NASDAQ/ TASE: TSEM

# TOVERAL

The Global Specialty Foundry Leader

Strategy/ Performance: Leadership Growth

January 2017

### Safe Harbor

This presentation contains forward-looking statements within the meaning of the "safe harbor" provisions of the Private Securities Litigation Reform Act of 1995. These statements are based on management's current expectations and beliefs and are subject to a number of risks, uncertainties and assumptions that could cause actual results to differ materially from those described in the forward-looking statements. All statements other than statements of historical fact are statements that could be deemed forward-looking statements. For example, statements regarding expected (i) customer demand, (ii) utilization and cross utilization of our Fabs, (iii) growth in our end markets, (iv) market and technology trends, and (v) growth in revenues, cash flow, margins and net profits are all forward-looking statements. Actual results may differ materially from those projected or implied by such forward-looking statements due to various risks and uncertainties applicable to TowerJazz's business as described in the reports filed by Tower Semiconductor Ltd. ("Tower") with the Securities and Exchange Commission (the "SEC") and the Israel Securities Authority ("ISA"), including the risks identified under the heading "Risk Factors" in Tower's most recent filings on Forms 20-F and 6-K. No assurances can be given that any of the events anticipated by the forward-looking statements will transpire or occur, or if any of them do, what impact they will have on the results of operations or financial condition of TowerJazz.

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### Proven Analog Business Model

Fastest Growing Foundry in the world with Proportional Growth in All Financial Metrics





### Market Leadership

Well Positioned in the Fastest Growing Markets with Long Term Customer Relationships and Roadmap Alignment



### Technology Leadership

Wide Range of Advanced and Differentiated Specialty Analog Offerings



### Operational Excellence

High Worldwide Manufacturing Capabilities and Flexibility



### **Continuous Quarterly Revenue Growth**



TOWERJAZ

### **Key Financial Metrics**



EBITDA



### Net Profit



### Net Profit (excluding one-time items)





# The Global Specialty Analog Foundry





### Specialty Analog IC Manufacturing

**Proprietary Process Technology** 

To enable first time design success and fast time to market

To enable "dual-sourcing" and output optimization



# WE NEVER COMPETE WITH OUR CUSTOMERS

### Market MEGATRENDS driven by Internet of Things Key megatrends driving rapid growth in Analog/Mixed-Signal applications



The Global Specialty Foundry

# Advanced Specialty Analog Technology Platforms with Broad Technology Portfolio





# Why do we

# need/ want/ care about

# analog technology?



# This is why!





### Our world is analog... TowerJazz connects it to the digital!



# SiGe optical transceivers and mmWave backhaul

### Transferring a picture between two mobile phones -An example of the critical roles of analog chips



# Our world is analog... TowerJazz connects it to the digital!

SiGe HBT power amplifiers; RF Antenna switches; Integrated on a chip FE modules: ANALOG

> Processing and storing the picture in NVM (20 nm and below, not TowerJazz)

Multicast signal Base stations

> SiGe optical transceivers and mmWave backhaul

Ultra low noise SiGe RF amplifiers; SOI Antenna switches; RF CMOS: ANALOG

Processing and storing the picture in NVM



4gb

**Picture acquisition: ANALOG** to digital using **CMOS image sensors** 

Transferring a picture between two mobile phones -An example of the critical roles of analog chips PM and signal conditioning for display: ANALOG





### Our TAM and SAM: Focus on Analog Power, CIS Imaging and RF End Market Application Viability



Source: 1. World Semiconductor Trade Statistics Organization 2. Internal and IDM data



Our present served applications represent ~\$7.5 billion of wafer based revenues opportunity and a total analog opportunity of ~\$40 billion in 2021

A large and exciting growth opportunity for TowerJazz



### **RF HPA Key Markets and Solutions**



Mobile RF SOI and SiGe

# High Growth driven by Smartphones and IoT



### Infrastructure HP SiGe

High Growth driven by video, data internet traffic





Emerging Applications driven by radar and other high-frequency applications, and Traditional Analog Markets in HDD and analog components



### **Power Key Markets and Solutions**



### Display, Audio, Touch, Power Management

0.18um BCD Technology

High Volume driven by consumer device growth



# Automotive & Communication

0.18um BCD + NVM and digital

High Value driven by more integrated power



# **LED Lighting**

700V Power Technology

Emerging Market in low energy lighting for power semiconductors



Industrial & Infrastructure High Power Modules

High Power motor drivers



### **CIS Market Segments and Trends**





### **End Market Diversification – Top Customers**

	Power	Radio Fre High Perform	equency / nance Analog	CMOS Image Sensors	<b>Others</b> (A&D, Mixed-Signal, Sensors, Embedded Memory, ESD etc.)
	28%	22% mobile	9% Infrastructure	16%	25%
Customer 1	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
Customer 2		$\checkmark$	$\checkmark$		
Customer 3	$\checkmark$		$\checkmark$		$\checkmark$
Customer 4	$\checkmark$				
Customer 5		$\checkmark$	$\checkmark$		$\checkmark$
Customer 6		$\checkmark$	$\checkmark$		
Customer 7	$\checkmark$			$\checkmark$	$\checkmark$
Customer 8	$\checkmark$		$\checkmark$		$\checkmark$
Customer 9					$\checkmark$
Customer 10	$\checkmark$				
Customer 11-15	$\checkmark$		$\checkmark$	$\checkmark$	$\checkmark$



### **Revenue Build**





# Foundry Landscape

(\$M)	2005		20	10	20	Accumulated Growth	
A	TSMC	8,217	TSMC	13,307	TSMC	26,439	222%
В	UMC	3,259	UMC	3,965	GlobalFoundries	4,990	341%
С	SMIC	1,171	GlobalFoundries	3,510	UMC	4,464	37%
D	PowerChip	1,587	PowerChip	2,424	SMIC	2,222	90%
E	Chartered	1,132	SMIC	1,555	PowerChip	1,268	-20%
1	Vanguard	353	TowerJazz	509	TowerJazz	961	842%
2	Dongbu	347	Vanguard	505	Vanguard	736	108%
3	HHNEC	313	Dongbu	495	Hua Hong Semi	650	108%
4	SSMC	280	SSMC	330	Dongbu HiTek	585	69%
5	He Jian	250	X-Fab	320	SSMC	460	64%
11	Tower	102					
Digital	Digital Deep Sub Micron The fastest growing foundry in the world						orld

Source: IC Insights, EE Times, Company Reports



			2014		2014	2015		2015	2016F		2016
2016F	2015		Sales	14/13 %	Share of	Sales	15/14 %	Share of	Sales	16/15 %	Share of
Rank	Rank	Company (Headquarters)	(\$M)	Change	Total	(\$M)	Change	Total	(\$M)	Change	Total
1	1	TSMC (Taiwan)	24,975	25%	<b>59%</b>	26,439	<b>6%</b>	<b>59%</b>	28,570	8%	58%
2	2	GlobalFoundries (U.S.)1	4,355	6%	10%	5,019	15%	11%	5,645	<b>12</b> %	11%
3	3	UMC Group (Taiwan)	4,331	<b>9%</b>	10%	4,464	3%	10%	4,490	1%	9%
4	4	SMIC (China)2	1,970	0%	5%	2,236	14%	<b>5</b> %	2,850	27%	6%
5	6	TowerJazz (Israel)	828	64%	<b>2%</b>	961	16%	<b>2</b> %	1,245	30%	3%
6	5	Powerchip (Taiwan)	1,291	9%	3%	1,268	<b>-2</b> %	3%	1,240	<b>-2</b> %	3%
7	7	Vanguard (Taiwan)	790	11%	2%	736	-7%	<b>2%</b>	780	6%	<b>2</b> %
8	8	Hua Hong Semi (China)	665	14%	2%	650	<b>-2</b> %	1%	700	8%	1%
9	9	Dongbu HiTek (S. Korea)3	541	20%	1%	593	10%	1%	640	8%	1%
10	10	SSMC (Singapore)	480	-3%	1%	474	-1%	1%	470	-1%	1%

Source: IC Insights, company reports

"TowerJazz is expected to grow from \$505 million in sales in 2013 to \$1,245 million in 2016 (a 35% CAGR)" (IC Insights, August update to 2016 McClean report)



### High Quality and Flexibility of Worldwide Manufacturing Capabilities





# **Analog vs. Digital : Main Differences**

	Digital Moore's Law Foundries	Specialty Analog Foundries
Capacity CapEx	High	Low
Technology CapEx	High	Low
Product Lifetime	Short	Long
Customer Engagement	Typically multi-source	Sole or limited source
Technology Differentiation	At leading edge only	Across process technologies
Segment Sizes	Large	High value specialty through mid-size
Process Technologies	CMOS	CIS, SiGe, BCD, BiCMOS, MEMS
Technology Nodes	65nm-16nm 10nm prototyping	350nm-65nm – SPECIALTY
	High speed data crunching and heavy storage	Real world interfacing to digital world



### **Strategy Behind M&As**

### 1. Increase Served Market

- Acquire new technologies w/ established customer base
- Acquire new technologies which serves existing base

### 2. Increase Operational Capacity

- Acquiring capacity at substantial lower cost than organic growth

### 3. Create Geographic Alignment

- Improved customer alignment through local manufacturing (e.g. JDP execution)
- Operational optimization and reduced customer risk through flow cross qualification



# TowerJazz M&A Model for Advanced Analog Capacity at Minimal Cost and Minimal Risk

- Acquire existing factories from system or device maker companies with
  - Long term loading agreements to cover first multiple years running costs
  - Available capacity for incremental business from day one
  - Employee base and expertise within our defined strategic core analog capabilities

### TowerJazz Announces Completion and Kick-off of its Joint Venture with Panasonic Corporation

Joint Venture to include three Semiconductor Factories in Japan, Manufacturing of Panasonic and Additional Products

April 1, 2014

TowerJazz Completes Acquisition of Maxim's Fabrication Facility in San Antonio, Texas

Acquisition to expand TowerJazz's worldwide manufacturing capacity and capabilities; Supporting Company's excess customer demand

February 2, 2016



### **Industry Consolidations**

- To date, the major consolidations have opened up greater opportunities for us because we were a trusted supplier of either the acquiring or the acquired company or both
- Examples of consolidations with TowerJazz press released relationships (there are additional):





# Main Financial Targets and Focus – 2016 financial targets

	<b>Target</b> (announced in Q1'16)	Status
Margins improvement: Higher margin mix – supported by cross qualification and offloading activities	Operating margin from 8% for FY 2015 to double digit throughout 2016 with H2>H1	On track – Q3'16 at 15%
	TPSCo 3 <sup>rd</sup> party ramp to reach \$25M by Q4'16	On track
Net profit continuous increase- realization of capacity increase	Maintain and grow positive net profit	22 25 35 40
Free cash flow state of mind	Growing free cash flow	20 27 31.5 Q4'15 Q1'16 Q2'16 Q3'16



# **Present Capacity Financial Model**

\$ <b>M</b>	Q3'16 Annualized	Incremental Model	Total	
Revenue	1,305	295	1,600	From current run rate to \$1.6B annual run revenue from existing capacity
Gross Profit	324	165	489	
R&D	62	5	67	
SG&A	67	0	67	
EBITDA	387	160	547	
Net Profit	160	101	261	After taxes and TPSCo minority; Q3 Net Profit e recorded in tax line and other income line
Cash from operations	344	121	465	
Cap-Ex	168	0	168	Q3'16 Annualized Cap-Ex assumes sustainable \$42M/Q, excluding customer pre-payment fun
FCF	176	121	297	FCF = Cash from operations less Cap-Ex



### **Corporate Financial Targets and Focus**

#### Gross margin and Operating Profit Increase

- ASP increase through improved mix
- Optimized cost structure
- Cross qualification actions between fabs which experience excess demand to other manufacturing facilities with available capacity

#### Reduce Op-Ex percentage from revenues

- Existing R&D and SG&A structure can support \$1.6B organization
- Maximize global strength with worldwide synergies of support & other functions
- Execute saving measures and improve efficiency

### Free Cash Flow, Cash From Operations and Net Profit Growth

- Execute all the above
- Existing Cap-Ex structure can support \$1.6B organization
- Invest in Cap-Ex for growth only upon:
  - Proof of mid to short term ROI
  - Cross qualification products manufactured between fabs



### **Major Milestones**





Continuing Company's proven successful business model driving analog leadership with <u>low cost capacity expansion</u> resulting in growing revenue (35% CAGR since 2013) with proportional growth in margins, profit and free cash flow, focusing on shareholder value.



### Well Positioned for Maximized and Continued Growth

- Gaining market share and leading position in growing markets:
  - RF SOI and SiGe for wireless smartphone, IoT, and data networks
  - CMOS Image Sensor and 3D Gesturing
  - Power management and conversion
- Strong available capacity against a model where predominantly all fixed costs are already absorbed

### **Driving Strong Financial Performance**

- Q4'16 annualized mid-range guidance of \$1.36B as compared to \$961M in 2015
- Sustainable business and financial model for margins and net profit growth
- Strong balance sheet and financial ratios
- Free cash flow growth



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