

ECSCRM 2020 2021



24-28 Oct.
Tours - France



1990-2020: 30 YEARS OF SiC DEVICE DEVELOPMENT From technology to applications

09:15 / 09:30 Welcome of the Tutorial Day **AUDITORIUM DESCARTES**

09:30 / 12:30 **Su-1A : Tutorial 1**

9:30 Didier CHAUSSENDE (SIMAP)
Historical evolution of SiC material through the lens of bulk and epitaxial growth

10:30 Dethard PETERS (Infineon)
How SiC technology has been matured for power devices across the last 3 decades

11:30 Peder BERGMAN (Linköping University and STMicroelectronics SiC AB)
Present Status of SiC Materials and Characterization

14:00 / 17:00 **Su-2A : Tutorial 2**

14:00 Fabrizio ROCCAFORTE (CNR-IMM)
Contacts, doping & MOS interfaces: An overview of processing issues in SiC device technology

15:00 Michel PITON (Alstom Tarbes)
How is SiC a game changer for high power applications?

16:00 Graham S. WOOD (University of Edinburgh)
Silicon Carbide resonating sensors



08:50 / 10:20

Plenary Session

AUDITORIUM RONSARD

08:50

Mo-PS-01 | PALMOUR John
Driving SiC into the Mainstream
Wolfspeed

09:35

Mo-PS-02 | SAGGIO Mario
Designing SiC devices for the transition to e-mobility
STMicroelectronics

10:40 / 12:10

Mo-1A : SiC Epitaxy

10:40

Mo-1A-01 | ZIELINSKI Marcin
Precise control of Al incorporation during CVD growth of SiC epilayers using hydrogen chloride
 M. ZIELINSKI¹, M. BUSSEL¹, M. PORTAIL², A. MICHON², Y. CORDIER²
¹ *NOVASiC, Savoie Technolac, France*
² *CRHEA-CNRS*

11:00

Mo-1A-02 | JI Shiyang
Characterization and improvement of the doping uniformity inside 4H-SiC trenches filled by CVD
 S. JI¹, K. KOJIMA¹, M. SOMETANI¹, S. HARADA¹, Y. TANAKA¹, H. YAMAGUCHI¹
¹ *National institute of advanced industrial science and technology (AIST)*

11:20

Mo-1A-03 | CRIPPA Danilo
Opening through 8-inch silicon carbide epitaxy
 D. CRIPPA¹, M. MAUCERI¹, S. PRETI¹, M. AZADMAND¹, C. VECCHIO¹, M. PUGLISI¹, G. CIVIDINI¹
¹ *LPE, Italy*

11:40

Mo-1A-Inv | TSUCHIDA Hidekazu
Recent progress in 4H-SiC CVD growth and defect control
 TSUCHIDA Hidekazu
CRIEPI

13:30 / 15:00

Mo-2A : MOSFETs

13:30

Mo-2A-Inv | VELIADIS Victor
SiC mass commercialization: present status and barriers to overcome
 VELIADIS Victor
PowerAmerica, North Carolina State University

14:00

Mo-2A-01 | DOMEIJ Martin
Gate oxide reliability and VTH stability of planar SiC MOS technology
 M. DOMEIJ¹, J. FRANCHI¹, S. MASLOUGKAS¹, P. MOENS¹, J. LETTENS¹, J. CHOI¹, F. ALLERSTAM¹
¹ *ON Semiconductor*

14:20

Mo-2A-02 | TOMINAGA Takaaki
Impact of Recovery Characteristics on Switching Loss of SiC MOSFETs
 T. TOMINAGA¹, T. IWAMATSU¹, Y. NAKAO¹, H. AMISHIRO¹, H. WATANABE¹, N. MIURA¹, S. YAMAKAWA¹, S. NAKATA²
¹ *Mitsubishi Electric Corporation*
² *Kanazawa Institute of Technology*

14:40

Mo-2A-03 | KOCHOSKA Sara

Pulsed forward bias body diode stress of SiC MOSFETs with individual mapping of basal plane dislocations

S. KOCHOSKA¹, M. DOMEIJ, S. SUNKARI, J. JUSTICE, H. DAS, H. LEE, X.Q. HU, T. NEYER

¹ Corp. R&D - SiC development

15:20 / 16:50

Mo-3A : Quantum Technology

15:20

Mo-3A-01 | KOBAYASHI Takuma

Generation and transformation of intrinsic color centers in 4H-silicon carbide via ion implantation and annealing

T. KOBAYASHI¹, M. RÜHL², J. LEHMEYER², L. ZIMMERMANN², M. KRIEGER², H. WEBER²

¹ Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Osaka University

² Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

15:40

Mo-3A-02 | UDVARHELYI Péter

Vibronic states and their effect on the temperature and strain dependence of silicon-vacancy qubits in 4H-SiC

P. UDVARHELYI¹, C. BABIN², F. KAISER², D. LUKIN³, T. OHSHIMA⁴, J. UL-HASSAN⁵, N.T. SON⁵, J. VUCKOVIC³, J. WRACHTRUP², A. GALI¹, G. THIERING¹, N. MORIOKA⁶

¹ Wigner Research Centre for Physics

² 3rd Institute of Physics, University of Stuttgart and Institute for Quantum Science and Technology IQST

³ E. L. Ginzton Laboratory, Stanford University

⁴ National Institutes for Quantum and Radiological Science and Technology

⁵ Department of Physics, Chemistry and Biology, Linköping University

⁶ Institute for Chemical Research, Kyoto University



16:00

Mo-3A-03 | ABE Yuta

Electrical detection of T_{v2a} -type V_{Si} centres in SiC-MOSFETY. ABE¹, A. CHAEN¹, M. SOMETANI², S. HARADA², Y. YAMAZAKI³,
T. OHSHIMA³, T. UMEDA⁴¹ *University of Tsukuba, National Institutes for Quantum and Radiological Science and Technology*² *National Institute of Advanced Industrial Science and Technology (AIST)*³ *National Institutes for Quantum and Radiological Science and Technology*⁴ *University of Tsukuba*

16:20

Mo-3A-Inv | DYAKONOV Vladimir

Engineering and coherent control of silicon vacancy defects in SiC

DYAKONOV Vladimir

Julius Maximilian University of Würzburg

INVITED POSTERS

16:50 / 17:10

AUDITORIUM RONSARD

Mo-IP-01 | YODO Mikako

Seed surface orientation dependence of the dislocation formation at the initial stage of physical vapor transport growth of 4H-SiC crystalsM. YODO¹, H. OKANO¹, N. OHTANI¹¹ *Kwansei Gakuin University, School of Science and Technology*

Mo-IP-02 | YAMASHIRO Yusuke

Behavior of Shockley-type Stacking Faults in SiC Superjunction MOSFET under Body Diode Current StressY. YAMASHIRO¹, M. OKADA¹, M. BABA¹, T. TANAKA², H. WATANABE²,
K. KOJIMA¹, S. HARADA¹, H. YAMAGUCHI¹¹ *National Institute of Advanced Industrial Science and Technology, Japan*² *Advanced Technology R&D Center, Mitsubishi Electric Corporation, Japan*

Mo-IP-03 | MLETSCHNIG Kristijan Luka

Aluminum activation in 4H-SiC measured on laterally contacted MOS capacitors with a buried current-spreading layerK.L. MLETSCHNIG¹, M. ROMMEL², W. SCHUSTEREDER¹, P. PICHLER²¹ *Infineon Technologies Austria AG*² *Fraunhofer Institute for Integrated Systems and Device Technology IISB*

Mo-IP-04 | VUONG VAN Cuong

500°C Operation Characteristics of 4H-SiC MOSFETs Differential Amplifier Circuit for Harsh Environment ApplicationsC. VUONG VAN¹, M. TETSUYA¹, K. KAZUYA¹, S. TAKUMA¹,
K. SHIN-ICHIRO¹¹ *Research Institute for Nanodevice and Bio Systems, Hiroshima University*

Time	Exhibitor
17:20	Wolfspeed
17:23	Aixtron
17:26	SK Siltron CSS
17:29	LPE
17:32	Soitec
17:35	NOVASIC
17:38	3D-Micromac AG
17:41	Pureon
17:44	Semilab
17:47	Annealsys
17:50	Centrotherm
17:53	Entergis / Sinmat
17:56	X-Fab
17:59	Rigaku
18:02	Plasma-Therm
18:05	Beneq
18:08	Toray Research Center
18:11	Ceramic Forum
18:14	Lasertec Corp
18:17	Silvaco
18:20	Mersen
18:23	Epiluvac
18:26	Schupp
18:29	Cameca
18:32	EtaMax
18:35	SGL Carbon
18:38-18:50	Break

Time	Exhibitor
18:50	Nippon Kornmeyer Carbon Group
18:53	Meister Abrasives AG
18:56	mi2-factory
18:59	Fraunhofer IISB
19:02	CMC Materials
19:05	TRUMPF Hüttinger
19:08	Kiselkarbid i Stockholm AB (KISAB)
19:11	SOMOS
19:14	Saint-Gobain
19:17	IBS
19:20	LayTec
19:23	RENA Technologies
19:26	Toyota Tsusho corporation
19:29	Pfeiffer Vacuum
19:32	Clas-SiC Wafer Fab
19:35	CS Clean Solutions AG

LEVEL -2

08:30 / 10:00

AUDITORIUM RONSARD

Tu-1A : Diodes & Superjunctions

- 08:30** Tu-1A-Inv | GODIGNON Philippe
Edge terminations for 4H-SiC power devices: a review
 GODIGNON Philippe
CNM-CSIC
- 09:00** Tu-1A-01 | MALOUSEK Roman
SiC diode with vertical superjunction realized using channeled implant and a multi epitaxial growth
 R. MALOUSEK¹, J. CHOCHOL¹, H. DAS¹, J. JUSTICE¹, S. SUNKARI¹, F. ALLERSTAM¹, K. GUMAELIUS¹, J. FRANCHI¹, M. DOMEIJ¹, R. WADA², T. KUROI²
¹ ON Semiconductor
² Nissin Ion Equipment
- 09:20** Tu-1A-02 | YUAN Zimo
Localized Lifetime Control of 10kV 4H-SiC PiN Diodes by MeV Proton Implantation
 Z. YUAN¹, K. JACOBS¹, M. BAKOWSKI², A. SCHÖNER³, S. RESHANOV³, W. KAPLAN³, H. NEE¹, A. HALLÉN¹
¹ KTH Royal Institute of Technology, Sweden
² RISE Acreo Swedish ICT AB, Sweden
³ II-VI Kista AB, Sweden
- 09:40** Tu-1A-03 | GHANDI Reza
Demonstration of 2kV SiC Deep-Implanted Super-Junction PiN Diodes
 R. GHANDI¹, C. HITCHCOCK¹, S. KENNERLY¹
¹ GE Research

AUDITORIUM DESCARTES

Tu-1B : MOS Processing

- 08:30** Tu-1B-01 | MIKAMI Kyota
Channel mobility of NO- and N2-annealed 4H-SiC(0001) p-channel MOSFETs with various donor concentrations of n-body
 K. MIKAMI¹, K. ITO¹, K. TACHIKI¹, T. KIMOTO¹
¹ Kyoto University
- 08:50** Tu-1B-02 | ITO Koji
Universal Mobility in SiC MOSFETs with Very Low Interface State Density
 K. ITO¹, M. HORITA, J. SUDA, T. KIMOTO
¹ Kyoto University
- 09:10** Tu-1B-03 | FIORENZA Patrick
Charge trapping mechanisms in nitridated SiO₂/4H-SiC MOSFET interfaces: threshold voltage instability and interface chemistry
 P. FIORENZA¹, C. BONGIORNO¹, M. SAGGIO², F. GIANNAZZO¹, F. ROCCA-FORTE¹
¹ CNR-IMM, Italy
² STMicroelectronics
- 09:30** Tu-1B-Inv | TACHIKI Keita
Mobility improvement in 4H-SiC MOSFETs by H₂ etching before SiO₂ deposition and interface nitridation
 K. TACHIKI¹, K. ITO¹, K. MITSUAKI¹, T. KIMOTO¹
¹ Dept. of Electronic Sci. & Eng., Kyoto University

10:20 / 12:10 AUDITORIUM RONSARD

Tu-2A : Extended defects

10:20 Tu-2A-Inv | ELLISON Alexandre
Dislocation density evolution in PVT growth of 150 and 200 mm SiC
 ELLISON Alexandre
STMicronics Silicon Carbide AB

10:50 Tu-2A-01 | ZIMBONE Massimo
Extended defects in 3C-SiC: the case of Stacking Faults
 M. ZIMBONE¹, A. SARIKOV²,
 C. BONGIORNO¹, A. MARZEGALLI³,
 C. CALABRETTA¹, L. MIGLIO⁵,
 V. SCUDERI¹, F. LA VIA¹
¹ CNR-IMM, Italy
² V. Lashkarev Institute of Semiconductor Physics NAS Ukraine, Ukraine
³ L-NESS and Dipartimento di Fisica, Politecnico di Milano, Italy
⁵ L-NESS and Dipartimento di Scienza dei Materiali, Università degli Studi di Milano-Bicocca, Italy

11:10 Tu-2A-02 | ASADA Satoshi
Impacts of single Shockley stacking fault on electrical characteristics of 4H-SiC bipolar devices analyzed by TCAD simulation
 S. ASADA¹, H. TSUCHIDA¹,
 T. MIYAZAWA¹
¹ Central Research Institute of Electric Power Industry

11:30 Tu-2A-03 | TAKANO Kazumi
Effective method (Selective E-V-C technique) to screen out the BPDs that cause reliability degradation
 K. TAKANO¹, Y. IGARASHI¹
¹ ITES

11:50 Tu-2A-04 | SARIKOV Andrey
Molecular dynamics simulations study of stacking fault annihilation mechanism in 3C-SiC layers epitaxially grown on Si(001) substrates
 A. SARIKOV¹, A. MARZEGALLI²,
 L. BARBISAN³, M. ZIMBONE⁴,
 C. BONGIORNO⁴, M. MAUCERI⁵,
 D. CRIPPA⁶, F. LA VIA⁴, L. MIGLIO³
¹ V. Lashkarev Institute of Semiconductor Physics NAS Ukraine ² L-NESS and Dipartimento di Fisica, Politecnico di Milano, Italy ³ L-NESS and Dipartimento di Scienza dei Materiali, Università degli Studi di Milano-Bicocca, Italy ⁴ CNR-IMM, Italy ⁵ LPE, Italy ⁶ LPR S.p.A, Italy

10:20 / 12:00 AUDITORIUM DESCARTES

Tu-2B : Materials & Defects

10:20 Tu-2B-01 | DO Euihyeon
Expansion patterns of single Shockley stacking faults from mechanical scratches on 4H-SiC epilayers
 E. DO¹, M. KANEKO¹, T. KIMOTO¹
¹ Dept. of Electronic Sci. & Eng., Kyoto University

10:40 Tu-2B-02 | MAHADIK Nadeemullah
Microstructural Analysis of Extended defects in Thick SiC Epitaxial Layers using UVPL and X-ray topography
 N. MAHADIK¹, R. STAHLBUSH¹,
 K. INABA², A. TAKASE³, W. SUNG⁴
¹ Naval Research Laboratory
² Rigaku Corporation Japan
³ Rigaku Americas Corporation
⁴ SUNY Polytechnic Institute Colleges of Nano. Sci. and Engr

11:00 Tu-2B-03 | BAIERHOFER Daniel
Defect Reduction in Epilayers for SiC trench MOSFETs by Enhanced Epitaxial Growth
 D. BAIERHOFER¹, B. THOMAS¹,
 F. STAIGER¹, B. MARCHETTI¹,
 C. FÖRSTER¹, T. ERLBACHER²
¹ Robert Bosch GmbH
² Friedrich-Alexander University of Erlangen-Nuremberg

11:20 Tu-2B-04 | DAS Hrishikesh
A deeper look into the effects of extended defects in SiC epitaxial layers on device performance and reliability
 H. DAS¹, S. SUNKARI¹, J. JUSTICE¹,
 D. HAMANN¹
¹ ON Semiconductor

11:40 Tu-2B-05 | ZIMBONE Massimo
Extended defects in 3C SiC: Inverted domain boundary
 M. ZIMBONE¹, C. BONGIORNO¹, C.
 CALABRETTA¹, G. FISCARO¹, A. LA
 MAGNA¹, V. SCUDERI¹, F. LA VIA¹
¹ CNR-IMM, Italy

13:30 / 15:00 AUDITORIUM RONSARD

Tu-3A : 3C-SiC

- 13:30** Tu-3A-Inv | LA VIA Francesco
New approaches and new understanding in the growth of 3C-SiC: from thin film to bulk
 LA VIA Francesco
CNR-IMM, Italy
- 14:00** Tu-3A-01 | CALABRETTA Cristiano
Impact of N doping on 3C-SiC defects
 C. CALABRETTA¹, A. CANNIZZARO¹,
 V. SCUDERI¹, R. ANZALONE²,
 M. MAUCERI³, D. CRIPPA³,
 S. BONINELLI¹, F. LA VIA¹
¹ *CNR-IMM, Italy*
² *STMicronics, Italy*
³ *LPE, Italy*
- 14:20** Tu-3A-02 | BONINELLI Simona
Growth of thick [111]-oriented 3C-SiC films on T-shaped Si micro-pillars
 S. BONINELLI¹, M. AGATI¹,
 C. CALABRETTA¹,
 F. MANCARELLA¹, M. MAUCERI²,
 D. CRIPPA², M. ALBANI³,
 R. BERGAMASCHINI³, L. MIGLIO³,
 F. LA VIA¹
¹ *CNR-IMM, Italy*
² *LPE S.P.A., Italy*
³ *L-NESS and Dipartimento di Scienza dei Materiali, Università di Milano-Bicocca*
- 14:40** Tu-3A-03 | FERRO Gabriel
3C-SiC heteroepitaxial layers grown on silicon substrates with various orientations
 G. FERRO¹, T. YEGHOYAN,
 F. CAUWET, V. SOULIÈRE
¹ *Laboratoire des Multimateriaux et Interfaces*

13:30 / 14:50 AUDITORIUM DESCARTES

Tu-3B : Schottky contacts

- 13:30** Tu-3B-01 | HARA Masahiro
Ideal Thermionic Field Emission and Field Emission Transport through Metal/Heavily-Doped SiC Schottky Barriers
 M. HARA¹, H. TANAKA², M. KANEKO¹,
 T. KIMOTO¹
¹ *Kyoto University*
² *Osaka University*
- 13:50** Tu-3B-02 | VIVONA Marilena
Electrical properties of Ni/heavily-doped 4H-SiC Schottky contacts
 M. VIVONA¹, G. GRECO¹, M. SPERA¹,
 P. FIORENZA¹, F. GIANNAZZO¹,
 A. LA MAGNA¹, F. ROCCAFORTE¹
¹ *CNR-IMM, Italy*
- 14:10** Tu-3B-03 | BELLOCCHI Gabriele
Influence of thickness, deposition method and annealing temperature on Ti/4H-SiC Schottky barrier height
 G. BELLOCCHI¹, M. VIVONA²,
 C. BONGIORNO², P. BADALÀ¹,
 A. BASSI¹, S. RASCUNÀ¹,
 F. ROCCAFORTE²
¹ *STMicronics, Italy*
² *CNR-IMM, Italy*
- 14:30** Tu-3B-04 | RENZ Arne Benjamin
Engineering the Schottky interface of 3.3 kV SiC JBS diodes using a P2O5 surface passivation treatment
 A.B. RENZ¹, A. PEREZ-TOMAS²,
 O.J. VAVASOUR¹, Q. CAO¹, V.A. SHAH¹,
 Y. BONYADI³, V. PATHIRANA⁴,
 T. TRAJKOVIC⁴, G.W.C. BAKER¹,
 P. MAWBY¹, P.M. GAMMON¹
¹ *University of Warwick, School of Engineering*
² *Catalan Institute of Nanoscience and Nanotechnology*
³ *Lyra Electronics, Warwick University Campus, Wellesbourne, UK*
⁴ *Cambridge Microelectronics Ltd., Capital Park, Fullbourn, Cambridge, UK*

15:20 / 16:40 AUDITORIUM RONSARD

Tu-4A : HV and advanced devices

- 15:20** Tu-A4-01 | SUNDARESAN Siddarth
Impact of device design parameters on 15 kV SiC MOSFET performance
 S. SUNDARESAN, J. PARK¹,
 V. MULPURI¹, R. SINGH¹
¹ *GeneSiC Semiconductor*
- 15:40** Tu-A4-02 | NEO Lophitis
Compact Trench Floating Field Rings termination for 10kV+ rated SiC n-IGBTs
 L. NEO¹, P.M. GAMMON², A. RENZ²,
 T. DAI², A. TIWARI³, T. TRAJKOVIC³,
 T.A. MAWBY², M. ANTONIOU²
¹ *University of Nottingham*
² *University of Warwick*
³ *University of Cambridge*
- 16:00** Tu-A4-03 | RAHIMO Munaf
Advanced 1200V SiC MOSFET based on Singular Point Source MOS (S-MOS) Technology
 M. RAHIMO¹, I. NISTOR¹,
 D. GREEN²
¹ *mqSemi AG*
² *Silvaco Europe Ltd.*
- 16:20** Tu-A4-04 | OTTAVIANI Laurent
Neutron detection by SiC- and Diamond- based sensors
 L. OTTAVIANI¹, O. PALAIS¹, A. KLIX²,
 C. DESTOUCHES³, A. LYOUSSI³
¹ *IM2NP - UMR CNRS 7334, Aix-Marseille University*
² *KIT- Institute of Neutron Physics and Reactor Technology*
³ *INSTN - Bâtiment 238 Centre CEA de Cadarache*

15:20 / 17:00 AUDITORIUM DESCARTES

Tu-4B : Fundamental properties

- 15:20** Tu-4B-01 | ISHIKAWA Ryoya
Anisotropy of electron mobility in 4H-SiC over wide ranges of donor concentration and temperature
 R. ISHIKAWA¹, M. HARA¹,
 H. TANAKA², M. KANEKO¹,
 T. KIMOTO¹
¹ *Kyoto University*
² *Osaka University*
- 15:40** Tu-4B-02 | STAHLBUSH Robert
Tracking the Lifetime Enhancement by Oxidation in 4H-SiC Epilayers
 R. STAHLBUSH¹, N. MAHADIK¹,
 P. BONANNO¹, D. LICHTENWALNER²,
 S. RYU²
¹ *Naval Research Laboratory*
² *Wolfspeed, Inc.*
- 16:00** Tu-4B-03 | DIALLO Lindor
Enhancement of the magnetic properties of SiC by ion implantation-towards a Diluted Magnetic Semiconductor at Room Temperature
 L. DIALLO¹, A. FNIDIKI²,
 L. LECHEVALLIER², L. ZHANG²,
 M. LAZAR³, M. MARTEAU⁴,
 A. DECLEMY⁴
¹ *Light, nanomaterials, nanotechnologies University of Technology of Troyes (UTT) & CNRS ERL 7004 12 rue Marie Curie CS 42060 10004 Troyes, France.*
² *Normandie University, INSA Rouen, UNIROUEN, CNRS, GPM, 76800 Rouen, France*
³ *Light, nanomaterials, nanotechnologies University of Technology of Troyes (UTT) & CNRS ERL 7004, France*
⁴ *Institut PPRIME, UPR 3346 CNRS, Université de Poitiers, ENSMA, SP2MI, France*
- 16:20** Tu-4B-04 | CHENG Qianyu
Ray-tracing simulation analysis of effective penetration depths of all dislocation types lying in the basal plane on grazing incidence X-ray topographs of 4H-SiC Wafers
 Q. CHENG¹, H. PENG¹, S. HU¹, Z. CHEN¹, Y. LIU¹, B. RAGHOTHA-MACHAR¹, M. DUDLEY¹
¹ *Stony Brook University*

15:20 / 17:00 **AUDITORIUM DESCARTES**

16:40 Tu-4B-05 | NISHIO Johji
Transmission electron microscopy study of single Shockley stacking faults in 4H-SiC expanded from basal plane dislocation segments accompanied by threading edge dislocations on both ends

J. NISHIO¹, R. IJIMA¹, C. OTA¹

¹ Corporate R&D Center, Toshiba Corporation



17:00 / 19:00

LEVEL -2

Tu-P: Tuesday – Characterization and modelling

Tu-P-01 | BORGHESE Alessandro

A Scalable SPICE-Based Compact Model for 1.7 kV SiC MOSFETsA. BORGHESE¹, M. RICCIO¹, L. MARESCA¹, G. BREGGIO¹, S. KICIN², A. IRACE¹¹ *Università degli Studi di Napoli Federico II*² *ABB Power Grids Switzerland Ltd*

Tu-P-02 | SHIMONO Takaya

I-V characteristics of power devices fabricated on bonded substrate of 3C-SiC poly crystal and 4H-SiC single crystalT. SHIMONO¹, H. UCHIDA², A. ONOGI¹, H. FUJIWARA¹¹ *MIRISE Technologies Corporation*² *SICOXS Corporation*

Tu-P-03 | DANG Yifan

Numerical Investigation and Optimization of Long-term Stability for SiC Solution GrowthY. DANG¹, C. ZHU², M. IKUMI¹, M. TAKAISHI¹, W. YU², W. HUANG¹, X. LIU¹, S. HARADA¹, T. MIHO¹, T. UJIHARA¹¹ *Department of Material Science and Engineering, Nagoya University*² *Center for Integrated Research of Future Electronics (CIRFE), Institute of Materials and System for Sustainability (IMaSS), Nagoya University*

Tu-P-04 | RAMM Mark

Simulation Study of Crack Formation in Bulk SiC Crystals Grown by PVTM. RAMM¹, M. RUDINSKY¹, A. KULIK¹, M. BOGDANOV¹¹ *STR Group, Inc. – Soft-Impact, Ltd.*

Tu-P-05 | LIM Minwho

Process-based Modeling of 4H-SiC Double-trench MOSFETs with Reshaped Trench GeometriesM. LIM¹, O. RUSCH¹, T. ERLBACHER¹, S. BEUER¹, M. ROMMEL¹, A. BAUER¹, S. KIM², M. KANG², H. RO², H. SHIN²¹ *Fraunhofer Institute for Integrated Systems and Device Technology IISB*² *Pohang University of Science and Technology (POSTECH)*

Tu-P-06 | WOERLE Judith

Phosphorous and Aluminum implantation for MOSFET manufacturing: Revisiting implantation dose rate and subsequent surface morphologyJ. WOERLE¹, M. BELANCHE¹, M. NEGRI², C. LAMONTAGNE³, R. NIPOTI⁴¹ *Advanced Power Semiconductor Laboratory, ETH Zurich, Switzerland*² *Axcelis Technologies Srl, Agrate Brianza, Italy*³ *Axcelis Technologies Inc., Beverly, MA, US*⁴ *CNR-IMM, Italy*

Tu-P-07 | MURAKAMI Eiichi

Significant Differences in BTI and TDDB Characteristics of Commercial Planar SiC-MOSFETsE. MURAKAMI¹, T. TAKEDSHITA¹, K. ODA¹¹ *Kyushu Sangyo University*

Tu-P-08 | LEBEDEV Alexander

Effect of electron irradiation temperature on radiation resistance of SiC.A. LEBEDEV¹, V. KOZLOVSKI², K. DAVYDOVSKAYA¹, M. LEVINSTEIN¹, A. IVANOV³, G. OGANESYAN¹¹ *Ioffe Institute, St.-Petersburg, Russia*² *Peter the Great St.Petersburg Politechnical University*³ *Submicron Heterostructures for Microelectronics Research and Engineering Center of RAS*

Tu-P-09 | LEBEDEV Alexander

Effect of high energy (0.9 MeV) electron irradiation on high voltage 4H-SiC MOSFETs

A. LEBEDEV¹, L. FURSIN², V. KOZLOVSKI³, M. LEVINSHTEIN¹, A. STREL'CHUK¹, A. IVANOV⁴, A. ZUBOV⁵

¹ Ioffe Institute, Russia

² United Silicon Carbide, Inc., USA

³ Department of Experimental Physics, St. Petersburg State Polytechnic University, Russia

⁴ Submicron Heterostructures for Microelectronics Research and Engineering Center of RAS, Russia

⁵ National Research University of Information Technologies, Mechanics and Optics, Russia

Tu-P-10 | PRISTAVU Gheorghe

Forward electrical behavior of SiC-Schottky diodes at deep cryogenic temperatures

G. PRISTAVU¹, G. BREZEANU¹, R. PASCU², D. ONEATA¹, F. DRAGHICI¹, F.G. DELLA CORTE³, S. RASCUNA⁴

¹ University "Politehnica" of Bucharest

² National Institute for R&D in Microtechnologies

³ Università degli Studi di Napoli Federico II

⁴ STMicroelectronics

Tu-P-11 | STREL'CHUK Anatoly

Current-voltage characteristics of Cr-SiC (4H) Schottky diodes

A. STREL'CHUK¹, E. KALININA¹

¹ Ioffe Institute, Russia

Tu-P-12 | AMMAR Ali

High Voltage 4H-SiC NPN Bipolar Junction Transistor with Optimized Junction Termination Extension

A. AMMAR¹, L.V. PHUNG, D. PLANSON, H. MOREL, C. SONNEVILLE

¹ Ampere Laboratory / INSA Lyon / CNRS

Tu-P-13 | LEHMEYER Johannes

Evaluation of 4H-SiC MOSFET transfer characteristics using machine-learning techniques

J. LEHMEYER¹, M. KRIEGER¹, T. CITAK¹

¹ Lehrstuhl für Angewandte Physik, Department Physik, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany

Tu-P-14 | MCPHERSON Joseph

Robustness of Semi-Superjunction 4H-SiC Power DMOSFETs to Single-Event Burnout from Heavy Ion Bombardment

J. MCPHERSON¹, A. WOODWORTH², T.P. CHOW¹, W. JI¹

¹ Rensselaer Polytechnic Institute

² NASA Glenn Research Center

Tu-P-15 | MATACENA Ilaria

SiC MOSFET C-V characteristics with (positive) biased Drain

I. MATACENA¹, L. MARESCA, M. RICCIO², A. IRACE², G. BREGGIO², S. DALIENTO², A. CASTEL-LAZZI³

¹ University of Naples Federico II Napoli, Italy

² Università degli Studi di Napoli Federico II

³ Kyoto University of Advanced Science

Tu-P-16 | WALTL Michael

Performance Analysis of 4H-SiC CMOS Inverter Circuits employing Physical Charge Trapping Models

M. WALTL¹, Y. HERNANDEZ¹, C. SCHLEICH¹, H. REISINGER², B. STAMPFER¹, T. GRASSER¹

¹ Institute for Microelectronics, TU Wien, Vienna, Austria

² Infineon Technologies AG, Neubiberg, German

Tu-P-17 | DONATO Nazareno

On the Short Circuit electro-thermal failure of 1.2 kV 4H-SiC MOSFETs with 3D cell layouts

N. DONATO¹, K. NAYDENOV¹, F. UDREA¹, A. MIHAILA², G. ROMANO², S. WIRTHS², L. KNOLL²

¹ University of Cambridge

² Hitachi ABB Power Grids

Tu-P-18 | NAYDENOV Kaloyan

Clamped and unclamped inductive switching of 3.3kV 4H-SiC MOSFETs with 3D cellular layouts

K. NAYDENOV¹, N. DONATO¹, F. UDREA¹, A. MIHAILA², G. ROMANO², S. WIRTHS², L. KNOLL²

¹ University of Cambridge

² Hitachi ABB Power Grids

Tu-P-19 | LODHA Surabhi

Electrical Characteristics of 4H-SiC MPS Diodes with Different Schottky/PN Area Ratio

S. LODHA¹, Z. YU¹, M. MAZZILLO¹, S. HABENICHT¹, J. URRESTI¹, J. STACHE¹, W. SCHNITT¹

¹ Nexperia GMBH

Tu-P-21 | FOERTHNER Julietta

Optimization of photon collection efficiency from single silicon vacancy-center in 4H Silicon Carbide through lens structures

J. FOERTHNER¹, M. ROMMEL¹, C. GOBERT¹, S. BEUER¹, P. BERWIAN¹, R. NAGY¹

¹ Fraunhofer Institute for Integrated Systems and Device Technology IISB

Tu-P-22 | FISICARO Giuseppe

Kinetics of surface instabilities and extended defects during the epitaxial growth of cubic silicon carbide

G. FISICARO¹, I. DERETZIS¹, G. CALOGERO¹, C. BONGIORNO¹, M. ZIMBONE¹, M. KOLLMUSS²,

P. WELLMANN², M. ZIELINSKI³, S. SCALESE¹, F. GIANNAZZO¹, F. ROCCAFORTE¹, F. LA VIA¹, A.

LA MAGNA¹

¹ Consiglio Nazionale delle Ricerche, Istituto per la Microelettronica e Microsistemi (CNR-IMM), Italy

² Crystal Growth Lab, Materials Department 6 (i-meet), FAU Erlangen-Nürnberg, Germany

³ NOVA SiC, Savoie Technolac, France

Tu-P-24 | CSÓRÉ András

On the origin of anomalous electron spin resonance for vanadium defects in SiC

CSÓRÉ András

¹ Department of Atomic Physics, Budapest University of Technology and Economics

² Wigner Research Centre for Physics

Tu-P-25 | FAZIO Tommaso

Theoretical/computational study of point defects in SiC and perspectives for Quantum Technologies

T. FAZIO¹, A. LA MAGNA², E. PALADINO³, I. DERETZIS², G. FISICARO²

¹ University of Catania and CNR-IMM, Italy

² CNR-IMM, Italy

³ University of Catania and INFN, Italy

Tu-P-26 | NISHIHARA Yoshitaka

Evaluation of Defects in a SiC Substrate using the Photoluminescence Measurement Method

Y. NISHIHARA¹, K. KAMEI¹, K. MOMOSE¹, H. OSAWA¹

¹ SHOWA DENKO K.K.

Tu-P-27 | HAN Lei

Injected photon density dependence of the surface recombination velocity for 4H-SiC

L. HAN¹, T. KATO², M. KATO¹

¹ NITech

² National Institute of Advanced Industrial Science and Technology (AIST)

Tu-P-28 | KATO Masashi

Injected photon density dependence of the surface recombination velocity for 4H-SiC

M. KATO¹, L. HAN¹, T. KATO²

¹ Nagoya Institute of Technology

² National Institute of Advanced Industrial Science and Technology (AIST)

Tu-P-29 | MELI Alessandro

Spectroscopical characterization of 4H-SiC thick epilayer for detection applications

A. MELI¹, A. MUOIO¹, R. REITANO², A. TROTTA³, L. MEDA⁴, M. PARISI³, F. LA VIA¹

¹ CNR-IMM, Italy

² University of Catania, Italy

³ ENI-MAFE, Italy

⁴ ENI-Renewable Energy, Magnetic Fusion and Material Science Research Center, Italy

Tu-P-30 | SCUDERI Viviana

4H- and 6H-like stacking faults in 3C-SiC cross-section epilayer. Characterization by room-temperature γ -photoluminescence and γ -Raman analysis.

V. SCUDERI¹, R. ANZALONE², C. CALABRETTA¹, M. MAUCERI³, F. LA VIA¹

¹ CNR-IMM, Italy

² STMicroelectronics, Italy

³ LPE, Italy

Tu-P-31 | SOUKHOJAK Andrey

Measurement of dislocation density in SiC wafers using production XRT

A. SOUKHOJAK¹, T. STANNARD¹, I. MANNING¹, C. LEE¹, G. CHUNG¹, M. GAVE¹, E. SANCHEZ¹

¹ SK Siltron CSS

Tu-P-32 | CANNIZZARO Annalisa

Dynamics of grain boundary in 3C-SiC grown on compliance substrates

A. CANNIZZARO¹, M. ZIELINSKI², F. LA VIA¹, S. BONINELLI¹

¹ CNR-IMM, Italy

² NOVASiC, Savoie Technolac, France

Tu-P-33 | KALLINGER Birgit

Doping-related photoluminescence spectroscopy

B. KALLINGER¹, H. SCHLICHTING¹, M. KOCHER¹, M. ROMMEL¹, P. BERWIAN¹

¹ Fraunhofer Institute for Integrated Systems and Device Technology IISB

Tu-P-34 | EL HAGEALI Sami

Multi-scale luminescence investigation of defects in 4H-SiC epilayers

S. EL HAGEALI¹, H. GUTHREY¹, S. JOHNSTON¹, M. AL-JASSIM¹, B. GORMAN²

¹ NREL

² Colorado School of Mines

Tu-P-35 | CHENG Qianyu

Dislocation Contrast Analysis on PVT-grown 4H-SiC through Synchrotron Grazing-incidence X-Ray Topography and Ray-Tracing Simulation with Consideration of Surface Relaxation and X-Ray Absorption

Q. CHENG¹, T. AILIHUMAER¹, H. PENG¹, Y. LIU¹, Z. CHEN¹, S. HU¹, B. RAGHOTHAMACHAR¹, M. DUDLEY¹

¹ Stony Brook University

Tu-P-36 | CHEN Zeyu

Synchrotron Rocking Curve X-ray Topography characterization of high energy implanted 4H-SiC lattice damage

Z. CHEN¹, Y. LIU¹, H. PENG¹, Q. CHENG¹, S. HU¹, B. RAGHOTHAMACHAR¹, M. DUDLEY¹

¹ Stony Brook University

Tu-P-37 | GOBERT Christian

Writing structures in 4H-SiC and diamond for quantum technological applications with nanometer precision using a He/Ne ion microscope

C. GOBERT¹, F. VOLLNHALS², P. GNAUCK³, F. PÉREZ-WILLARD³, B. KALLINGER¹, J. FOERTHNER¹, P. BERWIAN¹, M. ROMMEL¹, X. VIDAL⁴, R. NAGY⁵, S.H. CHRISTIANSEN⁶
¹ Fraunhofer Institute for Integrated Systems and Device Technology IISB ² Institute for Nanotechnology and Correlative Microscopy, INAM gGmbH ³ Carl Zeiss Microscopy GmbH ⁴ Fraunhofer Institute for Applied Solid State Physics IAF ⁵ Chair of Electron Devices, University of Erlangen-Nuremberg ⁶ Institute for Nanotechnology and Correlative Microscopy, INAM gGmbH; Fraunhofer Institute for Ceramic Technologies and Systems IKTS

Tu-P-38 | MUOIO ANNAMARIA

Automatic image analysis of stackingfault

A. MUOIO¹, V. SCUDERI¹, C. CALABRETTA¹, M. ZIMBONE¹, F. LA VIA¹
¹ CNR-IMM, Italy

Tu-P-39 | ZIKO Mehadi Hasan

Comparative Electrical Properties Study of Al-Foil/p- and n-Type 4H/6H-SiC Schottky Barrier Diode Fabricated Using Diffusion Welded Bonding

M.H. ZIKO¹, A. KOEL¹, T. RANG¹
¹ Tallinn University of Technology

Tu-P-40 | LA VIA Francesco

Residual stress measurement by Raman on surface-micromachined monocrystalline 3C-SiC on silicon

F. LA VIA¹, L. BELSITO¹, M. FERRI¹, S. SAPIENZA¹, A. RONCAGLIA¹, M. ZIELINSKI², V. SCIDERI¹
¹ CNR-IMM, Italy ² NOVA^{SiC}, Savoie Technolac, France

Tu-P-41 | PINAULT-THAURY Marie-Amandine

Nitrogen investigation by SIMS in two wide band gap semiconductors: Diamond and Silicon Carbide

M. PINAULT-THAURY¹, F. JOMARD¹
¹ GEMaC - CNRS / Université de Versailles

Tu-P-42 | SATO Yuta

Self-turn-on Phenomenon of SiC MOSFETs by Fast Switching Operation

Y. SATO¹
¹ Nakata Syuuhei

Tu-P-43 | DOBROWOLSKI Artur

Determining the number of graphene layers based on Raman response of the SiC substrate

A. DOBROWOLSKI¹, J. JAGIELLO¹, D. CZOLAK¹, T. CIUK¹
¹ Lukasiewicz Research Network – Institute of Microelectronics and Photonics

Tu-P-44 | FUKUNAGA Shuhei

Identification of High Resolution Transient Thermal Network Model for Power Module Packages

S. FUKUNAGA¹, T. FUNAKI¹
¹ Osaka University

Tu-P-45 | ABED ALI Fatme

Design of an integrated power module for Silicon Carbide MOSFET with self-compensation of the magnetic field

F. ABED ALI¹, H. ALAWIEH², P. LEFRANC³, P. JEANNIN³, Y. AVENAS³, T. YOUSSEF⁴, H. MOUSSA²
¹ Institut Vedecom / G2Elab ² Institut vedecom ³ G2Elab ⁴ Institut Vedecom / Safran Tech

Tu-P-46 | LIU Yafei

Synchrotron X-Ray Rocking Curve Topography Characterization of Power Electronic GaN Materials

Y. LIU¹, H. PENG¹, Z. CHEN¹, Q. CHENG¹, S. HU¹, B. RAGHOTHAMACHAR¹, M. DUDLEY¹

¹ Stony Brook University

Tu-P-47 | HU Shanshan

Characterization of Prismatic Slip in AlN Crystals Grown by PVT

S. HU, Y. LIU¹, H. PENG¹, Q. CHENG¹, Z. CHEN¹, B. RAGHOTHAMACHAR¹, M. DUDLEY¹

¹ Stony Brook University

Tu-P-48 | LAZAR Mihai

Enhanced Resonant Raman scattering of GaN functional layers using Al thin films - a versatile tool for multilayer structure analysis

M. LAZAR¹, A. MURAVITSKAYA¹, A. RUMYANTSEVA¹, A.J.E. NDOHI², C. SONNEVILLE², D. PLANSON², P. ADAM¹, S. POTIRON³

¹ Laboratory Light, Nanomaterials & Nanotechnologies, CNRS ERL 7004, University of Technology of Troyes, France ² AMPERE, UMR 5005 CNRS, INSA Lyon, France ³ Laboratoire de Recherche en Nanosciences, Université de Reims Champagne Ardenne, France

Tu-P-49 | ZHOU Ziwei

Raman characterization of Carbon cluster in the interface of 4H-SiC Power Devices by different Annealing method

Z. ZHOU¹

¹ Shenzhen BASiC semiconductor Ltd.

Tu-P-50 | VIDARSSON Arnar

Observation of fast near-interface traps in 4H-SiC MOS capacitors using capacitance voltage analysis at cryogenic temperatures

VIDARSSON Arnar

¹ University of Iceland ² Griffith University

Tu-P-51 | RENZ Arne Benjamin

The improved reliability performance of post-deposition annealed ALD-SiO₂

A.B. RENZ¹, P.M. GAMMON¹, O.J. VAVASOUR¹, F. LI¹, T. DAI¹, G.W.C. BAKER¹, N. GRANT¹, J.D. MURPHY¹, P.A. MAWBY¹, V.A. SHAH¹

¹ University of Warwick, School of Engineering

Tu-P: Tuesday – Processing

Tu-P-52 | FROMMELT Sebastian

Graphite-based solutions for SiC PVT furnaces and SiC epitaxy reactors

S. FROMMELT¹, T. FINK¹, T. TAETZ¹, C. WIJAYAWARDHANA¹

¹ SGL Carbon GmbH

Tu-P-53 | KASHIMURA Tomoyuki

The fundamental study of liquid phase epitaxy of SiC using Gibbs-Thomson effect of SiC particles in Si-Cr solvents

T. KASHIMURA¹, T. YOSHIKAWA¹, S. YAMAGUCHI¹

¹ Institute of Industrial Science, The University of Tokyo

Tu-P-54 | AOKI Hideto

Step structures of 4H-SiC (000-1) in Si and Si-40mol%Cr solvents at 1873 K after interface reconstruction

H. AOKI¹, S. KAWANISHI², T. MITANI³, D. CHAUSSENDE⁴

¹ Institute of Industrial Science, The University of Tokyo ² Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan ³ National Institute of Advanced Industrial Science and Technology, Japan ⁴ University Grenoble Alpes, CNRS, Grenoble INP (Institute of Engineering), SIMAP, France

Tu-P-55 | CRIPPA Danilo

Opening through 8-inch silicon carbide epitaxy

D. CRIPPA¹, M. MAUCERI¹, S. PRETI¹, M. AZADMAND¹, C. VECCHIO¹, M. PUGLISI¹, G. CIVIDINI¹
¹ LPE, Italy

Tu-P-56 | KAWANISHI Sakiko

SiC solution growth using SiC/graphite gradient crucible

S. KAWANISHI¹, H. SHIBATA¹
¹ Tohoku University

Tu-P-58 | SHIBAGAKI Masami

The novel technology of carbon sputtering cap and Ar sealed EBAS (Electron Bombardment Annealing System) annealing for extremely smooth surface morphology of 4H-SiC (0001)

M. SHIBAGAKI¹, Y. HARI¹
¹ Canon ANELVA Corporation

Tu-P-59 | PEZOLDT Joerg

Silicon Carbide - Graphene nano-gratings on 4H and 6H semi-insulating SiC

J. PEZOLDT¹, S. MATHEW¹, S.P. LEBEDEV², A.A. LEBEDEV², B. HÄHNLEIN³, J. STAUFFENBERG⁴, E. MANSKE⁴, J. KRÖGER⁵
¹ FG Nanotechnologie, TU Ilmenau, Germany ² Ioffe Institute, St.-Petersburg, Russia ³ FG Technische Physik I, TU Ilmenau, Germany ⁴ FG Fertigungs- und Präzisionsmesstechnik, TU Ilmenau, Ilmenau, Germany ⁵ FG Experimentalphysik I, TU Ilmenau, Germany

Tu-P-60 | YU Sean

Highest Quality and Repeatability for Single Wafer 150mm SiC CMP designed for High Volume Manufacturing

S. YU¹, M. LIU¹, J. GIVENS¹
¹ Applied Materials

Tu-P-61 | MAY Alexander

Via size-dependent properties of TiAl ohmic contacts on 4H-SiC

A. MAY¹, T. ERLBACHER¹, M. ROMMEL¹
¹ Fraunhofer-Institut für Integrierte Systeme und Bauelementetechnologie IISB

Tu-P-62 | BADALÀ Paolo

Structural and electrical characterization of Ni-based ohmic contacts on 4H-SiC formed by solid-state laser annealing

P. BADALÀ¹, E. SMECCA², S. RASCUNÀ¹, C. BONGIORNO², E. CARRIA¹, A. BASSI¹, G. BELLOCCHI¹, C. TRINGALI¹, A. LA MAGNA², A. ALBERTI²
¹ STMicroelectronics, Italy ² CNR-IMM, Italy

Tu-P-63 | LA MAGNA Antonino

Multiscale simulations of plasma etching in silicon carbide structures

A. LA MAGNA¹, M. ITALIA¹, I. DERETZIS¹, S. SCALESE¹
¹ CNR-IMM, Italy

Tu-P-64 | TAKEUCHI Riku

High-Selective Deep RIE of 4H-SiC with SiO₂ Hard Mask in Cl₂/HBr/O₂ Plasma Chemistry

R. TAKEUCHI¹, T. SATO¹, S. KUROKI¹
¹ Research Institute for Nanodevices and Bio Systems, Hiroshima University

Tu-P-65 | KAWAMURA Kazuya

Coverage Enhancement of Si-SOI/4H-SiC Wafer Direct Bonding by SiO₂ insertion

K. KAWAMURA¹, T. MEGURO¹, M. TSUTSUMI¹, T. OHSHIMA², Y. TANAKA³, S. KUROKI¹
¹ Research Institute for Nanodevice and Bio Systems, Hiroshima University ² National Institutes for Quantum and Radiological Science and Technology ³ National Institute of Advanced Industrial Science and Technology

Tu-P-66 | SUNDARAMOORTHY Vinoth

Ohmic contact formation on 4H-SiC with a low thermal budget by means of Schottky barrier modulation

V. SUNDARAMOORTHY¹, S. WIRTHS¹, L. KNOLL¹

¹ Hitachi ABB Power Grids

Tu-P-67 | ROCCAFORTE Fabrizio

Pt Schottky contacts on 3C-SiC layers grown on 4°-off-axis 4H-SiC

F. ROCCAFORTE¹, G. GRECO¹, P. FIORENZA¹, S. DI FRANCO¹, F. GIANNAZZO¹, F. LA VIA¹,

M. ZIELINSKI², V. JOKUBAVICIUS³, R. YAKIMOVA³

¹ CNR-IMM, Italy ² NOVASiC, France ³ IFM, Linköping University, Sweden

Tu-P-68 | MOKHTARZADEH Mahsa

Optimization of Etching Processes for Fabrication of Smooth Silicon Carbide Thin Membranes for applications in Quantum Technology

M. MOKHTARZADEH¹, R. KOSAK¹, C. DAVID¹

¹ Laboratory for Micro and Nanotechnology (LMN), Paul Scherrer Institute, Switzerland

Tu-P-70 | LAZAR Mihai

Ion Implantation Point Defect Engineering in SiC for Photonic Quantum Technology

M. LAZAR¹, M. BROCHETON²

¹ Light, nanomaterials, nanotechnologies (L2n) UTT- ERL CNRS 7004 ² Laboratoire de Recherche en Nanosciences (LRN), Université de Reims Champagne Ardenne, France

Tu-P-71 | YASUDA Yuto

Observation of carrier lifetime distribution in GaN vertical pn diode

Y. YASUDA¹, A. TANAKA², H. AMANO², M. KATO¹

¹ Nagoya Institute of Technology ² Nagoya University

Tu-P-72 | ANZALONE Ruggero

Impact of dislocation on warpage of thinned 4H-SiC wafers

R. ANZALONE¹, B. CAFRA¹, A. SEVERINO¹

¹ STMicroelectronics

Tu-P-73 | FIORENZA Patrick

2D-imaging of the 4H-SiC MOSFET channel by scanning capacitance microscopy

P. FIORENZA¹, M.S. ALESSANDRINO², B. CARBONE², A. RUSSO², F. GIANNAZZO¹,

F. ROCCAFORTE¹

¹ CNR-IMM, Italy ² STMicroelectronics, Italy

Tu-P-74 | BERGER Clément

Optimisation of Ti ohmic contacts formed on 4H-SiC by laser annealing

C. BERGER¹, D. ALQUIER¹, J.F. MICHAUD¹

¹ GREMAN UMR 7347 - CNRS, Université de Tours

Tu-P-75 | GAY Xavier

A Novel Tool Layout and Process for Single Side Wet Electrochemical Processing of Porous Silicon Carbide Layers Without Edge Exclusion

X. GAY¹, N. BAY¹, F. DELAHAYE¹, S. HANSEN¹, H. KÜHNLEIN¹

¹ RENA Technologies GmbH

Tu-P-76 | KRUSE Manuel

Total Silicon Carbide solution from wafer making to device making

M. KRUSE¹, G. KLUG¹

¹ DISCO HI-TEC EUROPE GmbH

Tu-P-77 | CALVO RUIZ Diego

Novel Vitrified-bond Ultra-fine Grinding Technology for SiC Polishing

D. CALVO RUIZ¹, C. SILENO¹

¹ Meister Abrasives AG

Tu-P-78 | GEMMILL William

Advancements in Polishing Pad Technology for the SiC Wafering Process

W. GEMMILL¹, V. MACK¹, T. KNIGHT¹

¹ Pureon, Inc.

Tu-P-79 | VIVONA Marilena

Electrical characterization of W-based Schottky barrier on 4H-SiC

M. VIVONA¹, G. BELLOCCHI², G. GRECO¹, S. DI FRANCO¹, M. SAGGIO², S. RASCUNA²,

F. ROCCAFORTE¹

¹ CNR-IMM, Italy ² STMicroelectronics, Italy

Tu-P-80 | MOEGGENBORG Kevin

Polish Scratch Simulation vs. Polish Tool Type

K. MOEGGENBORG¹, M. JU¹

¹ SK Siltron CSS

Tu-P-81 | MARTINS Maria

Probing the SiO₂/SiC interface with nanometer depth resolution using low-energy muons

M. MARTINS¹, J. WOERLE², P. KUMAR², X. NI¹, A. SUTER¹, Z. SALMAN¹, T. PROKSCHA²,

U. GROSSNER²

¹ Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institute, Switzerland ² Advanced Power Semiconductor Laboratory, ETH Zurich



08:30 / 10:00 AUDITORIUM RONSARD

We-1A : Advanced Processing

08:30 We-1A-Inv | JENNINGS Mike
MOSFET advanced process technology for heteroepitaxy and bulk 3C-SiC wafers
 JENNINGS Mike
Swansea University, Wales, UK

09:00 We-1A-01 | GIANNAZZO Filippo
Electrical scanning probe microscopy investigation of Schottky and metal-oxide junctions on hetero-epitaxial 3C-SiC on Silicon
 F. GIANNAZZO¹, P. FIORENZA¹, E. SCHILIRÒ¹, C. BONGIORNO¹, S. MONNOYE², H. MANK², M. ZIELINSKI², F. LA VIA¹, F. ROCCAFORTE¹
¹ CNR-IMM, Italy ² NOVASIC, Savoie Technolac, France

09:20 We-1A-02 | DHAR Sarit
Surface control for next-generation deposited dielectrics in 4H-SiC MOSFETs
 S. DHAR¹, I. JAYAWARDHENA¹, R. RAMAMURTHY², S. DAS¹, L. WANG¹, R. THORPE³, D. MORISSETTE², M. KURODA¹, L. FELDMAN³
¹ Auburn University ² Purdue University ³ Rutgers University

09:40 We-1A-03 | LEWKE Dirk
Study of laser backside ohmic contact formation of SiC-Ni interface to evaluate the process influence on the electrical characteristics
 D. LEWKE¹, F. SUPPLIETH², M. VON RINGLEBEN¹, J. RANSOM²
¹ 3D-Micromac AG ² X-Fab

10:20 / 12:10 We-2A : Bulk growth

10:20 We-2A-Inv | WELLMAN Peter
Review of Sublimation growth of SiC bulk crystals
 WELLMAN
University of Erlangen-Nürnberg

10:50 We-2A-01 | XING Xinming
Structure and morphology evolution of concave-shaped SiC {0001} surfaces in liquid silicon
 X. XING¹, T. YOSHIKAWA², D. CHAUSSENDE¹
¹ University Grenoble Alpes, CNRS, Grenoble INP (Institute of Engineering), SIMAP ² Institute of Industrial Science, The University of Tokyo

08:30 / 10:00 AUDITORIUM DESCARTES

We-1B : MOS Interface

08:30 We-1B-01 | KUMAR Piyush
Depth resolved study of the SiO₂-SiC interface using low-energy muon spin rotation spectroscopy
 P. KUMAR¹, M. MARTINS², M. BATHEN¹, J. WOERLE¹, T. PROKSCHA³, U. GROSSNER¹
¹ Advanced Power Semiconductor Laboratory, ETH Zurich, Switzerland ² Advanced Power Semiconductor Laboratory, ETH Zurich, Switzerland, Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institute, PSI, Switzerland ³ Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institute, PSI, Switzerland

08:50 We-1B-02 | BELANCHE Manuel
Sensitivity of Dit extraction at the SiO₂/SiC interface using quasi-static capacitance-voltage measurements
 M. BELANCHE¹, J. WOERLE¹, P. KUMAR¹, R. STARK¹, U. GROSSNER¹
¹ Advanced Power Semiconductor Laboratory, ETH Zurich

09:10 We-1B-03 | OGATA Yu
Nanoscale evaluation of Al₂O₃/diamond MOS interfaces using time-resolved scanning nonlinear dielectric microscopy
 Y. OGATA¹, K. YAMASUE¹, X. ZHANG², T. MATSUMOTO², N. TOKUDA², Y. CHO¹
¹ Tohoku University ² Kanazawa University

09:30 We-1B-Inv | KNOLL Lars
Latest advances in the implementation and characterization of high-k gate dielectric in SiC power MOSFETs
 KNOLL Lars
Hitachi ABB Powergrids Semiconductor

10:20 / 12:00 We-2B : Characterization techniques

10:20 We-2B-01 | YAMASUE Kohei
Surface potential fluctuations of SiO₂/SiC interfaces investigated by local capacitance-voltage profiling based on time-resolved scanning nonlinear dielectric microscopy
 YAMASUE Kohei
Tohoku University

AUDITORIUM RONSARD

11:10 We-2A-02 | LIU Xinbo
A solvent design method for SiC solution growth based on solution property induced surface stability

X. LIU¹, Y. DANG¹, S. HARADA², T. UJIHARA²
¹ Department of Materials Processing Engineering
² Center for Integrated Research of Future Electronics (CIRFE), Institute of Materials and System for Sustainability (IMaSS)

11:30 We-2A-03 | PARTHASARATHY SRaghavan

Growth and characterization of low defect, large diameter and high yielding 4H-N+-SiC in large volume manufacturing environment

S. PARTHASARATHY¹, R. DRACHEV¹,
 B. BERLINER¹, H. CHOU¹
¹ GT Advanced Technologies

11:50 We-2A-04 | ARZIG Matthias
Analysis of the morphology of the growth interface as a function of the gas phase composition during the PVT growth of silicon carbide

M. ARZIG¹, P. WELLMANN¹, U. KÜNECKE¹
¹ Crystal Growth Lab, Materials Department 6 (i-meet), Friedrich-Alexander University of Erlangen-Nürnberg, Germany

13:30 / 15:00 We-3A : Point defects

13:30 We-3A-Inv | SON Nguyen
Identification of deep levels of the carbon antisite-vacancy defect in 4H-SiC

N. SON¹, Y. OHKOUCHI², H. NAKANE², T. TRINH¹, T. OHSHIMA³, I. IVANOV¹, M. KATO²
¹ Department of Physics, Chemistry and Biology, Linköping University ² Department of Engineering Physics, Electronics and Mechanics, Nagoya Institute of Technology ³ National Institutes for Quantum and Radiological Science and Technology

14:00 We-3A-01 | HANAWA Masafumi
Evaluation of band-edge photoluminescence spectrum on N-doped 4H-SiC at high temperatures

M. HANAWA¹, H. TSUCHIDA¹
¹ Central Research Institute of Electric Power Industry (CRIEPI)

AUDITORIUM DESCARTES

10:40 We-2B-02 | PENG Hongyu
Variation of dislocation contrast in synchrotron X-ray topography using narrow rocking curve width

H. PENG, Z. CHEN, Y. LIU, Q. CHENG,
 X. HUANG, B. RAGHOTHAMACHAR,
 M. DUDLEY
¹ Materials Science and Chemical Engineering, Stony Brook University, Stony Brook, New York, 11794, USA, ² Advanced Photon Source, Argonne National Laboratory, Lemont, Illinois, 60439, USA

11:00 We-2B-03 | FUJIMOTO Keiya
Visualization of Transient Internal Temperature Changes during SiC-Schottky Barrier Diode Operation using Optical-Interference Contactless Thermometry

K. FUJIMOTO¹, H. HANAFUSA¹, S. TAKUMA¹, S. HIGASHI¹
¹ Graduate School of Advanced Science and Engineering, Hiroshima University

11:20 We-2B-04 | BERCU Nicolas
KPFM - Raman spectroscopy coupled technique for the characterization of wide bandgap semiconductor devices

N. BERCU¹, M. LAZAR², O. SIMONETTI¹, P. ADAM², M. BROUILLARD¹, L. GIRAUDET³
¹ Laboratoire de Recherche en Nanoscience (LRN), Université de Reims Champagne-Ardenne
² Lumière, nanomatériaux, nanotechnologies CNRS ERL 7004 (L2n), ICD, Université Technologique de Troyes

11:40 We-2B-05 | PLANSON Dominique
4H-SiC PiN diode protected by narrow field rings investigated by the OBIC method

D. PLANSON¹, C. SONNEVILLE¹,
 P. BEVILACQUA¹, L.V. PHUNG¹, B. ASLLANI¹,
 D. TOURNIER³, P. BROSELARD²
¹ AMPERE, UMR 5005 CNRS, INSA Lyon, France
² Caly Technologies

13:30 / 15:00 We-3B : Implantation and annealing

13:30 We-3B-01 | MATSUOKA Taiga
Sulfur ion implantation into SiC: Deep and double donor

T. MATSUOKA¹, M. KANEKO¹, T. KIMOTO¹
¹ Dept. of Electronic Sci. & Eng., Kyoto University

AUDITORIUM RONSARD

14:20 We-3A-02 | BATHEN Marianne
Stability, evolution and diffusion of intrinsic point defects in 4H-SiC

M. BATHEN¹, R. KARSTHOF², M. LINNARSSON³, A. GALECKAS², U. GROSSNER¹, L. VINES²

¹ Advanced Power Semiconductor Laboratory, Switzerland ² Department of Physics, University of Oslo, Norway ³ Department of Applied Physics, Sweden

14:40 We-3A-03 | TAKAHASHI Katsuya
Impacts of High-Concentration Carrier Traps on Electrical Characteristics of p-i-n Diodes on HPSI SiC Substrates

K. TAKAHASHI¹, H. TANAKA², M. KANEKO¹, T. KIMOTO¹

¹ Dept. of Electronic Sci. & Eng., Kyoto University ² Osaka University, and Kyoto University

15:30 / 16:50 We-4A : New material aspects

15:30 We-4A-01 | ROUCHIER Séverin
150mm SiC engineered substrates for high-voltage power devices

S. ROUCHIER¹, G. GAUDIN¹, J. WIDIEZ², F. ALLIBERT¹, E. ROLLAND², K. VLADIMIROVA², G. GELINEAU², N. TROUTOT², C. NAVONE², G. BERRE³, D. BOSCH³, Y.L. LEOW³, A. DUBOUST³, A. DROUIN¹, J-M BETHOUX¹, R. BOULET¹, A. CHAPELLE¹, E. CELA¹, G. LAVAITTE¹, A. BOUVILLE-LALLART¹, L. VIRAVAUUX¹, S. BHARGAVA³, S. THOMAS³, I. RADU¹, C. MALEVILLE¹, W. SCHWARZENBACH¹

¹ SOITEC SA ² CEA LETI ³ Applied Materials

15:50 We-4A-02 | RAMAKERS Senja
Atomistic simulations of the polytype stability and defect nucleation mechanisms in 4H-SiC epitaxy

S. RAMAKERS¹, T. ECKL¹, A. MARUSCZYK², T. HAMMERSCHMIDT³, M. MROVEC³, R. DRAUTZ³

¹ Corporate Sector Research and Advance Engineering, Robert Bosch GmbH., Germany

² Bosch Security Systems B.V., The Netherlands

³ Interdisciplinary Centre for Advanced Materials Simulation, Ruhr-Universität Bochum, Germany

AUDITORIUM DESCARTES

13:50 We-3B-02 | CALABRETTA Cristiano
Graphite Assisted P and Al implanted 4H-SiC Laser Annealing

C. CALABRETTA¹, A. PECORA¹, M. AGATI¹, S. PRIVITERA¹, S. BONINELLI¹, F. LA VIA¹

¹ CNR-IMM, Italy

14:10 We-3B-03 | FUKAYA Shuhei
Deep levels in SiC PiN structure with a p layer formed by ion implantation or epitaxial growth

S. FUKAYA¹, Y. YONEZAWA², T. KATO², M. KATO¹

¹ Nagoya Institute of Technology ² National Institute of Advanced Industrial Science and Technology (AIST)

14:30 We-3B-Inv | SADDOW Stephen
The Development of a Monolithic Silicon Carbide Neural Interface for Long-Term Human Implantation

SADDOW Stephen
 Department of Electrical Engineering, University of South Florida, USA

15:30 / 17:00 We-4B : Devices & Reliability

15:30 We-4B-Inv | AGARWAL Anant
Design strategies for rugged power MOS-FETs and reliability challenges

AGARWAL Anant
 The Ohio State University

16:00 We-4B-01 | COQ GERMANICUS Rosine
Failure analysis of atmospheric neutron-induced Single Event Burnout of a commercial SiC MOSFET

R. COQ GERMANICUS¹, K. NISKANEN², A. MICHEZ², N. MOULTIF³, W. JOUHA³, O. LATRY³, J. BOCH², U. LÜDERS¹, A. TOUBOUL¹

¹ Normandie Univ, Ensicaen, Unicaen, CNRS, CRIS-MAT, UMR6508, Caen, France

² Institut d'Electronique et des Systèmes, UMR5214, University of Montpellier, France

³ Groupe de Physique des Materiaux, CNRS, UMR6634, Rouen, France

AUDITORIUM RONSARD

16:10 We-4A-03 | DOJIMA Daichi
A novel approach of utilizing mechanically flexible SiC substrate to grow crack-free AlN bulk crystal by thermal strain relaxation functionality

D. DOJIMA¹, M. MATSUBARA²,
 H. MINAMIYAMA², T. KANEKO¹
¹ *Kwansei Gakuin University*
² *Toyo Aluminium K.K.*

16:30 We-4A-04 | CAFRA Brunella
Dislocation density impact on mechanical characteristics of 4H-SiC substrates

B. CAFRA¹, N. PILUSO¹, A. GRASSO¹,
 A.A. MOON¹, A. SEVERINO¹
¹ *STMicroelectronics*

AUDITORIUM DESCARTES

16:20 We-4B-02 | LICHTENWALNER Daniel
Gate bias effects on SiC MOSFET terrestrial-neutron single-event burnout

D. LICHTENWALNER¹, D. GAJEWSKI¹, S. RYU¹,
 B. HULL¹, S. ALLEN¹, J. PALMOUR¹
¹ *Wolfspeed*

16:40 We-4B-03 | RAFÍ Joan Marc
Low temperature annealing of electron and neutron irradiation effects on four-quadrant SiC radiation detectors

J.M. RAFÍ¹, V. DAUDERYS¹, G. PELLEGRINI¹, P.
 GODIGNON¹, S. OTERO UGOBONO¹,
 G. RIUS¹, G. KRAMBERGER², I. TSUNODA³,
 M. YONEOKA³, K. TAKAKURA³
¹ *Instituto de Microelectrónica de Barcelona (CNM-CSIC)* ² *Jozef Stefan Institute* ³ *National Institute of Technology (KOSEN), Kumamoto College*

POSTERS

17:00 / 19:00

LEVEL -2

We-P – Devices and applications

We-P-01 | MATHIEU DE VIENNE Cédric
Experimental investigation of a 10 kV-70A switch with six SiC-MOSFETs in a series-connection configuration

C. MATHIEU DE VIENNE¹, P. LEFRANC², B. ASLLANI³, P. JEANNIN², B. LEFEBVRE³
¹ *SuperGrid institute, G2Elab* ² *G2Elab* ³ *SuperGrid Institute*

We-P0-3 | HOFFMANN Felix
Comparison of the H3TRB Performance of Silicon and Silicon Carbide Power Modules

F. HOFFMANN¹, N. KAMINSKI¹, S. SCHMITT²
¹ *University of Bremen* ² *Semikron Elektronik GmbH&Co. KG*

We-P-04 | SHANMUGAM Priyadarshini
A New Approach in the Field of Hydrogen Gas Sensing using MEMS based 3C-SiC- μ Cs

P. SHANMUGAM¹, L. IGLESIAS², M. PORTAIL³, I. DUFOUR², D. CERTON¹, D. ALQUIER¹,
 J.F. MICHAUD¹
¹ *GREMAN Laboratory UMR-CNRS 7347, University of Tours, France* ² *IMS Laboratory UMR-CNRS 5218, University of Bordeaux, France* ³ *Centre de Recherche sur l'Heteroepitaxie et ses Applications CNRS-UPR10, France*

We-P-05 | YABU MASAHIRO
Investigation of interaction between threading screw dislocations and the growing crystal surface during PVT-growth of 4H-SiC crystals

M. YABU¹, M. NAKANO¹, M. YODO¹, T. HASHIGUCHI¹, N. OHTANI¹
¹ *Kwansei Gakuin University, School of Science and Technology*

We-P-06 | NAKATA Shuhei

Self-turn-on Phenomenon of SiC MOSFETs by Fast Switching Operation

S. NAKATA¹, Y. SATO¹

¹ Kanazawa Institute of Technology

We-P-07 | ZHANG Luyang

Investigations of Short Circuit Robustness of SiC IGBTs with Considerations on Physics Properties and Gate Design

L. ZHANG¹, T. DAI¹, P. GAMMON¹, J. GONZALEZ¹, A. RENZ¹, V. SHAH¹, P. MAWBY¹

¹ University of Warwick

We-P-08 | SHIMA Takuma

Effects of MOS charges on roll-off characteristics of 4H-SiC short channel n/p MOSFETs

T. SHIMA¹, T. MAEDA², S. ISHIKAWA², S. KUROKI¹

¹ Research Institute for Nanodevice and Biosystems, Hiroshima University

² Phenitec Semiconductor Co., Ltd

We-P-09 | HITCHCOCK Collin

Aluminum Acceptor Ionization Energies in 4H SiC for Low Dose, Ultra-High Energy (> 1MeV) Implants

C. HITCHCOCK¹, R. GHANDI¹, P. DEEB¹, S. KENNERLY¹, M. TORKY², T.P. CHOW²

¹ GE Research ² Rensselaer Polytechnic Institute

We-P-10 | MOHAMED Torky

Determination of Effective Critical Breakdown Field in 4H-SiC Superjunction Devices

T. MOHAMED¹, P. CHOW¹

¹ Rensselaer Polytechnic Institute

We-P-11 | MUOIO Annamaria

Neutron detection study through simulations with FLUKA

A. MUOIO¹, M. LAURA², M. ALESSANDRO³, P. MIRIAM⁴, T. ANTONIO⁴, L.V. FRANCESCO⁵

¹ CNR-IMM, Italy ² ENI - Renewable Energy, Magnetic Fusion and Material Science Research Center, Novara ³ IMM-CNR; Università di Catania Dipartimento di Fisica, Catania ⁴ ENI-MAFE, Venezia

⁵ IMM - CNR; LNS - INFN, Catania

We-P-12 | VALERO Valentin

Comparison of the response of SiC-based detectors for fast neutron measurements at monoenergetic neutron fields

V. VALERO¹, L. OTTAVIANI¹, Q. POTIRON², A. LYOUSSI³, C. DESTOUCHES³, M. HOURY²,

R. BABUT⁴, V. GRESSIER⁴, B. CHEYMOL⁵, A. VOLTE¹, M. CARETTE¹, C. REYNARD-CARETTE¹

¹ Aix Marseille Univ, Université de Toulon, CNRS, IM2NP, France ² CEA, IRFM, France ³ CEA/DES/IRESNE/DER, Section of Experimental Physics, Safety Tests and Instrumentation, France ⁴ IRSN, France

⁵ Laboratoire de Physique Subatomique et de Cosmologie, Université Grenoble-Alpes, CNRS/IN2P3, France

We-P-13 | MENDY Simon

Electrothermal Modelling and Measurements of Parallel-Connected VTH Mismatched SiC MOSFETs under Inductive Load Switching

S. MENDY¹, R. WU¹, J.O. GONZALEZ¹, O. ALATISE¹

¹ University of Warwick

We-P-14 | TORKY Mohamed

Comparative Performance Evaluation of Conventional and Superjunction Vertical 4H-SiC High-Voltage Power MOSFETs

M. TORKY¹, P. CHOW¹

¹ Rensselaer Polytechnic Institute

We-P-15 | STEFANAKIS Dionysios

Determining 4H-SiC carrier lifetime values for temperature range 300K to 865K via TCAD simulation

D. STEFANAKIS¹, N. MAKRIS², K. ZEKENTES², D. TASSIS³

¹ ARISTOTLE UNIVERSITY OF THESSALONIKI ² Foundation for Research & Technology-Hellas (FORTH)

³ Aristotle University of Thessaloniki

We-P-16 | MAEDA Noriyuki

SPICE model reproducing the static and dynamic characteristics of a SiC complementary JFET inverter from 300 to 573 K

N. MAEDA¹, M. KANEKO¹, H. TANAKA², T. KIMOTO¹

¹ Kyoto University ² Kyoto University, Osaka University

We-P-17 | PASCU Razvan

Differential hydrogen sensor based on SiC MOS capacitors

R. PASCU¹, G. BREZEANU², G. PRISTAVU², F. DRAGHICI²

¹ National Institute for Research and Development in Microtechnologies - IMT Bucharest and

University "POLITEHNICA" Bucharest ² University "POLITEHNICA" Bucharest

We-P-18 | TIAN Xiaoli

Design and Characterization of 10kV High Voltage 4H-SiC P-channel IGBTs with Low VF

X. TIAN¹, Y. YANG², W. FENG², J. LU¹, C. ZHENG³, C. YANG¹, Y. BAI¹, C. LI³, X. LIU¹

¹ Institute of Microelectronics of Chinese Academy of Sciences ² College of Microelectronics,

University of Chinese Academy of Sciences ³ CRRC Times Electric Co. Ltd

We-P-19 | SCHARNHOLZ Sigo

Investigation of SiC thyristors with varying amplifying gate design

S. SCHARNHOLZ¹, R. HASSDORF¹, D. BAUERSFELD¹, B. VERGNE¹, L. PHUNG², D. PLANSON²

¹ ISL AMPERE, UMR 5005 CNRS, INSA Lyon, France

We-P-20 | KALININA Evgenia

4H-SiC photodetectors irradiated with Argon ions

E. KALININA¹, A. LEBEDEV¹, M. KUDOYAROV¹, I. NIKITINA¹, E. DEMENTYEVA¹, V. ZABRODSKII¹

¹ Ioffe Institute, St.-Petersburg, Russia

We-P-22 | OTERO UGOBONO Sofia

Monolithic integration of graphene in SiC radiation sensors for harsh-environment applications

S. OTERO UGOBONO¹, P. GODIGNON¹, G. PELLEGRINI¹, J.M. RAFI¹, G. RIUS¹,

M.d.C. JIMENEZ-RAMOS², J. GARCIA LOPEZ², A. GARCIA-OSUNA²

¹ IMB-CNM-CSIC ² Centro Nacional de Aceleradores (U. Seville, CSIC, J. de Andalucia)

We-P-23 | BAKER Guy

A study of 4H-SiC semi-superjunction rectifiers for practical realisation

G. BAKER¹, T. DAI¹, L. ZHANG¹, Y. QI¹, F. LI¹, V. SHAH¹, P. MAWBY¹, M. ANTONIOU¹,

P. GAMMON¹

¹ University of Warwick

We-P-24 | KARKER Olfa

Modeling and development of 4H-SiC nanowire/nanoribbon biosensing FET structures

O. KARKER¹, K. ZEKENTES², V. STAMBOULI³, E. BANO⁴

¹ IMEP-LaHC & LMGP, University Grenoble Alpes, CNRS, France ² MRG-IESL/ FORTH, VassilikaVouton, Greece ³

LMGP, University Grenoble Alpes, CNRS, France ⁴ IMEP-LaHC, University Grenoble Alpes, CNRS, France

We-P-25 | SUNDARAMOORTHY Vinoth

Performance comparison of 6.5 kV SiC PiN diode with 6.5 kV SiC JBS and Si diodes

V. SUNDARAMOORTHY¹, A. MIHAILA¹, L. SPEJO², R. MINAMISAWA², L. KNOLL¹

¹ Hitachi ABB Powergrids

² Fachhochschule Nordwestschweiz, Switzerland

We-P-26 | RENZ Arne Benjamin

A study of high resistivity semi-insulating 4H-SiC epilayers formed via the implantation of germanium and vanadium

A.B. RENZ¹, O.J. VAVASOUR¹, M. ROMMEL², G.W.C. BAKER¹, P.M. GAMMON¹, T. DAI¹,
M. ANTONIOU¹, P. MAWBY¹, F. LI¹

¹ University of Warwick ² Fraunhofer Institute for Integrated Systems and Device Technology IISB

We-P-27 | CORDIER Yvon

AlGaIn/GaN High Electron Mobility Transistors grown by MOVPE on 3C-SiC/ Si(111) for RF applications

Y. CORDIER¹

¹ CRHEA-CNRS

We-P-28 | CUONG Vuong Van

High-Temperature Reliability of Integrated Electronic Circuit Based on 4H-SiC MOSFET with TiN Metal Gate

V.V. CUONG¹, M. TETSUYA¹, K. SHIN-ICHIRO¹

¹ Research Institute for Nanodevice and Bio Systems, Hiroshima University

We-P-29 | MEGURO Tatsuya

Output Characteristics of SOI-Si/4H-SiC Hybrid Pixel Device for Radiation Hardend CMOS Image Sensors

T. MEGURO¹, M. TSUTSUMI¹, A. TAKEYAMA², T. OHSHIMA², Y. TANAKA³, S. KUROKI¹

¹ Research Institute for Nanodevice and Bio Systems, Hiroshima University ² National Institutes for Quantum and Radiological Science and Technology ³ National institute of advanced industrial science and technology

We-P-30 | RIM You Seung

Confined magnetic field sputtering-based Nickel films on ultrawide bandgap α -Ga₂O₃ for Schottky barrier modulation and high thermal stability

Y.S. RIM¹, H. KIM¹

¹ Sejong University

We-P-31 | KOTAMRAJU Siva

Analysis of interface trap distribution for Pd/AlN/6H-SiC and Pd/HfO₂/6H-SiC MOS capacitor sensors at 700K

S. KOTAMRAJU¹, P. VUDUMULA¹

¹ IIIT srinity

We-P-32 | BERA Lakshmi Kanta

Multi-layer high-K gate stack materials for low Dit 4H-SiC based MOSFETs

L.K. BERA¹, N. SINGH¹, Z. CHEN¹, C.H.M. CHUA¹, K.J. CHUI¹, R.P. SINGH¹, K.M. HAN¹,
K. CHONG¹, D. KWONG¹

¹ Institute of Microelectronics (IME) - A*STAR, Singapore

17:00 / 19:00 We-P – Materials

We-P-33 | K. Mochizuki

Models for impurity incorporation during vapor-phase epitaxy

K. Mochizuki

Hosei University

We-P-34 | KIM Tae Hee

4-inch Si-SiC Single Crystals Grown using high purity β -SiC powder

T.H. KIM¹, G.D. LEE¹, C.Y. LEE¹

¹ KC industrial

We-P-35 | KIM Tae Hee

4-inch N-type SiC Single Crystals Grown using high purity β -SiC powder

T.H. KIM¹, G.D. LEE¹, C.Y. LEE¹

¹ KC industrial

We-P-36 | LEE Chae young

2-inch Si-SiC Single Crystals Grown using -SiC and -SiC powder mixed source

C.y. LEE¹, T.h. KIM¹, G.D. LEE¹, W.J. LEE²

¹ KC industrial ² dong-Eui University

We-P-37 | YAMOCHI Tsuyoshi

Stacking fault formation at the interface between the seed and grown crystal of physical vapor transport-grown 4H-SiC crystals

T. YAMOCHI¹, T. IZAWA¹, N. OHTANI¹

¹ Kwansai Gakuin University, School of Science and Technology

We-P-38 | HASHIGUCHI Takato

Enhanced nitrogen incorporation in the <11-20> directions on the (000-1) facet of 4H-SiC crystals

T. HASHIGUCHI¹, T. OTA¹, N. OHTANI¹

¹ Kwansai Gakuin University, School of Science and Technology

We-P-40 | NAKANO Masataka

Investigation of the step structure on the (000-1) facet of physical vapor transport-grown 4H-SiC crystals on an off-axis seed crystal

M. NAKANO¹, M. YABU¹, N. OHTANI¹

¹ Kwansai Gakuin University, School of Science and Technology

We-P-41 | MANNING Ian

Advances in 200 mm 4H SiC wafer development and production

I. MANNING¹, K. MOEGGENBORG¹, J. SEARSON¹, M. GAVE¹, A. SOUKHOJAK¹, G. CHUNG¹, E. SANCHEZ¹

¹ SK Siltron CSS

We-P-42 | MANABE MORINO

Investigation of the deflection behavior of threading dislocations in 4H-SiC crystals

M. MANABE¹, A. NAKAI¹, N. OHTANI¹

¹ Kwansai Gakuin University, School of Science and Technology

We-P-43 | ZHU Can

6-inch SiC crystal growth by solution method assisted with AI technology

C. ZHU¹, W. YU², K. SUZUKI¹, Y. DANG³, T. FURUSHO¹, S. HARADA¹, M. TAGAWA¹, T. UJIHARA¹

¹ Center for Integrated Research of Future Electronics (CIRFE), Institute of Materials and System for Sustainability (IMaSS), Nagoya University ² Institute of Materials and System for Sustainability (IMaSS), Nagoya University ³ Department of Materials Science and Engineering, Nagoya University

We-P-44 | STEINER Johannes

Applicability of birefringence measurements for the determination of bulk properties of silicon carbide wafers

J. STEINER¹, P.J. WELLMANN¹, B.D. NGUYEN², S. SANDFELD², M. RODER³, A. DANILEWSKY³

¹ Crystal Growth Lab, Materials Department 6 (i-meet), FAU Erlangen-Nuremberg

² Research Center Jülich Institute for Advanced Simulation

³ Crystallography, Institute of Earth Sciences, Albert-Ludwigs-University Freiburg

We-P-45 | PEZOLDT Joerg

Cubic silicon carbide formation using reactive silicon-carbon multilayers

J. PEZOLDT¹, I. GALINO², N. DUBOISKAYA¹, D. SHEKHAWAT¹, J. GUERRA³, M. HOPFELD⁴,
L. HONIG⁴, P. SCHAAF⁴

¹ FG Nanotechnologie, TU Ilmenau, Germany ² Saarland University, Chair of Metallic Materials, Campus C6.3, D-66123 Saarbrücken, Germany ³ Pontificia Universidad Católica del Perú, Departamento de Ciencias, Sección Física, Peru ⁴ FG Werkstoffe der Elektrotechnik, TU Ilmenau, Germany

We-P-46 | IHLE Jonas

In-situ monitoring of unintentionally released nitrogen gas in the initial PVT Silicon Carbide growth process using mass spectrometry

J. IHLE¹, P. WELLMANN¹

¹ Crystal Growth Lab, Materials Department 6 (i-meet), University of Erlangen-Nürnberg (FAU)

We-P-47 | KÖHLER Johannes

Chemical Vapor Deposition of 3C-SiC on [100] oriented Silicon at low Temperature < 1200°C for photonic applications

J. KÖHLER¹, M. KOLLMUß¹, P. WELLMAN¹, W. FAN², H. OU², D. CHAUSENDE³

¹ Crystal Growth Lab, Materials Department 6 (i-meet), FAU Erlangen-Nuremberg

² Department of Photonics Engineering, Technical University of Denmark, Denmark

³ Université Grenoble Alpes, CNRS, Grenoble INP (Institute of Engineering), SIMAP, France

We-P-48 | KOLLMUSS Manuel

Large area growth of cubic silicon carbide using closed space PVT by application of homoepitaxial seeding

M. KOLLMUSS¹, M. SCHÖLER¹, R. ANZALONE², M. MAUCERI³, F. LA VIA⁴, P. WELLMANN¹

¹ Crystal Growth Lab, Materials Department 6 (i-meet), FAU Erlangen-Nuremberg, Germany

² STMicroelectronics, Italy ³ LPE S.P.A., Italy ⁴ CNR-IMM, Italy

We-P-49 | PORTAIL Marc

Designing SiC based CMUT structures: an original approach and related material issues

M. PORTAIL¹, S. CHENOT¹, R. KHAZAKA², L. NGUYEN¹, D. ALQUIER³, J.F. MICHAUD³

¹ CNRS-CRHEA ² ASM ³ GREMAN UMR 7347 - CNRS, Université de Tours

We-P-50 | JOKUBAVICIUS Valdas

Growth of 3C-SiC on 2-inch hexagonal SiC using sublimation epitaxy

V. JOKUBAVICIUS¹, R. YAKIMOVA¹

¹ Department of Physics, Chemistry and Biology, Linköping University

We-P-51 | SAZAWA Hiroyuki

3C-SiC with less rotational variants mixing grown on 4H-SiC C-face substrate by CVD

H. SAZAWA¹, H. YAMAGUCHI¹, K. KOJIMA¹, H. YAMAGUCHI¹

¹ National Institute of Advanced Industrial Science and Technology, Advanced Power Electronics Research Center

We-P-52 | RANA Tawhid

Interfacial Dislocation reduction by optimizing process condition in 4H-SiC epitaxy

T. RANA¹, G. CHUNG¹, A. SOUKHOJAK¹, M. JU¹, M. GAVE¹

¹ SK Siltron CSS

We-P-53 | GHEZELLOU Misagh

The effect of carbon precursor on the evolution of surface morphology of 4H-SiC epitaxial layers during the growth

M. GHEZELLOU¹, J. UL HASSAN¹, R. KARHU¹

¹ Department of Physics, Chemistry and Biology, Linköping University, Sweden

We-P-54 | ZIELINSKI Marcin

Vanadium incorporation in 3C-SiC epilayers and its consequences for electrical properties of 3C-SiC material.

M. ZIELINSKI¹, C. MOISSON¹, M. BUSSEL¹, H. MANK¹, S. MONNOYE¹, M. PORTAIL²,
A. MICHON², Y. CORDIER²

¹ NOVASiC ² CRHEA-CNRS

We-P-55 | FAN Wei

Impact of Surface Emissivity on Crystal Growth and Epitaxial Deposition

W. FAN¹, J. LENNARTZ¹, P. SCHMIDT-SANE¹, B. KOZAK¹, B. BALLAND¹, A. GALYUKOV², D. FEEZELL³

¹ Momentive Technologies ² STR US ³ University of New Mexico

We-P-56 | PARTHASARATHY Shravan Kumar

Environmental effects on the coherence time of VSi color centers in 4H-SiC

S.K. PARTHASARATHY¹, B. KALLINGER¹, P. BERWIAN¹, R. NAGY²

¹ Fraunhofer Institute for Integrated Systems and Device Technology IISB

² Friedrich-Alexander University of Erlangen-Nuremberg

We-P-57 | TAIBI Ibrahim

Structural, electronic and optical properties of 6H-SiC and 3C-SiC with the application in solar cell devices

I. TAIBI

Applied Materials laboratory

We-P-58 | MALIKA DIAFI

Study of Zn-Co Alloy Coatings Modified by Nano- TiO₂ Particles Incorporation

¹ Physic Laboratory of Thin Films and Applications (LPCMA), University of Biskra, Algeria

We-P-59 | GUO Ling

Evaluation of Line-shape Defect in Epitaxial Wafer

¹ SHOWA DENKO K.K.

We-P-60 | FUKUI Takuya

Carrier lifetime of 4H-SiC SJ-UMOSFET

T. FUKUI¹, M. KATO¹, T. TAWARA²

¹ Nagoya Institute of Technology ² National Institute of Advanced Industrial Science and Technology (AIST)

We-P-61 | ANZALONE Ruggero

High temperature etching for threading dislocation investigation on GaN epi-layer

R. ANZALONE¹, A. SEVERINO¹

¹ STMicroelectronics

We-P-62 | LEBEDEV Alexander

Study of 3C SiC films grown by sublimation on 4H-SiC semiinsulated substrates.

A. LEBEDEV¹, V. DAVYDOV¹, I. ELISEEV¹, S. LEBEDEV¹, I. NIKITINA¹, A. SMIRNOV¹

¹ Ioffe Institute

We-P-63 | CHUNG Gil

Decoration and density changes of dislocations in PVT-grown SiC boules with post-growth thermal processing

¹ SK Siltron CSS

We-P-64 | KRANERT Christian

Non-destructive, cost-efficient, and fast full wafer defect quantification for SiC by X-ray topography

C. KRANERT¹, C. REIMANN¹, R. WEINGÄRTNER¹, J. FRIEDRICH¹, M. FEHRENTZ², E. SÖRMAN³,
A. ELLISON³

¹ Fraunhofer Institute for Integrated Systems and Device Technology IISB ² Rigaku Europe SE

³ STMicroelectronics Silicon Carbide AB

We-P-65 | KARHU Robin

Creation of defect centers in 4H-SiC

R. KARHU¹, D. HABERSAT², A. BURK³, B. VANMIL²

¹ Oak Ridge Associated Universities (ORAU) ² DEVCOM Army Research Laboratory ³ Fibertek

We-P-66 | CALABRETTA Cristiano

Effect of N and Al doping on Stacking Faults reduction in 3C SiC

C. CALABRETTA¹, R. ANZALONE¹, V. SCUDERI¹, A. CANNIZZARO¹, M. MAUCERI², D. CRIPPA², S. BONINELLI¹, F. LA VIA¹

¹ CNR-IMM, Italy ² LPE, Italy

We-P-67 | NA Moonkyong

Stresses effect on the formation of ?-shaped dislocations in 4H-SiC epitaxial layer

M. NA¹, W. BAHNG¹, H. JANG², N.K. KIM¹, J.H. MOON¹, J.H. YOON³, H.D. JUNG³

¹ Korea Electrotechnology Research Institute ² Korea Electrotechnology Research Institute/Pusan National Univeristy ³ Etamax Co., Ltd.

We-P-68 | KODOLITSCH Elisabeth

Impact of epitaxial defects on device behavior and their correlation to electrical characteristics in SiC devices

E. KODOLITSCH¹, V. SODAN², M. KRIEGER³, N. TSAVDARIS²

¹ Infineon Technologies Austria AG / Friedrich-Alexander University of Erlangen-Nuremberg

² Infineon Technologies Austria AG ³ Friedrich-Alexander University of Erlangen-Nuremberg

We-P-69 | HRICH Haitham

From buffer layer to graphene monolayer grown by sublimation on 4H-SiC (0001) large terraces

H. HRICH¹, M. MORET¹, O. BRIOT¹, M. PAILLET¹, J.M. DECAMS², P. LANDOIS¹, S. CONTRERAS¹

¹ Laboratoire Charles Coulomb, UMR 5221, Univ Montpellier, CNRS, Montpellier, France

² Annealsys, 139 rue des Walkyries, 34000 Montpellier, France

We-P-70 | JOUSSEAUME Yann

Liquid Si-induced 4H-SiC surface structuring using a sandwich configuration

Y. JOUSSEAUME¹, F. CAUWET¹, G. FERRO¹

¹ Laboratoire des Multimatériaux et Interfaces, Université de Lyon

We-P-71 | SCHLICHTING Holger

The Influence of Extended Defects in 4H-SiC Epitaxial Layers on Gate Oxide Performance and Reliability

H. SCHLICHTING¹, B. KALLINGER¹, T. ERLBACHER¹, M. KOCHER¹

¹ Fraunhofer Institute for Integrated Systems and Device Technology IISB, Schottkystr. 10, 91058 Erlangen, Germany

² FAU Chair of Electronic Devices, Cauerstr. 6, 91058 Erlangen, Germany

09:00 / 10:00

AUDITORIUM RONSARD

Th-1A : Harsh Environment, Ics & Sensors

09:00

Th-1A-Inv | ZETTERLING Carl-Mikael
Extreme Environment Electronics using SiC Bipolar Ics
 ZETTERLING Carl-Mikael
KTH Royal Institute of Technology

09:30

Th-1A-01 | KANEKO Mitsukai
Suppression of a logic-threshold-voltage shift in a SiC complementary JFET logic gate at high temperature
 M. KANEKO¹, M. NAKAJIMA¹, T. KIMOTO¹
¹ *Kyoto University*

09:50

Th-1A-02 | MEHTA Mohit
DC Modeling of 4H-SiC JFET Gate Length Reduction at 500°C
 M. MEHTA¹, P. NEUDECK², J. LAWSON³
¹ *KBRWyle Services, LLC. (NASA Govt. Contractor)*
² *NASA Glenn Research Center* ³ *NASA Ames Research Center*

10:40 / 11:20

Th-2A : Harsh Environment, Ics & Sensors

10:40

Th-2A-01 | ASLANIDOU Sofia
Fabrication and Characterization of Epitaxial Graphene Field Effect Transistor Devices based on a Monolithic Bottom Gate
 S. ASLANIDOU¹, A. GARCÍA-GARCÍA², G. RIUS², P. GODIGNON²
¹ *IMB-CNM-CSIC / UAB* ² *IMB-CNM CSIC*

11:00

Th-2A-02 | KUROKI Shin-Ichiro
Output Characteristics of 4H-SiC Pixel Devices for Radiation Hardened UV CMOS Image Sensors
 S. KUROKI¹, K. NISHIGAITO¹, T. MEGURO¹, A. TAKEYAMA², T. OHSHIMA², Y. TANAKA³
¹ *Research Institute for Nanodevice and Bio Systems, Hiroshima University*
² *National Institutes for Quantum and Radiological Science and Technology (QST)*
³ *National Institute of Advanced Industrial Science and Technology (AIST)*

11:20 / 12:05

Plenary Session 2

11:20

Th-PS-01 | KIMOTO Tsunenobu
A New Horizon of SiC Technology Driven by Deeper Understanding of Physics
Kyoto University

12:05 / 12:45

Closing Session

12:05

Conference Award Announcements

12:15

Conference Highlights

12:30

ICSCRM 2022 : Pr. U. Grossner (ETHZ, Switzerland)

12:40

ICSCRM 2023: Pr. A. Irace (U. Napoli, Italy)

PROGRAM AT A GLANCE

	Sun.	Mon.	Tues.	Wed.	Thurs.
@	Auditorium Descartes	Auditorium Ronsard	Auditorium Ronsard	Auditorium Descartes	Auditorium Ronsard
08:30	Welcome Coffee & Opening	Opening	Tu-1A: Diodes & Superjunctions	We-1A: Advanced Processing	Th-1A: Harsh Environment, Ics & Sensors
10:00	Su-1A: Tutorial	Mo-1A: SiC Epitaxy	Tu-2A: Extended defects	We-2A: Bulk growth	Th-2A: Harsh Environment, Ics & Sensors
12:00	LUNCH BREAK	LUNCH BREAK	LUNCH Break	LUNCH Break	Plenary Session 2
13:30	Su-2A: Tutorial	Mo-2A: MOSFETS	Tu-3A: 3C-SiC	We-3A: Point defects	End of the conference at 14:00
17:00	BREAK / Badges	Mo-3A: Quantum Technology	Tu-4A: HV and advanced devices	We-4A: New material aspects - G1E - 5342	
18:30	WELCOME PARTY (from 18:30 @ 2nd floor)	INVITED POSTER introduction	Tu-4B: Fundamental properties	We-4B: Devices & Reliability	
19:30		INDUSTRIAL SESSION @ - 2nd floor	Tu-P: POSTER SESSION	We-P: POSTER SESSION	INDUSTRIAL Exhibition 08:30/14:00 @ - 2nd Floor
		INDUSTRIAL Exhibition 08:00/19:45 @ - 2nd floor	INDUSTRIAL Exhibition 08:00/19:00 @ - 2nd floor	INDUSTRIAL Exhibition 08:00/19:00 @ - 2nd floor	
				GALA DINNER at "La Grange de Meslay" (from 19:30)	