

FORM 6-K

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

For the month of September 2007 No. 2

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 20, 2007, Tower Semiconductor announced that it Wins High-Volume Manufacturing Deal for Fab2 at the 0.13um Technology Generation. Attached hereto is a copy of the press release.

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 20, 2007

By: /s/ Nati Somekh Gilboa

Nati Somekh Gilboa
Corporate Secretary

TOWER SEMICONDUCTOR WINS HIGH-VOLUME MANUFACTURING DEAL FOR FAB2 AT THE 0.13UM TECHNOLOGY GENERATION

Expects Sales of Thousands of Wafers-per-Month to First-Tier U.S. IDM which could become one of Tower's top Three Customers

TECHNOLOGY TRANSFER TO COMMENCE NEXT QUARTER; PRODUCTION SHIPMENTS EXPECTED TO BEGIN BY END OF 2008

MIGDAL HAEMEK, Israel - September 20, 2007 - Tower Semiconductor Ltd. (NASDAQ: TSEM; TASE: TSEM), a pure-play independent specialty foundry today announced that it has won a multi-million dollar per month manufacturing deal for its Fab2 at the 0.13-micron technology generation from a first-tier, U.S. integrated device manufacturer (IDM). Under this deal, technology will be transferred during the coming several quarters after which Tower expects to manufacture between five and eight thousand wafers-per-month, utilizing the new tools it is purchasing from companies such as AMD and Intel, as was previously announced.

The high-volume production shipments are expected to commence towards the end of 2008. Following such production, Tower expects that the U.S. IDM could become one of Tower's top three customers.

"We are pleased, and feel it quite an achievement, that an IDM of this size, capability and reputation chose Tower to be it's foundry partner for a critical and projected very large volume family of products," said Tower's CEO, Russell Ellwanger. "We are excited that this product line will utilize our expanded manufacturing capacity in the advanced 0.13-micron technology. We are in advanced stages of closing the deals to acquire the additional tools needed to increase our capacity in Fab2 to a level that will meet this demand."

About Tower Semiconductor Ltd.:

Tower Semiconductor Ltd. (Nasdaq: TSEM, TASE: TSEM) is an independent specialty foundry that delivers customized solutions in a variety of advanced CMOS technologies, including digital CMOS, mixed-signal and RF (radio frequency) CMOS, CMOS image sensors, power management devices, and embedded non-volatile memory solutions. Tower's customer orientation is complemented by its uncompromising attention to quality and service. Its specialized processes and engineering expertise provides highly flexible, customized manufacturing solutions to fulfill the increasing variety of customer needs worldwide. Offering two world-class manufacturing facilities with standard and specialized process technologies ranging from 1.0- to 0.13-micron, Tower Semiconductor provides exceptional design support and technical services to help customers sustain long-term, reliable product performance, while delivering on-time and on-budget results. More information can be found at <http://www.towersemi.com>.

Safe Harbor

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. Potential risks and uncertainties include, without limitation, risks and uncertainties associated with: (i) the completion of the equipment installation, technology transfer and ramp-up of production in Fab 2 and raising the funds therefor, (ii) the cyclical nature of the semiconductor industry and the resulting periodic overcapacity, fluctuations in operating results, future average selling price erosion that may be more severe than our expectations, (iii) having sufficient funds to operate the company in the short-term and the funding needs for its ramp-up plan, (iv) operating our facilities at satisfactory utilization rates which is critical in order to defray the high level of fixed costs associated with operating a foundry and reduce our losses, (v) our ability to satisfy the covenants stipulated in our credit facility agreement, as amended, (vi) our ability to capitalize on increases in demand for foundry services, (vii) meeting the conditions to receive Israeli government grants and tax benefits approved for Fab 2 and obtaining the approval of the Israeli Investment Center for a new expansion program, (viii) attracting additional customers, (ix) not receiving orders from our wafer partners and customers, (x) failing to maintain and develop our technology processes and services, (xi) competing effectively, (xii) our large amount of debt and our ability to repay our short-term and long-term debt on a timely basis, (xiii) achieving acceptable device yields, product performance and delivery times, (xiv) the timely development, internal qualification and customer acceptance of new processes and products, (xv) the entering into and the consummation of agreements to purchase the equipment to increase Fab2 capacity and the timely installation thereof, (xvi) timely and successful execution of the technology transfer project mentioned above, including the customers' demand to grow to the quantities currently forecasted and (xvii) and business interruption due to terror attacks, earthquakes, other acts of God and the security situation in Israel.

A more 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 our business is included under the heading "Risk Factors" in our most recent filings on Forms 20-F, F-3 and 6-K, as were filed with the Securities and Exchange Commission and the Israel Securities Authority. Future results may differ materially from those previously reported. We do not intend to update, and expressly disclaim any obligation to update, the information contained in this release.

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