عنوان مقاله:

Simulation of hBN layer numbers effects on the electrical characteristics of the vertical tunneling graphene transistor

محل انتشار:

اولین کنفرانس ملی نانو از سنتز تا صنعت (سال: 1396)

تعداد صفحات اصل مقاله: 1

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خلاصه مقاله:

In the recent decades, graphene was taken into research studies, more seriously due to it’s very suitable electronic, optical and mechanical properties at electronic usages. Single layer and multilayer graphenes are used in channel of Field–Effect Transistors (FET). Recently vertical graphene based graphene FET tunneling is taken into consideration. In this model, the source and the drain are composed of a single layer of graphene and hBN is used as the tunneling barrier. However using of graphene in FET for digital circuits is limited, due to lack of energy band gaps. This paper is focused on simulation of VTGFET, and vertical graphene nano-ribbons (GNR) FET (VTGNRFET). VTGFET characteristics were improved by changing the number of barrier layers. Simulation method of this paper, is the tight binding (TB) and the non-equilibrium Green s function. It is observed that Ion /Ioff enhances by increasing the hBN layer. In addition, the sub-threshold swing decreases. In addition, Ion /Ioff increases by increasing the width of Nanoribbon. This paper innovation is using multiple layers of hBN as tunneling barrier.

کلمات کلیدی:

Graphene; Boron Nitride; Ion/Ioff Ratio; Tunneling Transistors; Green Function