Analysis of Random Variation in Subthreshold FGMOSFET

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The analysis of random variation in the performance of Floating Gate Metal Oxide Semiconductor Field Effect Transistor (FGMOSFET) which is an often cited semiconductor based electronic device, operated in the subthreshold region defined in terms of its drain current (I_D), has been proposed in this research. I_D is of interest because it is directly measurable and can be the basis for determining the others. All related manufacturing process induced device level random variations, their statistical correlations, and low voltage/low power operating condition have been taken into account. The analysis result has been found to be very accurate since it can fit the nanometer level SPICE BSIM4 based reference with very high accuracy. By using such result, the strategies for minimizing variation in I_D can be found and the analysis of variation in the circuit level parameter of any subthreshold FGMOSFET based circuit can be performed. So, the result of this research has been found to be beneficial to the variability aware design of subthreshold FGMOSFET based circuit.