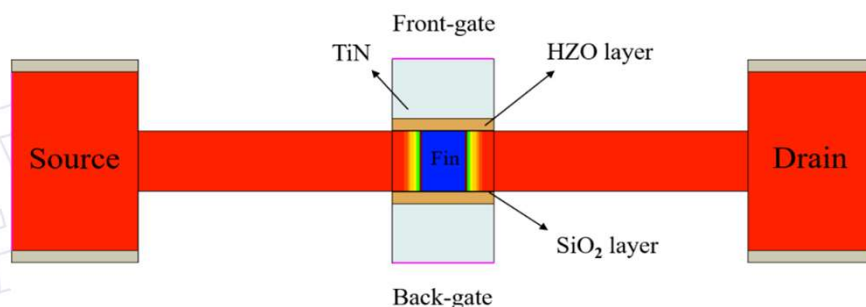


Electronics and ICT

Title

Ferroelectric Field Effect Transistor with Multiple Independently-Controlled Gates and Memory Array Device Made Thereof

<p>Abstract</p>	<p>A non-volatile semiconductor memory element using ferroelectric material as a gate-insulating layer, which is applied to a neural network circuit array and is part of an artificial intelligence acceleration chip. This new type of memory element has a structure of independently controlled double gates and has the functions of selecting elements and storing data on a single element at the same time. It improves the traditional ferroelectric transistor element and applies it to memory arrays, which will increase the energy per unit area of stored information.</p>
<p>Benefits</p>	<p>The traditional FinFET structure is used to implement the ferroelectric transistor, the gate voltage on both sides is the same, and the write operation is started when the voltage is applied. The actual operation still needs to be equipped with transistors (control elements) in the memory array. Each memory unit in the array has two transistors, and the chip area is relatively larger. When an independent double-gate ferroelectric transistor is used as a memory element, one end is used as a control end and the other end can be used to write data to be stored. Each memory cell in the array only needs one electronic element, which can significantly save chip area.</p>
<p>Industry Categories</p>	<ol style="list-style-type: none"> 1. Semiconductor memory manufacturing industry 2. Chip design industry (artificial intelligence chip design)
<p>Keywords</p>	<p>Emerging non-volatile memory (NVM), Ferroelectric material, Independent double-gate FeFET, Neuromorphic computing, FeFET memory crossbar array.</p>
<p>Patent No.</p>	<p>TW I760122 · US 17/317,766</p>



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