

عنوان مقاله:

Effect of Fringing Field on the Performance of P-I-N Carbon Nanotube Field Effect Transistors

محل انتشار:

دومین کنگره بین المللی علوم و فناوری نانو (سال: 1387)

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خلاصه مقاله:

Carbon nanotube field effect transistors have been under special attention in recent years. This is due to their unique properties such as nearly ballistic transport and the capability of delivering high current densities. There are a variety of structures suggested for using the carbon nanotube as the channel of a CNTFET, among them the coaxial structure has been shown to have the best gate to channel electrostatic coupling and has been fabricated recently [1]. In this paper we investigate the effect of fringing field on the performance of the coaxial p-i-n CNTFETs. This type of CNTFET was first proposed by Koswatta et al [2]. Fig.1 shows the proposed transistor structure. P-i-n CNTFETs operate by modulating the band to band (BTB) current between the doped and the intrinsic parts of the carbon nanotube. Its main virtue lies on its lower power delay product (PDP) if compared to other types of CNTFET. PDP is a measure of power dissipation per switching event [2]. In this paper the effect of fringing field on the performance of the proposed transistor has been studied in detail. For the devices of nanometer size the fringing field between the electrodes is considerable and should be accounted for the device performance and circuit design

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