Zacks Equity Research

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Ken Nagy, CFA

www.zacks.com 111 North Canal Street, Chicago, IL 60606

Towerjazz (TSEM-NASDAQ)

TSEM: Earnings Preview. Expect Solid Quarter. Tower moves from 10th to 5th in Foundry Landscape

Current Recommendation	**Outperform**
Prior Recommendation	N/A
Date of Last Change	01/31/2010
Current Price (02/09/11)	$1.38
Six- Month Target Price	**$4.00**

OUTLOOK

Towerjazz is a pure-play semiconductor wafer foundry with two IC plants in Israel and one in California, that manufacture SiGe, MEMS, RF, embedded flash-based memory, analog/mixed-signal, and CMOS image-sensor devices. Over the past year the firm has been building capacity due to accelerated design-win momentum, which have been realized within a large group of diversified, global customers, many of which being market share and technology platform leaders for their respective markets. We see value in the shares and reiterate our outperform rating.

SUMMARY DATA

52-Week High	**$1.84**
52-Week Low	**$1.26**
One-Year Return (%)	**7.81**
Beta	**1.59**
Average Daily Volume (sh)	**824,006**
Shares Outstanding (mil)	**258**
Market Capitalization ($mil)	**$357**
Short Interest Ratio (days)	**2.13**
Institutional Ownership (%)	**5**
Insider Ownership (%)	**1**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**27.8**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**3.0**
P/E using 2010 Estimate	**2.3**
P/E using 2011 Estimate	**2.1**
Zacks Rank	**4**

Risk Level	**Above Avg.,**
Type of Stock	**Small-Blend**
Industry	**Elec Comp-Semic**
Zacks Rank in Industry	**48 of 63**

ZACKS ESTIMATES

Revenue
(in millions of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2008	58 A	58 A	59 A	77 A	252 A
2009	58 A	61 A	80 A	101 A	297 A
2010	114 A	126 A	135 A	135 E	510 E
2011	128 E	138 E	145 E	149 E	560 E

Earnings per Share
(Non-GAAP)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2008	-$0.04 A	$0.08 A	$0.04 A	$0.04 A	$0.12 A
2009	-$0.02 A	$0.03 A	$0.07 A	$0.11 A	$0.19 A
2010	$0.13 E	$0.15 A	$0.15 A	$0.16 E	$0.59 E
2011	$0.14 E	$0.15 E	$0.18 E	$0.21 E	$0.68 E

Zacks Projected EPS Growth Rate - Next 5 Years % **15**

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Earnings Preview/ Foundry Position/ 2011 Outlook

Towerjazz will continue to make good on its promises of $500 million revenue run rate and 70% year over year growth. For good measure the firm got to GAAP net profit one quarter (last quarter) earlier than the firm originally promised. (The first in 10 years) The firm has been building capacity due to accelerated design-win momentum. We expect another strong quarter in the fourth quarter, similar to quarter three and expect the GAAP net profit to be a regular occurrence.

We feel Towerjazz should outpace its foundry competitors as well as the overall semiconductor industry in 2011. Specialty foundry enjoys higher margins and is less susceptible to industry downturns. In addition the firm is out in front on several industry leading technologies such as HPA, Power, and optical. The Tower and Jazz merger was completed at a time when the rest of the industry was struggling to survive. The balance sheet improvements are a source of strength which likely sets up the firm for further growth activity in the future. The firm ranks number one in specialty foundry.

Foundry Landscape 2008-2010

($M)	2008		2009		2010	
1	TSMC	10,556	TSMC	,8989	TSMC	13,307
2	UMC	3,070	UMC	2,815	UMC	3,965
3	Chartered	1,743	GlobalFoundries*	2,641	GlobalFoundries	3,510
4	SMIC	1,353	SMIC	1,070	SMIC	1,555
5	Vanguard	511	Dongbu	395	**TowerJazz**	**510**
6	Dongbu	490	Vanguard	382	Vanguard	505
7	X-Fab	368	**TowerJazz**	**299**	Dongbu	495
8	SSMC	340	SSMC	280	SSMC	330
9	HHNEC	290	HHNEC	240	X-Fab	320
10	**TowerJazz**	**252**	X-Fab	212	HHNEC	295
11	Grace	230	He Jian	180	Grace	260
12	He Jian	195	Silterra	170	WIN	221
13	Silterra	175	WIN	145	Altis	215
14	ASMC	134	Grace	100	He Jian	205
15	WIN	117	ASMC	94	Silterra	200
16	Mosel-Vitelic	98	XinXin	55	ASMC	150
17	XinXin	20	Mosel-Vitelic	51	Mosel-Vitelic	80
18	Altis	0	Altis	0	XinXin	75
19	-	-	-	-	-	-
20+	Others	148	Others	171	Others	204

Tower Semiconductor Raises $100 Million

On October 25, 2010, Tower Semiconductor successfully completed the institutional stage of a fund raising in Israel, receiving commitments from investors to a new series of long-term bonds it intends to issue. The bonds will mature in two equal installments on December 2015 and December 2016.

The series F bonds will be NIS denominated and will be linked to the exchange rate of the NIS into the US Dollar. Under the terms of the bonds, it will carry an interest rate of 7.8% per annum, payable semi-annually on June 30 and on December 31 of each year through 2016, commencing December 31, 2010, and will be convertible into the Company's ordinary shares commencing September 2012 at about 20 percent premium over the Company's ordinary shares market price. (With a 2 year vesting period ending September 2012)

By October 27th the firm had $100 million in commitments. Cash will be used to grow internal capacity (mainly fab2) potential M&A.

Looking at the past year this completes a comprehensive debt restructure. This restructure comprised the extension of the $45 million Wells-Fargo credit lines, $80 million Jazz level bonds exchange to bonds due in 2015, $50 million pay down and restructure of the remaining $160 million Israeli banks debt to a long term loan and this deal. Tower has created a new balance sheet with zero bank loans' principal due during the coming 3 years, servable debt ratios and a cash balance which will enable the firm to be flexible if M&A opportunities present themselves.

INVESTMENT THESIS

Tower Semiconductor Ltd. operates as a global specialty foundry company. Its wholly owned subsidiary, Jazz Semiconductor, Inc., specializes in analog-intensive mixed-signal (AIMS) foundry solutions. Tower and Jazz manufacture integrated circuits with geometries ranging from 1.0 to 0.13-micron, as well as provide design enablement tools to allow complex designs to be achieved quickly and accurately. The company and its subsidiary offer a range of process technologies, including digital, mixed-signal and RFCMOS, HV CMOS, BCD, non-volatile memory (NVM), embedded NVM, MEMS, and CMOS image sensors. Tower and Jazz maintain two fabrication facilities in Israel, as well as one fabrication facility in the United States, with additional capacity available through manufacturing partnerships in China.

As of December 31, 2009, Tower has 85 patents and Jazz has 174 Patents

Foundry History

Historically semiconductor firms (also called integrated device manufacturers or IDMs) manufactured chips in their own fabs (chip fabrication plant). By the 1990's as chips grew smaller and more complex it was a natural that fab less outsourced manufacturing began to emerge. Semiconductor devices are broadly divided into three categories—analog, digital and radio frequency (RF). Analog semiconductors condition and regulate real world information such as light, temperature, speed, pressure, power and electrical currents. Digital logic semiconductors process information in only two states. Mixed-signal semiconductors combine both analog and digital technology into a single device. Typically, an analog sensor samples real world information, and then converts the input into an electronic analog signal, which is converted into a digital format for further digital processing. The analog and mixed-signal markets tend to be more varied and specialized, with customized products that have longer life cycles than the digital industry segment. There is an ongoing drive to decrease the number of discrete devices, lessen power requirements and shrink the size of the existing devices, which correspondingly increase performance

and reliability. Consequently, a greater amount of functionality is being consolidated into increasingly smaller devices

The availability of IC designs require process technologies other than standard digital CMOS have created a market for independent foundries that focus on providing specialized process technologies. Thus, wafer manufacturers may also need to make a significant investment in specialty process technologies to manufacture these semiconductors. Specialty process technologies enable greater analog content and can reduce the die size of an analog or mixed-signal semiconductor, thereby increasing the number of dies that can be manufactured on a wafer and reducing final die cost. In addition, specialty process technologies can enable increased performance, superior noise reduction and improved power efficiency of analog and mixed-signal semiconductors compared to traditional standard CMOS processes. These specialty process technologies include advanced analog CMOS, radio frequency CMOS (RF CMOS),CMOS Image Sensors (CIS), high voltage CMOS, bipolar CMOS (BiCMOS), silicon germanium BiCMOS (SiGe BiCMOS), and bipolar double-diffused metal oxide semiconductor (BCD).

Specialized Markets, higher margin

The company uses CMOS (complementary metal oxide semiconductor) IC technology within the semiconductor devices. Strategically, management has targeted the manufacture of embedded flash-based memory, analog/mixed-signal and CMOS image-sensor device markets. Management asserts that these targeted specialized markets produce relatively higher gross margins and have higher growth characteristics than the general industry. Embedded flash memory is non-volatile erasable memory used within MP3 players, wireless handsets, digital cameras, DVD players, set-top boxes and PCs. The analog/mixed signal ICs are used in a wide variety of end applications that include wireless handsets, PCs, DVD players, automotive electronics and medical imaging equipment. CMOS image sensors are used within wireless handsets, digital cameras, video cameras and video game consoles. Applications within the consumer market account for 50% of revenue, while communications was 15%, PC was 7%, multi-markets 18% and the combined industrial, medical and automotive the remaining 10%.

Some industries that will benefit from optical sensors include certain processing industries that can use sensors for controlling chemical formulations and temperatures. In the medical industry, the sensors will facilitate the development of novel imaging systems. The sensors will help the construction industry monitor the structural health of different buildings, bridges, and tunnels and facilitate the environmental industry in monitoring pollutants and contamination.
The multiplexing capability of optical sensors makes them an excellent candidate for structural health monitoring in aerospace applications where weight is a major consideration. Degradable polymer sensors are used to deliver antiviral drugs, pain and chemotherapy medications, and contraceptives. Universities and companies can use simulation equipment for their research and teaching needs. A range of basic and applied research programs are being conducted in aeropropulsion, space sciences, photonics, and materials technology

Merger.

Jazz semiconductor was formed as the result of a spin off in 2002 from Conexant (Conexant dates back to Rockwell Semiconductor). Jazz is the owner of the Newport Beach CA 200mm facility and several industry leading technologies such as SiGE, BiCMOS, and MEMS. We feel the merger is significant to Tower for the following reasons.

- The merger was done at a time when the rest of the industry was in survival mode.

- The customer base was doubled.
- Towerjazz is the lead in specialty higher margin foundry.



Diverse Customer Base (Source,Towerjazz)

The firm produces its products with its specialty process technology the designs are typically more complex than the manufacture of standard technology. This has the effect of drawing industry leading customers to the firm and makes it harder for them to leave for the competition.

SiGe

TSEM's BiCMOS process technologies have more features than RF CMOS process technologies and power various RF semiconductors such as wireless transceivers and television tuners. Towerjazz takes it a step further and incorporate high-speed bipolar transistors into an RF CMOS process. The equipment requirements for BiCMOS manufacturing are specialized and require enhanced tool capabilities to achieve high yield manufacturing. Towerjazz remains the only foundry in the world with multi-fab SiGE capacity.

Power Management

TSEM's high voltage CMOS and BCD process technologies have more features than advanced analog CMOS processes and are well suited for power and driver semiconductors such as voltage regulators, battery chargers, power management products and audio amplifiers.

With worldwide energy standards becoming more stringent, we are optimistic about Towerjazz technology. In particular, several new government standards are being enacted that will force new products to adopt newer technologies, displacing the inefficient legacy linear transformers. The standards imposed by the California Energy Commission (CEC) became mandatory for all external power supplies by July 2008. This is a critical event given that California is the seventh largest economy in the world and usually the pioneer in leading edge legislation that many other states usually adopt later. Washington State and Arizona have both since adopted the same California standard. China recently announced a

new voluntary program similar to the Energy Star program and also adopted the California standards. The European Commission has set European standards for energy efficient external AC/DC power supplies that are even more stringent than the CEC standards, although it is initially on a voluntary basis. Australia not only adopted the CEC standards, but made compliance mandatory by April 2006. The current worldwide energy situation has created greater sensitivity to the burgeoning problem. TSEM integrated power products conform to these new standards. As customers begin to design-in integrated power ICs that are in conformance with these new energy efficiency standards, the firm should be able to capitalize on the conversion.

We feel Towerjazz should outpace its foundry competitors as well as the overall semiconductor industry in 2010. Specialty foundry enjoys higher margins and is less susceptible to industry downturns. In addition the firm is out in front on several industry leading technologies such as HPA, Power, and optical. The Tower and Jazz merger was completed at a time when the rest of the industry was struggling to survive. The balance sheet is a source of strength which likely sets up the firm for further growth activity in the future.

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