

IBM, Samsung team on unconventional, super-efficient semiconductor

By reorienting transistors on the semiconductor, IBM and Samsung say their technology can cut power consumption by 85%.

By Michael Cooney

Senior Editor, Network World

DEC 14, 2021 9:03 AM PST

IBM and Samsung Electronics have designed what the tech giants call an unconventionally designed semiconductor that promises to reduce energy consumption by 85% over existing chips.

The design would enable a ton of new applications including energy-efficient cryptomining and data encryption but also cell phone batteries that could hold a charge for over a week instead of days without being recharged, companies stated.

[Get regularly scheduled insights by signing up for Network World newsletters.]

The new semiconductor could also find its way into new internet of things (IoT) and edge devices that draw less energy, letting them operate in more diverse environments like ocean buoys, autonomous vehicles and spacecraft, the companies stated.

What's new about the chip design is that its vertical-transport field effect transistors (VTFET) are built perpendicular to the surface of the chip with a vertical (up-and-down) current flow. With conventional chip technology, transistors lie flat on the surface of a semiconductor, with the electric current flowing laterally (side-to-side), according to a blog by Brent Anderson, VTFET Architect and Program Manager, and Hemanth Jagannathan, VTFET Hardware Technologist and Principal Research Staff Member.

“The VTFET process addresses many barriers to performance and limitations to extend Moore's Law as chip designers attempt to pack more transistors into a fixed space. It also influences the contact points for the transistors, allowing for greater current flow with less wasted energy,” the researchers stated.

VTFET addresses scaling barriers by relaxing physical constraints on transistor gate length, spacer thickness, and contact size so that these features can each be optimized, either for performance or energy consumption, the researchers stated.

“Moore's Law, the principle that the number of transistors incorporated in a densely populated IC chip will approximately double every two years, is quickly nearing what are considered insurmountable barriers,” the researchers stated. “As more and more transistors are crammed into a finite area, engineers are running out of space, but VTFET innovation focuses on a whole new dimension, which offers a pathway to the continuation of Moore's Law.”

RECOMMENDED WHITEPAPERS



Delivering Innovation at the Edge



Healthcare Performance-Driven Company Helps Its Operations Team Reduce Manual Tasks With Automation

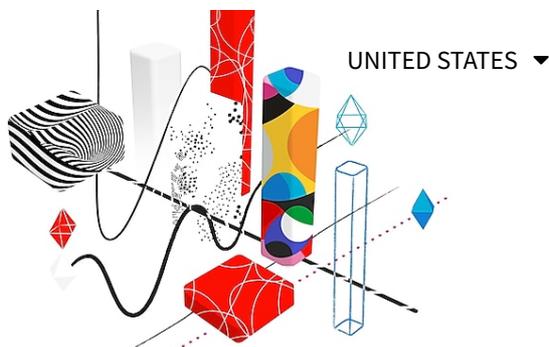


How Choosing a Technology Rotation strategy Can Help Meet Corporate Sustainability Goals

[Intel](#) this week said that it, too, was looking at vertical chip stacking as a way to continue developing [semiconductors that grow with Moore's Law](#).

SponsoredPost Sponsored by Adobe

The Roadmap to Business Modernisation



Join the Network World communities on [Facebook](#) and [LinkedIn](#) to comment on topics that are top of mind.

Michael Cooney is a Senior Editor with Network World who has written about the IT world for more than 25 years. He can be reached at michael_cooney@idg.com.

Follow    

Copyright © 2021 IDG Communications, Inc.

SD-WAN buyers guide: Key questions to ask vendors (and yourself)

SPONSORED LINKS

dtSearch® instantly searches terabytes of files, emails, databases, web data. See site for hundreds of reviews; enterprise & developer evaluations

Get started with AWS AppConfig

Getting a Grip on Basic Cyber Hygiene with the CIS Controls

Solution Architect Perspectives: Cybersecurity in a Perimeter-less Network Environment

Unsure of how your website ranks in terms of visual media performance? Request your free custom web performance report and learn how you can start optimizing for user experience.

NETSCOUT Visibility Without Borders keeps you one step ahead by helping you to quickly mitigate cyberattacks and resolve network performance issues.

Help Your Team Rise : Upgrade to AMD Ryzen PRO mobile Processors.

Learn how AWS can help reinvent your business with data

Modernize your security operations with Cisco's XDR approach.

UNITED STATES ▼