

FORM 6-K

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

For the month of August 2009 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 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 August 18, 2009, the registrant announces that Jazz Semiconductor's Optimized SiGe Technology Targeted at Replacing GaAs Components in Growing Millimeter Wave and Cell Phone Markets.

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: August 18, 2009

By: /s/ Nati Somekh Gilboa

Nati Somekh Gilboa
Corporate Secretary

Jazz Semiconductor's Optimized SiGe Technology Targeted at Replacing GaAs Components in Growing Millimeter Wave and Cell Phone Markets

High Performance SiGe replaces several GaAs chips; lowers cost and increases integration

Expanding millimeter wave and FEM markets estimated to grow from \$400M in 2009 to over \$750M in 2012, a CAGR of over 23%

NEWPORT BEACH, Calif., August 18, 2009 – Jazz Semiconductor, Inc., a Tower Group Company (NASDAQ: TSEM, TASE: TSEM), today announced it is targeted at replacing GaAs components in high growth markets such as millimeter wave and front-end components of cellular phones with its enhanced SiGe BiCMOS process, IP and design enablement offerings. SiGe provides significant integration and cost advantage over GaAs, enabling products in the emerging markets of automotive collision avoidance, phased-array radar, and HDTV wireless distribution as well as established markets such as optical network and cellular phone front-end components.

Jazz is working with more than half of the top 10 IC providers in several of these market segments on SiGe solutions. According to data from Strategy Analytics, the combined millimeter wave and FEM market is estimated to grow from \$400 million in 2009 to over \$750 million in 2012, a CAGR of over 23%, outpacing most other sectors in the semiconductor industry.

The company's process technology includes a SiGe transistor with demonstrated performance of up to 200GHz as well as noise and power performance that is competitive with GaAs while offering as much as 40% lower die cost. Also included are CMOS options to enable mixed-signal and digital functions on the same chip further reducing cost of the complete system.

To facilitate the transition from GaAs to SiGe-based designs, Jazz partnered with Agilent to provide a SiGe design kit in ADS (Advanced Design System), a leading design platform for GaAs-based products, speeding time-to-market for customers targeting applications up to and beyond 60 to 77GHz. As stated in Agilent's press release on June 2, 2009, "Our collaboration with Jazz is in response to the strong market demand from our mutual customers for a fast and

efficient RFIC design flow,” said Avery Chung, foundry program manager of Agilent’s EEs of EDA division. “With these new SiGe PDKs in ADS 2009, customers will be able to design high-performance ICs operating up to 60GHz and higher. They can use the breadth of capability ADS provides, including design for manufacturing toolsets and Momentum, the industry-leading 3-D planar EM simulator.”

An example of a successful transition from GaAs to SiGe is the recently announced collaboration between Jazz and UCSD to develop a 2-antenna quad-beam 11-15 GHz phased array receiver that enables high-performance phased arrays for satellite communications by integrating many functions on the same silicon chip and replacing 8 GaAs ICs, drastically lowering the cost of phased array assembly. First time success was achieved using Jazz’s 0.18-micron SiGe BiCMOS process and its own proprietary models, kit and DIRECT MPW (Multi-project Wafer) program.

“We continue to see migration of GaAs products into SiGe as an exciting growth opportunity for our technology. This transition is largely complete in optical front-end components but just beginning in cellular phone front-ends and millimeter-wave applications,” said Dr. Marco Racanelli, Senior Vice President and GM of RF/HPA and Aerospace and Defense Business Groups. “We will continue to invest in high performance processes as well as design enablement infrastructure to speed time-to-market for our customers in these emerging applications.”

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

Tower Semiconductor Ltd. (NASDAQ: TSEM, TASE: TSEM) is a 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 manufacturing facilities in Israel and one in the U.S. with additional manufacturing capacity available in China through partnerships with ASMC and HHNEC. 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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