

FORM 6-K

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

For the month of October 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 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 October 15, 2009, the registrant announces that NASA Selects Jazz Semiconductor and ADSANTEC for Lunar Atmosphere and Dust Environment Explorer (LADEE) Mission.

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: October 15, 2009

By: /s/ Nati Somekh Gilboa

Nati Somekh Gilboa
Corporate Secretary

NASA Selects Jazz Semiconductor and ADSANTEC for Lunar Atmosphere and Dust Environment Explorer (LADEE) Mission

SiGe technology from Jazz combined with rad-hard design techniques from ADSANTEC enabling essential space applications

RANCHO PALOS VERDES and NEWPORT BEACH, Calif., October 15, 2009 – Jazz Semiconductor, a Tower Group Company (Nasdaq: TSEM, TASE: TSEM) and ADSANTEC, a fabless design house, today announced their SERDES solution has been selected by NASA for its Lunar Atmosphere Dust Environment Explorer (LADEE) mission. The LADEE mission will orbit the Moon with the main objective of characterizing the lunar dust environment to determine the global density, composition, and time variability of the fragile lunar atmosphere before it is perturbed by further human activity and will deliver optical data at a rate of above 500 Mb/s. The launch date for the mission is scheduled for May 1, 2012.

ADSANTEC specializes in ASICs in CMOS and SiGe BiCMOS technologies utilizing patented and patent pending radiation-hard by design (RHBD) techniques. The ADSANTEC Ultra High Speed (above 30 Gb/s) rad-hard SERDES product utilizes the commercially available SiGe BiCMOS process (SBC18) from Jazz along with its own patent pending RHBD systems. Jazz and ADSANTEC's technology solution was chosen for the LADEE mission by MIT as well as for a next generation mission to Mars by JPL. ADSANTEC has developed and validated more than 30 high speed RHBD ASICs fabricated in Jazz's SBC18 process technology, including an ultra high speed TIA and VCSEL driver. To accelerate rad-hard ASIC design, ADSANTEC has developed a library of rad-hard silicon verified cells, which are available from Jazz Semiconductor.

"We have routinely achieved first-pass success with Jazz's industry-leading SiGe technology in delivering high speed ASICs with demanding specifications targeting both space and terrestrial applications," said Dr. Vladimir Katzman, President of ADSANTEC. "We are now excited to further broaden our partnership with Jazz by making our rad-hard and commercial grade design libraries available to other Jazz customers." Currently, ADSANTEC supplies components fabricated in Jazz Semiconductor's process technologies to several tier 1 communications customers worldwide.

“We are excited to be partnering with ADSANTEC on the lunar mission as well as helping to expand our support of the rad-hard community with the addition of RHDB techniques and IP to our commercial wafer fabrication processes,” said Dr. Marco Racanelli, Sr. VP and GM, RF & HPA, and Aerospace & Defense Business Groups. “This, together with a broad selection of 0.18um CMOS and SiGe technology options, our previously announced cryogenic device models and monthly direct-shuttle program, will help speed time-to-market for customers targeting new products at space and other high radiation environments.”

More information about the LADEE mission can be found on the NASA website at <http://nasascience.nasa.gov/missions/ladee>.

About ADSANTEC

The Advanced Science and Novel Technology Company (ADSANTEC) is a fabless semiconductor design house. Since 2002, the company concentrates on product development in high speed ICs for block-to-block and system-to-system serial interconnects; high-density ICs for space and other special applications; libraries of basic logic gates and functional blocks in advanced BiCMOS technologies; universal and user-programmable low-power input/output interfaces; internal and external intrusion detection in large-scale computer networks based on proprietary algorithms; open-market and custom IC solutions for communication and test equipment; and boards, modules and subsystems that feature the company’s growing IP portfolio. The principals of the company hold Ph.D. scientific degrees and have many years of experience in successful development of products in the mentioned areas using the modern most advanced technological processes. ADSANTEC’s headquarters is in Rancho Palos Verdes, CA with a 2,000 square foot production facility in Torrance, CA which contains laboratory space and equipment sufficient for ADSANTEC to develop and test the fabricated products.

About Jazz Semiconductor, Inc.

Jazz Semiconductor, Inc., a Tower Group Company (NASDAQ: TSEM, TASE: TSEM), is a leading wafer foundry focused on Analog-Intensive Mixed-Signal (AIMS) process technologies. Jazz offers world-class design enablement tools to allow complex designs to be achieved quickly and more accurately. The company’s broad process portfolio of modular AIMS technologies includes RFCMOS, Analog CMOS, Silicon and SiGe BiCMOS, SiGe C-BiCMOS, Power CMOS and High Voltage CMOS. Through access to Tower’s process technologies, Jazz offers Digital CMOS, Embedded NVM, CMOS Image Sensors, and Flash MTP and OTP solutions. Jazz Semiconductor’s executive offices and its U.S. wafer fabrication facility are located in Newport Beach, CA. For more information, please visit 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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