

IEEE TRANSACTIONS ON ELECTRON DEVICES

A PUBLICATION OF THE IEEE ELECTRON DEVICES SOCIETY



AUGUST 2013

VOLUME 60

NUMBER 8

IETDAI

(ISSN 0018-9383)

EDITORIAL

A Warm Welcome to a New T-ED Editor	<i>J. D. Cressler</i>	2443
---	-----------------------	------

REGULAR PAPERS

Silicon and Column IV Semiconductors Devices

Low-Field Behavior of Source-Gated Transistors	<i>J. M. Shannon, R. A. Sporea, S. Georgakopoulos, M. Shkunov, and S. R. P. Silva</i>	2444
Characterization of RF-MOSFETs in Common-Source Configuration at Different Source-to-Bulk Voltages from S-Parameters	<i>F. Zárate-Rincón, G. A. Álvarez-Botero, R. Torres-Torres, R. S. Murphy-Arteaga, and S. Decoutere</i>	2450
Interface Trap Density of Gate-All-Around Silicon Nanowire Field-Effect Transistors With TiN Gate: Extraction and Compact Model	<i>F. Najam, Y. S. Yu, K. H. Cho, K. H. Yeo, D.-W. Kim, J. S. Hwang, S. Kim, and S. W. Hwang</i>	2457
Tunable Bandgap in Bilayer Armchair Graphene Nanoribbons: Concurrent Influence of Electric Field and Uniaxial Strain	<i>K. Khaliji, M. Noei, S. M. Tabatabaei, M. Pourfath, M. Fathipour, and Y. Abdi</i>	2464
Complementary Role of Field and Temperature in Triggering ON/OFF Switching Mechanisms in Hf/HfO ₂ Resistive RAM Cells	<i>B. Govoreanu, S. Clima, I. P. Radu, Y.-Y. Chen, D. J. Wouters, and M. Jurczak</i>	2471
The Effect of Germanium Fraction on High-Field Band-to-Band Tunneling in p ⁺ -SiGe/n ⁺ -SiGe Junctions in Forward and Reverse Biases	<i>J.-Y. Li and J. C. Sturm</i>	2479
Interplay Between Process-Induced and Statistical Variability in 14-nm CMOS Technology Double-Gate SOI FinFETs	<i>X. Wang, B. Cheng, A. R. Brown, C. Millar, J. B. Kuang, S. Nassif, and A. Asenov</i>	2485
Experimental Comparison Between Trigate p-TFET and p-FinFET Analog Performance as a Function of Temperature	<i>P. G. Der Agopian, J. A. Martino, R. Rooyackers, A. Vandooren, E. Simoen, and C. Claeys</i>	2493
Wideband Impedance Model for Coaxial Through-Silicon Vias in 3-D Integration	<i>F. Liang, G. Wang, D. Zhao, and B.-Z. Wang</i>	2498

(Contents Continued on Page 2441)

New Analysis Method for Time-Dependent Device-to-Device Variation Accounting for Within-Device Fluctuation	M. Duan, J. F. Zhang, Z. Ji, W. D. Zhang, B. Kaczer, T. Schram, R. Ritzenthaler, G. Groeseneken, and A. Asenov	2505
Sub-60-nm Extremely Thin Body In _x Ga _{1-x} As-On-Insulator MOSFETs on Si With Ni-InGaAs Metal S/D and MOS Interface Buffer Engineering and Its Scalability	S. Kim, M. Yokoyama, N. Taoka, R. Nakane, T. Yasuda, O. Ichikawa, N. Fukuhara, M. Hata, M. Takenaka, and S. Takagi	2512
Scalable Virtual-Ground Multi-Level-Cell Floating-Gate Flash Memory	Y. Yamauchi, Y. Kamakura, and T. Matsuoka	2518
2-D Compact Model for Drain Current of Fully Depleted Nanoscale GeOI MOSFETs for Improved Analog Circuit Design	C. Mondal and A. Biswas	2525
Compound Semiconductor Devices		
Minority Carrier Transport and Their Lifetime in InGaAs/GaAsP Multiple Quantum Well Structures	C. Z. Carlin, G. K. Bradshaw, J. P. Samberg, P. C. Colter, and S. M. Bedair	2532
Thin Film Transistors		
Hydrogenated IGZO Thin-Film Transistors Using High-Pressure Hydrogen Annealing	S.-I Oh, G. Choi, H. Hwang, W. Lu, and J.-H. Jang	2537
Solution-Processed Logic Gates Based on Nanotube/Polymer Composite	Z. Liu, X. Gao, Z. Zhu, Z. Qiu, D. Wu, Z.-B. Zhang, and S.-L. Zhang	2542
Optoelectronics, Displays, and Imaging		
Measuring the Thermal Resistance in Light Emitting Diodes Using a Transient Thermal Analysis Technique	S. Natarajan, M. Ha, and S. Graham	2548
Modification of a Driving Waveform in an AC Plasma Display Panel With Sc-doped MgO Protecting Layer	J. K. Kim	2556
Low-Power CMOS Image Sensor Based on Column-Parallel Single-Slope/SAR Quantization Scheme	F. Tang, D. G. Chen, B. Wang, and A. Bermak	2561
Characterization of the First FBK High-Density Cell Silicon Photomultiplier Technology	C. Piemonte, A. Ferri, A. Gola, T. Pro, N. Serra, A. Tarolli, and N. Zorzi	2567
Investigation of Photo-Induced Hysteresis and Off-Current in Amorphous In-Ga-Zn Oxide Thin-Film Transistors Under UV Light Irradiation	S.-Y. Lee, J.-Y. Kwon, and M.-K. Han	2574
Characteristics of the GaAs Photoconductive Semiconductor Switch Operated in Linear-Alike Mode	B. Wang, T. Zhang, K. Liu, and J. Qiu	2580
High Detectivity Uncooled Thermal Detectors With Resonant Cavity Coupled Absorption in the Long-Wave Infrared	A. S. Gawarikar, R. P. Shea, and J. J. Talghader	2586
Solid State Device Phenomena		
Modified Pulsed MOS Capacitor for Characterization of Ultraclean Thin p/p ⁺ Silicon Epitaxial Layers	A. Elhami Khorasani, T. L. Alford, and D. K. Schroder	2592
Coupled Electro-Thermal Simulation for Self-Heating Effects in Graphene Transistors	L. Liu, Y. Lu, and J. Guo	2598
Impact of Single Charge Trapping on the Variability of Ultrascaled Planar and Trigate FDSOI MOSFETs: Experiment Versus Simulation	A. Subirats, X. Garros, J. El Hussein, C. Le Royer, G. Reimbold, and G. Ghibaudo	2604
A Novel p-i-n Inductor for Tunable Wideband Matching Network Application	C.-I. Lee and W.-C. Lin	2611
Photocapacitance Decay Technique for Interface Trap Characterization Near Inversion Band in Wide Bandgap MOS Capacitors	S. DasGupta, R. J. Kaplar, S. Atcitty, and M. J. Marinella	2619
Sub 0.5 V Operation of Performance Driven Mobile Systems Based on Area Scaled Tunnel FET Devices	A. Rajoriya, M. Shrivastava, H. Gossner, T. Schulz, and V. R. Rao	2626
Sensors and Actuators		
Fabrication of a 128 × 128 Pixels Charge Transfer Type Hydrogen Ion Image Sensor	M. Futagawa, D. Suzuki, R. Otake, F. Dasai, M. Ishida, and K. Sawada	2634
Transfer Function of Interfacial Stress Sensor for Artificial Skin Applications	X. Lü, K. Sundara-Rajan, W. Lu, and A. V. Mamishev	2640
CPW Tunable Band-Stop Filter Using Hybrid Resonator and Employing RF MEMS Capacitors	N. Zhang, Z. Deng, and F. Sen	2648
Temperature-Stable Silicon Oxide (SiO _x) Micromechanical Resonators	R. Tabrizian, G. Casinovi, and F. Ayazi	2656

Vacuum Electron Devices

Analysis of Multipactor Effect Using a Phase-Shift Keying Single-Carrier Digital Modulated Signal	2664
..... <i>D. González-Iglesias, M. P. B. Rodríguez, Ò. M. Belda, B. Gimeno, V. E. Boria, D. Raboso, and V. E. Semenov</i>	
Automatic Optimization of a Klystron Interaction Structure	2671
..... <i>C. J. Lingwood, G. Burt, K. J. Gunn, R. G. Carter, R. Marchesin, and E. Jensen</i>	
Effects of Pulsewidth and Area of Carbon Nanotube Films on Their Pulsed Field Emission Characteristics	2677
..... <i>Y. Zhang, S. Deng, J. Du, X. Lai, J. Chen, and N. Xu</i>	

Emerging Technologies and Devices

Observation of the Ambient Effect in BTI Characteristics of Back-Gated Single Layer Graphene Field Effect Transistors	2682
..... <i>W. J. Liu, X. W. Sun, X. A. Tran, Z. Fang, Z. R. Wang, F. Wang, L. Wu, J. F. Zhang, J. Wei, H. L. Zhu, and H. Y. Yu</i>	

BRIEF PAPERS

a-IGZO TFTs With Inductively Coupled Plasma Chemical Vapor Deposited SiO _x Gate Dielectric	2687
..... <i>X. Xiao, W. Deng, X. He, and S. Zhang</i>	
Quantum Confinement and Volume Inversion in MOS ³ Model for Short-Channel Tri-Gate MOSFETs	2691
..... <i>A. Kloes, M. Schwarz, T. Holtij, and A. Navas</i>	
Modeling of Temperature and Field-Dependent Electron Mobility in a Single-Layer Graphene Sheet	2695
..... <i>R. Verma, S. Bhattacharya, and S. Mahapatra</i>	
