FORM 6-K

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

For the month of May 2010 No. 3

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 May 12, 2010, the Registrant announced its financial results for the three months ended March 31, 2010. Attached hereto are the following exhibits

Exhibit 99.1	Press release dated May 12, 2010

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:May 12, 2010

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

Exhibit 99.1

TowerJazz Announces First Quarter Record Revenue Demonstrating 96 percent Y/Y Growth and Record EBITDA at $35 million

Q2 2010 mid-range revenue guidance reflects 107 percent growth year-over-year and achieves $500 million annual run-rate

MIGDAL HAEMEK, Israel – May 12, 2010 – TowerJazz, the global specialty foundry leader, today announced financial results for the quarter ended March 31, 2010.

First Quarter Highlights

- Record revenue of $113.8 million, $55.7 million higher year over year with $33.6 million higher Ebitda, representing 60 percent incremental Ebitda margins;

- Achieved GAAP operating profit for the first time since 2000;

- Increased non-GAAP operating profit to $35 million with operating margins of 31 percent, as compared to $1 million and 2 percent in Q1 2009, respectively;

- Guiding for continued sequential growth in Q2 2010, expecting $123-128 million in revenues, with mid range guidance representing 107 percent and 10 percent growth as compared to Q2 2009 and Q1 2010, respectively;

- All-time record EBITDA of $35 million;

- Non-GAAP gross margins improved to 43 percent with $49 million gross profit, as compared with 39 percent in the prior quarter and 21 percent in Q1 2009, and GAAP gross margin in the quarter was 14 percent;

- Strong growth in quarter-end cash-balance of $83 million, as compared to $40 million as of end of Q1 2009.

CEO and Chairman Perspective

Russell Ellwanger, Chief Executive Officer, commented: “We entered 2010 with extreme momentum with fourth quarter revenue having broken $100 million and yearly record design-wins of 308. This momentum has increased with another record revenue of about $114 million, a record EBITDA of $35 million and most importantly, looking into the future, foreseeable long-term sustainable growth with a quarterly record 111 design-wins. Within these design wins, are multiple customers who are number one market share and technology platform leaders for their respective markets.” Ellwanger further added, “From what we have seen of published results, our first quarter propelled us to be the number one specialty foundry by revenue and placed us among the top five foundries worldwide. In January we referred to a 2010 revenue t arget of a half billion dollars with $160 million EBITDA. Our second quarter guidance will have already attained the $500M run-rate, upon which we presently see indications of continued growth in the second half of the year.”

Amir Elstein, Chairman of the Board of Directors of TowerJazz, stated: “I am pleased to see both tactical and strategic execution at TowerJazz which positions us for significant profitable growth going forward. The continued EBITDA margins improvement show both efficient operations as well as the added value that our customer base realizes from TowerJazz’s singular specialty offerings. I become ever more confident that this positive momentum will further strengthen TowerJazz position as the worldwide specialty foundry leader.”

2010 First Quarter Results Summary

For the first quarter 2010, the Company is reporting record revenue of $113.8 million, with a gross profit of $16 million, an operating profit of $155 thousand, a record EBITDA of $35 million and a non-GAAP net profit of $29 million, or $0.14 earnings per share.

First quarter 2010 revenue representing a 96 percent increase over first quarter 2009 revenue of $58.1 million and 13 percent over fourth quarter 2009 revenue of $100.6 million.

Gross profit for the first quarter 2010 was $49 million on a non-GAAP basis, representing a year over year growth of 308 percent and sequential growth of 27 percent. This represents a gross margin of 43 percent, compared with gross margin of 21 percent in the first quarter last year and gross margin of 39 percent in the prior quarter. On a GAAP basis, the Company reported a gross profit of $16 million.

Operating profit in the first quarter of 2010 was $35 million on a non-GAAP basis, substantially higher than $1 million reported in the first quarter of 2009 and 51 percent higher than the $23 million achieved in the prior quarter.

Further, for the first time since 2000, TowerJazz achieved an operating profit on a GAAP basis of $155 thousand. This is compared to a GAAP operating loss of $28 million in the first quarter of 2009, and GAAP operating loss of $11 million in the fourth quarter of 2009.

Net profit in the first quarter of 2010 was $29 million on a non-GAAP basis, or $0.14 earnings per share, which is substantially better than the non-GAAP net loss of $3 million or $0.02 per share reported in the first quarter of 2009, and the non-GAAP net profit of $9 million or $0.05 per share achieved in the prior quarter.

Calculated in accordance with GAAP, first quarter 2010 loss was $36 million or $0.18 per share as compared to $28 million or loss of $0.17 per share for the first quarter of 2009 and $31 million or $0.16 per share in the previous quarter. The GAAP loss includes financing expenses of $34 million, resulting mainly from non-cash GAAP financing expenses due to the significant increase in the market and fair value of the Company's securities creating additional shareholders' value. Excluding financing expenses, net loss for the first quarter 2010 would have been $2 million, a significant improvement compared to $27 million in the first quarter of 2009 and $13 million in the previous quarter.

EBITDA for the first quarter of 2010 was $35 million, an all-time record, and up substantially from $2 million reported in the first quarter of 2009 and $23 million in the prior quarter.

The Company's cash balance, as of March 31, 2010 was $83 million, as compared to $82 million as of December 2009 and $40 million as of the end of the first quarter of 2009.

Financial Guidance

TowerJazz forecasts revenue in the second quarter of 2010 to range of $123 and $128 million, with a mid range guidance representing a sequential revenue growth of 10 percent and 107 percent year-over-year growth in revenues.

Conference Call and Web Cast Announcement
TowerJazz will host a conference call to discuss first quarter 2010 results today, May 12, 2010, at 10:00 a.m. Eastern Time (EST) / 5:00 p.m. Israel time.

To participate, please call:
1-888-668-9141 (U.S. toll-free number) or +972-3-918-0609 (international) and mention ID code: TOWER-JAZZ

Callers in Israel are invited to call locally by dialing 03-918-0609.

The conference call will also be Web cast live at www.earnings.com and at www.towerjazz.com and will be available thereafter on both Web sites for replay for a period 90 days, starting a few hours following the call.

As previously announced, beginning with the fourth quarter of 2007, the Company has been presenting its financial statements in accordance with U.S. GAAP.

As applied in this release, the term Earnings Before Interest Tax Depreciation and Amortization (EBITDA) consists of loss, according to U.S. GAAP, excluding interest and financing expenses (net), tax, depreciation and amortization and stock based compensation expenses. EBITDA is not a required GAAP financial measure and may not be comparable to a similarly titled measure employed by other companies. EBITDA should not be considered in isolation or as a substitute for operating income, net income or loss, cash flows provided by operating, investing and financing activities, or other income or cash flow statement data prepared in accordance with GAAP.

This release, including the financial tables below, presents other financial information that may be considered "non-GAAP financial measures" under Regulation G and related reporting requirements promulgated by the Securities and Exchange Commission as they apply to our company. These non-GAAP financial measures exclude (1) depreciation and amortization, (2) compensation expenses in respect of options granted to directors, officers and employees and (3) finance expenses, net other than interest paid, such that non-GAAP financial expenses, net include only interest paid during the reported period. Non-GAAP financial measures should be evaluated in conjunction with, and are not a substitute for, GAAP financial measures. The tables also present the GAAP financial measures, which are most comparable to the non-GAAP financial measures as we ll as reconciliation between the non-GAAP financial measures and the most comparable GAAP financial measures. The non-GAAP financial information presented herein should not be considered in isolation from or as a substitute for operating income, net income or loss, cash flows provided by operating, investing and financing activities, per share data or other income or cash flow statement data prepared in accordance with GAAP and is not necessarily consistent to the non-GAAP data presented in previous filings.

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. T o 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.

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 and you should not place any undue reliance on such forward-looking statements. Potential risks and uncertainties include, without limitation, risks and uncertainties associated with: (i) maintaining existing customers and attracting additional customers, (ii) cancellation of orders, (iii) failure to receive orders currently expected (iv) the cyclical nature of the semiconductor industry and the resulting periodic overcapacity, fluctuations in operating results and future average selling price erosion, (v) the large amount of debt and liabilities and having sufficient funds to satisfy our debt obliga tions and other liabilities on a timely basis or succeed in restructuring the debt, (vi) operating our facilities at high utilization rates which is critical in order to defray the high level of fixed costs associated with operating a foundry and reduce our losses, (vii) our ability to satisfy the covenants stipulated in our agreements with our lenders, banks and bond holders, (viii) our ability to capitalize on potential increases in demand for foundry services, (ix) having customer demand that will exceed our manufacturing capacity, (x) meeting the conditions to receive Israeli government grants and tax benefits approved for Fab2 and obtaining the approval of the Israeli Investment Center for an expansion program, (xi) our ability to accurately forecast financial performance, which is affected by limited order backlog and lengthy sales cycles, (xii) the purchase of equipment to increase capacity, the completion of the equipment installation, technology transfer and raising the funds therefor, (xiii) our de pendence on a relatively small number of products for a significant portion of our revenue, (xiv) a substantial portion of our revenues being accounted for by a small number of customers, (xv) the concentration of our business in the semiconductor industry, (xvi) product returns, (xvii) our ability to maintain and develop our technology processes and services to keep pace with new technology, evolving standards, changing customer and end-user requirements, new product introductions and short product life cycles, (xviii) competing effectively, (xix) achieving acceptable device yields, product performance and delivery times, (xx) possible production or yield problems in our wafer fabrication facilities, (xxi) our ability to manufacture products on a timely basis, (xxii) our dependence on intellectual property rights of others, our ability to operate our business without infringing others' intellectual property rights and our ability to enforce our intellectual property against infringement, (xxiii) our a bility to fulfill our obligations and meet performance milestones under our agreements, including successful execution of our agreement with an Asian entity signed in 2009, (xxiv) retention of key employees and recruitment and retention of skilled qualified personnel, (xxv) exposure to inflation, currency exchange and interest rate fluctuations and risks associated with doing business internationally and in Israel, and (xxvi) business interruption due to fire, the security situation in Israel and other events beyond our control.

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 Tower's most recent filings on Forms 20-F, F-3, F-4, S-8 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. Future results may differ materially from those previously reported. The Company does not intend to update, and expressly disclaims any obligation to update, the information contained in this release.

Contacts

TowerJazz Investor Relations
Noit Levi, +972 4 604 7066
Noit.levi@towerjazz.com

CCG Investor Relations
Ehud Helft / Kenny Green, (646) 201 9246
towersemi@ccgisrael.com

TOWER SEMICONDUCTOR LTD. AND SUBSIDIARIES
CONSOLIDATED BALANCE SHEETS
(dollars in thousands)

	March 31, 2010	December 31, 2009
	unaudited	
A S S E T S		
CURRENT ASSETS		
Cash and cash equivalents	$ 83,448	$ 81,795
Trade accounts receivable	52,103	40,604
Other receivables	2,371	2,520
Inventories	32,600	32,250
Other current assets	9,423	10,304
Total current assets	179,945	167,473
LONG-TERM INVESTMENTS	30,233	29,361
PROPERTY AND EQUIPMENT, NET	353,968	371,400
INTANGIBLE ASSETS, NET	64,192	67,601
GOODWILL	7,000	7,000
OTHER ASSETS, NET	7,402	8,002
TOTAL ASSETS	$ 642,740	$ 650,837
LIABILITIES AND SHAREHOLDERS' EQUITY		
CURRENT LIABILITIES		
Short term bank loan	$ 12,000	$ 7,000
Trade accounts payable	48,741	42,012
Deferred revenue	6,156	24,696
Other current liabilities	30,488	23,652
Total current liabilities	97,385	97,360
LONG-TERM DEBT	404,560	428,813
LONG-TERM CUSTOMERS' ADVANCES	8,102	8,262
OTHER LONG-TERM LIABILITIES	67,370	60,388
TOTAL LIABILITIES	577,417	594,823
SHAREHOLDERS' EQUITY	65,323	56,014
TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY	$ 642,740	$ 650,837

TOWER SEMICONDUCTOR LTD. AND SUBSIDIARIES
RECONCILIATION OF REPORTED GAAP TO NON-GAAP CONSOLIDATED STATEMENTS OF OPERATIONS (UNAUDITED)
(dollars in thousands, except per share data)

	Three months ended March 31,		Three months ended March 31,		Three months ended March 31,	
	2010	2009	2010	2009	2010	2009
	non-GAAP		Adjustments (see a, b, c, d below)		GAAP	
REVENUES	$ 113,796	$ 58,059	$ --	$ --	$ 113,796	$ 58,059
COST OF REVENUES	64,499	45,978	32,975 (a)	29,162 (a)	97,474	75,140
GROSS PROFIT (LOSS)	49,297	12,081	(32,975)	(29,162)	16,322	(17,081)
OPERATING COSTS AND EXPENSES						
Research and development	5,524	3,793	330 (b)	563 (b)	5,854	4,356
Marketing, general and administrative	8,597	6,933	1,716 (c)	(198)(c)	10,313	6,735
	14,121	10,726	2,046	365	16,167	11,091
OPERATING PROFIT (LOSS)	35,176	1,355	(35,021)	(29,527)	155	(28,172)
FINANCING INCOME (EXPENSE), NET	(3,636)	(5,790)	(30,155)(d)	4,812 (d)	(33,791)	(978)
OTHER INCOME, NET	51	--	--	--	51	--
PROFIT (LOSS) BEFORE INCOME TAX	31,591	(4,435)	(65,176)	(24,715)	(33,585)	(29,150)
INCOME TAX BENEFIT (EXPENSE)	(2,659)	1,277	--	--	(2,659)	1,277
NET PROFIT (LOSS) FOR THE PERIOD	$ 28,932	$ (3,158)	$ (65,176)	$ (24,715)	$ (36,244)	$ (27,873)
BASIC PROFIT (LOSS) PER ORDINARY SHARE						
Profit (loss) per share	$ 0.14	$ (0.02)				
Weighted average number of ordinary shares outstanding - in thousands	206,931	160,026				
NON-GAAP GROSS MARGINS	43%	21%				
NON-GAAP OPERATING MARGINS	31%	2%				
NON-GAAP NET MARGINS	25%	(5)%				

(a) Includes depreciation and amortization expenses in the amounts of $32,764 and $29,009 and stock based compensation expenses in the amounts of $211 and $153 for the three months ended March 31, 2010 and 2009, respectively.
(b) Includes depreciation and amortization expenses in the amounts of $145 and $403 and stock based compensation expenses in the amounts of $185 and $160 for the three months ended March 31, 2010 and 2009, respectively.
(c) Includes depreciation and amortization expenses in the amounts of $335 and $335 and stock based compensation expenses in the amounts of $1,381 and -$533 for the three months ended March 31, 2010 and 2009, respectively.
(d) Non-gaap finance expenses include only interest paid during the reported period.

TOWER SEMICONDUCTOR LTD. AND SUBSIDIARIES
RECONCILIATION OF REPORTED GAAP TO NON-GAAP CONSOLIDATED STATEMENTS OF OPERATIONS (UNAUDITED)
(dollars in thousands, except per share data)

	Three months ended		Three months ended		Three months ended	
	March 31, 2010	December 31, 2009	March 31, 2010	December 31, 2009	March 31, 2010	December 31, 2009
	non-GAAP		Adjustments (see a, b, c, d below)		GAAP	
REVENUES	$ 113,796	$ 100,616	$ --	$ --	$ 113,796	$ 100,616
COST OF REVENUES	64,499	61,868	32,975(a)	32,194 (a)	97,474	94,062
GROSS PROFIT (LOSS)	49,297	38,748	(32,975)	(32,194)	16,322	6,554
OPERATING COSTS AND EXPENSES						
Research and development	5,524	6,694	330 (b)	317 (b)	5,854	7,011
Marketing, general and administrative	8,597	8,711	1,716 (c)	1,319 (c)	10,313	10,030
	14,121	15,405	2,046	1,636	16,167	17,041
OPERATING PROFIT (LOSS)	35,176	23,343	(35,021)	(33,830)	155	(10,487)
FINANCING EXPENSE, NET	(3,636)	(11,965)	(30,155)(d)	(6,713)(d)	(33,791)	(18,678)
OTHER INCOME (EXPENSE), NET	51	(118)	--	--	51	(118)
PROFIT (LOSS) BEFORE INCOME TAX	31,591	11,260	(65,176)	(40,543)	(33,585)	(29,283)
INCOME TAX EXPENSE	(2,659)	(2,128)	--	--	(2,659)	(2,128)
NET PROFIT (LOSS) FOR THE PERIOD	$ 28,932	$ 9,132	$ (65,176)	$ (40,543)	$ (36,244)	$ (31,411)
BASIC PROFIT PER ORDINARY SHARE						
Profit per share	$ 0.14	$ 0.05				
Weighted average number of ordinary shares outstanding - in thousands	206,931	194,236				
NON-GAAP GROSS MARGINS	43%	39%				
NON-GAAP OPERATING MARGINS	31%	23%				
NON-GAAP NET MARGINS	25%	9%				

(a) Includes depreciation and amortization expenses in the amounts of $32,764 and $32,046 and stock based compensation expenses in the amounts of $211 and $148 for the three months ended March 31, 2010 and December 31, 2009, respectively.
(b) Includes depreciation and amortization expenses in the amounts of $145 and $148 and stock based compensation expenses in the amounts of $185 and $169 for the three months ended March 31, 2010 and December 31, 2009, respectively.
(c) Includes depreciation and amortization expenses in the amounts of $335 and $340 and stock based compensation expenses in the amounts of $1,381 and $979 for the three months ended March 31, 2010 and December 31, 2009, respectively.
(d) Non-gaap finance expenses include only interest paid during the reported period.