Title: High Frequency Nano-transistor based Ring Oscillator

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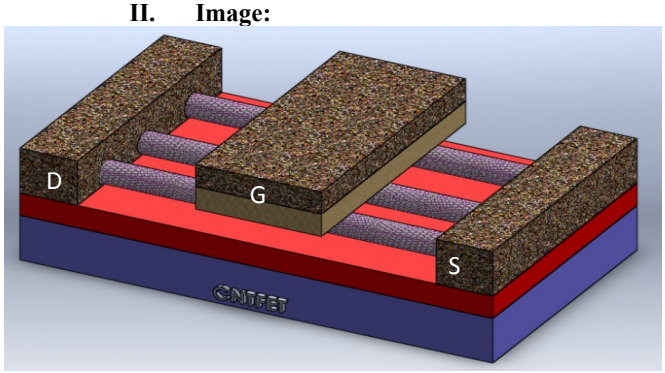
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I. Abstract

Carbon Nanotube (CNT) transistor based ring oscillator is expected to significantly reduce the losses in signal generation circuits and increase the power density. This makes CNT devices very stimulating candidates for next-generation semiconductor electronics, for the applications in controllers, digital electronics, and high-frequency communications.
Presently, both graphine and carbon nanotube devices show excellent properties in the field of electrical and mechanical. Particularly, CNT based transistor devices have attracted significant attention recently, due to the potential for achieving high breakdown voltage and current levels without enlarging the chip size. Especially, chip dimension become in nano meter size. In addition, CNT devices show superior high frequency operation performance than their lateral counterparts. This research proposed CNT transistor based oscillator model which is the competitor of the conventional MOSFET technology due to their higher current drive capability, ballistic transport, lesser power delay product, higher thermal stability, and so on. Based on these promising properties of CNT transistor, a CNT transistor based ring oscillator operating around 6THz and beyond is introduced here in 14 nm technology node. The oscillator is proposed based on CNT transistor based five stack inverters. The inverters with DC gain of 32.5 dB are achieved by proper design with the non-loaded delay around 0.2ns. The oscillator's average power consumption is as low as 0.43μW with the operational frequency of 6THz. The proposed ring oscillator design shows better performance in low energy consumption and high operating frequency by comparing with present commercial silicon based ring oscillator.

II. Image:



III. Reference:

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IV. Biography:

D. Soheli Farhana has completed her PhD in Engineering from International Islamic University Malaysia and Postdoctoral Fellowship at International Islamic University Malaysia, Malaysia. She was the visiting researcher at ONE Lab, MIT. She has published more than 15 papers in reputed journals and has been serving as an editorial board member of reputed journals and also serving as the committee member in several conferences.

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