TOWERJaZZ

The Global Specialty Foundry Leader
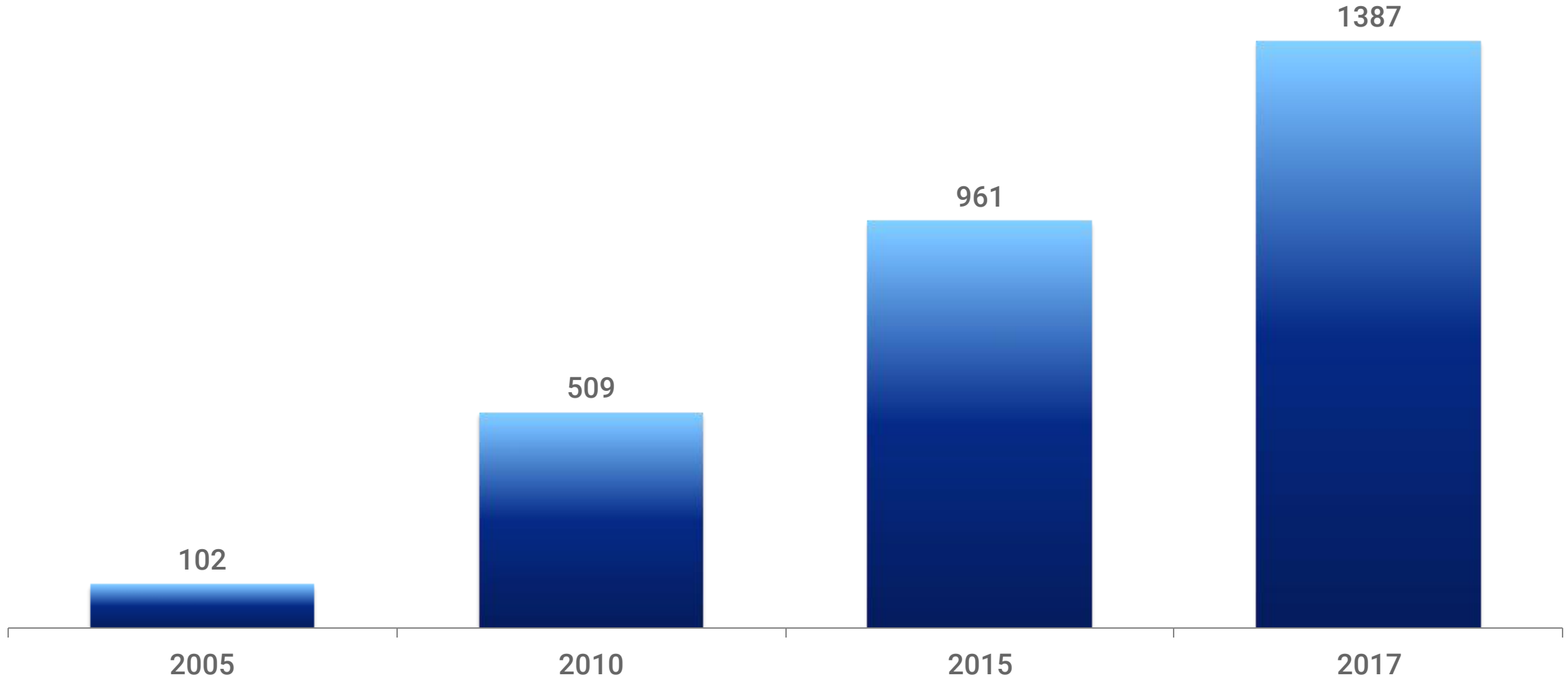
Driving Value Creation

June 2018

TowerJazz: The Global Specialty Foundry Leader | Full Circle Value Creation

Proof of Value Creation

Proven Analog Business Model
Fastest growing foundry in the world with proportional growth in all financial metrics.

Necessary

Technology Leadership
Wide range of advanced and differentiated specialty analog offerings.

Strong Market Support

Customer Partner "Youthful Mind"

Market Leadership
Well positioned in the fastest growing markets with long term customer relationships and roadmap alignment.

Sufficient

Annual Revenues $M - 5-year tracking till today

Bar chart of annual revenues ($M):
- 2005: 102
- 2010: 509
- 2015: 961
- 2017: 1387

TOWERJaZZ
The Global Specialty Foundry Leader

Market Mega Trends
Resulting in rapid growth in specialty analog applications

| **Wireless Everything** | **Green Everything** | **Smart Everything** |
| Seamless Connectivity | Energy Efficiency | Interactive Smart Systems |

Radio Frequency and
High Precision Analog

~30%

of corporate revenues

Power

~30%

of corporate revenues

Sensors

~15%

of corporate revenues

TOWERJAZZ
The Global Specialty Foundry Leader

RF HPA Enabled Markets and Technology

Wireless Front-Ends
SiGe and RF SOI

Wireline Optical and mmWave
HP SiGe and Si Photonics

TOWERJazz
The Global Specialty Foundry Leader

TowerJazz Addressed CIS Markets

Automotive	Industrial / Machine Vision	Medical	High end photography and Cinematography	3D, Gesture control, AR/VR	Security

ADAS and Autonomous driving	2D barcode reader Traffic control Industrial QA Food automation	Intra-oral Extra Oral Mammography Surgery C-Arm and Flouro	Cinematography High end DSLR Mirror less (ILC)	Gesture control Augmented Reality Virtual Reality	City safety Borders camera House safety

Automotive, Industrial, Security and Medical Total CIS Content Expected to Double 2016 to 2020*

TOWERJAZZ
The Global Specialty Foundry Leader

Power Management : Serving IC and Discrete Markets

Largest of all Specialty Markets (>$28B in 2017 with 8% CAGR)*

Computers & Servers

Consumer

Automotive

Industrial

* source: Yole Development 2017

A song that greatly impacted my life and relevance to TowerJazz

- Tapestry (1972, Carole King)
  - When I was 17 years old; The lyrics touched me deeply, "How do I create a tapestry of my life?"

"My life has been a tapestry of rich and royal hue,

An everlasting vision of the ever-changing view

A wondrous woven magic in bits of blue and gold

A tapestry to feel and see, impossible to hold."

A song that greatly impacted my life and relevance to TowerJazz

- Some additional thoughts:

  - No single beautiful line or few lines of thread make a beautiful tapestry => a beautiful tapestry is based upon consistently adding beautiful lines

  - A very poorly done line can totally distract and or destroy the tapestry

  - Hence – if a serious mistake is made – it must be found immediately and corrected
    - It's ok to make mistakes (but correct them fast)

  - If you wait too much time – everything from the point of mistake onwards – must be ripped out of the tapestry

Worldwide Manufacturing Facilities

Global capacity assurance and flexibility; all major flows are cross qualified at multiple sites

Migdal HaEmek, Israel

6", 150mm
CMOS, CIS, Power/ Discrete

Migdal HaEmek, Israel

8", 200mm
CMOS, CIS, Power/ Discrete, MEMS

Newport Beach, USA

8", 200mm
CMOS, CIS, MEMS, RF Analog

San Antonio, USA

8", 200mm
Power, RF Analog

Tonami, Japan

8", 200mm
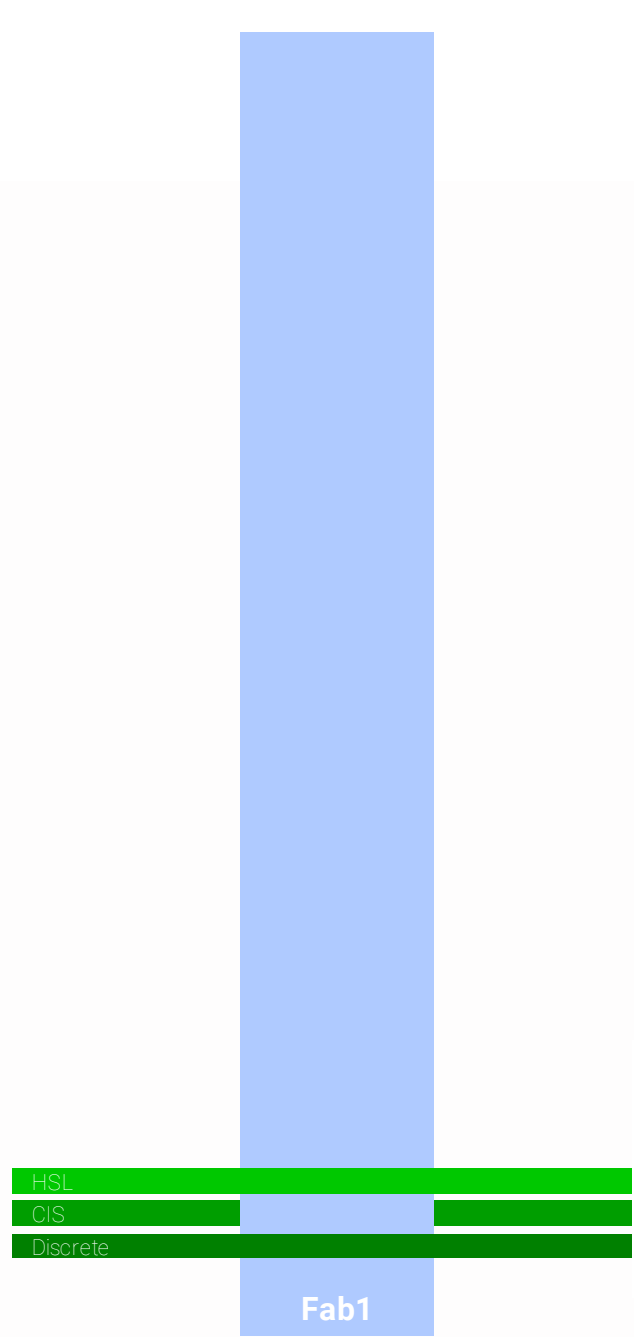Power/ Discrete, NVM, CCD

Arai, Japan

8", 200mm
Analog, CIS

Uozu, Japan

12", 300mm
CMOS, CIS, RF, Power

TOWERJAZZ
The Global Specialty Foundry Leader
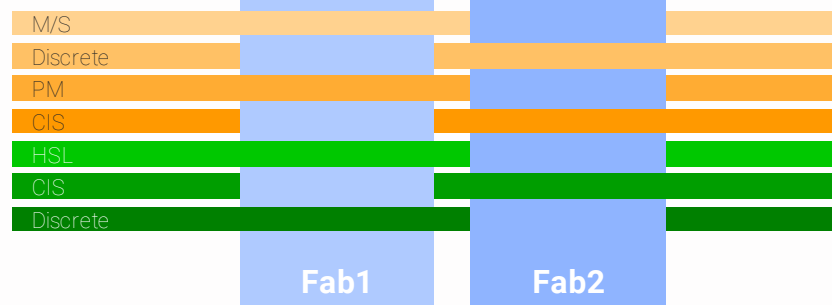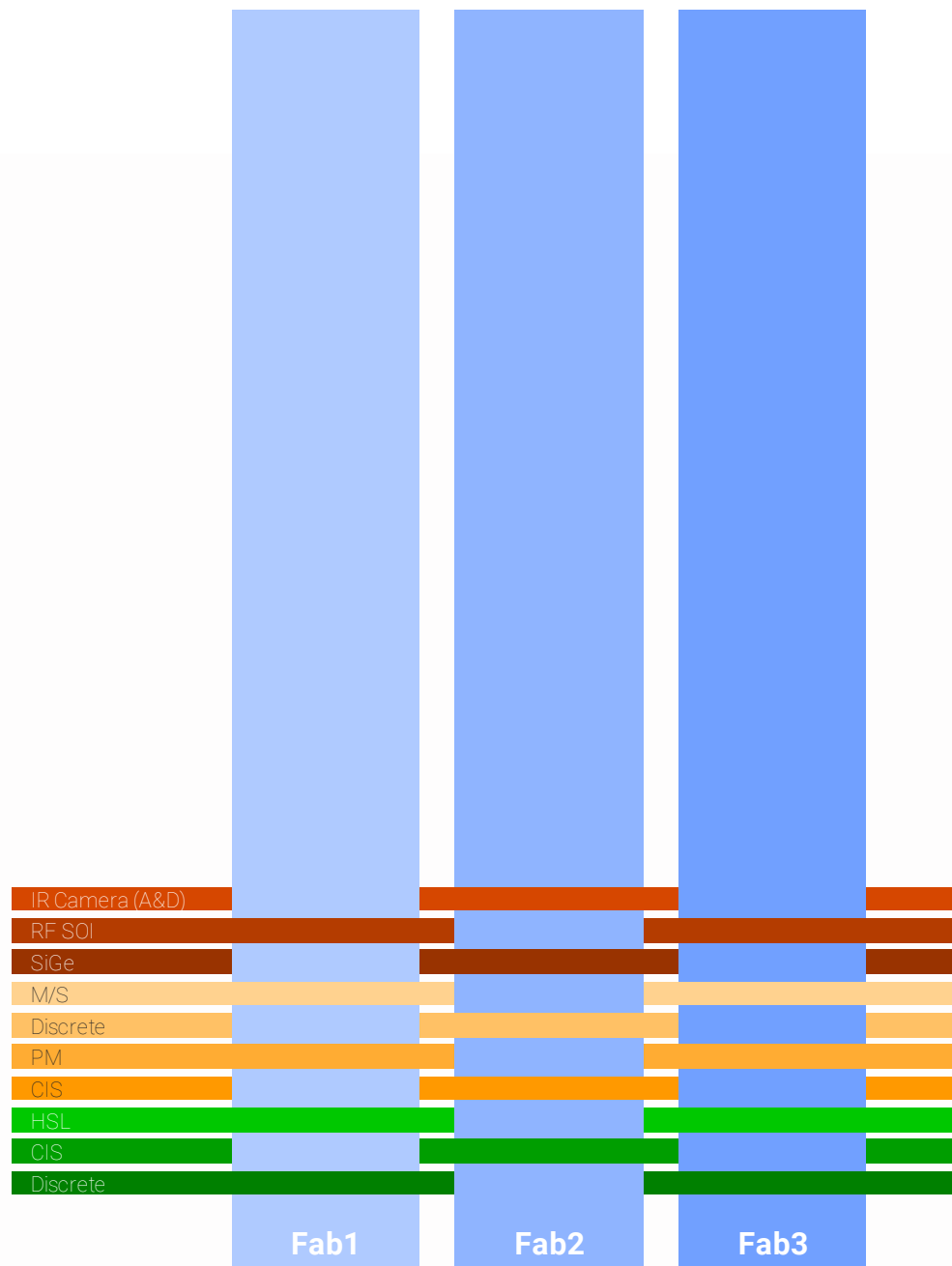
- 6" facility, built in 1983 in Migdal Haemek, Israel

- Main products: power discrete, analog switch gates and some Image Sensors

- Still running at 90% utilization – benefit of analog business model

HSL

CIS

Discrete

Fab1

TOWERJAZZ
The Global Specialty Foundry Leader

- 8" facility, in Migdal Haemek, Israel

- Main products:
  - Industrial and x-ray image sensors, cinematography
  - RF SOI
  - Power Management
  - Power Discrete
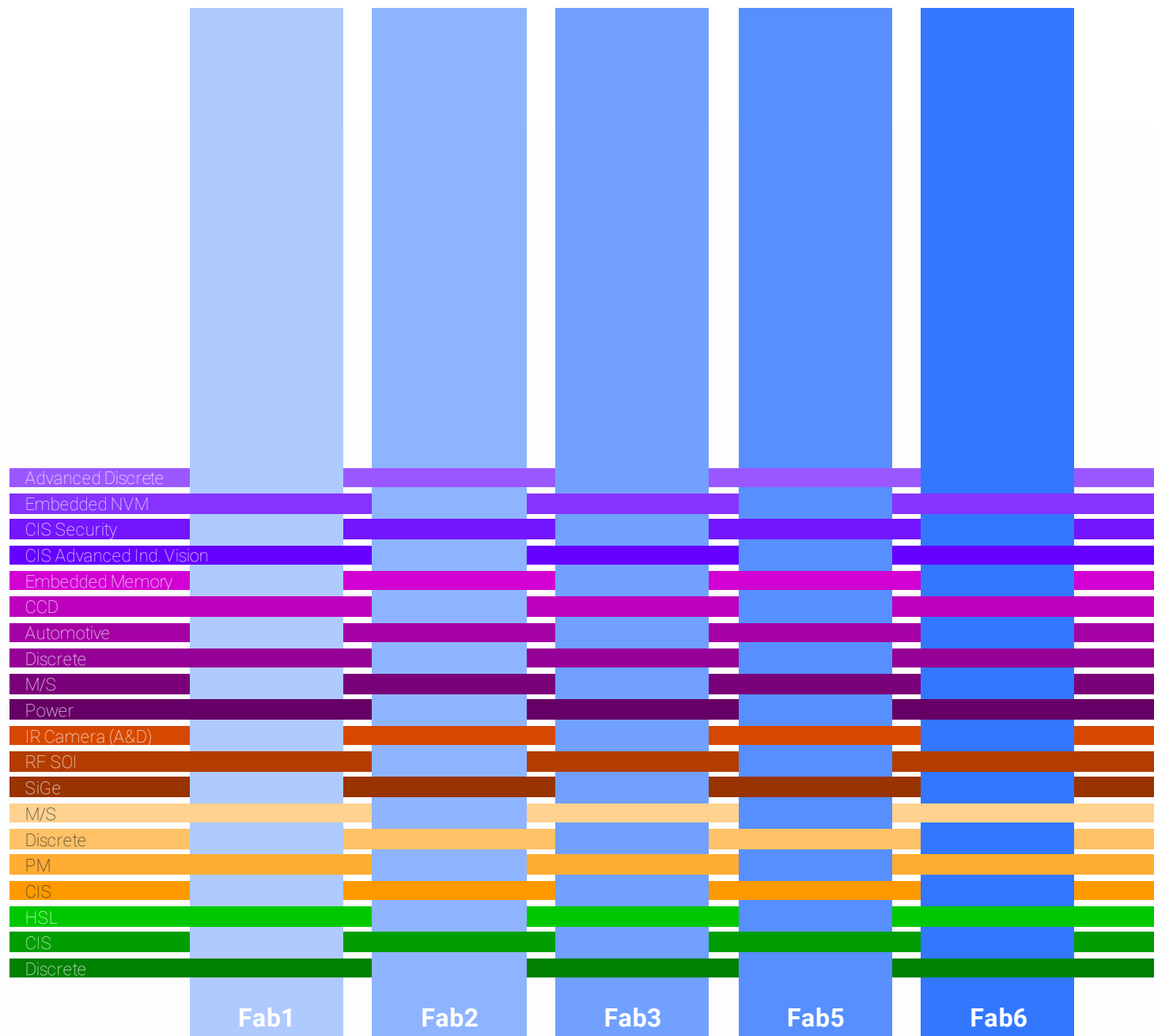 - Transient voltage suppression (TVS)

To note: there is vertical revenue growth as well – Fab2 has increased 10X in revenue over past 12 years by having rich customer aligned product roadmap offerings

M/S

Discrete

PM

CIS

HSL

CIS

Discrete

Fab1   **Fab2**

TOWERJAZZ
*The Global Specialty Foundry Leader*

- 8" facility, in Newport Beach, CA

- Main products:
  - RF SOI switches, LNAs and PA controllers
  - SiGe PAs
  - SiGe wireline optical and mmWave
  - IR cameras
  - Various A&D and ITAR restricted A&D

**To note:** there is vertical revenue growth as well – Fab3 has more than doubled in revenue since 2008 acquisition

IR Camera (A&D)
RF SOI
SiGe
M/S
Discrete
PM
CIS
HSL
CIS
Discrete

Fab1   Fab2   Fab3

TOWERJAZZ
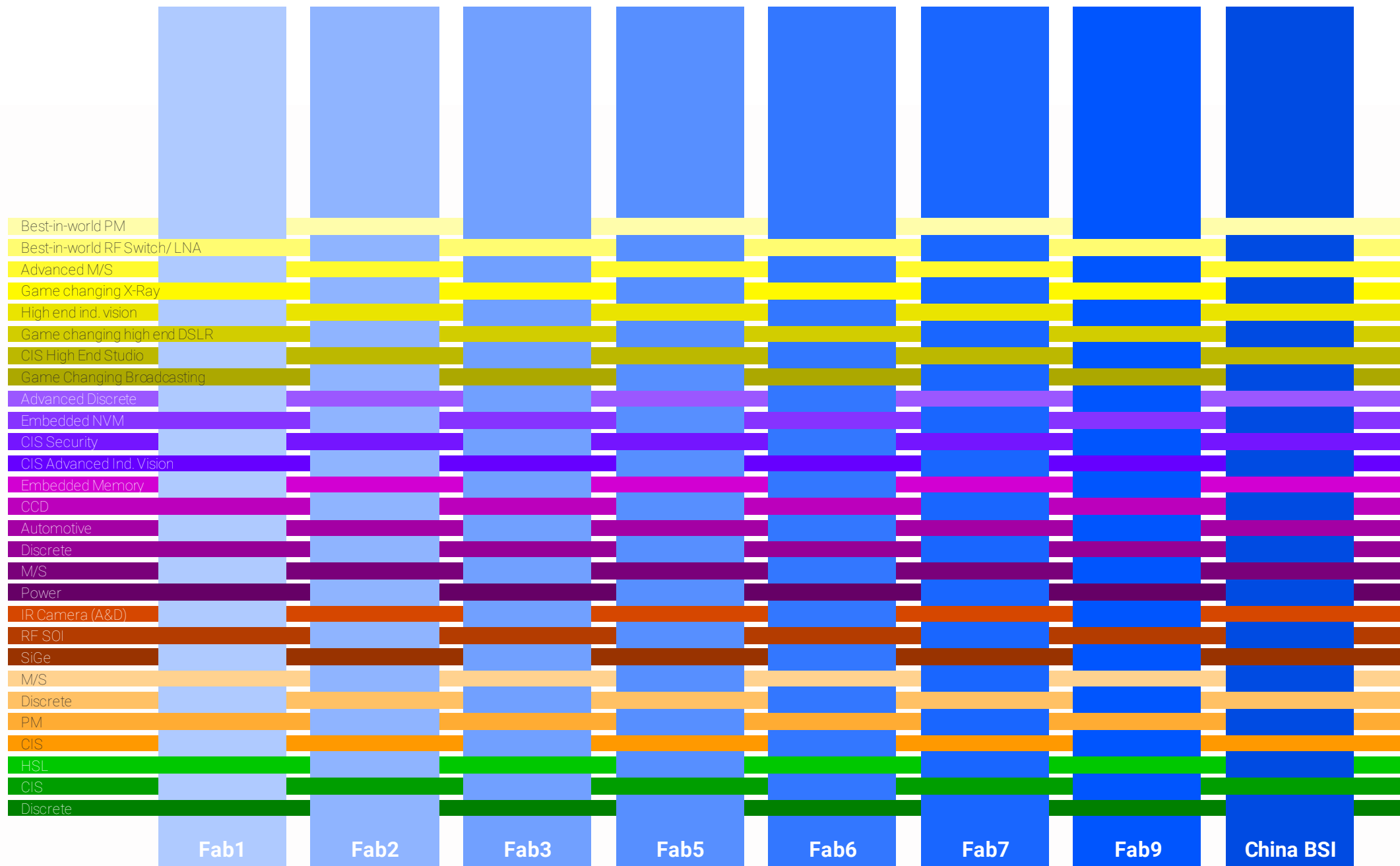The Global Specialty Foundry Leader

- 8" facilities, in Tonami and Arai, Japan

- Main products:
  - Additional capacity for Power Management/ Mixed-Signal growth beyond Fab2
  - Big automotive portfolio
  - Power discrete
  - CCD Camera
  - Embedded memory
  - CIS security camera and most advanced industrial vision
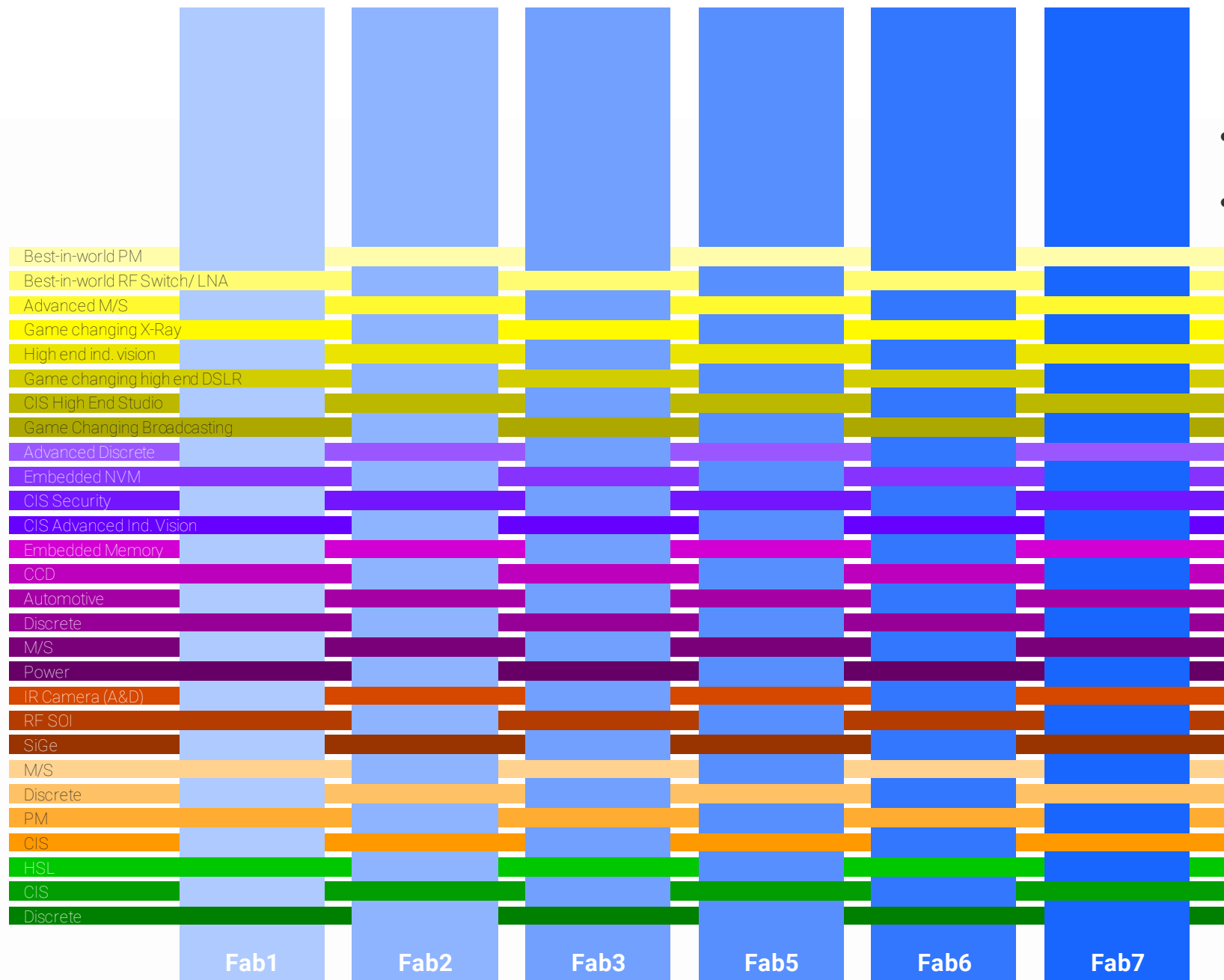
- 12" facility, in Uozu, Japan
- Main products:
  - Extension of present roadmap
    - 65nm RF SOI/ LNA
    - High end studio camera
    - Advanced mixed-signal
  - New served markets:
    - 65nm best-in-world power 5-16V BCD
    - Game changing CIS x-ray
    - Game changing high-end DSLR
    - Game changing broadcast camera
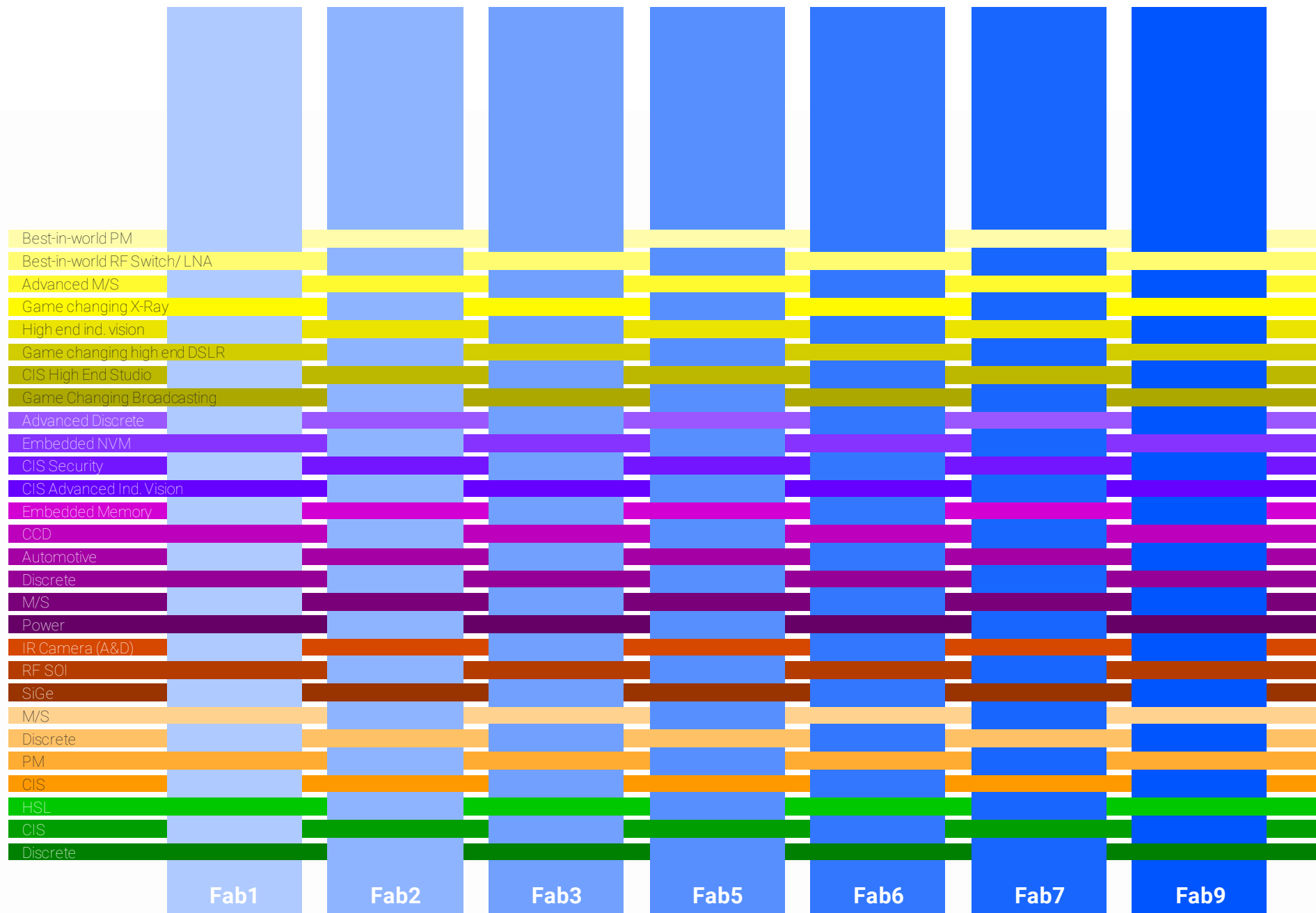
- 8" facility, in San Antonio, Texas
- Main products:
  - Long term automotive power contract
  - Capacity for power discrete, RF and power management

Best-in-world PM
Best-in-world RF Switch/ LNA
Advanced M/S
Game changing X-Ray
High end ind. vision
Game changing high end DSLR
CIS High End Studio
Game Changing Broadcasting
Advanced Discrete
Embedded NVM
CIS Security
CIS Advanced Ind. Vision
Embedded Memory
CCD
Automotive
Discrete
M/S
Power
IR Camera (A&D)
RF SOI
SiGe
M/S
Discrete
PM
CIS
HSL
CIS
Discrete

Fab1 Fab2 Fab3 Fab5 Fab6 Fab7 Fab9

16

TOWERJAZZ
The Global Specialty Foundry Leader

	Fab1	Fab2	Fab3	Fab5	Fab6	Fab7	Fab9	China BSI
Best-in-world PM								
Best-in-world RF Switch/ LNA								
Advanced M/S								
Game changing X-Ray								
High end ind. vision								
Game changing high end DSLR								
CIS High End Studio								
Game Changing Broadcasting								
Advanced Discrete								
Embedded NVM								
CIS Security								
CIS Advanced Ind. Vision								
Embedded Memory								
CCD								
Automotive								
Discrete								
M/S								
Power								
IR Camera (A&D)								
RF SOI								
SiGe								
M/S								
Discrete								
PM								
CIS								
HSL								
CIS								
Discrete								

17

TOWERJAZZ
The Global Specialty Foundry Leader

New Superordinate "Mega" Trends

What is coming next...
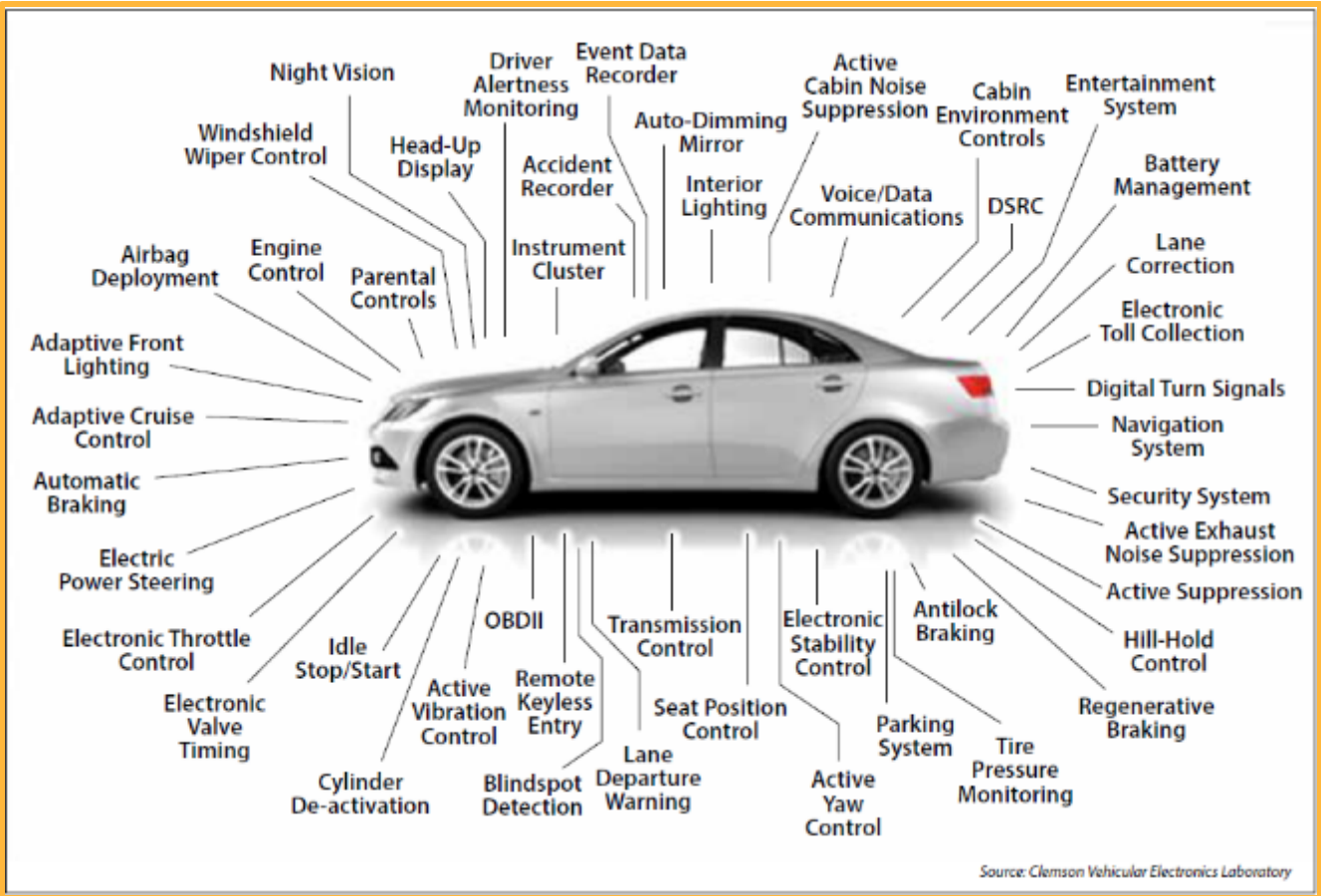
Automotive & Autonomous Driving

The Sensor Fusion Experience

Digitization of the automobile is driving rapid growth in electronic content
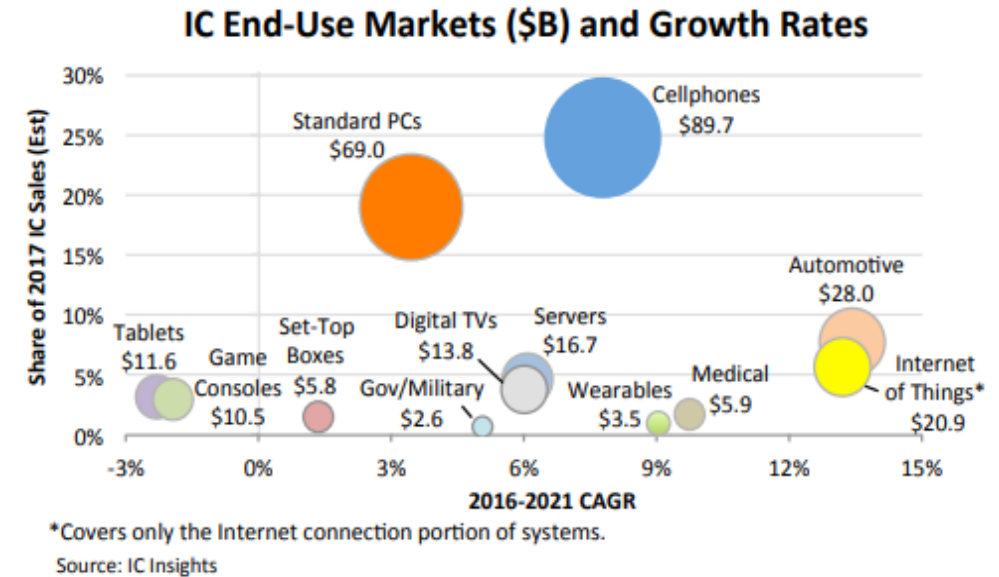
Electronics as % of Cost in an Automobile
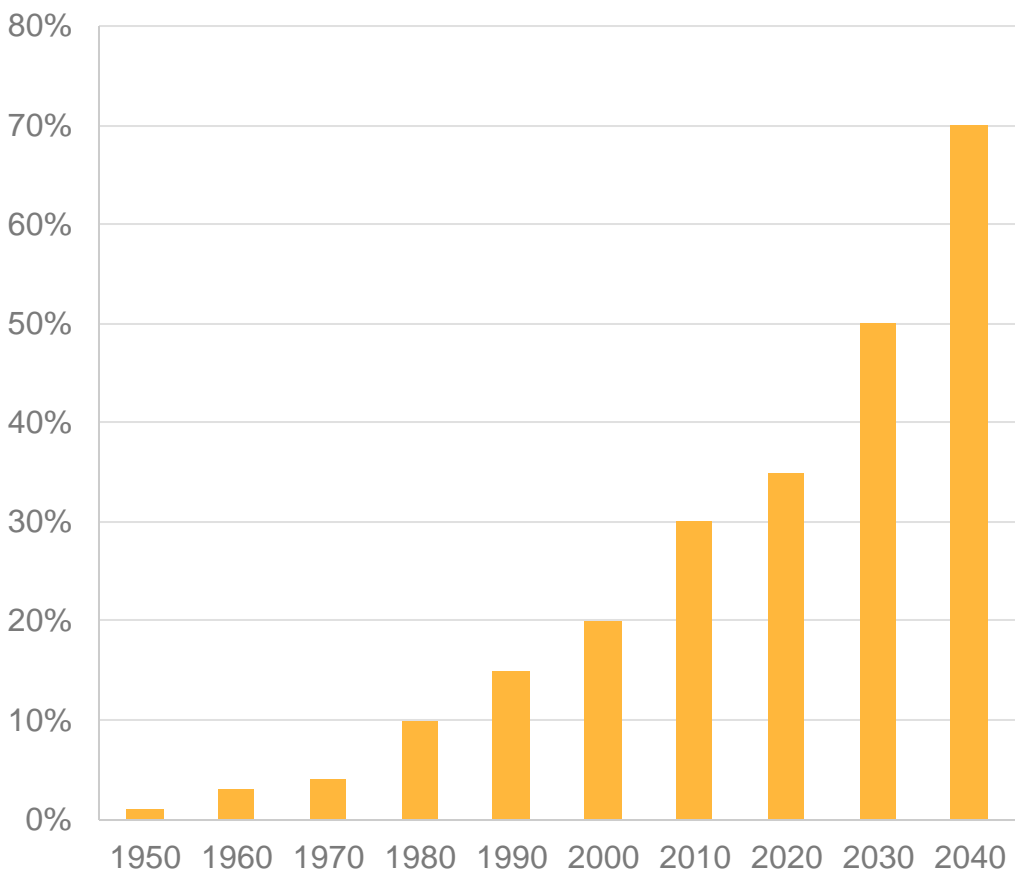
Automotive Electronics Systems

Source: Clemson Vehicular Electronics Laboratory

TOWERJAZZ
The Global Specialty Foundry Leader

Automotive Market Focus

- Automotive is the **fastest growing** and the **third largest** end-use IC market

- Nearly **70%** of Automotive IC content is **Analog,** well **aligned to TowerJazz** Specialty Analog technologies

  - **Power** for EV/Hybrid battery management

  - **RF** for connectivity and Radar (Example: Denso/Toyota partnership announced)

  - **Sensors** for ADAS (Example: FLIR IR night vision partnership announced)

IC End-Use Markets ($B) and Growth Rates

Share of 2017 IC Sales (Est) vs 2016-2021 CAGR

- Cellphones $89.7
- Standard PCs $69.0
- Automotive $28.0
- Internet of Things* $20.9
- Servers $16.7
- Digital TVs $13.8
- Tablets $11.6
- Game Consoles $10.5
- Medical $5.9
- Set-Top Boxes $5.8
- Wearables $3.5
- Gov/Military $2.6

*Covers only the Internet connection portion of systems.

Source: IC Insights

Autonomous and Advanced Driver Assistance Systems (ADAS)

360° coverage required | 6-8 cameras per car | VGA moving to HD | High Dynamic Range | Near IR vision | LIDAR for accurate ranging

"TowerJazz's leading SiGe technology enabled us to create the collision avoidance system which is our flagship offering. TowerJazz's advanced process enabled the engineers to fully achieve the challenging specs required for next generation short range radar (SRR) for automotive applications. This solution allows DENSO to be a world leader in supplying collision avoidance systems for automotive safety." (Denso, Director, Advanced Safety Engineering)

Long-Range Radar
LIDAR
Camera
Short-/Medium Range Radar
Ultrasound
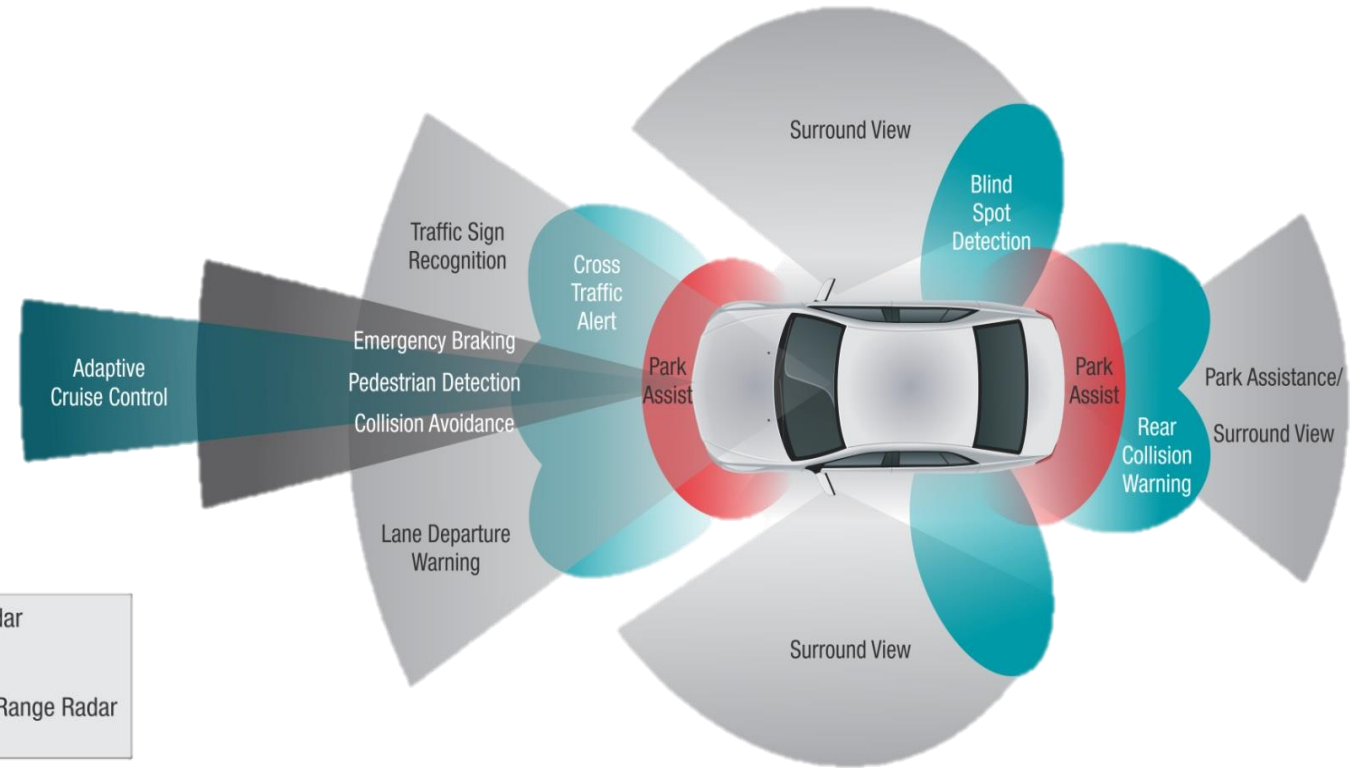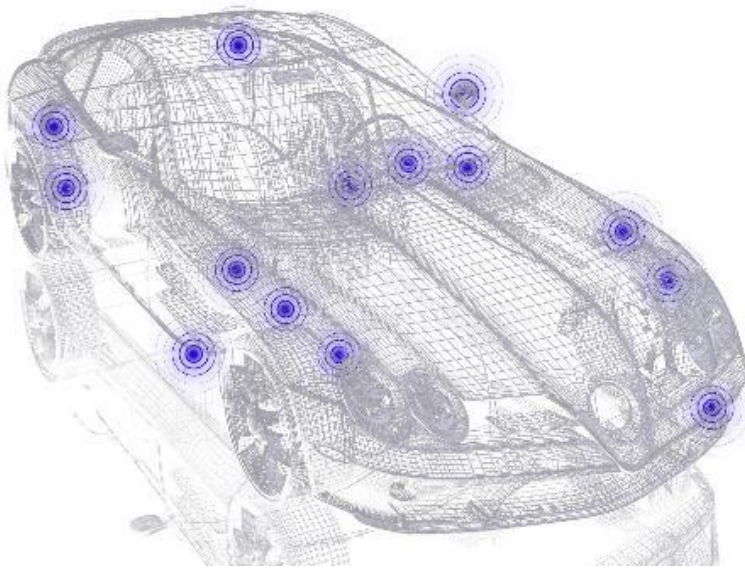
"We chose TowerJazz for its advanced pixel technology, specially customized for our CMOS image sensor chips addressing very high volume markets. Together with our technology, we were able to demonstrate a 4X better sensitivity to our customers. TowerJazz's CIS offering is proven in the industry and we are pleased to manufacture locally in Israel with a leader in the global analog foundry space." (Newsight Imaging, CEO).

Artificial Intelligence
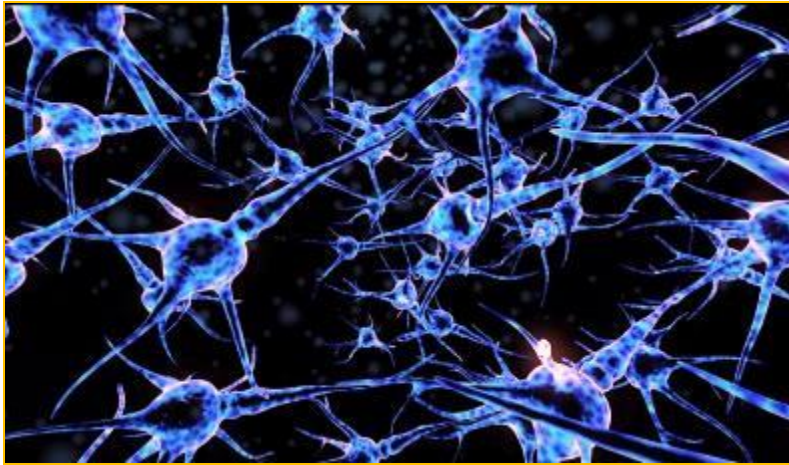Experiencing the
World Differently

Artificial intelligence market revenue worldwide 2016-2025 $M
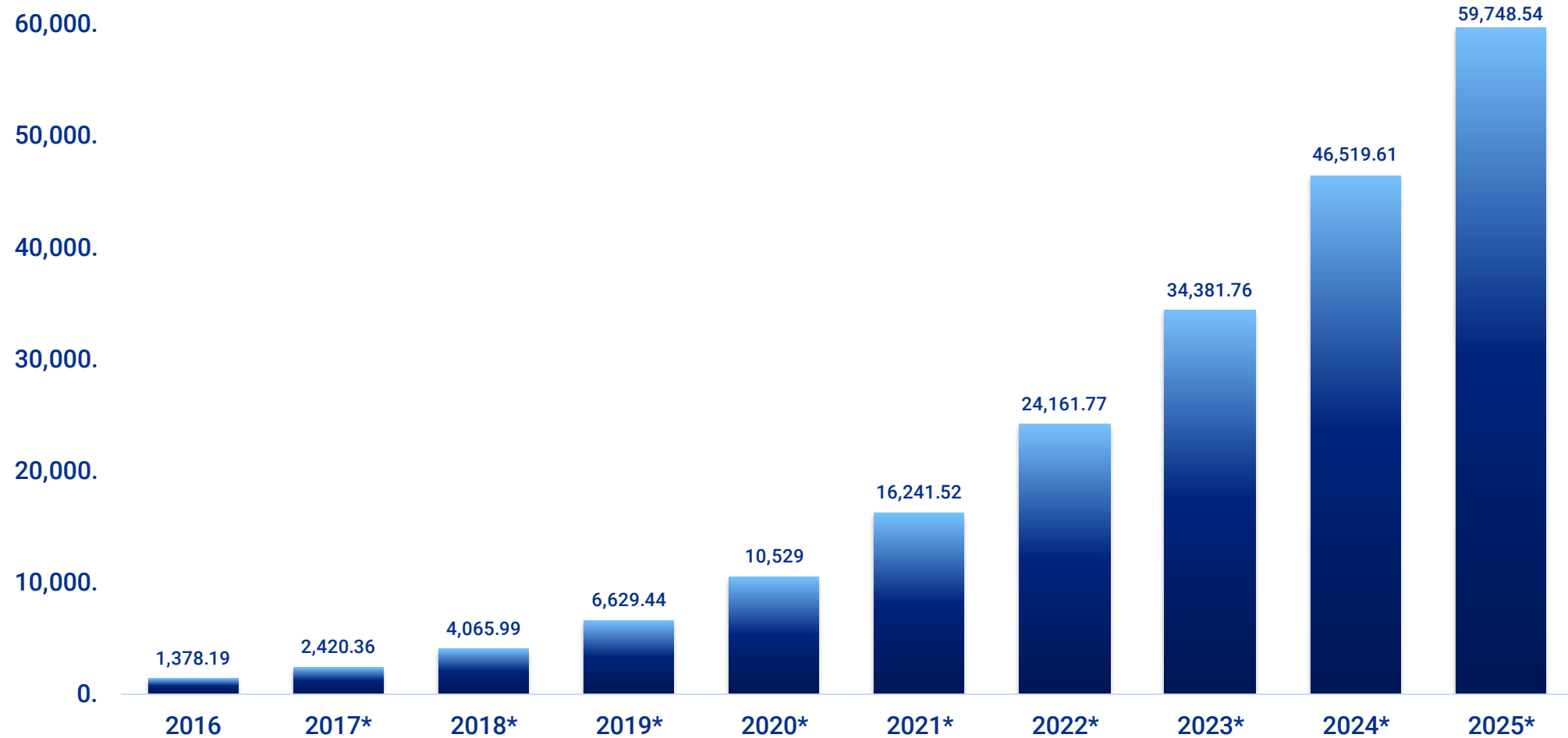
Source: Artificial Intelligence Market Forecasts, Tractica, September 2017

Analog Neural Network AI processor based on CIS pixels as Neurons

Neuron is a mixed-signal device !
Axon is an analog device!

input layer   hidden layer 1   hidden layer 2   output layer

x_0

w_0

axon from a neuron

synapse

$w_0 x_0$

dendrite

$w_1 x_1$

cell body

$\sum_i w_i x_i + b$ f

$f\left(\sum_i w_i x_i + b\right)$

output axon

activation function

$w_2 x_2$

TOWERJAZZ
The Global Specialty Foundry Leader
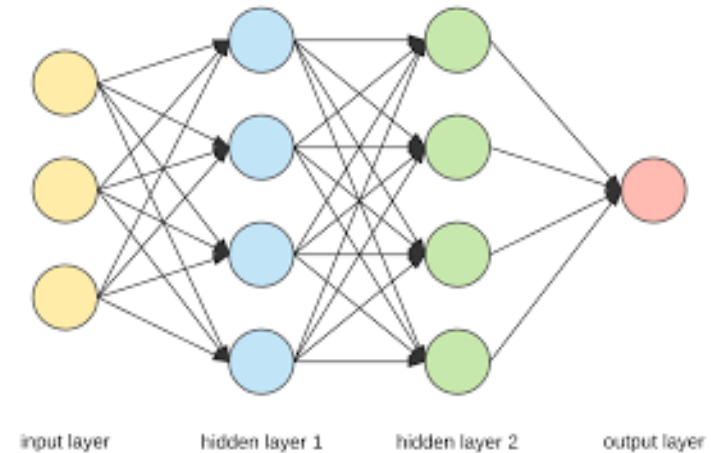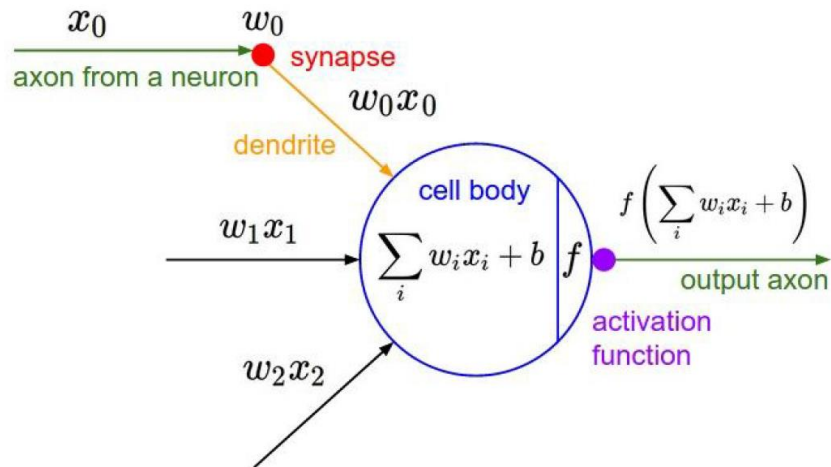
Augmented Reality & Virtual Reality
Creating Alternative Reality

AR and VR Worldwide Market Size 2016-2021 ($B)

8X growth
in the next 2 years

Market size in billion U.S. dollars

- 2016: 6.1
- 2017*: 9.4
- 2018**: 17.8
- 2020**: 143.3
- 2021**: 215

Source
IDC

Additional Information:
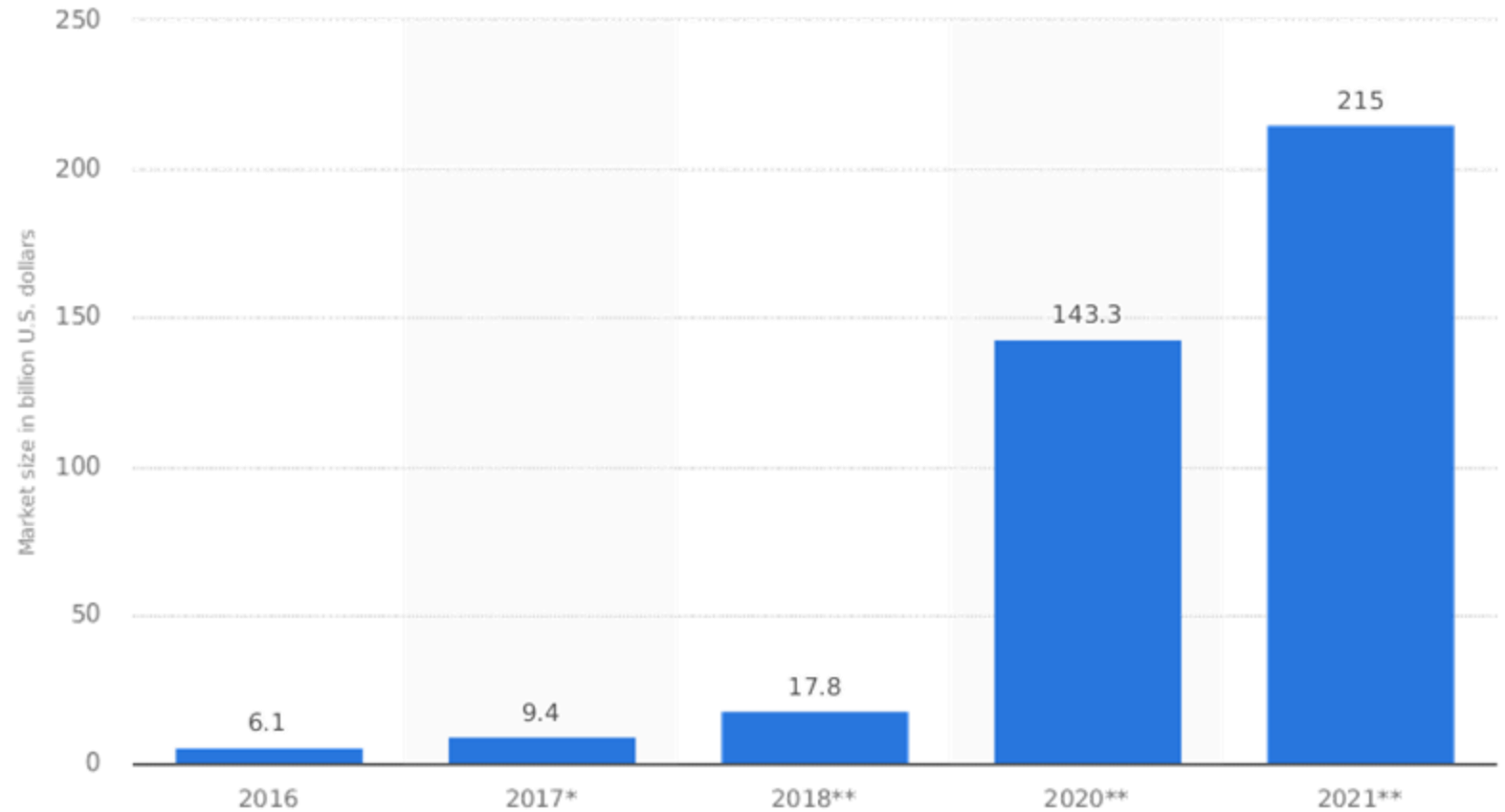Worldwide; IDC; November 2017

AR/VR − 3D ToF sensors and OLED on Silicon displays

Time of Flight Sensing

- Simple idea: measure the time it takes for light to return from the object

- Two detection mechanisms that trade off between speed and SNR
    - Active Gating: Ultrafast Global shutter technology for real-time imaging, but lower SNR
    - Single photon Avalanche diode (SPAD): Highest SNR but relatively slower due to "quenching" required

New Organic Served Markets

- AR/VR
- Analog AI
- Auto sensors fusion
- Disruptive magnetic sensor
- Novel integrated SiPho
- Novel market enabling switch technologies

Rows (left labels):
Disruptive magnetic sensor
Automotive sensor fusion
Novel integrated SiPho
Adv. Material switch
MEMS switch
Haptic and Gas Senso
Sensors "Fusion"
Analog AI
AR/VR
Best-in-world PM
Best-in-world RF Switch/ LNA
Advanced M/S
Game changing X-Ray
High end ind. vision
Game changing high end DSLR
CIS High End Studio
Game Changing Broadcasting
Advanced Discrete
Embedded NVM
CIS Security
CIS Advanced Ind. Vision
Embedded Memory
CCD
Automotive
Discrete
M/S
Power
IR Camera (A&D)
RF SOI
SiGe
M/S
Discrete
PM
CIS
HSL
CIS
Discrete

Columns: Fab1 Fab2 Fab3 Fab5 Fab6 Fab7 Fab9 China BSI

Optical Fiber Components Enabled by TowerJazz HP SiGe and Si Photonics

Disruptive magnetic sensor
Automotive sensor fusion
Novel integrated SiPho
Adv. Material switch
MEMS switch
Haptic and Gas Senso
Sensors "Fusion"
Analog AI
AR/VR
Best-in-world PM
Best-in-world RF Switch/ LNA
Advanced M/S
Game changing X-Ray
High end ind. vision
Game changing high end DSLR
CIS High End Studio
Game Changing Broadcasting
Advanced Discrete
Embedded NVM
CIS Security
CIS Advanced Ind. Vision
Embedded Memory
CCD
Automotive
Discrete
M/S
Power
IR Camera (A&D)
RF SOI
SiGe
M/S
Discrete
PM
CIS
HSL
CIS
Discrete

Fab1 Fab2 Fab3 Fab5 Fab6 Fab7 Fab9 China BSI M&A

31

TOWERJAZZ
The Global Specialty Foundry Leader

Partnerships and M&A Strategy

- **Increase Served Market and Technology Offering**

  - Acquire new technologies w/ established customer base

  - Acquire new technologies which serves existing base

  - Acquire existing foundry (manufacturing and business)

  - Green field predominantly funded by partners

- **Increase Operational Capacity and Flexibility**

  - Acquiring capacity at substantial lower cost than organic growth, coupled with long-term supply agreement

  - Green field, predominantly funded by partners

Target Acquisitions

High-end technology outside of present portfolio

Low cost, regional focused capacity expansion

Under-valued, high revenue asset acquisition

TOWERJazz
The Global Specialty Foundry Leader

Our Vision, Mission & Values

VISION

MISSION

VALUES

VISION

To be the world leader in specialty foundry solutions as measured by our customers, employees and investors.

MISSION

To bring to market specialty foundry solutions that provide unique value to our customers by attentively listening to and proactively providing for their needs, through attracting and retaining the best global talent to serve them.

VALUES

- Embrace a Customer Centric Mentality
- Foster a Culture Built on Mutual Trust and Respect
- Demand Quality and Excellence in Everything We Do
- Data Driven and Results Oriented
- Knowledge, Skills and Attitude, Focused on Collaboration and Innovation

TOWERJAZZ
The Global Specialty Foundry Leader

Foundry Landscape

($M)	2005		2010		2015		2017		2017/16 Change	Accumulated Change
1	TSMC	8,217	TSMC	13,307	TSMC	26,439	TSMC	32,163	9%	290%
2	UMC	3,259	UMC	3,965	GF	4,990	GF	6,060	10%	378%*
3	SMIC	1,171	GF	3,510	UMC	4,464	UMC	4,898	7%	50%
4	PowerChip	1,587	PowerChip	2,424	SMIC	2,222	SMIC	3,101	6%	165%
5	Chartered	1,132	SMIC	1,555	PowerChip	1,268	TowerJazz	1,387	11%	1258%
6	Vanguard	353	TowerJazz	509	TowerJazz	961	Powerchip	1,035**	19%	(35%)**
7	Dongbu	347	Vanguard	505	Vanguard	736	Vanguard	817	2%	131%
8	HHNEC	313	Dongbu	495	Hua Hong	650	Hua Hong	808	12%	158%
9	SSMC	280	SSMC	330	Dongbu	585	Dongbu	676	1.5%	95%
10	He Jian	250	X-Fab	320	SSMC	460	X-Fab	578	13%	179%
++	Tower	102								

Digital Deep Sub Micron

Specialty Analog

Highest Growth Foundry

TOWERJAZZ
The Global Specialty Foundry Leader

Annual Revenues $M

- Total revenue growth of 13.6X over 12 years
- Focus on quality growth, resulting in 2017:
    - Net profit of over $200M
    - EBITDA of over $400M
    - FCF of ~$200M

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Revenue	102	187	231	252	299	509	611	639	505	828	961	1,250	1,387

TOWERJAZZ
The Global Specialty Foundry Leader
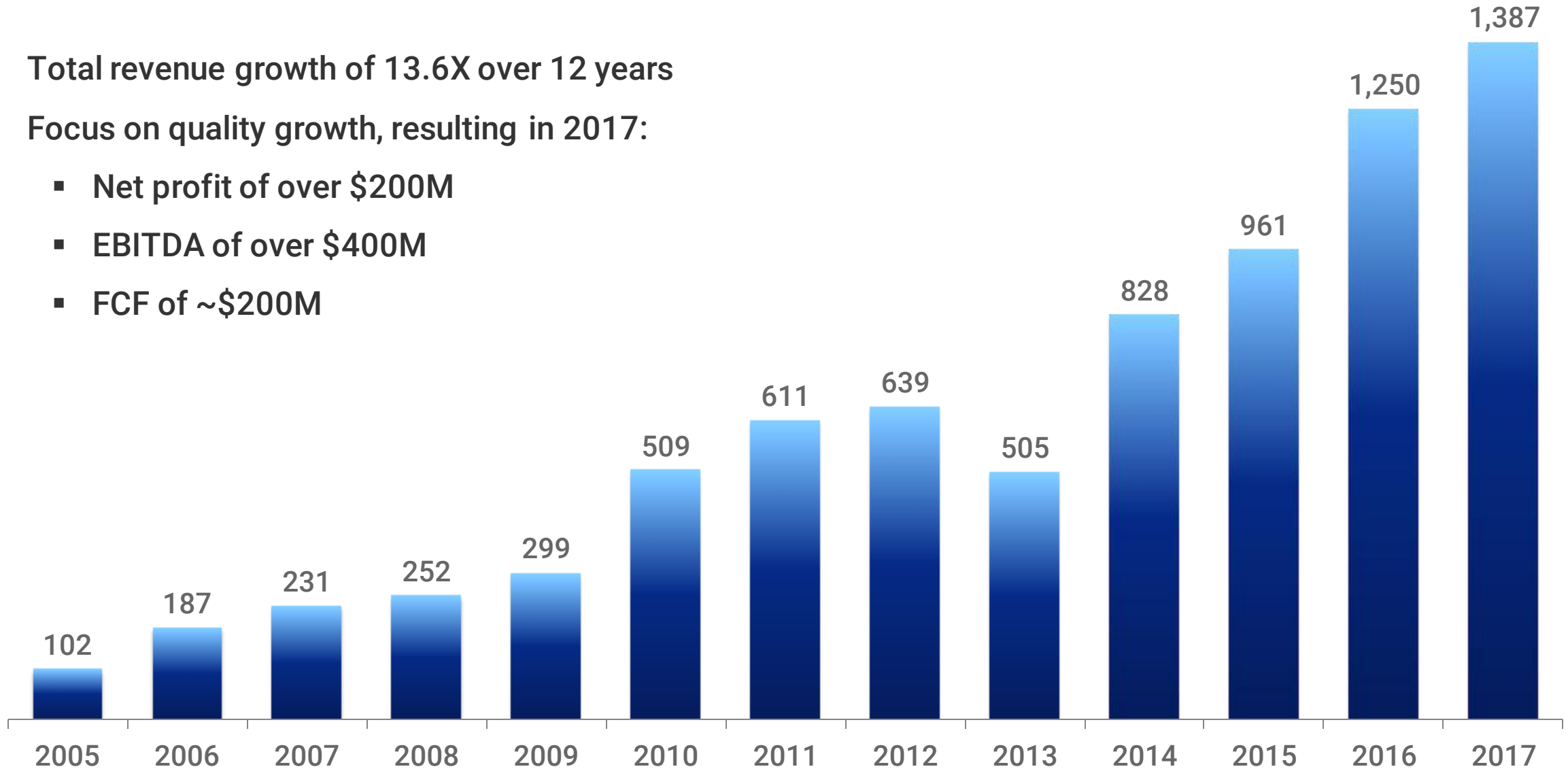
Annual Revenues $M - 5-year tracking till today

Our focus

- **Create value through customer partnership:**
  - Protecting and growing high-end share of presently served markets
    - Cost effective model for capacity acquisition
  - Organically increase into growing new served markets
  - Acquire technologies with capacity, to enter new served markets where organic development would not create ROI

Thank You

TOWERJaZZ

www.towerjazz.com

Contact us:
Noit Levy-Karoubi, VP Investor Relations, noitle@towersemi.com