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S-MOS Cell Technology Improves Efficiency of SiC MOSFETs

A Singular Point Source MOS (S-MOS) cell concept suitable for power MOS-based devices was presented by the startup company mqSemi. The S-MOS concept has been adapted and implemented on a 1200V SiC MOSFET structure by means of 3D-TCAD simulations using Silvaco Victory Process and Device Software. A full set of static and dynamic results has been presented

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Mercedes Applies Neuromorphic Computing in EV Concept Car

The Mercedes Vision EQXX concept car, promoted as "the most efficient Mercedes-Benz ever built," incorporates neuromorphic computing to help reduce power consumption and extend vehicle range. To that end, BrainChip's Akida neuromorphic chip enables in-cabin keyword spotting as a more power-efficient way than existing AI-based keyword detection systems

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Samsung Claims First with In-Memory MRAM

Samsung today announced an MRAM innovation, claiming the world's first in-memory computing based on MRAM capable of performing both data storage and data computing within a single memory network. The company claims its MRAR array chip is the next step to realizing low-power AI chips.

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TALK TO US



Weebit, CEA-Leti Advance ReRAM Technology

Weebit Nano of Israel and French research institute CEA-Leti report advances in the development of resistive-RAM (ReRAM) technology, although few are ready for prime time. CEA-Leti's advance involves what it calls a "newfangled approach" that enables ReRAM devices to operate as energy-storage elements as well as memory, depending on the applied bias.

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Introducing the String Battery

Batteries come in many package types: cylindrical, rectangular, pouches, and even custom shapes, but they all have one thing in common: they are in sealed, rigid, or semi-rigid enclosures with their form factors and electrical capacities set in advance by the design and implementation.

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S-MOS Cell Technology Improves Efficiency of SiC MOSFETs

A Singular Point Source MOS (S-MOS) cell concept suitable for power MOS-based devices was presented by the startup company mqSemi. The S-MOS concept has been adapted and implemented on a 1200V SiC MOSFET structure by means of 3D-TCAD simulations using Silvaco Victory Process and Device Software. A full set of static and dynamic results has been presented for comparing the S-MOS with reference SiC MOSFET 2D structures employing Planar and Trench MOS cell designs.

The performance of silicon-based power devices, such as power MOSFETs and insulated gate bipolar transistors (IGBTs), has been greatly improved over the years using MOS cell process and design platforms. Both these devices have been based either on planar or trench MOS cells, arranged in cellular or linear layout designs.

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As automakers shift their focus to electric vehicles, many are struggling to squeeze every last volt from a single battery charge. The need to reduce power consumption in vehicle electronic systems has therefore become critical to extending EV range.

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Use of in-memory computing architectures has increased over the years because of its ability to crunch data at the edge, which can in turn reduce the amount of data movement and network latency. Samsung’s renewed focus on in-memory computing, however, stems from MRAM’s low-resistance nature, which ordinarily limits its ability to reduce power consumption when used in standard in-memory architecture.

Weebit, CEA-Leti Advance ReRAM Technology

Weebit Nano of Israel and French research institute CEA-Leti report advances in the development of resistive-RAM (ReRAM) technology, although few are ready for prime time.

CEA-Leti’s advance involves what it calls a “newfangled approach” that enables ReRAM devices to operate as energy-storage elements as well as memory, depending on the applied bias. As part of its roadmap, the institute has been exploring in-memory energy as a supplemental feature for in-memory computing to reduce energy use. ReRAM-based batteries are highly scalable as well as dynamically allocable and can be placed next to memory blocks, near the processor, it said.

Gaël Pillonet, a senior researcher at CEA-Leti, said locating the energy supply close to the processor is especially helpful when the processor requires peak power, typically supplied by an external source. ReRAM has the potential to act as an energy storage device because devices used faradaic processes to store information inside an active volume.

Introducing the String Battery

Batteries come in many package types: cylindrical, rectangular, pouches, and even custom shapes, but they all have one thing in common: they are in sealed, rigid, or semi-rigid enclosures with their form factors and electrical capacities set in advance by the design and implementation. Further, most battery advances are based on improved chemistries or physical elements such as anode, cathode, or separator materials. Whatever is going on inside, the reality is that these enhanced batteries look like their predecessors — which generally is not a bad thing with respect to use and retrofit.

Now, however, an MIT-based team has devised a battery that is truly “out of the box.” Its rechargeable Li-ion battery is extruded as a thin, flexible string, fabricated as a continuous fiber using a standard fiber-drawing system and 3D printing along with innovative, proprietary battery gels.