

2018 33rd Symposium on Microelectronics Technology and Devices (SBMicro 2018)

**Bento Goncalves, Brazil
27-31 August 2018**



**IEEE Catalog Number: CFP18SBO-POD
ISBN: 978-1-5386-8392-7**

**Copyright © 2018 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

****** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP18SBO-POD
ISBN (Print-On-Demand):	978-1-5386-8392-7
ISBN (Online):	978-1-5386-8391-0

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

SBMicro 2018

33rd Symposium on Microelectronics
Technology and Devices



Session 1: Emerging Devices I

ACCOUNTING FOR SERIES RESISTANCE IN THE COMPACT MODEL OF TRIPLE-GATE JUNCTIONLESS NANOWIRE TRANSISTORS 1

Renan Trevisoli, Rodrigo Doria, Michelly de Souza and Marcelo Pavanello

INFLUENCE OF CHANNEL SILICON THICKNESS AND BIOLOGICAL MATERIAL PERMITTIVITY ON NTFET BIOSENSOR 5

Christian Macambira, Paula Agopian and João Martino

LOW-FREQUENCY NOISE INVESTIGATION IN LONG-CHANNEL FULLY DEPLETED INVERSION MODE N-TYPE SOI NANOWIRE 9

Allan Roberto Molto, Bruna Cardoso Paz, Mikaël Cassé, Sylvain Barraud, Gilles Reimbold, Maud Vinet, Olivier Faynot and Marcelo Antonio Pavanello

A TUNNEL-FET DEVICE MODEL BASED ON VERILOG-A APPLIED TO CIRCUIT SIMULATION 13

Ricardo Rangel, Paula Agopian and João Martino

Session 2: Electrical Characterization I

LINEARITY ENHANCEMENT IN ASYMMETRIC SELF-CASCADE COMPOSED BY FD SOI NMOSFETS 17

Rafael Assalti, Denis Flandre and Michelly de Souza

ANALYSIS OF THE OUTPUT CONDUCTANCE DEGRADATION WITH THE SUBSTRATE BIAS IN SOI UTB AND UTBB TRANSISTORS 21

Fernando Costa, Renan Trevisoli Doria and Rodrigo Trevisoli Doria

DC METHOD FOR SELF-HEATING ESTIMATION APPLIED TO FINFET 25

Carlos Augusto Bergfeld Mori, Paula Ghedini Der Agopian and João Antonio Martino

IMPROVEMENT OF THE HARMONIC DISTORTION BY USING DIAMOND MOSFET 29

Marcelo Machado Aoyama, Magali Estrada, Antonio Cerdeira, Jacobus Willibrordus Swart and Salvador Pinillos Gimenez

Session 3: Technology Characterization

SBMicro 2018

33rd Symposium on Microelectronics Technology and Devices



NON UNIFORMITY CORRECTION IN A LONG WAVE INFRARED FOCAL PLANE ARRAY AS A FUNCTION OF THE HIGHER CALIBRATION TEMPERATURE 33

Augusto Santos, Gustavo Vieira and Ruy Castro

ON THE INFLUENCE OF CONDUCTOR, SEMICONDUCTOR AND INSULATING SUBSTRATE ON THE STRUCTURE OF ATOMIC LAYER DEPOSITED TITANIUM DIOXIDE THIN FILMS 38

Rodrigo Savio Pessoa, William Chiappim Junior, Giorgio Testoni, Gilberto Petraconi Filho and Homero Maciel

EFFECT OF INP EPITAXIAL LAYER REMOVAL FROM AN MOVPE REACTOR ON IN-SITU ZN DIFFUSION FOR THE DEVELOPMENT OF FOCAL PLANE ARRAY 44

Marcelo Rua, Eliseu Herculano, Rudy Kawabata, Luciana Pinto, Gustavo Vieira, Maurício Pires and Patrícia Souza

CHARACTERIZATION BY GISAXS AND ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY OF POROUS OXIDE FILMS 48

Danilo Huanca, Carlos Dias, Sebastião dos Santos Filho, patrick verdonck, Lucas Lima, Thomas Witters and Sven Van Elshocht

Session 4: Fabrication Process and Applications I

PIEZOELECTRICITY EVALUATION OF NANOFIBERS MEMBRANE ELECTROSPUN FROM PVDF DISPERSION FOR SENSOR APPLICATION 52

Enrico Ceroblo Nadeo, Ana Neilde R Silva and Armando Antonio Maria Laganá

RESONANT SPIRAL MICROMACHINED STRUCTURE AND THE EFFECTS OF A CURVED GEOMETRY 56

Gustavo M. Ferreira, Davies William Lima Monteiro, Bruno Henrique S. Guimarães and Felipe Augusto Costa de Oliveira

MICROFABRICATED ISM BAND INDUCTORS USING MCM-D TECHNOLOGY OVER ALUMINA SUBSTRATES 60

Cristina B. Adamo, Alexander Flacker, Rafael C. Medeiros, Sergio O. Castilho, André da F. Ponchet and Ricardo Teixeira

THE PRACTICE IN MICROELECTRONICS: A MANDATORY COMPLEMENT OF THE ONLINE COURSES IN THE CONTEXT OF DIGITAL SOCIETY 66

Olivier Bonnaud and Laurent Fesquet

SBMicro 2018

33rd Symposium on Microelectronics Technology and Devices



Session 5: Emerging Electron Devices II

BACK BIAS IMPACT ON EFFECTIVE MOBILITY OF P-TYPE NANOWIRES SOI MOSFETS 71

Bruna Cardoso Paz, Mikaël Cassé, Sylvain Barraud, Gilles Reimbold, Maud Vinet, Olivier Faynot and Marcelo Antonio Pavanello

EXPERIMENTAL ANALYSIS OF SELF-HEATING EFFECTS USING THE PULSED IV METHOD IN JUNCTIONLESS NANOWIRE TRANSISTORS 75

Flávio Bergamaschi, Genaro Mariniello, Sylvain Barraud and Marcelo Pavanello

INTERFACE CHARGES INFLUENCE ON THE SUBTHRESHOLD REGION FROM TRIPLE GATE SOI FINFET TO Ω -GATE NANOWIRE DEVICES 79

Vanessa Cristina Pereira da Silva, Joao Martino and Paula Agopian

EXPERIMENTAL ANALYSIS OF NEGATIVE TEMPERATURE BIAS INSTABILITIES DEGRADATION IN JUNCTIONLESS NANOWIRE TRANSISTORS 83

Nilton Graziano Jr, Rodrigo Doria, Sylvain Barraud, and Renan Trevisoli

Session 6: Fabrication Process and Applications II

A WIDE TUNING RANGE LC-VCO FOR THE ISM RADIO BAND 87

Miguel Gómez, Jose Luis Ramirez Bohorquez, Eduardo Lima and Fabiano Fruett

FIELD EFFECT TRANSISTORS BASED ON GRAPHENE MICRO WIRES DEFINED BY LITHOGRAPHY AND PLASMA ETCHING 91

Fernanda Rufino, Aline Pascon, Dunieskys Larrude and José Alexandre Diniz

FABRICATION AND ELECTRICAL CHARACTERIZATION OF MOS SOLAR CELLS FOR ENERGY HARVESTING 95

Marcos Norio Watanabe, William Chiappim Junior, Verônica Christiano, Fábio Izumi and Sebastiao Santos

INFLUENCE OF BIOLOGICAL ELEMENT PERMITTIVITY ON BE SOI MOSFETS 99

Leonardo Yojo, Ricardo Rangel, Katia Sasaki and João Martino

SBMicro 2018

33rd Symposium on Microelectronics Technology and Devices



JUNCTIONLESS-FET FABRICATION USING NH₄OH SOLUTION WET ETCHING FOR SILICON CHANNEL THINNING 103

Lucas Stucchi-Zucchi, Audrey R. Silva, José A. Diniz, Luana Espindola, Alfredo R. Vaz, and Frederico Clouidin

Session 7: Optoelectronics and Photonics

INGAP SOLAR CELL AS THE TOP JUNCTION OF A MULTIPLE JUNCTION DEVICE FOR SPATIAL APPLICATIONS 107

Victor Cunha, Daniel Micha, Rudy Kawabata, Luciana Pinto, Mauricio Pires and Patrícia Souza

EXPERIMENTAL LATERAL PIN GATED PHOTODIODE RGB DISCRIMINATION WITH MULTIPLE INCIDENT OPTICAL POWER 110

Rudolf Buhler, Gustavo Montesani and Renato Giacomini

INXGA1-XAS/INYGA1-YP MULTIPLE QUANTUM WELLS FOR MULTIJUNCTION SOLAR CELLS 114

Edgard Winter, Daniel Micha, Rudy Kawabata, Luciana Pinto, Maurício Pires and Patrícia Souza

APPLYING CMOS CAPABILITIES OF CEITEC'S FOUNDRY TOWARDS SILICON PHOTONIC DEVICES 118

Talita S. Bürger, Eliana A. M. A. Van Etten, Ricardo C. G. da Silva, Gilliard N. M. Silveira, Celio A. Finardi, Luana L. Mattos, Leandro Tezani, Rafael W. D. Pais, André M. Daltrini and Roberto R. Panepucci

Session 8: Electrical Characterization II

GROUND PLANE IMPACT ON THE THRESHOLD VOLTAGE OF RELAXED GE PFINFETS 122

Guilherme Vieira Gonçalves, Alberto Oliveira, Paula Agopian, João Martino, Liesbeth Witters, Jerome Mitard, Nadine Colaert, Cor Claeys and Eddy Simoen

ASYMMETRIC SELF-CASCODE CURRENT-VOLTAGE CONSTRUCTING ALGORITHM FOR ANALOG FIGURES-OF-MERIT EXTRACTION 126

Lígia Martins d'Oliveira, Valeriya Kilchytska, Denis Flandre and Michelly de Souza

EFFECT OF LINES AND VIAS DENSITY ON THE BEOL TEMPERATURE DISTRIBUTION 130

Rafael Nunes and Roberto Orio

INFLUENCE OF THE INTRINSIC LENGTH ON THE BEHAVIOR OF PIN DIODES FABRICATED ON SOI SUBSTRATES WORKING AS SOLAR CELLS 134

Fernando Silva, Rodrigo Doria and Michelly de Souza

SBMicro 2018

33rd Symposium on Microelectronics Technology and Devices



USING STATISTICAL STUDENT'S T-TEST TO QUALIFY THE ELECTRICAL PERFORMANCE OF THE DIAMOND MOSFETS 138

Vinicius Vono Peruzzi, Gabriel Augusto da Silva, Christian Renaux, Denis Flandre and Salvador Pinillos Gimenez

NUMERICAL SIMULATION AND ANALYSIS OF MISMATCHING IN GC SOI NMOSFETS ANALOG FIGURES OF MERIT 142

Camila Alves, Denis Flandre and Michelly de Souza

SBMicro Poster Session

COMPUTATIONAL STUDY ON SCHOTTKY BARRIER HEIGHT EXTRACTION FOR BALLISTIC NANOTUBE TRANSISTORS 146

Glenda Santos and Stefan Blawids

BACK ENHANCED SOI MOSFET AS UV LIGHT SENSOR 150

José Augusto Padovese, Leonardo Yojo, Ricardo Rangel, Katia Sasaki and João Martino

A PWM OUTPUT TEMPERATURE SENSOR 154

Diego Deotti, Jose Luis Ramirez Bohorquez and Fabiano Fruett

GROWTH AND CHARACTERIZATION OF GE JUNCTION FOR TRIPLE JUNCTION SOLAR CELL 158

Eliseu Herculano, Rudy Kawabata, Luciana Pinto, Daniel Micha, Roberto Jakomin, Maurício Pires and Patrícia Lustoza

NH4OH WET ETCHING FOR SILICON NANO OR SUB-MICRON WIRES 162

Guilherme M B Soares, Audrey R. da Silva, Lucas S. Zucchi, Frederico H. Cioldin, Luana Espindola, José Godoy Filho, Ioshiaki Doi and José Alexandre Diniz

IMPACT OF THE OCTAGONAL LAYOUT STYLE FOR MOSFETS USING 180NM BULK CMOS ICS TECHNOLOGY NODE 166

Dênis Loesch, Salvador Gimenez, Jacobus Willibrordus Swart and Gabriel Augusto da Silva

FEW LAYER LARGE AREA GRAPHENE SAMPLES GROWN BY CVD AIMING APPLICATION IN ELECTROCHEMICAL SENSING DEVICES 170

Deissy Johanna Feria Garnica, Diego Lopez, Marcelo Carreño and Ines Pereyra