
FORM 6-K

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

For the month of February 2010 No. 7

TOWER SEMICONDUCTOR LTD.

(Translation of registrant's name into English)

Ramat Gavriel Industrial Park

P.O. Box 619, Migdal Haemek, Israel 23105

(Address of principal executive offices)

Indicate by check mark whether the registrant files or will file annual reports under cover Form 20-F or Form 40-F.

Form 20-F S

Form 40-F £

Indicate by check mark whether the registrant by furnishing the information contained in this Form is also thereby furnishing the information to the Commission pursuant to Rule 12g3-2(b) under the Securities Exchange Act of 1934.

Yes £

No S

On February 22, 2010, the registrant announces TowerJazz Rolls Out Full Library of Patented Y-Flash Non-Volatile Memory Blocks at APEC 2010.

This Form 6-K is being incorporated by reference into all effective registration statements filed by us under the Securities Act of 1933.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

TOWER SEMICONDUCTOR LTD.

Date: February 22, 2010

By: /s/ Nati Somekh Gilboa
Name: Nati Somekh Gilboa
Title: Corporate Secretary

TowerJazz Rolls Out Full Library of Patented Y-Flash Non-Volatile Memory Blocks at APEC 2010

PALM SPRINGS, Calif., February 22, 2010 – TowerJazz, the global specialty foundry leader, today announced its full library of Y-Flash Non-Volatile Memory (NVM) building blocks at the Applied Power Electronics Conference (APEC), Booth #413, in Palm Springs, Calif., Feb. 22-24, 2010. This patented Y-Flash technology, not available from any other foundry in the industry, is designed to give customers flexibility on memory size, allowing optimization of performance/cost for any given application. TowerJazz invented its Y-Flash building blocks to meet the ever expanding customer needs for NVM in today's power supplies for consumer, medical, industrial and automotive applications. VDC Research forecasts worldwide shipment of power management ICs to grow more than 10% annually through 2012.

Y-Flash is the leading solution for NVM in the market today due its small cell size, zero mask adder and flexibility to implement various memory sizes. Current competing NVM solutions for medium density memories add 11 or more masks to the process flow, over the standard ~20 masks, making it impossible to have a one-chip solution for digital power management. Y-Flash can support a variety of memory densities from a few bits for trimming and chip ID applications up to 256Kb and more for code storage. NVM blocks that utilize this proprietary technology include array sizes that are up to five times smaller than other competitive solutions and can be built using only one gate oxide allowing for ultra low cost designs. Y-Flash is well-suited for applications such as digital controlled power, portable products and products requiring very tight and well matched IOs.

TowerJazz's Y-Flash module was recently integrated into Exar Corporation's latest digital power management design and Richard Randlett, Division Vice President, Advanced Analog Design commented, "TowerJazz has long experience and expertise in NVM technology and is well known in the industry and highly appreciated by Exar. We will definitely gain a great deal by using this technology in our new line of digital power products."

"Our new Y-Flash memory blocks are an industry leading solution for NVM technology and further validate our business strategy and commitment to providing the most complete power management platform in the industry," said Dr. Avi Strum, Vice President and General Manager, Specialty Business Unit at TowerJazz. "We developed this proprietary technology to further enhance our power management offerings, allowing for faster design cycles and lower cost designs for the emerging digital power applications."

Availability

The Y-Flash IP is available in the TS35PM/TS18PM design kits. This IP combined with TowerJazz's continuously customizable LDMOS from 20V to 80V process provides design flexibility and optimization demanded by today's power management ICs.

About TowerJazz

Tower Semiconductor Ltd. (NASDAQ: TSEM, TASE: TSEM), the global specialty foundry leader and its fully owned U.S. subsidiary Jazz Semiconductor, operate collectively under the brand name TowerJazz, manufacturing integrated circuits with geometries ranging from 1.0 to 0.13-micron. TowerJazz provides industry leading design enablement tools to allow complex designs to be achieved quickly and more accurately and offers a broad range of customizable process technologies including SiGe, BiCMOS, Mixed-Signal and RFCMOS, CMOS Image Sensor, Power Management (BCD), and Non-Volatile Memory (NVM) as well as MEMS capabilities. To provide world-class customer service, TowerJazz maintains two manufacturing facilities in Israel and one in the U.S. with additional capacity available in China through manufacturing partnerships. 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 Tower and/or Jazz'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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