CHAPTER 14

ELECTRONIC SCIENCE

Doctoral Theses

153. BHARDWAJ (Rohini)
Development and Characterization of Conducting Polymer/ Zinc Oxide Based Bio-Light Emitting Diode.
Supervisors : Prof. P. K. Bhatnagar and Dr. Swati Nagpal
Th 19815

Contents

1. Introduction. 2. Experimental techniques. 3. Growth and characterization of zinc oxide nanorods. 4. Enhanced luminous efficiency of MEH-PPV based light emitting diodes using zinc oxide nanorods on ITO substrates. 5. Fabrication of ZnO nanorods based ultraviolet light emitting diode using DNA as EBL. 6. Conclusions and future scope of work.

154. BHATTACHARYA (Monika)
Modeling, Simulation and Characterization of Noise in InAIAs/InGaAs Tied-Geometry Double-Gate High Electron Mobility Transistor for Millimeter-Wave Applications.
Supervisor : Prof. Mridula Gupta
Th 20268

Contents

1. Introduction. 2. Analytical small-signal equivalent circuit model for microwave performance characterization of InAIAs/ InGaAs DG-HEMT. 3. Scattering parameter based modeling and simulation of symmetric tied-gate InAIAs/InGaAs DG-HEMT for millimeter-wave applications. 4. An accurate charge control based approach for noise performace assessment of a symmetric tied-gate InAIAs/InGaAs DG-HEMT. 5. Temperature-dependent analytical model for microwave and noise performance characterization of $In_{0.52}AL_{0.48}As/In_mGa_{1-m}As$ ($0.53 \leq m \leq .08$) DG-HEMT. 6. Conclusion and future scope of research.

155. GAUTAM (Rajni)
Analytical Modeling and Simulation of Cylindrical Gate All Around MOSFET-Reliability and Sensor Applications.
Supervisors : Prof. Mridula Gupta and Prof. R. S. Gupta
Th 20269

Contents

1. Introduction. 2. Two-dimensional analytic model for cylindrical gate all around (GAA) MOSFET including localized charges. 3. Impact of localized charges on analog, RF/microwave and linearity performance of GAA MOSFET. 4. Impact of localized charges on circuit performance of GAA MOSFET and material engineering. 5. Device engineered gate all around (GAA) MOSFET for improved hot carrier reliability. 6. GAA MOSFET as a sensor. 7. Summary, conclusion and future scope.

156. GHOSH (Pujarini)
Analytical Modeling and Simulation of Dual Material Gate Stack Architecture Cylindrical/Surrounded Gate MOSEFTs.
Supervisors : Dr. Mridula Gupta and Dr. Subhasis Haldar
Th 19816

Contents

1. Introduction. 2. An analytical drain current model for dual material engineered cylindrical/surrounded gate MOSFET. 3. Threshold voltage model for dual metal gate stack architecture (DMGSA) cylindrical/surrounded gate MOSFET. 4. Linearity performance and intermodulation distortion of gate material engineered cylindrical gate MOSFET for RFIC design. 5. Small signal intrinsic equivalent circuit model of cylindrical/ surrounded gate MOSFET for microwave frequency applications. 6. Conclusion.

157. SINGH (Naorem Santakrus)
Theoretical Investigation of Parameters of Real Solar Cell Using Special Trans Function Theory (STFT).
Supervisor : Prof. Avinashi Kapoor
Th 19919

Contents

1. Introduction. 2. Literature review and special trans function theory (STFT). 3. Estimating the parameters of a real solar cell using special trans function theory (STFT). 4. Optimum load of

real solar cell using STFT. 5. Theoretical investigation of organic, plastic and dye sensitized solar cells. 6. Conclusion. References and appendix.

158. SINGH (Neetu)
Fabrication and Characterization of ZnO Based Quantum Dot Sensitized Solar Cells.
Supervisors : Prof. Avinashi Kapoor and Prof. R. M. Mehra
Th 20240

Contents

1. Introduction. 2. Experimental details and characterization techniques. 3. Synthesis and characterization of ZnO nanoparticles. 4. Synthesis and characterization of quantum dots. 5. Fabrication and characterization of quantum dot sensitized solar cells. 6. Conclusions and future aspects.