
FORM 6-K

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

For the month of April 2010 No. 1

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 x

Form 40-F o

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 o

No x

On April 01, 2010, the registrant announces VectraWave's First 40G Circuit designed using its SiGe BiCMOS Process.

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: April 01, 2010

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

TowerJazz Announces VectraWave's First 40G Circuit designed using SiGe BiCMOS Process

SiGe enables reduced cost, lower power consumption, and smaller die size than InP for high speed coder circuit

MIGDAL HAEMEK, Israel, and LES LOGES EN JOSAS, France, April 1, 2010 – TowerJazz, the global specialty foundry leader, today announced that VectraWave has designed its first 40G high speed coder circuit using a Silicon Germanium (SiGe) BiCMOS process. VectraWave chose TowerJazz's SBC18HX process over Indium Phosphide (InP), the traditional semiconductor material for choice for 40G circuits, due to its advantage of integrating digital circuits on the same die enabling lower cost, lower power consumption, better temperature compensation and smaller total board area. TowerJazz's industry leading SBC18HX also provides a wide variety of optimized process options and a well defined path to higher performance while maintaining existing analog IP.

VectraWave is developing a family of products including 43 Gbps high speed logic integrated circuits with a sub family of 43 Gbps high speed coders. In fact, VectraWave demonstrated a unique NRZ to RZ-DPSK coder operating up to 43Gps in a less than 1 square mm surface. Applications for these chips are data synchronization and fiber transmission. The markets for VectraWave's devices are high speed logic circuits for RF communication equipment, long haul/ultra long haul and metro access 10 to 100 Gbps optical networks. Its family of high speed coders allows the conversion of 5 to 43 Gbps NRZ standard bit rates to the specific coding format required by the optical fiber transmission link.

VectraWave's 40G devices are using TowerJazz's SBC18HX process variant with a 155GHz Ft NPN. Future opportunities for next-generation products include leveraging the foundry's 200GHz process for further high speed logic functions and improved performance. Since SiGe BiCMOS is manufactured using mainstream 200mm wafers, new 40G circuits can leverage all of the advantages of this process to deliver superior reliability and ruggedness. Indium Phosphide is generally done on 75mm wafers, occasionally on 100mm wafers, and is subject to brittleness and reliability concerns.

“By choosing TowerJazz as our foundry partner, we were able to realize many advantages with their SiGe BiCMOS process over traditional InP solutions including reduced cost, lower power consumption and smaller die size. We also enjoyed the benefits of the company’s high degree of flexibility, reliability and support,” said Yan Haentjens, Co-founder and President, VectraWave. “We required a partner that was focused on high speed process technologies with a long term roadmap that aligned with our product needs. TowerJazz offers successive generations of its industry leading SiGe BiCMOS process which will help VectraWave to continue developing innovative designs as we focus on capturing market share with our next-generation products. “

“It’s exciting for TowerJazz to be on the forefront of innovation with customers such as VectraWave. Our range of technology and features allows them to create differentiated high-speed products while taking advantage of our modular 0.18-micron SiGe BiCMOS platform,” said Chuck Fox, Senior Vice President of Worldwide Sales and Marketing, TowerJazz. “This type of partnership with VectraWave is significant as it enables them an industry first and we look forward to maintaining our relationship to produce their latest products which are smaller and more energy efficient than previous generations.”

About VectraWave

VectraWave SA, is a leading European Fabless company designing and providing RF ICs and System in Package devices for Optical and Microwave communication equipment providers. The VectraWave team has accumulated over 150 years of design background experience through its management, providing RFIC & MMIC design under various processes from DC to 90Ghz, as well as package design and multi-chip integration for specific high speed communication interface. VectraWave is proposing a wide range of standard products (ICs and Mixed signal SiPs), as well as its high skill team for design services on RFICs & MMICs high technology available processes. For more information, please visit www.vectrawave.com.

About TowerJazz

Tower Semiconductor Ltd. (NASDAQ: [TSEM](http://www.towerjazz.com), 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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