Abstract

In this paper, we have studied the effect of different parameters on threshold voltage of CNTFET devices using a numerical model developed with the Non-Equilibrium Greens Function approach in real space. In fact the work in hand involves the V_TH as a function of length gate taken from 10 nm to 30 nm for different temperature namely : 77 K, 150 K, 300 K, 400 K. then the variation of V_TH as a function of the nanotube diameter varying over the following chiralities : (13, 0), (16, 0), (19,0), (23, 0), (25, 0) was undertaken. Afterworlds, we conducted the variation of V_TH as a function of the oxide thickness with the values: 1.5 nm, 3 nm, 4.5 nm, 6 nm and 7 nm. Moreover, the V_TH was carried at depending upon the high-k materials such as: SiO_2, HfO_2, ZrO_2, ⟦Ta⟧_2 O_2 and TiO_2 And the source/drain doping used are ⟦2.5 m⟧^(-1), ⟦4 m⟧^(-1), ⟦6 m⟧^(-1), ⟦8 m⟧^(-1), and ⟦10 m⟧^(-1) (~0.01 dopant/atom). Finally, a conclusion is made basing at the different findings which revealed that the best reduce of V_TH was recorded under a liquid Nitrogen temperature of 77 K.