Review of: "the number of transistors in the unit area of each semiconductor chip and nanochip has increased"

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Potential competing interests: No potential competing interests to declare.

The speed of growth of this industry is such that, with the smaller components, the number of transistors in the unit area of each semiconductor chip and nanochip has increased. Reducing the dimensions of these components can reduce the consumption of raw materials and energy, lower the cost of these parts, and increase their speed and efficiency. Therefore, making and developing electronic tools with smaller dimensions and greater speed and efficiency has become more important day by day. Lithography is one of the most common methods for making electronic circuits. With the help of this method, structures can be made with a precision of 0.1 nm. Finding techniques with the help of which this method can be used for the industrial production of these parts (nanochips and microchips) is important.

Among the common methods of producing nanostructures, stretching, molding, phase separation, self-assembly, and electrospinning, electrospinning has many advantages such as ease of production, the possibility of industrialization, the ability to control the dimensions of the raw materials of nanochips and nanotransistors, and repeatability.

By reducing all the horizontal and vertical dimensions of the transistor, the electric charge density increases in different areas of the nano-transistor, or, in other words, the number of electric charges per unit area of the nano-transistor increases. Graphene in nMOS field-effect transistors is an excellent electrical conductor and also has outstanding spintronic properties. The ultra-thin carbon lattice is capable of transporting electrons with coordinated spin over longer distances and spinning for longer periods of time than any other known material at room temperature. Although the distance is still on the scale of a few micrometers and the time is still measured in nanoseconds, it essentially opens up the possibility of using rotation in microelectronic components.

References


7. Chad Allen. (2024). Review of: "FinFET nanotransistor, the reduction of scale causes more short channel effects, less gate control, an exponential increase in leakage currents, severe process changes, and power densities". Qeios. doi:10.32388/h3qk7b.

8. Marshall Thompson. (2024). Review of: "This device has less static leakage current than a MOSFET and is more resistant to SCEs". Qeios. doi:10.32388/93c55f.


10. Afshin Rashid. (2024). Review of: "transistor nMOS (with ultra-low power consumption, energy-efficient computing, during the sub-threshold range)". Qeios. doi:10.32388/1al4jb.

11. Lei Choe. (2024). Review of: "The field-effect tunneling transistor nMOS, as an alternative to conventional CMOS by enabling the voltage supply (VDD) with ultra-low power consumption". Qeios. doi:10.32388/z3oxov.


and also has outstanding spintronic properties*, Qeios. doi:10.32388/taeqha.