



TowerJazz and the Technion Developed a Breakthrough Analog Platform for Artificial Intelligence in Edge Devices

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NEWS ANNOUNCEMENT

FOR IMMEDIATE RELEASE

The technology allows ultra-low power data processing in sensors and IoT edge devices

Research paper was published in the December edition of Nature Electronics

MIGDAL HAEMEK, Israel, and HAIFA, Israel, December 11, 2019 – [TowerJazz](#), the global specialty foundry leader, and the Technion, the Israel Institute of Technology, today announced the successful development of a breakthrough technological platform that utilizes memristor devices featuring analog memory storage and computing capabilities, based on TowerJazz's commercial patented Y-Flash NVM on its well-established 0.18um CMOS technology. The technology enables development of ultra-low power Artificial Intelligence (AI) cores suitable for IoT edge devices and sensors such as fingerprint sensors, face and audio recognition applications among others. Compared with existing digitally based solutions, this solution enables several orders of magnitude lower power consumption and is very cost effective due to the ability to implement it in less advanced technology nodes.

The extensive research and development was co-led by teams from both TowerJazz and the Technion. The complete research paper was published in the upcoming edition of [Nature Electronics](#), and is the first Nature Electronics' publication of a research project conducted solely in Israel.

"We are very excited to be an important part of this breakthrough research and contribute to the expanding AI market. With advanced R&D being our major focus, we are constantly seeking emerging technologies and initiate development projects to enrich TowerJazz's offering," said Prof. Yakov Roizin, TowerJazz's Fellow. "Our collaboration with the Technion's team of experts has led to this profound achievement and we look forward to continue this fruitful and long term cooperation."

"We are very pleased with the outcome of our joint research. The collaboration between our professional academic team and our extensive research capabilities along with TowerJazz's team, analog expertise and technology, is what enabled to realize this extraordinary result," said Prof. Shahar Kvatinsky of the Andrew & Erna Viterbi Faculty of Electrical Engineering at the Technion. "We are confident that the joint effort of experts from both fields will yield more significant achievements in years to come."

In comparison to other NVM solutions targeting AI applications, the developed memristors are based on a commercial CMOS technology with enhanced reliability. Single poly Y-Flash floating gate NVM transistors, originally designed for digital data storage, were converted into two-terminal analog devices operated in the energy-efficient sub-threshold regime. The analog memristors are tuned using optimized switching voltages and times to achieve 65 discrete resistive levels. These memristors are easily integrated with other devices on the same platform.

"We believe that analog AI is the only solution for having AI in every edge device as this is the only way to meet the power consumption and cost requirements," said Dr. Avi Strum, TowerJazz Sr. Vice President and General Manager of the Sensors Business Unit. "This important breakthrough development is a great solution that will enable the fast growth of the analog AI market, aligned with market needs and existing and potential customer roadmaps".

For more information about TowerJazz's process technology offerings, please [click here](#) or inquire at: info@towerjazz.com.

About TowerJazz

Tower Semiconductor Ltd. (NASDAQ: TSEM, TASE: TSEM) and its subsidiaries operate collectively under the brand name TowerJazz, the global specialty foundry leader. TowerJazz manufactures next-generation integrated circuits (ICs) in growing markets such as consumer, industrial, automotive, medical and aerospace and defense. TowerJazz's advanced technology is comprised of a broad range of customizable process platforms such as: SiGe, BiCMOS, mixed-signal/CMOS, RF CMOS, CMOS image sensor, integrated power management (BCD and 700V), and MEMS. TowerJazz also provides world-class design enablement for a quick and accurate design cycle as well as Transfer Optimization and development Process Services (TOPS) to IDMs and fabless companies that need to expand capacity. To provide multi-fab sourcing and extended capacity for its customers, TowerJazz operates two manufacturing facilities in Israel (150mm and 200mm), two in the U.S. (200mm) and three facilities in Japan (two 200mm and one 300mm). For more information, please visit www.towerjazz.com.

Safe Harbor Regarding Forward-Looking Statements

This press release includes forward-looking statements, which are subject to risks and uncertainties. Actual results may vary from those projected or implied by such forward-looking statements. A complete discussion of risks and uncertainties that may affect the accuracy of forward-looking statements included in this press release or which may otherwise affect TowerJazz's business is included under the heading "Risk Factors" in Tower's most recent filings on Forms 20-F, F-3, F-4 and 6-K, as were filed with the Securities and Exchange Commission (the "SEC") and the Israel Securities Authority and Jazz's most recent filings on Forms 10-K and 10-Q, as were filed with the SEC, respectively. Tower and Jazz do not intend to update, and expressly disclaim any obligation to update, the information contained in this release.

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Attachments

- [Technion Nature AI FINAL 12112019](#)
- [TowerJazz and the Technion Developed a Breakthrough Analog Platform for AI](#)

