normal devices.

Chapter 6 analyses the electron-phonon interaction effects in DG MOSFETs with parallel connected gates using NEGF model. Acoustic phonon scattering and Optical phonon scattering are separately investigated. The effect of temperature on various scattering mechanisms are discussed. The on-current shows an increase with increasing temperature for DG MOSFETs with parallel connected gates in the nanometer regime. This is in contrast with larger devices, indicating that scattering effects are less predominant in the nano regime.

Chapter 7 concludes the thesis by briefly listing the main findings of the work such as the advantages of DG MOSFETs with parallel connected gates, its ability to suppress short channel effects and the effects of various scattering mechanisms in the device. A few suggestions are made on the extension of the present work that can be undertaken in future.

7 Conclusion

The Non-Equilibrium Green’s Function (NEGF) formalism employing approximation techniques such as Buttiker probe method or modified scattering and correlation functions method has turned out to be able to model dissipative quantum transport in small devices. The scattering mechanisms in DG MOSFETs with parallel connected gates were analyzed using the NEGF models capable of incorporating electron-phonon interactions and surface roughness effects. The characteristics of the DG MOSFET with parallel connected gates turned out to be superior to that of a normal DG MOSFET.

References


List of publications based on the work

A part of the work reported in the thesis has been published in international journals and conferences. A partial list of publications is given below.


iv. **Saji Joseph** and Vincent Mathew, “Scattering in Double Gate MOSFETs with Parallel Connected Gates”, Communicated to *Journal of Semiconductor Technology and Science*.

