1.

Record Nr.	UNINA9910865238403321
Autore	Singh Rajendra
Titolo	The Physics of Semiconductor Devices : Proceedings of IWPSD 2021
Pubbl/distr/stampa	Singapore : , : Springer, , 2024 ©2024
ISBN	981-9715-71-7
Edizione	[1st ed.]
Descrizione fisica	1 online resource (406 pages)
Collana	Springer Proceedings in Physics Series ; ; v.306
Altri autori (Persone)	SinghMadhusudan KapoorAshok
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- Contents -- Contributors -- 1 Impact of Various Device Parameters on the Series Resistance of Perovskite Solar Cell -- 1.1 Introduction -- 1.2 Device Architecture and Numerical Simulation -- 1.3 Results and Discussions -- 1.3.1 Device Validation -- 1.3.2 Impact of Active Layer Thickness on Series Resistance -- 1.3.3 Impact of Perovskite Layer Trap Density on the Series Resistance -- 1.3.4 Impact of Top Contact Work Function on Series Resistance -- References -- 2 Performance Investigation of Alkali Metal Fluorides as Alternate Electron Selective Contacts for TOPCon Solar Cells -- 2.1 Introduction -- 2.2 Proposed Design -- 2.3 Simulation Parameters and Model Details -- 2.4 Results and Discussion -- 2.4.1 JV Characteristics -- 2.4.2 Effect of Inclusion of Front Passivation -- 2.4.3 Effect of LiFx ESL Doping -- 2.4.4 Effect of Front Transparent Conductive Oxide (TCO) -- 2.4.5 Effect of LiFx ESL Thickness -- 2.4.6 Effect of Rear TOPCon Oxide Layer -- 2.5 Conclusion -- References -- 3 Computational Analysis of Antireflection Coatings for Semiconductor Solar Cells -- 3.1 Introduction -- 3.2 Antireflection Coating for Solar Cells -- 3.3 Antireflection Coating Design Considerations -- 3.4 Numerical Simulations -- 3.5 Results and Discussion -- 3.6 Conclusion -- References -- 4 Effect of O2 Partial Pressure on Valence Band Maxima of HfO2 Thin Film -- 4.1 Introduction -- 4.2 Experimental Details -- 4.3 Results and Discussion -- 4.4 Conclusions -- References

-- 5 Dependence of Analog Performance and Linearity with Channel Doping Concentration for an InGaAs MOSFET -- 5.1 Introduction -- 5.2 Aim(s) of the Study -- 5.3 Methods -- 5.4 Results and Discussions -- 5.4.1 Analog Performance Analysis -- 5.4.2 Linearity Analysis -- 5.5 Conclusion -- References.

6 Effect of Channel Epilayer Thickness on Low Power Analog Operation of Asymmetric U-Shaped pTFET -- 6.1 Introduction -- 6.2 Device Structure and Simulation Set-Up -- 6.3 Results and Discussion -- 6.4 Conclusion -- References -- 7 Effect of Helium Gas Addition to SF6/O2 Chemistry for SiC Dry Etching in AlGaN/GaN/SiC HEMTs -- 7.1 Introduction -- 7.2 Experimental Details -- 7.3 Results and Discussion -- 7.4 Conclusion -- References -- 8 Modeling of High and Low Resistant States in Single Defect Atomristors -- 8.1 Introduction -- 8.2 Methodology -- 8.3 Application and Analysis -- 8.3.1 Non-volatile Resistance Switching via Quantum Tunneling Effects -- 8.4 Transport in Single Defect Memristors -- 8.5 Conclusion -- References -- 9 Design of Vertical Superjunction AlGaN/GaN HEMT: A TCAD-Based Approach -- 9.1 Introduction -- 9.2 Device Simulation -- 9.3 Results and Discussions -- 9.4 Conclusion -- References -- 10 Effect on Photo-Absorbance and Optical Energy-Gap of Al2O3 Thin Film After Deposition of Ag Thin Film -- 10.1 Introduction -- 10.2 Experiment -- 10.2.1 Fabrication Process -- 10.2.2 Characterization -- 10.3 Results and Discussion -- 10.3.1 FESEM and EDAX Analysis -- 10.3.2 XRD Analysis -- 10.3.3 Optical Absorption Analysis -- 10.4 Conclusion -- References -- 11 Thermometry Across Switching Oxide Layer in ReRAM Device -- 11.1 Introduction -- 11.2 Experimental Details -- 11.3 Modeling and Analysis -- 11.4 Conclusion -- References -- 12 Effective Mobility Extraction of GaN-HEMT Using S-Parameter -- 12.1 Introduction -- 12.2 Device Fabrication -- 12.3 Effective Mobility (μeff) Calculation -- 12.4 Conclusion -- References -- 13 Stress Dependent Electrical Characteristics of Flexible a-IGZO TFTs -- 13.1 Introduction -- 13.2 Process Simulation -- 13.3 Impact of Bending on TFT Electrical Performance -- 13.4 Conclusion -- References.

14 Modeling of Negative Capacitance Field Effect Transistors Based on Different Ferroelectric Materials -- 14.1 Introduction -- 14.2 Device Structure -- 14.3 Model Description -- 14.3.1 Total Capacitances -- 14.4 Results and Discussion -- 14.5 Conclusion -- References -- 15 Comparative Investigation of Single and Double Channel AlGaN/GaN HEMTs for LNAs -- 15.1 Introduction -- 15.2 Atlas Simulation Results and Discussions -- 15.2.1 Comparison of Linearity Performance of SC HEMTs and DC HEMTs -- 15.2.2 Noise Parameter Comparison of SC HEMT and DC HEMT -- 15.3 ADS Simulation Method, Results, and Discussion -- 15.3.1 Low Noise Amplifier Circuit in ADS -- 15.3.2 Low Noise Circuit Performance Analysis for DC HEMT and SC HEMT -- 15.4 Conclusion -- References -- 16 ZnO Nanorods Orientation Control with Seedless Hydrothermal Growth and Finding Suitable Morphology with Simulation for Tactile Sensors -- 16.1 Introduction -- 16.2 Experimental and Simulation Sections -- 16.2.1 Materials -- 16.2.2 Growth Method of ZnO Nanorods (NRs) -- 16.2.3 Characterization and Simulation Techniques -- 16.3 Results and Discussion -- 16.3.1 Effect of Growth Temperature -- 16.3.2 Influence of Precursor Concentration -- 16.3.3 Piezoelectric Simulation of ZnO Nanorod -- 16.4 Conclusion -- References -- 17 A Comparative Demonstration of a 2D MXene-Based Asymmetric Memristor Using Pristine and Nanohybrid Ti3C2Tx -- 17.1 Introduction -- 17.2 Experiment -- 17.2.1 Material Characterization -- 17.2.2 Device Fabrication -- 17.3 Characterization and Device Operation -- 17.4 Conclusion -- References -- 18 Modelling and Simulation

of a Thin-Film Bulk Acoustic Resonator (FBAR) Based Gas Sensor -- 18.1 Introduction -- 18.2 FBAR Sensor -- 18.2.1 Principle -- 18.2.2 Sensing Layer -- 18.3 Geometry and Simulation of FBAR Gas Sensor -- 18.4 Result and Discussion -- 18.5 Conclusion -- References.

19 Design and Simulation of an Open EWOD Based Digital Microfluidic Device for Droplet Actuation Using COMSOL -- 19.1 Introduction -- 19.2 Simulation Details -- 19.2.1 Model Description -- 19.2.2 Electrostatics Module -- 19.2.3 Laminar Two-Phase Flow, Moving Mesh Module -- 19.3 Results and Discussions -- 19.3.1 Material Comparison -- 19.3.2 Layer Optimization -- 19.3.3 Effect of Voltage on Droplet Actuation -- 19.3.4 Effect of Droplet Nature on Droplet Actuation -- 19.4 Conclusion -- References -- 20 A Capacitive Transducer for Film Thickness Measurement -- 20.1 Introduction -- 20.2 Measurement Technique -- 20.3 Design of a Novel Capacitive Transducer -- 20.4 Fabricated Transducer -- 20.5 Experimental Setup -- 20.6 Experimental Results -- 20.7 Conclusion -- References -- 21 Performance Projection of Stacked Silicon Nanosheet-FET Architectures for Future Technology Node -- 21.1 Introduction -- 21.2 Device Design and Simulation Methodology -- 21.3 Results and Discussion -- 21.4 Conclusion -- References -- 22 Determination of Coupling Coefficient in Large Optical Cavity Distributed Feedback Laser Structure with Metal Surface Grating -- 22.1 Introduction -- 22.2 Simulation Studies -- 22.3 Results and Discussion -- 22.4 Conclusion -- References -- 23 Design and Simulation of Stepped Microcantilevers for Energy Harvesting Applications -- 23.1 Introduction -- 23.2 Numerical Analysis -- 23.3 Results and Discussions -- 23.4 Conclusions -- References -- 24 Lowering Motional Impedance in Micromachined Frequency-Synthesizer Using Ultra-thin (SiO2 ~ 30 nm) Internal Dielectric -- 24.1 Introduction -- 24.1.1 Design -- 24.1.2 Fabrication -- 24.2 Simulation Results and Discussion -- 24.3 Conclusion -- References -- 25 Thermally Synthesized Cu/CuO/Cu (Sheet) with Bipolar Resistive Switching -- 25.1 Introduction -- 25.2 Materials and Method -- 25.3 Result and Discussion.

25.4 Electrical Characterization -- 25.5 Conclusion -- References -- 26 Dynamic Tuning of ENZ Region of ITO and Sensing Using a Tapered Optical Fiber -- 26.1 Introduction -- 26.2 Experimental Details and Modeling -- 26.3 Results and Discussion -- 26.4 Conclusion -- References -- 27 Identifying the Recombination Zone in Perovskite Solar Cells -- 27.1 Introduction -- 27.2 Recombination Pathways -- 27.3 Device Structure and Simulation Tool -- 27.4 Results and Discussions -- 27.5 Conclusions -- References -- 28 High Speed Etching of Silicon in NaOH-Based Solution -- 28.1 Introduction -- 28.2 Experimental Method -- 28.3 Results -- 28.4 Conclusions -- References -- 29 Parylene Membrane Transfer on PDMS Microchannel for Microvalve Fabrication -- 29.1 Introduction -- 29.2 Lithography on Si-Wafer to Fabricate a Mold -- 29.3 Membrane Transfer Process Using Silicon -- 29.4 Membrane Transfer Using a Teflon Carrier -- 29.5 Conclusion -- References -- 30 RF Analysis of Tapered Angle Hetero-Junction Dopingless TFET for Low Power Applications -- 30.1 Introduction -- 30.2 Device Structure and Simulation Standards -- 30.3 Results and Discussion -- 30.4 Conclusion -- References -- 31 Impact of Pocket Doped Mg2Si/Si Heterojunction Ge Gated TFET for Low Optical Power Detection at 1550 nm -- 31.1 Introduction -- 31.2 Device Architecture and Simulation Methodology -- 31.3 Results -- 31.4 Conclusion -- References -- 32 MEMS Acoustic Sensor for Low Frequency Applications -- 32.1 Introduction -- 32.2 Design and Simulation -- 32.3 Proposed Fabrication Process Flow -- 32.4 Result and Discussion -- 32.5 Conclusion -- References -- 33 Aptamer

Functionalized CVD Grown Monolayer WS2 Based FETs for Real-Time Detection of E. coli -- 33.1 Introduction -- 33.2 Materials and Method -- 33.3 Characterization -- 33.3.1 Fabrication and Functionalization -- 33.4 Result and Discussion.
33.5 Conclusion.