

FORM 6-K

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

For the month of September 2009 No. 6

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 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

On September 29, 2009, the registrant announces Tower and Jazz Semiconductor Announce Deep-Silicon-Via™ Technology for Cellular and WiFi SiGe Power Amplifiers and Front-End Modules.

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: September 29, 2009

By: /s/ Nati Somekh Gilboa

Nati Somekh Gilboa
Corporate Secretary

Tower and Jazz Semiconductor Announce Deep-Silicon-Via™ Technology for Cellular and WiFi SiGe Power Amplifiers and Front-End Modules

Foundry leader in providing cell phone front-end silicon components enhances its SiGe platform to reduce power consumption and cost of PAs

ROME, Italy – European Microwave Week (EuMW), September 29, 2009 – Tower Semiconductor, Inc. (NASDAQ: TSEM, TASE: TSEM) and its U.S. subsidiary, Jazz Semiconductor, today announced the availability of its proprietary Deep-Silicon-Via™ (DSV) technology available in its 0.18-micron SiGe BiCMOS (SBC18). The new offering provides a simpler, more innovative way to create a low-inductance ground required to reduce power consumption of power amplifiers (PAs). Unlike older Through Wafer Vias used primarily with smaller wafer sizes in GaAs-based technology, the DSV is optimized for silicon 8-inch wafer manufacturing to significantly reduce the cost of the PA.

The DSV technology developed by Jazz utilizes existing equipment in its silicon CMOS wafer fabs and therefore can be scaled efficiently to high volumes without requiring complex thin wafer handling and processing. According to Strategy Analytics, power amplifiers in front-end modules of cell phones are expected to grow from 1.6 Billion units in 2009 to 2.5 Billion units in 2012. Today, Jazz is the leading supplier of silicon into the front-end modules of cell phones with market leading customers such as RFMD and Skyworks.

“We continue to invest in foundry technology for the front-end module by enabling silicon solutions of components that have traditionally been built in GaAs, helping customers reduce cost and increase integration levels. This new DSV technology is the latest offering in our Silicon Radio Platform that includes SiGe power amplifiers and SOI-based silicon switch technology,” said Dr. Marco Racanelli, Senior Vice President and General Manager, RF and High Performance Analog Business Group, Tower and Jazz Semiconductor.

A paper entitled, “A Deep-Silicon-Via Ground for SiGe Power Amplifiers,” will be presented by the company at the SiRF2010 conference in New Orleans on January 13, 2010. The paper will provide more details on the new technology including how it allows a more flexible layout than Through Wafer Via to result in smaller die size. DSV provides similar benefits to Through Wafer Via, yet it eliminates several thin wafer processing steps common with the older technology that

can lower yields and increase cost. In addition to providing an ultra low parasitic inductance path to ground of approximately 2pH which is 1 order of magnitude smaller than the Through Wafer Via inductance, it enables new creative ways for the designer in the PA design process. For example, new design features are using DSV to provide the function of the emitter ballast resistor; to improve linearity of gain and output power; to provide a short path to ground for shunt tuning elements; and using it for lateral shielding of circuit blocks.

Availability

DSV is currently available to Jazz customers through eBizz on the company's website for its 0.18um SiGe BiCMOS process (SBC18) and will be available for other RF processes in the future.

About Tower Semiconductor, Ltd. and Jazz Semiconductor, Inc.

Tower Semiconductor Ltd. (NASDAQ: TSEM, TASE: TSEM), the global specialty foundry leader and its fully owned subsidiary Jazz Semiconductor, a Tower Group Company is a leader in Analog-Intensive Mixed-Signal (AIMS) foundry solutions. Tower and Jazz manufacture integrated circuits with geometries ranging from 1.0 to 0.13-micron and provide industry leading design enablement tools to allow complex designs to be achieved quickly and more accurately. Tower and Jazz offer a broad range of process technologies including Digital, Mixed-Signal and RFCMOS, HV CMOS, BCD, Non-Volatile Memory (NVM), Embedded NVM, MEMS, and CMOS Image Sensors. To provide world-class customer service, Tower and Jazz maintain two fabrication facilities in Israel and one in the U.S. with additional capacity available through manufacturing partnerships in China. For more information, please visit www.towersemi.com and www.jazzsemi.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's and 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. 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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