide (Wolfspeed Japan)

Industrial Session December 9th
(Thursday) 11:30-12:30
[Presentation time: 5 minutes per company]

IS-1 Toray Research Center, Inc.

IS-2Materials Science and Technology Foundation

IS-3 STR Japan Co., Ltd.

IS-4 New Metals End Chemicals Corporation

IS-5 Tomoe Industries Co., Ltd.

IS-6 Rokko Electronics Co., Ltd.

IS-7 Nidek Co., Ltd.

IS-8Rigaku Co., Ltd.