Effect of Parameter Variation in UTBB FDSOI-NCFET

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In this work we have investigated the performance of UTBB FDSOI-NCFET [1] with different dielectric materials, different gate materials and spacer length variation. Also, we have studied the variation in ON-OFF current ratio and subthreshold swing with variation in these parameters. The basic idea here is to find out an ideal dielectric material, gate material and spacer thickness which should be used so as to get the optimum parameters for better performance of the device. We have validated our simulation using TCAD simulator. Here, we have considered PZT (Lead zirconium titnate) as a ferroelectric material as it possesses many advantages like high dielectric constant and nano-second polarization reversal [2]. This device is a unique amalgamation of Negative capacitance transistor and FDSOI. Negative capacitance provides low subthreshold swing and FDSOI ensures suppression of short channel effects and hence UTBB FDSOI-NCFET is a viable candidate for future low power transistors.

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