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**FORM 6-K**

**SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

For the month of December 2009 No. 4

**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

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On December 23, 2009, the registrant announces that TowerJazz USA Aerospace and Defense Division was selected by General Dynamics and the U.S. Air Force for Large Die ROIC Manufacturing Program.

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

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**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: December 23, 2009

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

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**TowerJazz USA Aerospace and Defense Division Selected by General  
Dynamics and the U.S. Air Force for Large Die  
ROIC Manufacturing Program**

***MANufacturing TEchnology Support (MATES) award targeting large die ROIC  
manufacturing for imagers, sensors and detectors***

**NEWPORT BEACH, Calif., December 23, 2009** – TowerJazz, the global specialty foundry leader, today announced its USA Aerospace and Defense Division has been awarded a contract by General Dynamics Information Technology, a business unit of General Dynamics (NYSE: GD), to support the MATES (MANufacturing TEchnology Support) program within the U.S. Air Force for large-die read-out-integrated-circuit (ROIC) production. The MATES program contract was originally awarded to General Dynamics in 2004. TowerJazz is a leading manufacturer of ROICs which are key elements in many commercial and military detectors, sensors, and imaging systems spanning air, land, sea and space. With this award, it will enhance the ability to support production requirements of increasingly complex future ROIC designs.

TowerJazz has recently expanded CMOS production for ROICs used in imaging arrays in both un-cooled and cooled applications in support of increased demand spanning 0.5-micron to 0.18-micron technology nodes. The two year program with General Dynamics will focus on 0.18-micron large-die, stitched ROICs. In the 0.18-micron node, TowerJazz is making available to its ROIC customers a wide range of features from its commercial technology including high density capacitors (up to 5.6fF/um<sup>2</sup>), 1.8, 3.3, and 5V FETs, native devices, bipolar devices, resistors with near-zero temperature coefficients and a wide array of metal options. TowerJazz also provides cryogenic models for its devices ensuring a high degree of confidence in the first time success of cooled ROIC designs.

TowerJazz supports the manufacture of ITAR designs in its Newport Beach, CA 8-inch silicon factory. This is a full on-shore operation with ITAR mask suppliers continuing a tradition started over 20 years ago when this facility was the primary semiconductor manufacturing site for Rockwell International.

“TowerJazz is extremely excited to have this opportunity to partner with General Dynamics in support of the Air Force’s MATES Program for large die ROIC fabrication. This program will leverage past and ongoing accomplishments at TowerJazz in support of on-shore fabrication critical to our National Defense and assist in enabling the next generation of essential Aerospace and Defense applications,” said Mike Scott, Director of Sales and Marketing, USA Aerospace and Defense Division, TowerJazz.

**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](http://www.towerjazz.com).

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## 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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### For TowerJazz

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