Agenda

Time	Presentation	Speakers
9:00 a.m	**Introduction**	**Tait Sorensen**, Group Vice President, Investor Relations
	Welcome	**Carlo Bozotti**, President and Chief Executive Officer
	Business and Financial Roadmap	**Carlo Ferro**, Chief Financial Officer
	Technology and Manufacturing	**Jean-Marc Chery**, Chief Operating Officer
	Application Strategic Focus	**Georges Penalver**, Chief Strategy Officer
10:30 a.m.	**Break – Demos**	
10:50 a.m.	**Internet of Things:** **A key driver of growth**	**Claude Dardanne,** EVP, General Manager, MDG **Benedetto Vigna,** EVP, General Manager, AMG **Bob Krysiak**, EVP, Region Americas, Global Mass Market & OLM Programs
	Smart Driving: **ST leading the transformation**	**Marco Monti,** EVP, General Manager, ADG **Marco Cassis**, EVP, President, Region Asia Pacific **Paul Cihak,** EVP, General Manager, Sales and Marketing, EMEA
	Closing Remarks	**Carlo Bozotti**, President and Chief Executive Officer
12:10 p.m.	**Q&A Panel**	**C.Bozotti, C.Ferro, G.Penalver, J.M.Chery**
1:00 p.m.	**Lunch – Demos**	

Agenda – Breakout Sessions

	Room 1 (Library) **ADG** Automotive and Discrete Group	**Room 2** (Louis XVI B) **MDG** Microcontroller and Digital ICs Group	**Room 3** (Louis XVI A) **AMG** Analog and MEMS Group
2:00 p.m.	**Marco Monti** **Bob Krysiak**	**Claude Dardanne** **Marco Cassis**	**Benedetto Vigna** **Paul Cihak**
2:30 p.m.	**Marco Monti** **Paul Cihak**	**Claude Dardanne** **Bob Krysiak**	**Benedetto Vigna** **Marco Cassis**
3:00 p.m.	**Marco Monti** **Marco Cassis**	**Claude Dardanne** **Paul Cihak**	**Benedetto Vigna** **Bob Krysiak**
3:30 p.m.	**Reception**		

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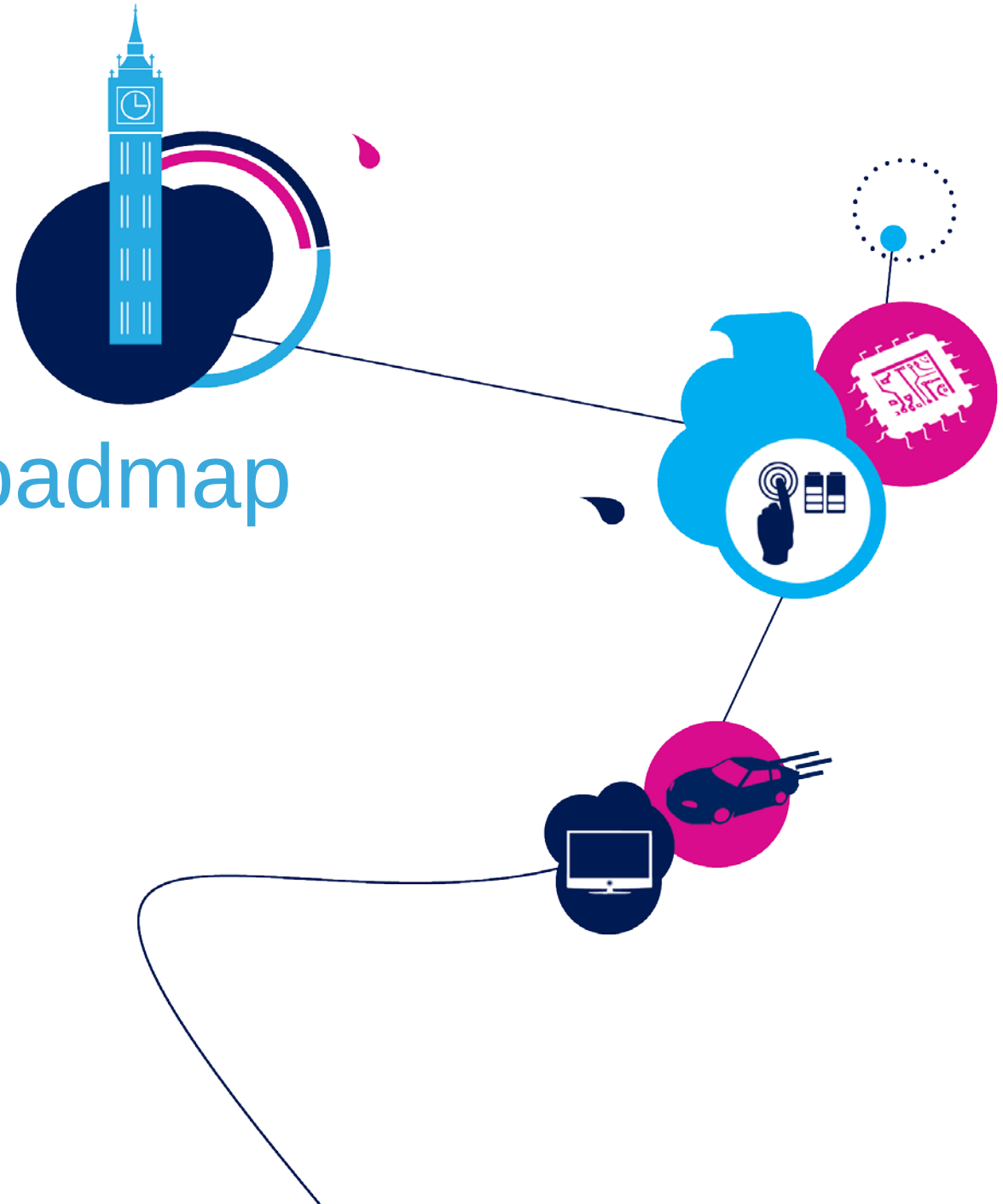
Forward Looking Statements

Some of the statements contained in this release that are not historical facts are statements of future expectations and other forward-looking statements (within the meaning of Section 27A of the Securities Act of 1933 or Section 21E of the Securities Exchange Act of 1934, each as amended) that are based on management's current views and assumptions, and are conditioned upon and also involve known and unknown risks and uncertainties that could cause actual results, performance, or events to differ materially from those anticipated by such statements, due to, among other factors:

- *Uncertain macro-economic and industry trends;*
- *Customer demand and acceptance for the products which we design, manufacture and sell;*
- *Unanticipated events or circumstances, which may either impact our ability to execute the planned reductions in our net operating expenses and / or meet the objectives of our R&D Programs, which benefit from public funding;*
- *Financial difficulties with any of our major distributors or significant curtailment of purchases by key customers;*
- *The loading, product mix, and manufacturing performance of our production facilities;*
- *The functionalities and performance of our IT systems, which support our critical operational activities including manufacturing, finance and sales, and any breaches of our IT systems or those of our customers or suppliers;*
- *Variations in the foreign exchange markets and, more particularly, the U.S. dollar exchange rate as compared to the Euro and the other major currencies we use for our operations;*
- *The impact of intellectual property ("IP") claims by our competitors or other third parties, and our ability to obtain required licenses on reasonable terms and conditions;*
- *The ability to successfully restructure underperforming business lines and associated restructuring charges and cost savings that differ in amount or timing from our estimates;*
- *Changes in our overall tax position as a result of changes in tax laws, the outcome of tax audits or changes in international tax treaties which may impact our results of operations as well as our ability to accurately estimate tax credits, benefits, deductions and provisions and to realize deferred tax assets;*
- *The outcome of ongoing litigation as well as the impact of any new litigation to which we may become a defendant;*
- *Product liability or warranty claims or recalls by our customers for products containing our parts;*
- *Natural events such as severe weather, earthquakes, tsunamis, volcano eruptions or other acts of nature, health risks and epidemics in locations where we, our customers or our suppliers operate;*
- *Changes in economic, social, labor, political, or infrastructure conditions in the locations where we, our customers, or our suppliers operate, including as a result of macro-economic or regional events, military conflict, social unrest, labor actions, or terrorist activities;*
- *Availability and costs of raw materials, utilities, third-party manufacturing services, or other supplies required by our operations.*

Such forward-looking statements are subject to various risks and uncertainties, which may cause actual results and performance of our business to differ materially and adversely from the forward-looking statements. Certain forward-looking statements can be identified by the use of forward looking terminology, such as "believes," "expects," "may," "are expected to," "should," "would be," "seeks" or "anticipates" or similar expressions or the negative thereof or other variations thereof or comparable terminology, or by discussions of strategy, plans or intentions.

Some of these risk factors are set forth and are discussed in more detail in "Item 3. Key Information — Risk Factors" included in our Annual Report on Form 20-F for the year ended December 31, 2015, as filed with the SEC on March 16, 2016. Should one or more of these risks or uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those described in this release as anticipated, believed, or expected. We do not intend, and do not assume any obligation, to update any industry information or forward-looking statements set forth in this release to reflect subsequent events or circumstances.



Business & Financial Roadmap

Carlo Ferro

Chief Financial Officer

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Who We Are

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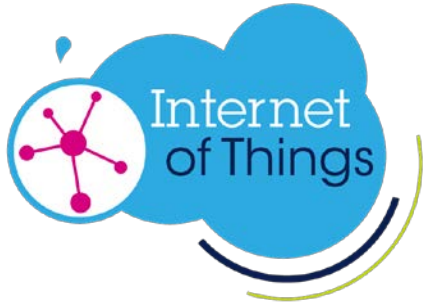
ST stands for life.augmented

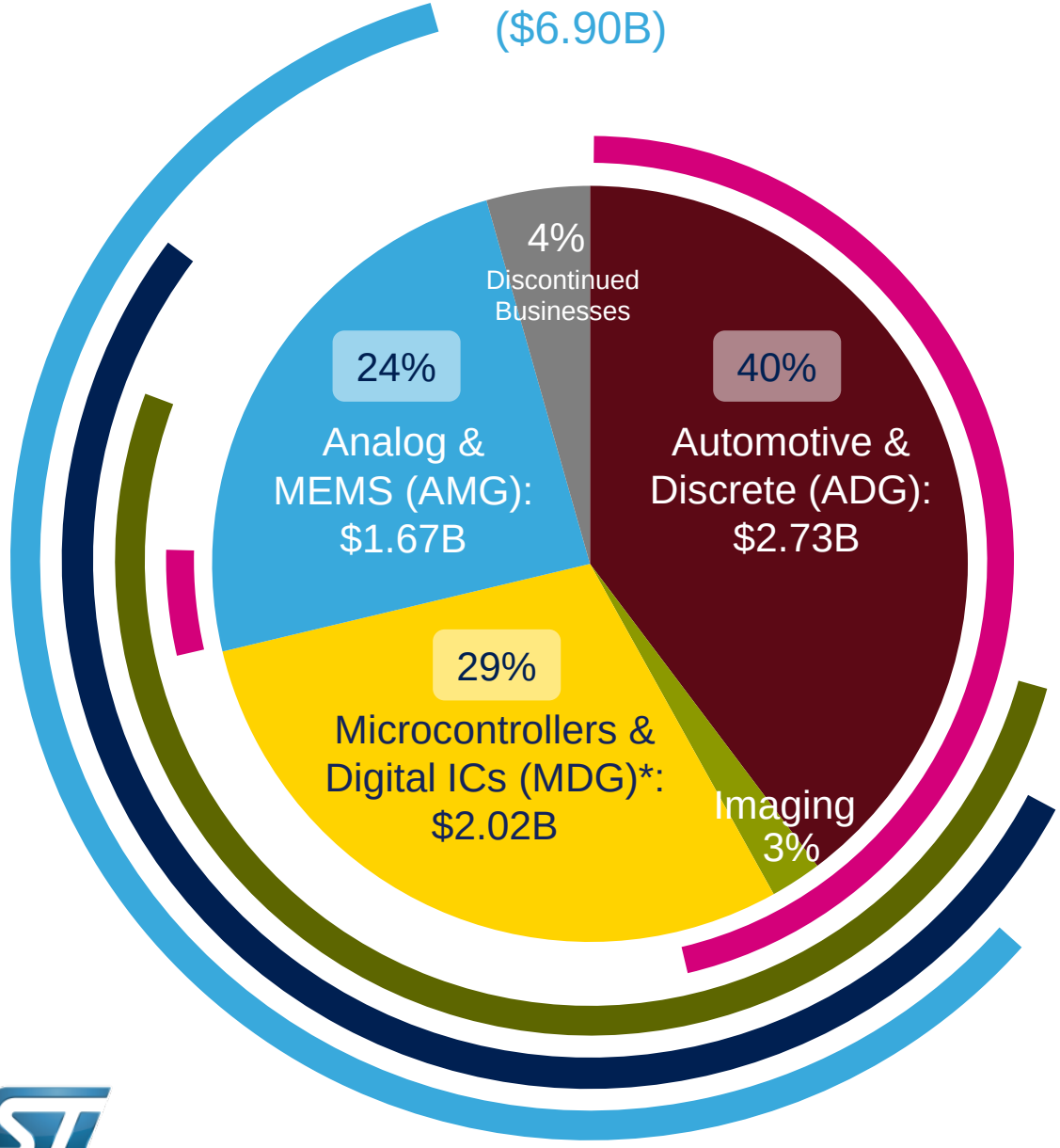
Everywhere microelectronics make a positive contribution to people's lives, ST is there



- A global semiconductor leader with an application strategic focus
- 2015 revenues of **$6.90B**
- Listed: NYSE, Euronext Paris and Borsa Italiana, Milan
- Approximately **43,200** employees worldwide
- Approximately **8,300** people working in R&D
- Portfolio of over **9,400** patent families
- **11** manufacturing (front and back-end) sites
- Over **75** sales & marketing offices

New Organization…

Aligned to Strategic Focus

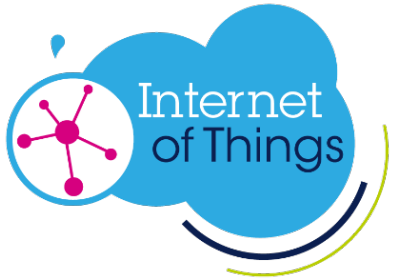


Smart Driving

Smart Industry

Smart Home & City

Smart Things



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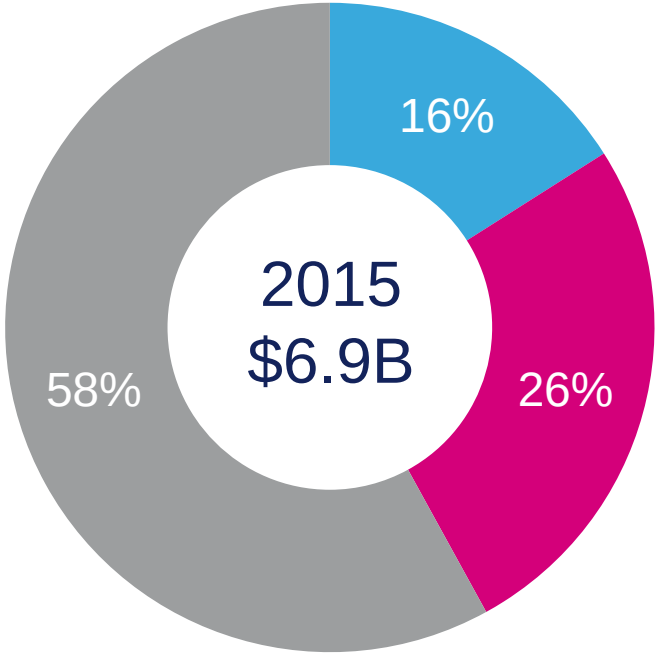
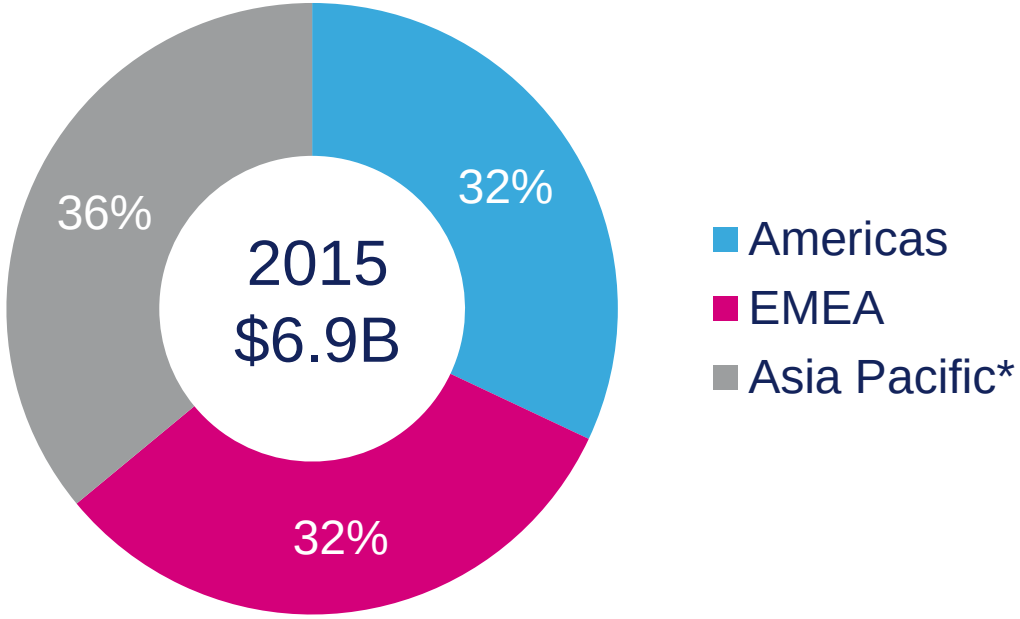
* For illustrative purposes. Discontinued businesses include set-top box, camera modules and the former ST-Ericsson products.

A Global Business

revenues by location of shipment (%)



revenues by region of origin (%)



* Combination of former Japan & Korea and Greater China & South Asia regions

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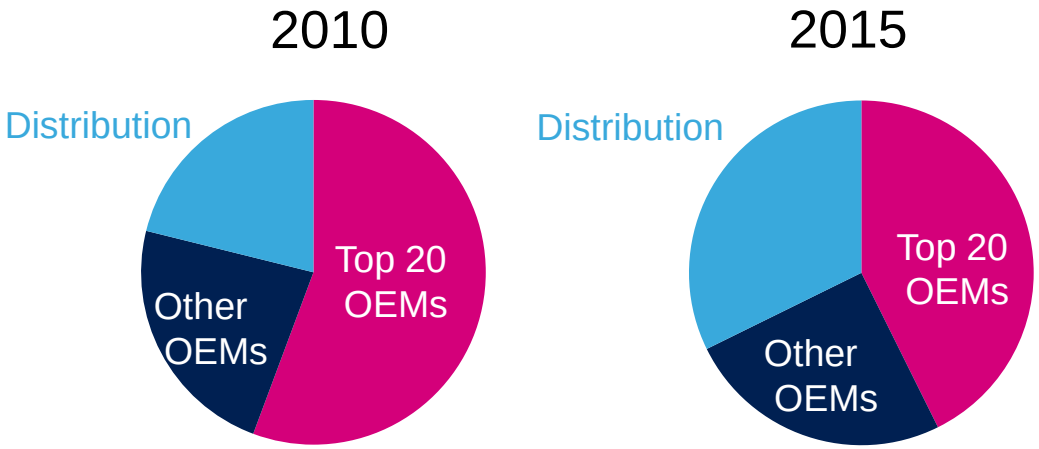
Transforming our Customer Base

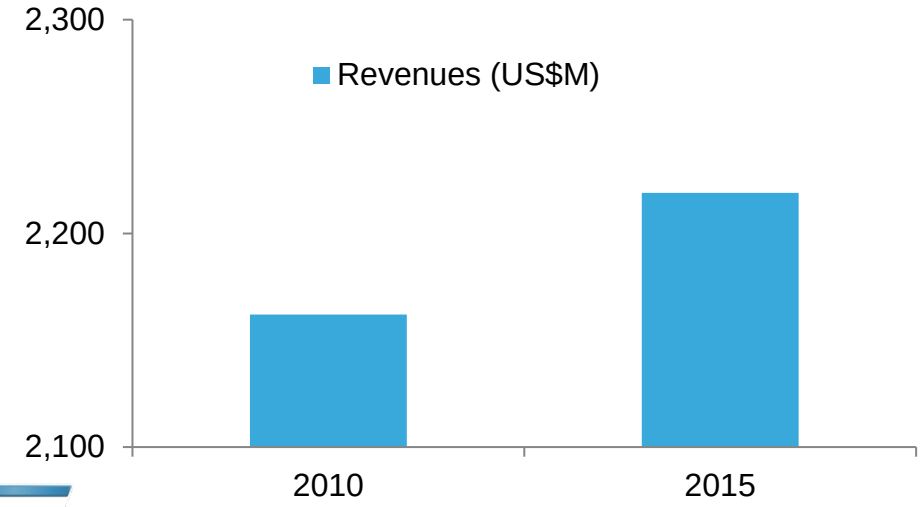


- **React to Nokia Business**
- **Customer Diversification**
- **Better Balance by Application**
- **Preparing to Restart Growth**

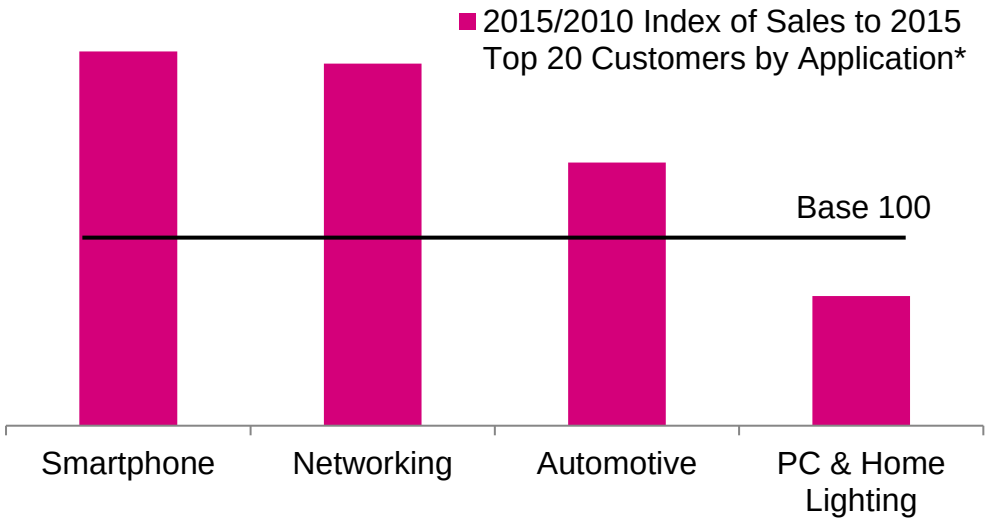
2015 Top 20 OEMs: (alphabetically)

Apple
Bosch
Ciena
Cisco
Conti
Delta
Denso
Finisar
HP
Huawei
Marelli
Mobileye
Philips
Samsung
Seagate
Sirius
Technicolor
Valeo
Western Digital
ZF-TRW

Growing in Distribution



Growing with most of the Top 20 Customers*



*Excluding discontinued businesses

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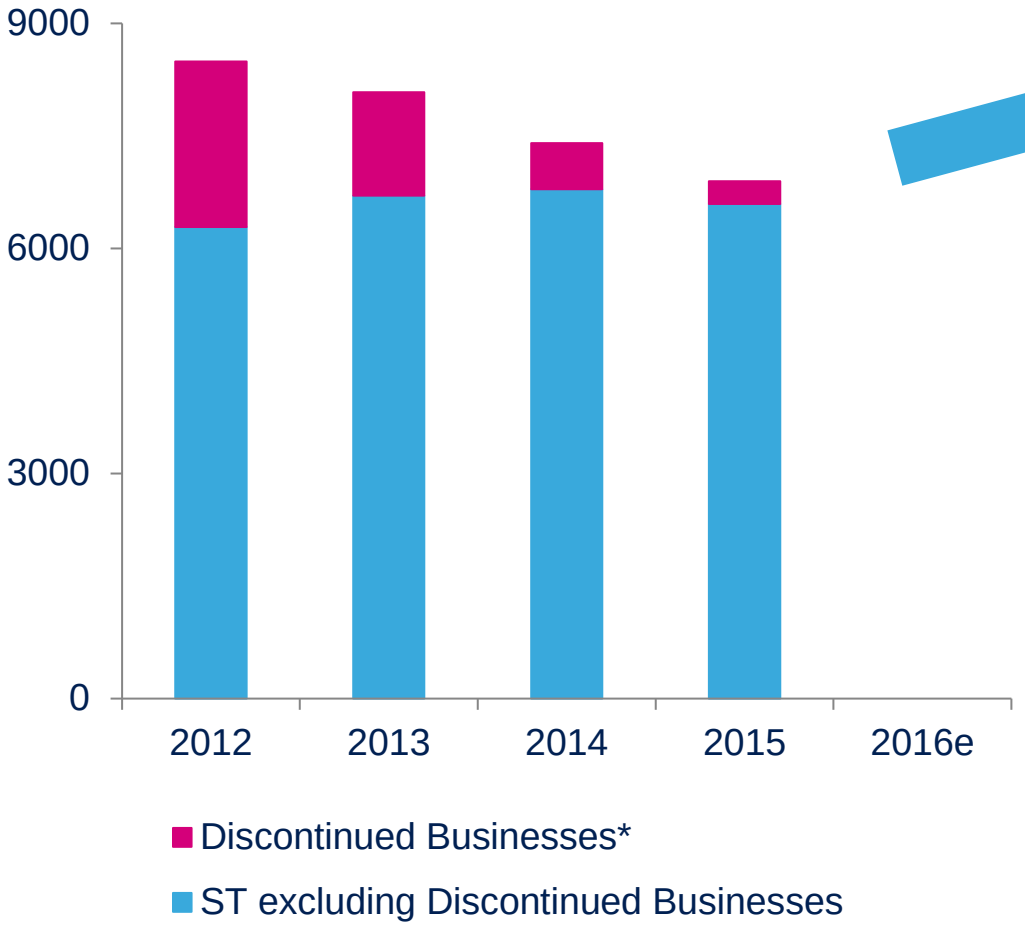
Returning to Revenue Growth



Focus on growth…

Microcontrollers and automotive already growing Y-o-Y

Power discrete, AMG and Imaging targeting sequential growth from current quarter and Y-o-Y growth 2H16/2H15

Gain market share

- Focus on key customers
- Continue expansion of customer base, particularly in mass market
- Sustain momentum in microcontrollers and automotive
- Stabilize position in analog and power discrete
- Recover in MEMS

Boost sales & marketing support and product development

- Increase sales & marketing efforts across all regions
- Redeploy ~600 people to support and accelerate growth of microcontrollers, digital automotive and ASICs

*Discontinued businesses include set-top box, camera modules and the former ST-Ericsson products

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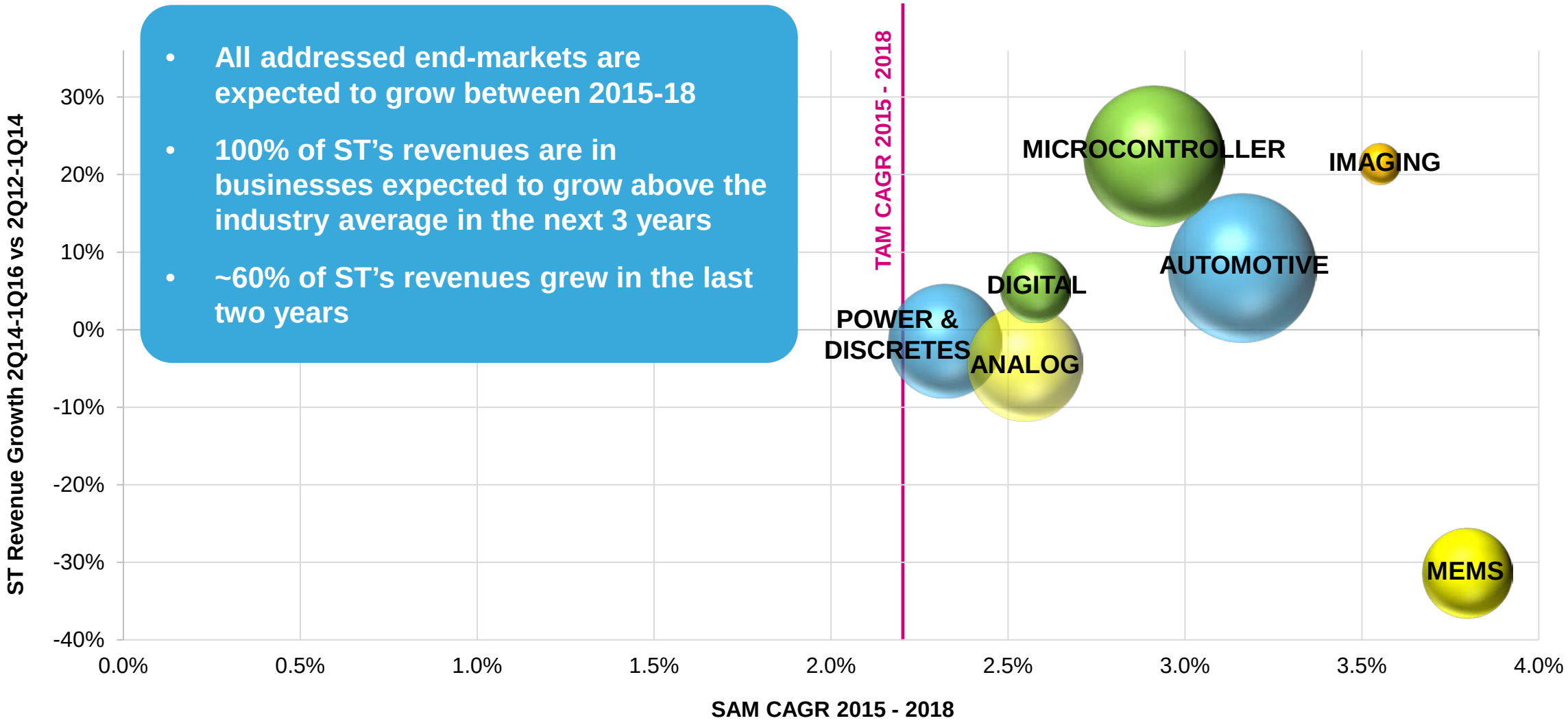
Focusing on Businesses with above Market Growth

- All addressed end-markets are expected to grow between 2015-18
- 100% of ST's revenues are in businesses expected to grow above the industry average in the next 3 years
- ~60% of ST's revenues grew in the last two years



Note: Size of bubble is proportional to ST's revenue.

Source: Company data, WSTS

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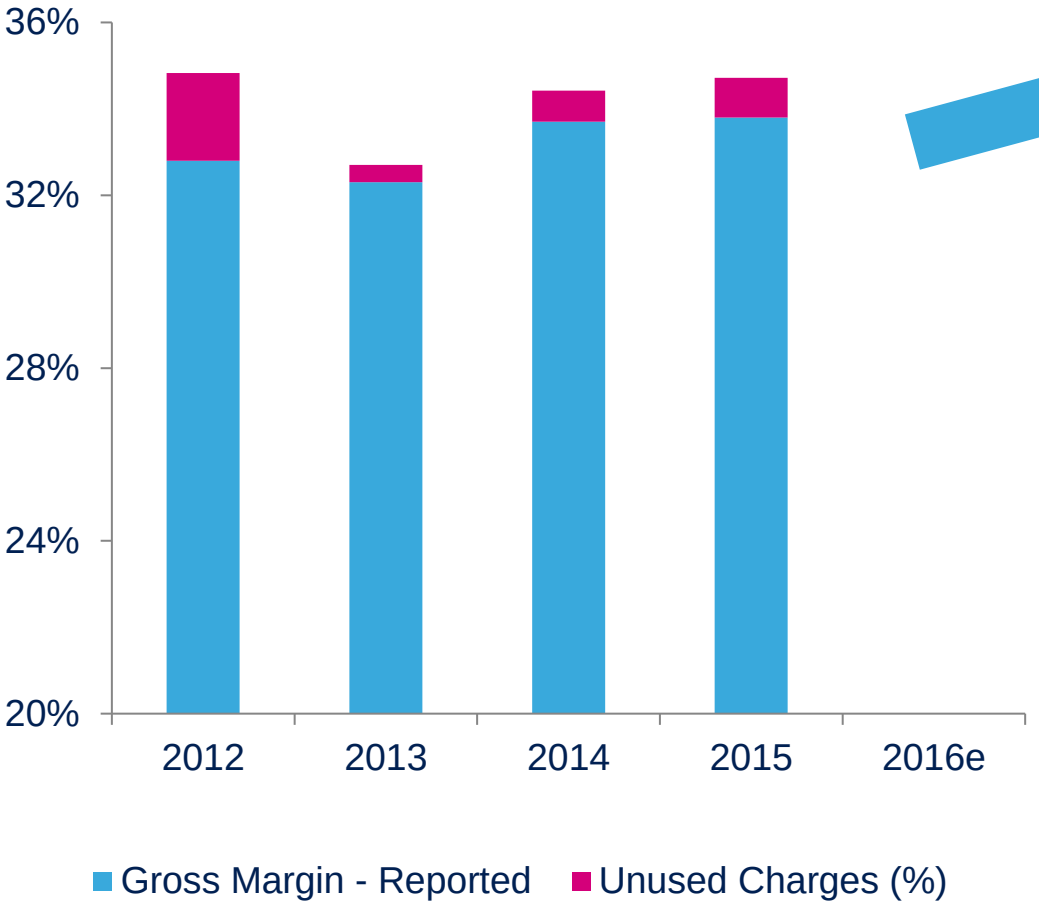
Gross Margin Initiatives



…with margin expansion*…

Improve product mix

- Increase revenues from value-add and differentiated new products / innovation / new technologies
- Decrease revenues from low margin discontinued products while executing on the Set-Top Box restructuring plan

Manufacturing excellence

- Improve fab loading, particularly in 12” with expanded technology mix
- Volume to reduce wafer cost in almost all fabs
- Continue capacity conversion from 6” to 8”
- Technology evolution, improved loading and performance of Front and Back-end plants
- Assembly cost and yields

Favorable Currency Effects, net of hedging

*Base FY2015

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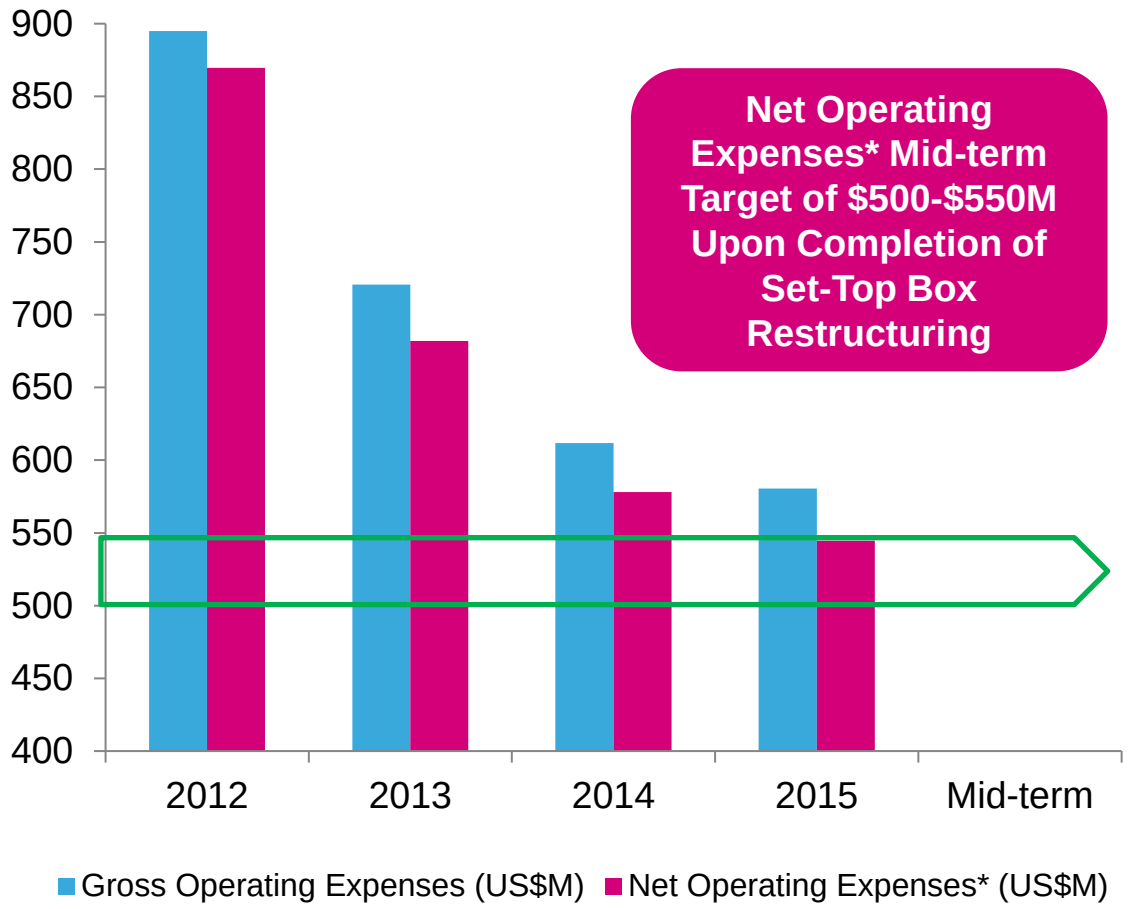
Operating Expense Discipline

…and expenses control…

Ongoing execution of the Set-Top Box restructuring plan

- Annualized savings at completion of plan estimated at $170M per year
- Restructure ~1,400 headcount
- Redeploy ~600 people to accelerate product development principally in digital automotive and microcontrollers

Favorable Currency Effects, net of hedging**



*Net Operating Expenses: R&D + SG&A – recurring R&D grants

** Base FY2015

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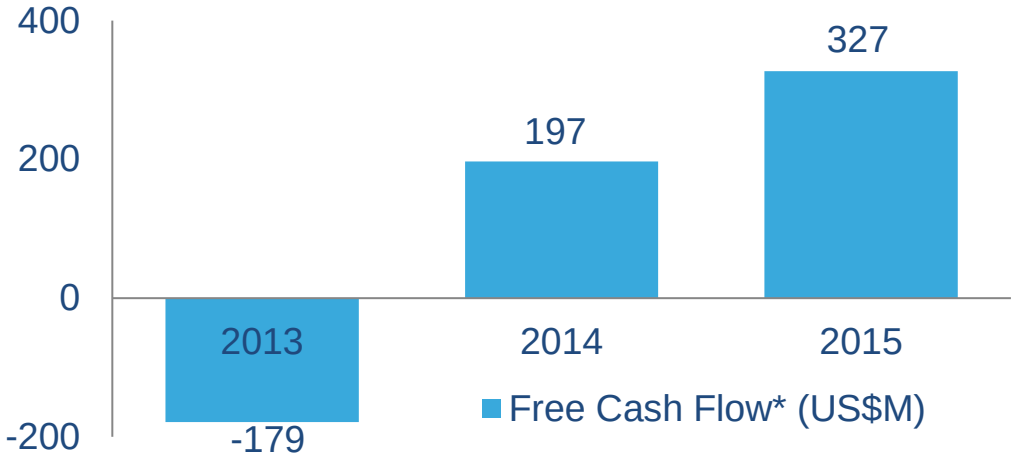
A Solid Capital Structure

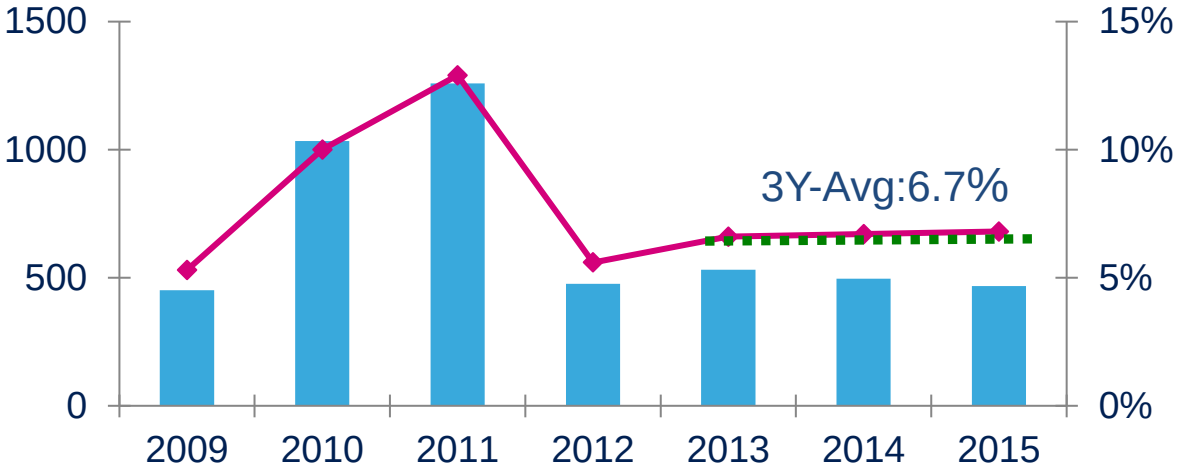
Free Cash Flow* generation



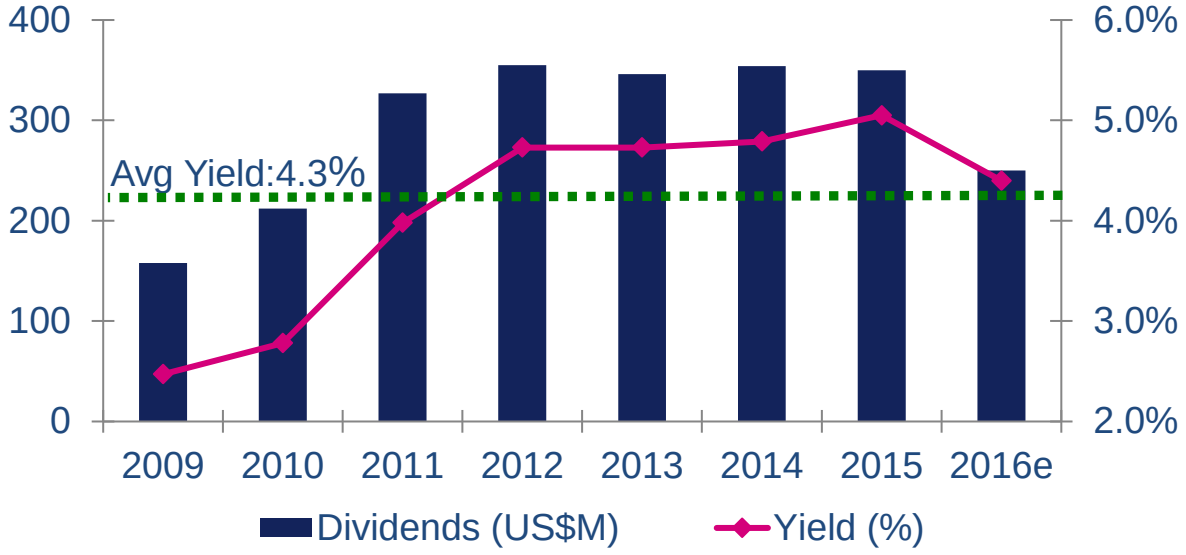
Net Cash Balance

End of period (US$M)	Dec 31 2014	Dec 31 2015	Apr 2 2016
Total Liquidity	2,351	2,106	2,040
Total Financial Debt	(1,801)	(1,612)	(1,601)
Net Financial Position*	**550**	**494**	**439**

Capital Expenditures



Dividends distribution



*Non-GAAP measures – see Appendix

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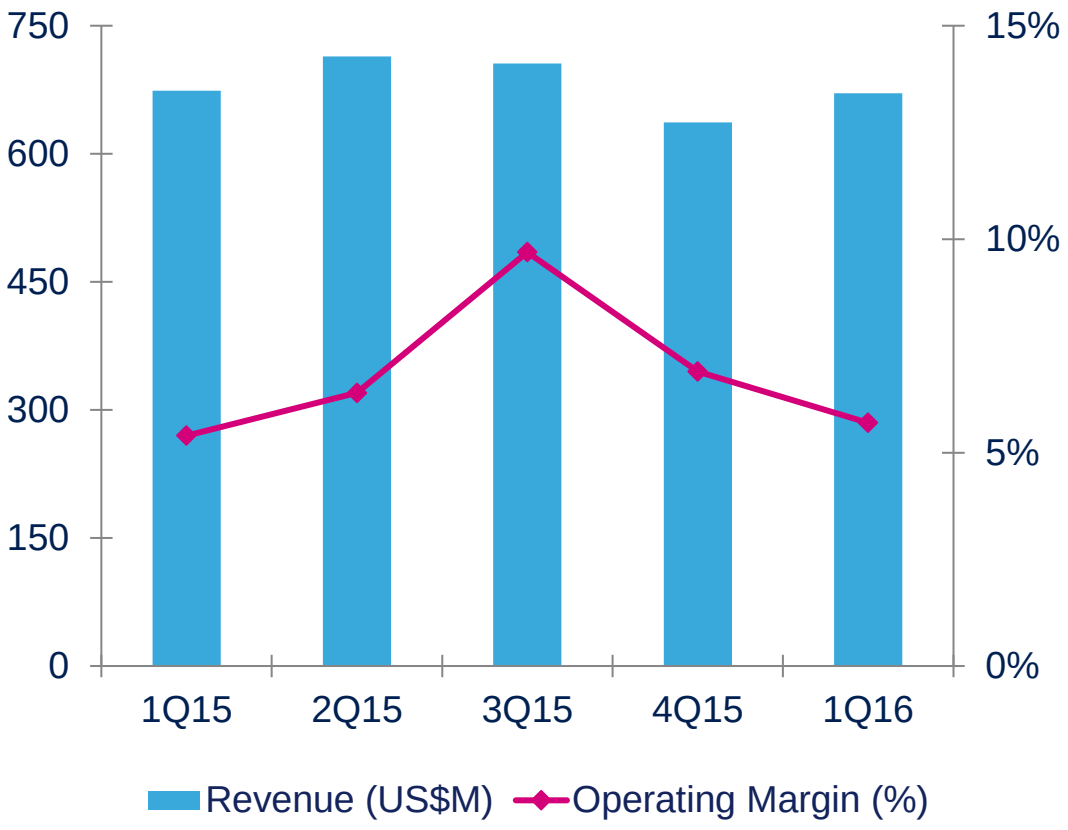
Automotive and Discrete (ADG)

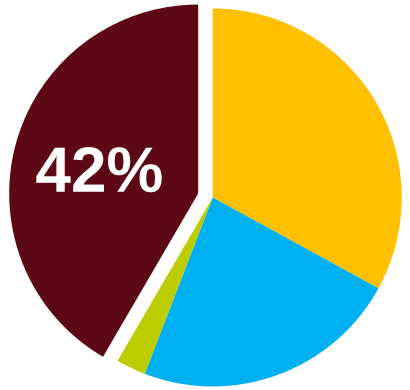
Financial Performance



ADG at a glance and contribution to ST 1Q16 sales

Dedicated Automotive ICs:

- ADAS
- Chassis
- Powertrain
- Body Electronics
- Infotainment
- Automotive-grade 32-bit microcontrollers



Power Discrete:

- MOSFET, including Silicon Carbide
- IGBT and Power Bipolar Transistors
- Power rectifiers, TRIACs and protections
- Passive integration products

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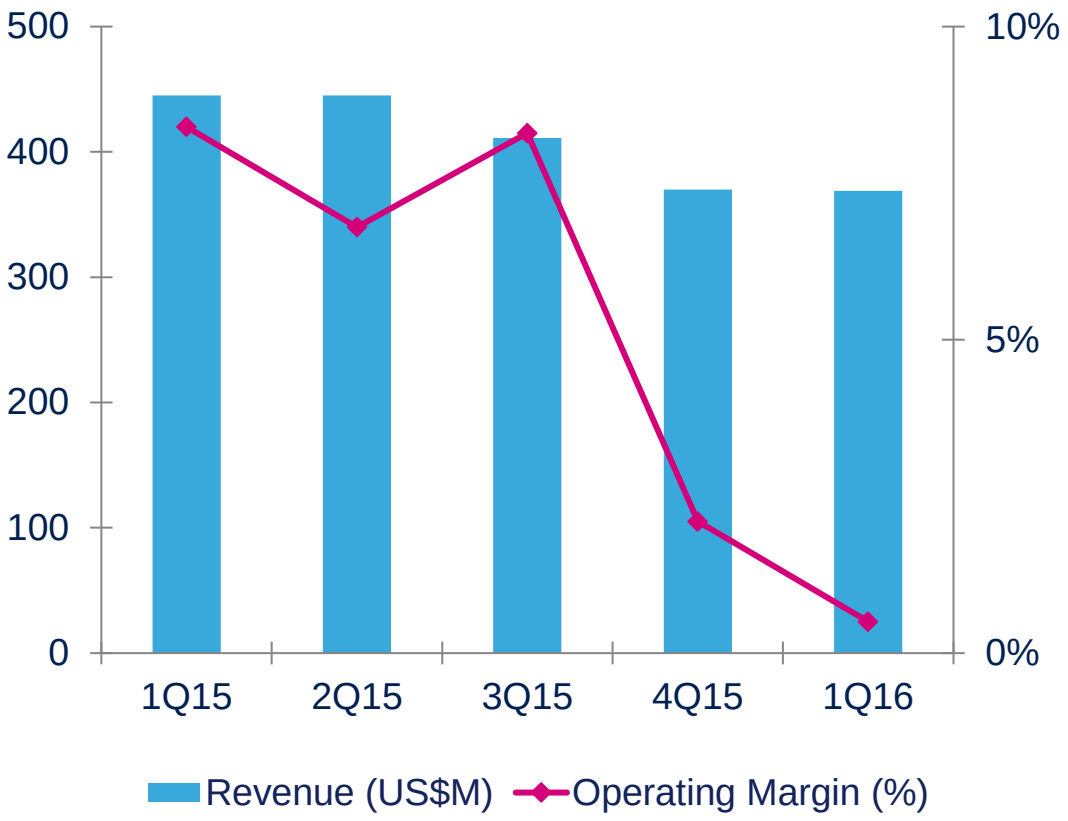
Analog and MEMS (AMG)

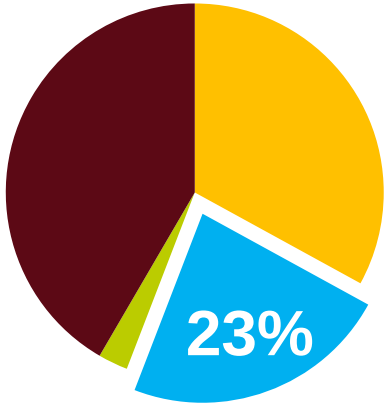
Financial Performance



AMG at a glance and contribution to ST 1Q16 sales

MEMS Sensors

- Motion
- Acoustic
- Environmental



MEMS Micro-actuators

- Mirrors
- Thermal / piezoelectric

Smart Power and Analog

- Industrial and power conversion
- General purpose analog
- Wired and wireless connectivity
- Power Management IC for mobile and portable
- Touchscreen controller

Internet of Things

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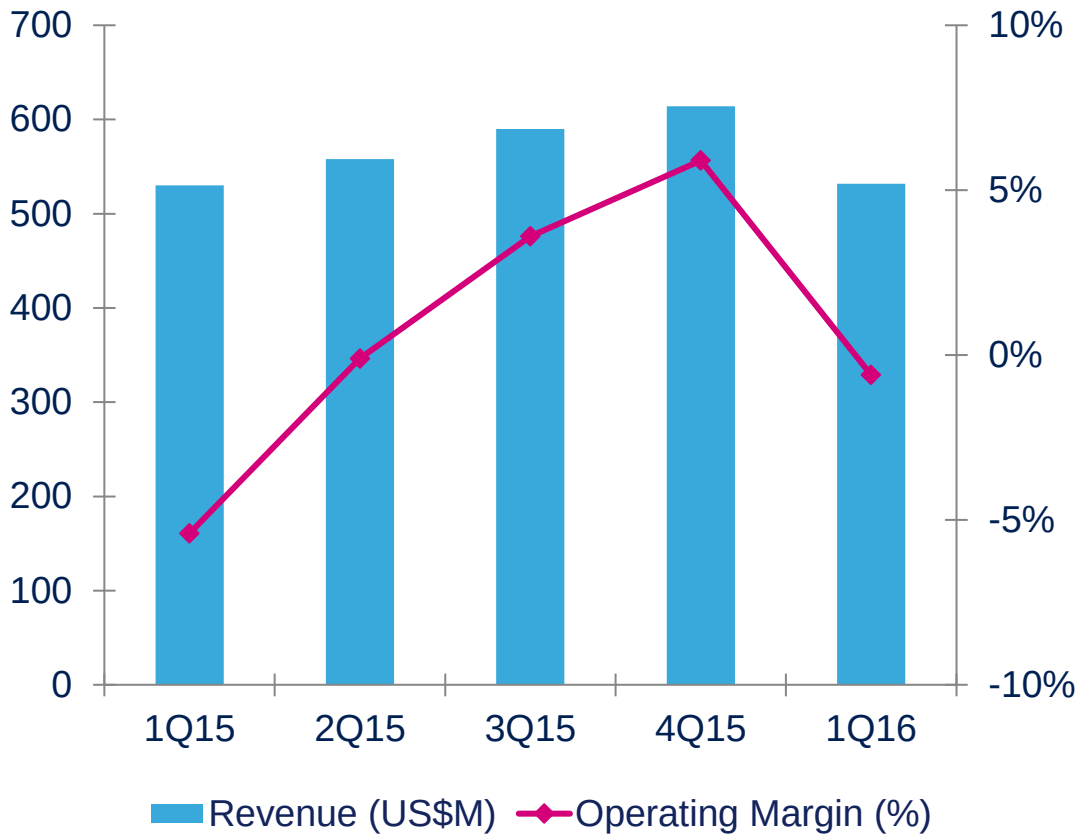
Microcontrollers and Digital ICs (MDG)

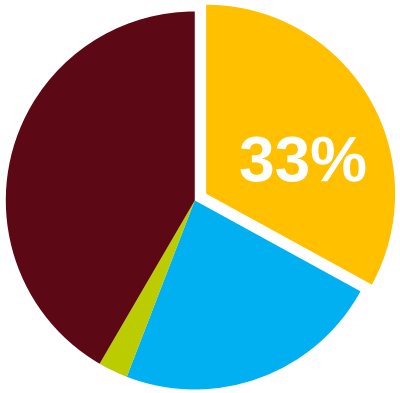
Financial Performance



MDG at a glance and contribution to ST 1Q16 sales

Microcontrollers:

- General Purpose
- Secure



Memories:

- EEPROM

ASICs:

- Digital including FD-SOI
- Mixed-process Technologies including Silicon Photonics

Also includes discontinued business of Set-Top Box and former ST-Ericsson products

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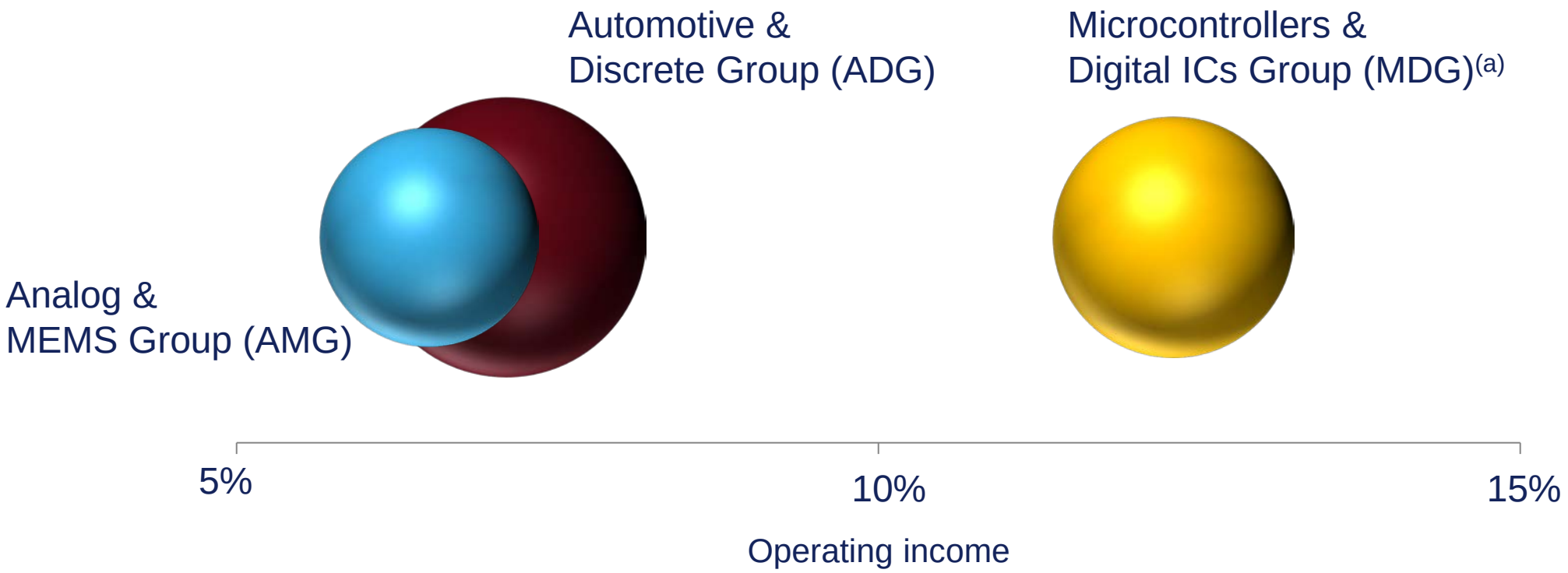
Internet of Things

New Groups Profitability in 2015

A starting point for improvement

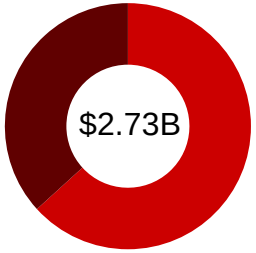


(a) MDG excludes Set-Top Box business and former ST-Ericsson products

Note: Size of bubble is proportional to revenue. Operating income before impairment and restructuring as a percentage of sales, excluding allocation of unused capacity charges.

Revenue Drivers & Opportunities

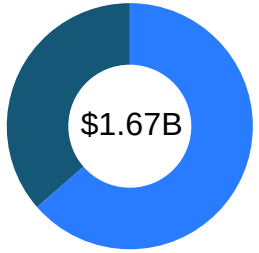
ADG 2015 Revenues



Automotive Power Discrete

- Leverage on technology leadership in Smart Power, eNVM, RF, FD-SOI and SiC
- Automotive-grade 32-bit MCU
- ADAS (Vision & Radar)
- Infotainment (Multimedia and Telematics, Navigation, Connectivity)
- ASIC and ASSP for Automotive
- ICs and discrete for car lighting
- Silicon Carbide products, MOSFET and IGBT for car electrification

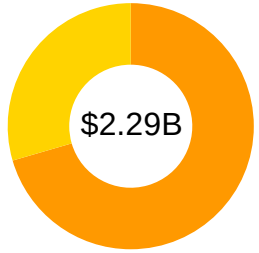
AMG 2015 Revenues



Analog MEMS

- Leverage on technology leadership in Analog and Smart Power and MEMS
- Wired and Wireless connectivity for IoT
- General purpose analog
- Power management in servers, smartphones and industrial
- Analog ASICs for industrial
- Automotive MEMS
- Micro-actuators
- Consumer MEMS recovery

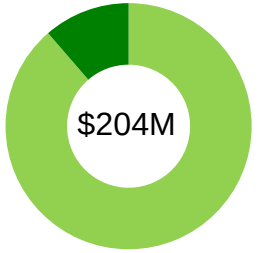
MDG 2015 Revenues



MCU Digital

- Leverage on technology leadership in eNVM, FD-SOI and RF
- General Purpose STM32 MCU
- Advanced Secure Element
- Secure contactless: banking / ID
- RF EEPROM
- Digital ASICs on FD-SOI
- Optical module ICs leveraging Silicon Photonics and BiCMOS

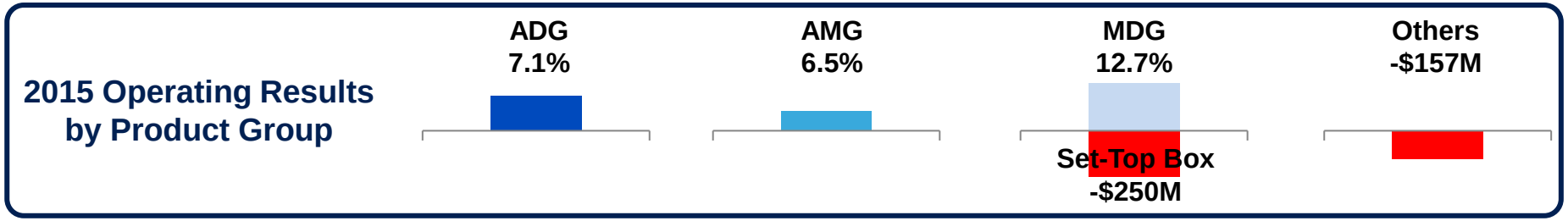
Others 2015 Revenues



Imaging Others

- Leverage on technology in CMOS sensors and pioneering “Time of Flight” Technology
- Specialized imaging sensors

Profitability Drivers & Opportunities



	ADG	AMG	MDG	Others
Leverage on Revenue Growth	✓	✓	✓	✓
Fab Loading				✓
Technology Mix in Crolles 12” (eNVM)	✓		✓	✓
Wafer Cost				
6” to 8” conversion in Power and Analog Fabs	✓	✓		
8” to 12” Products Evolution		✓	✓	
Assembly Cost and Yields	✓	✓	✓	✓
Value-add and Differentiated New Products	✓	✓	✓	✓
Product Mix				
Low Margin Discontinued Products (STB, Camera mod)			✓	✓
Execution of Set-Top Box Restructuring			✓	
Reduce Net Expenses				
Favorable Currency Effects	✓	✓	✓	✓

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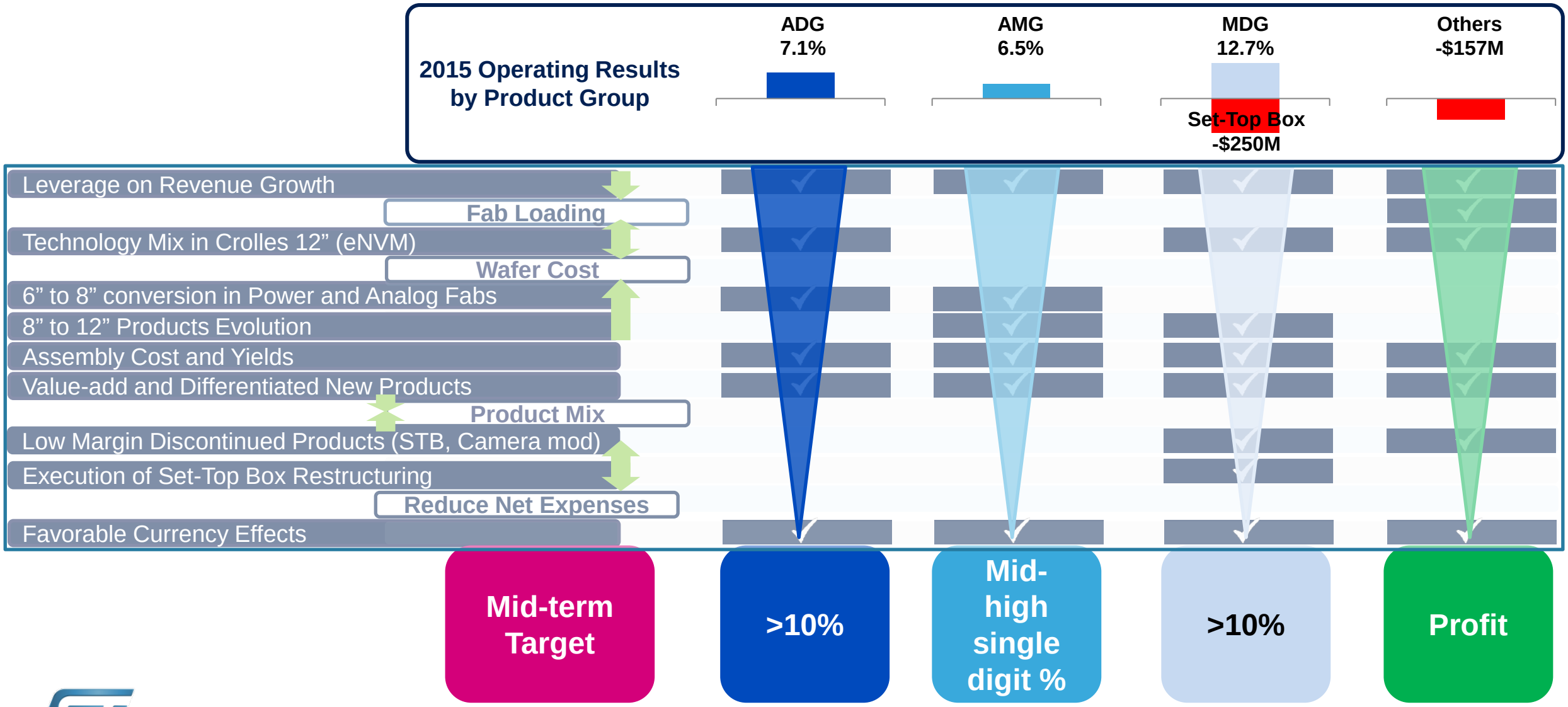
Note: Base FY2015

Profitability Drivers & Opportunities



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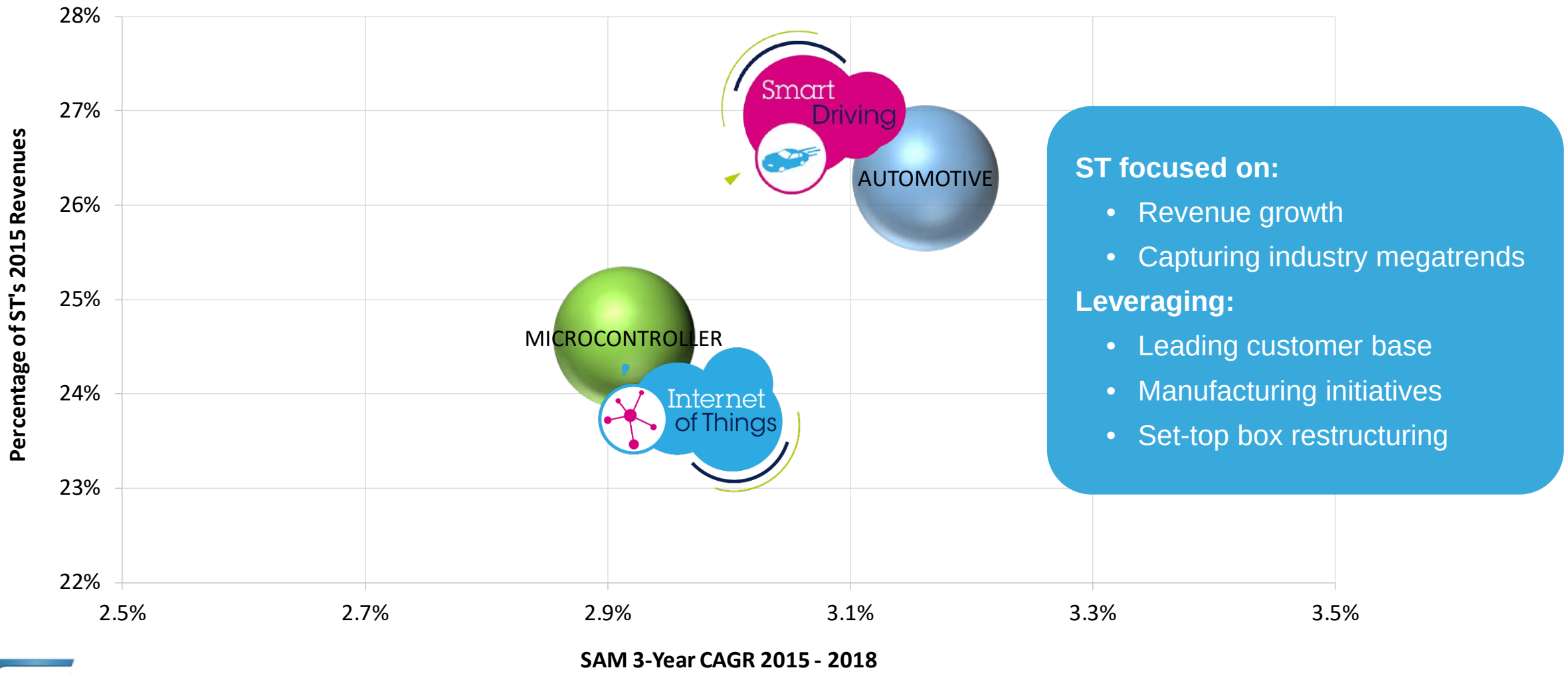
ST Revenue Focus:

Addresses high-growth areas to boost profitability



ST focused on:

- Revenue growth
- Capturing industry megatrends

Leveraging:

- Leading customer base
- Manufacturing initiatives
- Set-top box restructuring

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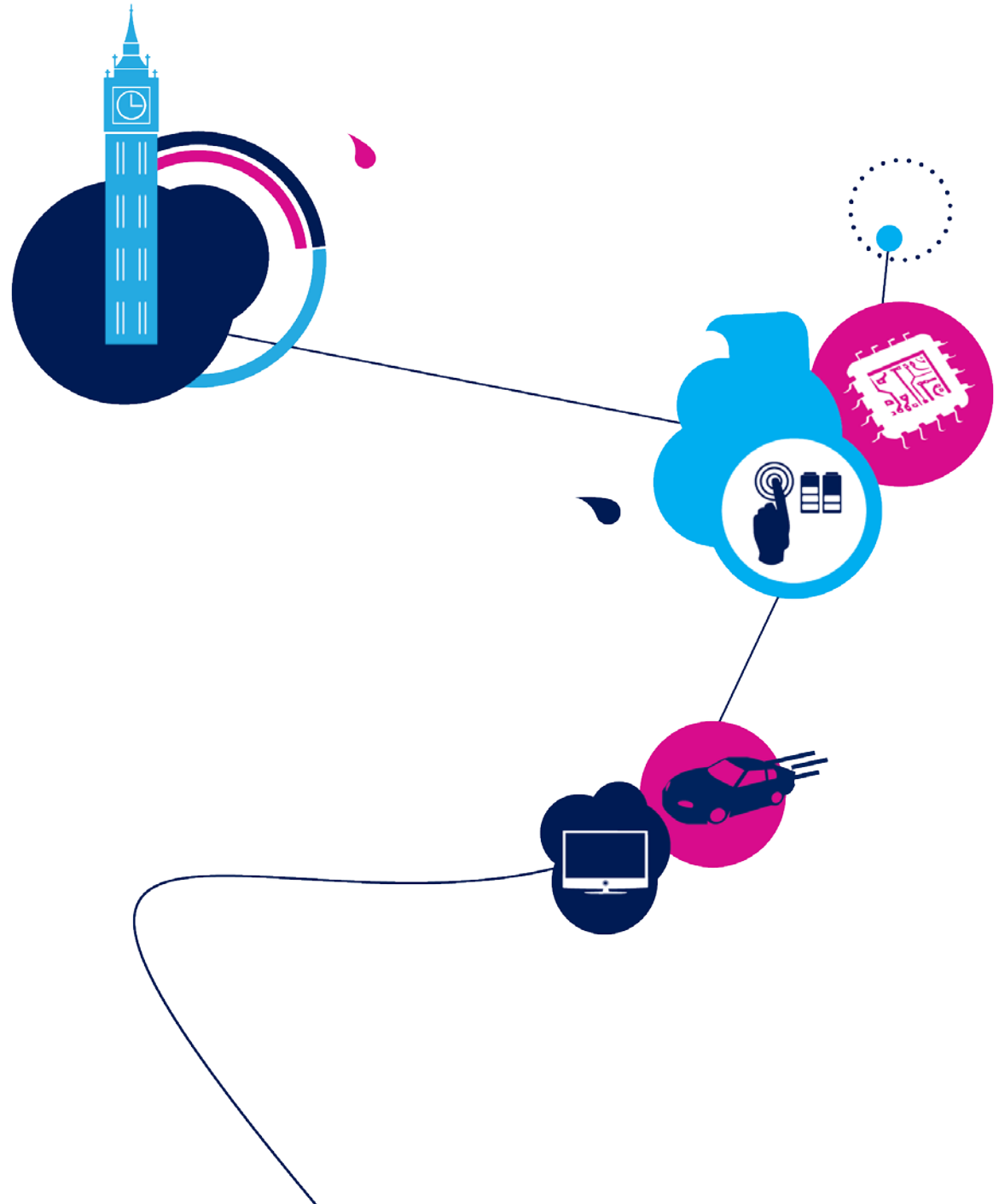
Note: Size of bubble is proportional to ST's revenue.

Source: Company data, WSTS

Appendix



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Product Group Data

In 1Q16, ST realigned its product families into three product groups: Automotive and Discrete Group (ADG); Analog and MEMS Group (AMG) and Microcontrollers and Digital ICs Group (MDG). MDG includes ST's set-top-box business which is currently undergoing a restructuring targeting annualized savings of $170 million upon completion. All prior-period amounts have been retrospectively aligned to the 2016 reporting segments.

Million US$	1Q15	2Q15	3Q15	4Q15	FY15	1Q16
Automotive and Discrete Group (ADG)						
- Net Revenues	674	714	706	637	2,731	**671**
- Operating Income (Loss)	36	46	68	44	194	**39**
Analog and MEMS Group (AMG)						
- Net Revenues	445	445	411	370	1,671	**369**
- Operating Income (Loss)	37	30	34	8	109	**2**
Microcontrollers and Digital ICs Group (MDG)						
- Net Revenues	530	558	590	614	2,292	**532**
- Operating Income (Loss)	(28)	(1)	22	36	29	**(3)**
Others *						
- Net Revenues	56	43	57	47	203	**41**
- Operating Income (Loss)	(64)	(63)	(33)	(63)	(223)	**(71)**
Total						
- Net Revenues	**1,705**	**1,760**	**1,764**	**1,668**	**6,897**	**1,613**
- Operating Income (Loss)	**(19)**	**12**	**91**	**25**	**109**	**(33)**

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* See appendix

Financial Performance

In US$M, except EPS	1Q15	2Q15	3Q15	4Q15	FY14*	FY15	1Q16
Net Revenues	1,705	1,760	1,764	1,668	7,404	6,897	1,613
Gross Margin	33.2%	33.8%	34.8%	33.5%	33.7%*	33.8%	33.4%
Operating Income (Loss) before impairment, restructuring**	10	33	102	*29*	258*	174	(5)
Operating Margin before impairment, restructuring**	0.6%	1.9%	5.8%	*1.7%*	3.5%	2.5%	(0.3%)
Net Income – Reported	(22)	35	90	2	128*	104	(41)
EPS Diluted	(0.03)	0.04	0.10	0.00	0.14	0.12	(0.05)
Adjusted EPS Diluted**	0.01	0.06	0.12	0.00	0.29	0.19	(0.02)
Free Cash Flow**	41	53	85	148	197	327	31
Net Financial Position	512	459	459	494	550	494	439
Effective Exchange Rate €/$	1.23	1.17	1.16	1.11	1.34	1.17	1.10

* Includes Nano2017 catch-up: the European Union approved the funding for the Nano2017 R&D program for the period 2013 to 2017 in June 2014; as a consequence, FY14 include a pre-tax profit of $97 million for grants related to FY13 (including 18 bps impact in gross margin)

**See appendix

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Pre-Tax Items to Adjusted Earnings*

OPERATING RESULT

NET EARNINGS

In US$M	1Q15	2Q15	3Q15	4Q15	1Q16
U.S. GAAP Net Earnings	**(22)**	**35**	**90**	**2**	**(41)**
Impairment & Restructuring	**29**	**21**	**11**	**4**	**28**
Estimated Income Tax Effect	**(1)**	**(1)**	**-**	**(4)**	**(3)**
Adjusted Net Earnings*	**6**	**55**	**101**	**2**	**(16)**

* See appendix

Appendix

- **Free cash flow** is defined as net cash from operating activities minus net cash from (used in) investing activities, excluding payment for purchases (proceeds from the sale of) marketable securities and net cash variation for joint venture deconsolidation. We believe free cash flow provides useful information for investors and management because it measures our capacity to generate cash from our operating and investing activities to sustain our operating activities. Free cash flow is not a U.S. GAAP measure and does not represent total cash flow since it does not include the cash flows generated by or used in financing activities. In addition, our definition of free cash flow may differ from definitions used by other companies.

- **Net financial position** resources (debt) represents the balance between our total financial resources and our total financial debt. Our total financial resources include cash and cash equivalents, marketable securities, short-term deposits and restricted cash, and our total financial debt includes short term borrowings, current portion of long-term debt and long-term debt, all as reported in our consolidated balance sheet. We believe our net financial position provides useful information for investors because it gives evidence of our global position either in terms of net indebtedness or net cash position by measuring our capital resources based on cash, cash equivalents and marketable securities and the total level of our financial indebtedness. Net financial position is not a U.S. GAAP measure.

- **Operating income before impairment and restructuring charges** excludes impairment, restructuring charges and other related closure costs. It is used by management to help enhance an understanding of ongoing operations and to communicate the impact of the excluded items.

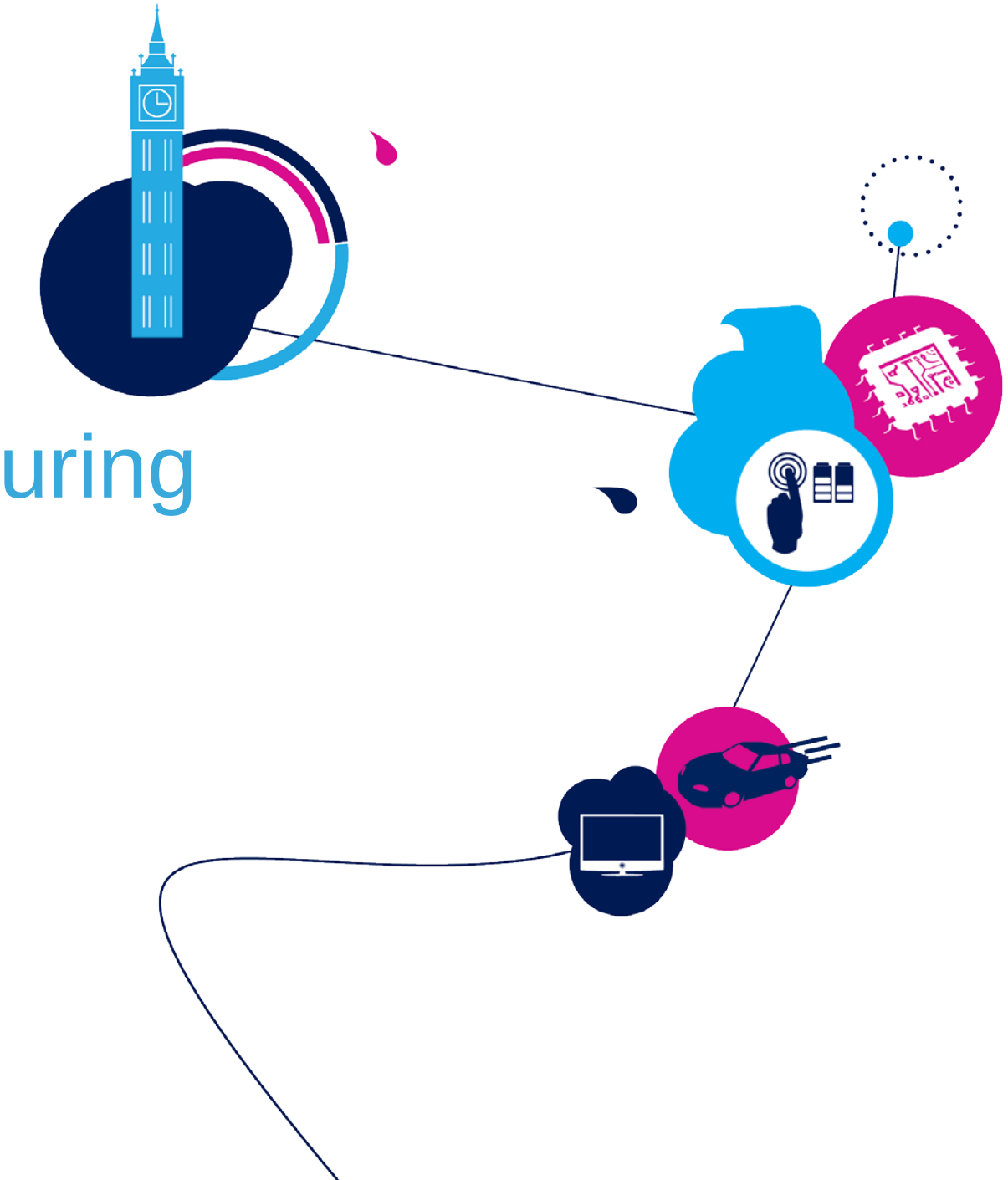
- **Adjusted net earnings and earnings per share (EPS)** are used by our management to help enhance an understanding of ongoing operations and to communicate the impact of the excluded items like impairment, restructuring charges and other related closure costs, net of the relevant tax impact.

- **Net revenues of "Others"** includes revenues from sales of Imaging Product Division, Subsystems, assembly services, and other revenue. **Operating income (loss) of "Others"** includes items such as unused capacity charges, impairment, restructuring charges and other related closure costs, phase out and start-up costs, and other unallocated expenses such as: strategic or special research and development programs, certain corporate-level operating expenses, patent claims and litigations, and other costs that are not allocated to product groups, as well as operating earnings of the Imaging Product Division, Subsystems and other products. "Others" includes $10 million, $30 million, and $19 million of unused capacity charges in the first quarter of 2016 and fourth and first quarters of 2015, respectively; and $28 million, $4 million, and $29 million of impairment, restructuring charges, and other related closure costs in the first quarter of 2016 and fourth and first quarters of 2015, respectively.

Technology & Manufacturing

Jean-Marc Chery

Chief Operating Officer



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Front-End Manufacturing

Unique capability

Technology portfolio aligned with application focus areas

Flexible IDM model with foundry partners

- Internal / external technology complementarity
- Manufacturing capacity flexibility at foundry

Clustering approach

6 Front-End sites, including 3 R&D centers

Digital		Analog and Power			
Crolles (R&D)	FD-SOI Logic BiCMOS & RF Image Sensors Embedded-NVM	Tours	Power Discrete Passive integration	Catania (R&D)	Advanced BCD MOSFET and Silicon Carbide
Rousset	Embedded-NVM	Agrate (R&D)	Advanced BCD MEMS	Singapore	Power Discrete BCD

Foundry partners

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Back-End Manufacturing

Unique capability

Packaging portfolio aligned with application focus areas

Internal and external complementarity

Combining specialized packages and mass production capability

Back-End: 5 manufacturing sites + R&D centers offering over 400 packages

Bouskoura	SOIC Power SO Power TO
Calamba	QFN BGA LGA (MEMS)
Shenzhen	SOIC Power SO / Power TO WLCSP Optical sensor package
Kirkop	LGA (MEMS) Sensor package BGA QFP
Muar	QFP SOIC Power SO BGA
Grenoble Agrate Singapore Kirkop	Package R&D & Central Engineering

OSAT partners

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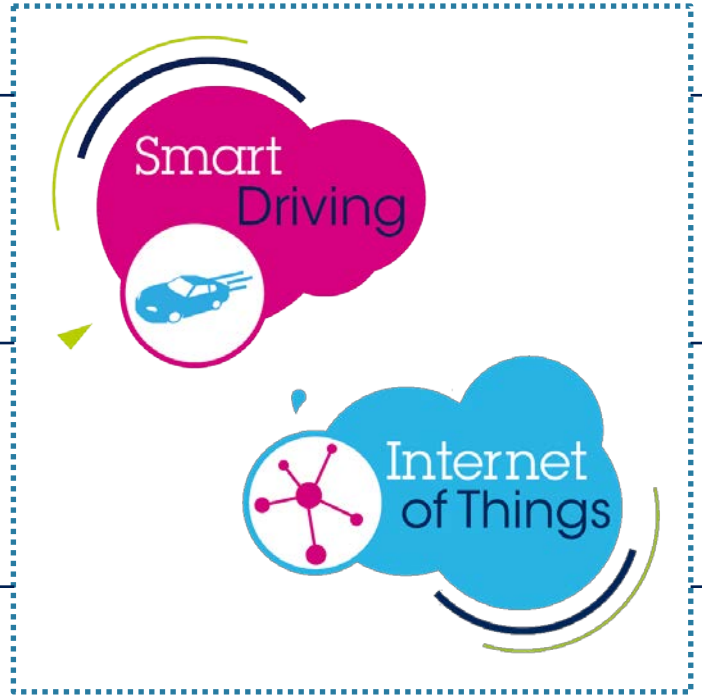
Technology Portfolio

aligned with strategic focus areas

The leading provider of technologies enabling solutions for Smart Driving and the Internet of Things

- Smart Power: BCD & VIP
- Power MOSFET & IGBT SiC & GaN Discrete
- Analog Mixed Signal Silicon Photonics



- MEMS Specialized Imaging Sensors
- FD-SOI FinFET through Foundry
- CMOS eNVM

Package technologies

Leadframe	Sensors
Laminate	Wafer level

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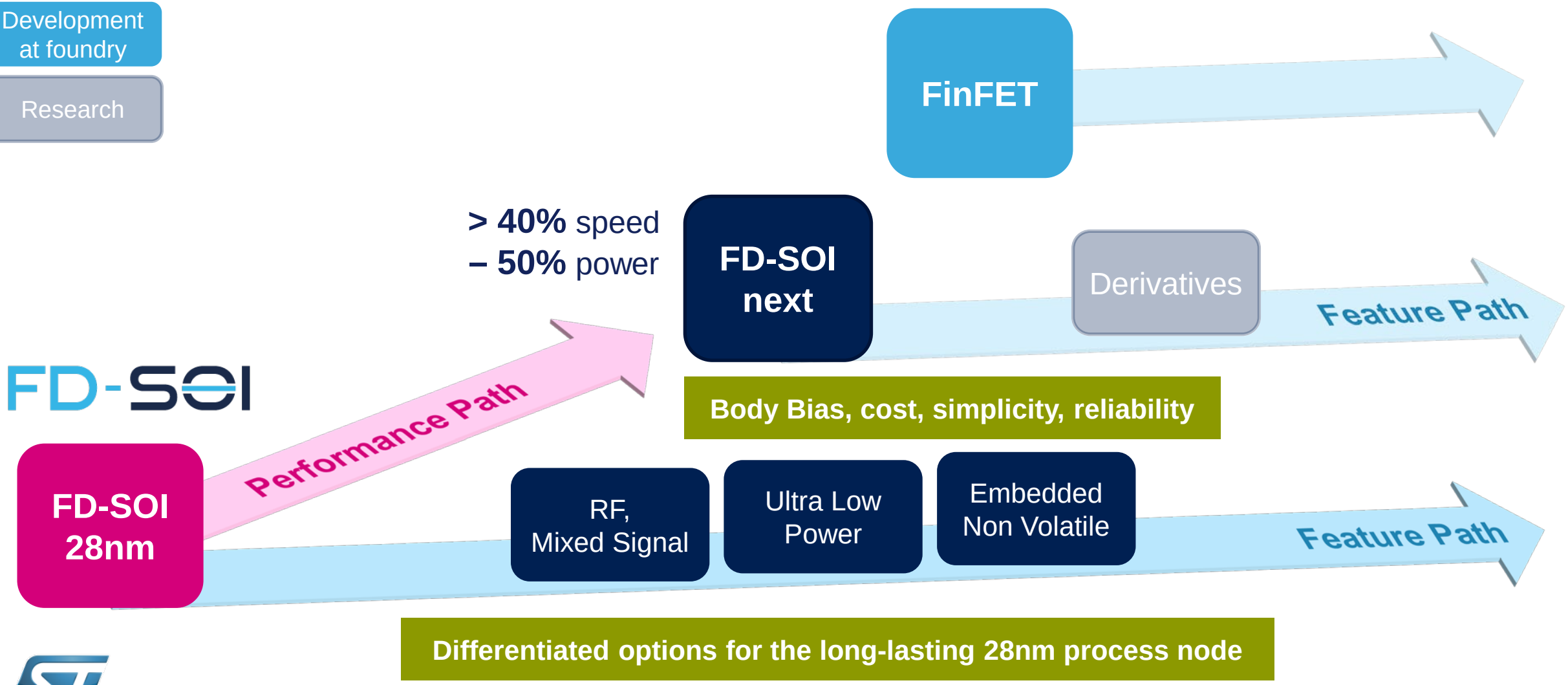
Advanced CMOS Roadmap

Mass Production

Development

Development at foundry

Research



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FD-SOI Fast Growing Ecosystem

CMOSM40 eNVM

40nm eFLASH technology for advanced MCUs addressing a wide range of applications

Consumer

- High performance logic for 32-bit MCUs
- State of the art Flash technology
- Competitive solution

Secure

- High performance page Flash erasable
- High robustness
- Competitive solution

Automotive & Industrial

- High performance logic for 32-bit MCUs
- State of the art Flash technology
- High reliability with extended temperature

FlightSense™

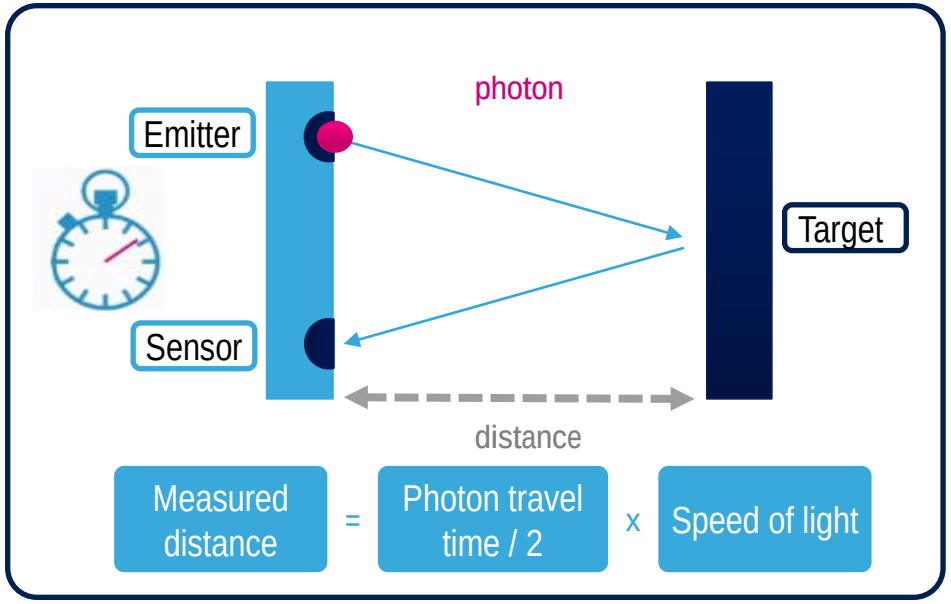
Smart Things
Camera assist, ranging, gesture


Smart Home & City
Robot cleaners, light control, toys


Smart Driving
Infotainment system control


Smart Industry
Detection, door control, robotics


True distance measurement
Independent of target size, color & reflectance



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BiCMOS & Silicon Photonics

BiCMOS55

Continuous evolution of **Silicon Germanium** & CMOS solutions improving performance vs. complexity trade-off

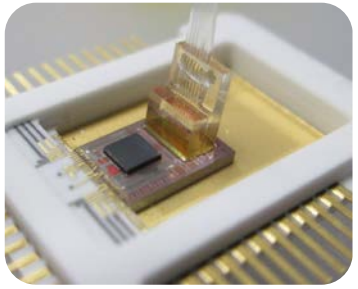
f_T > 300 GHz
f_{MAX} > 400 GHz

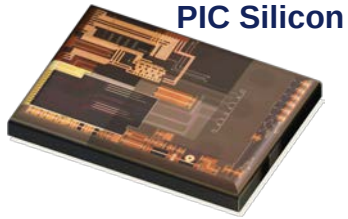
High Bandwidth – Power efficiency

Silicon Photonics

Enabling **high-speed optical** interconnection with **optimal space usage**, ranging from short to long-reach communication

- WAN: Transport, subway, access
- Enterprise
  Rack to rack, board to board
  LAN, data centers, routers, switches, HPC

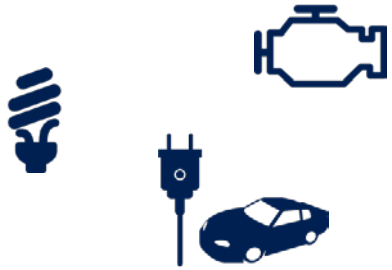


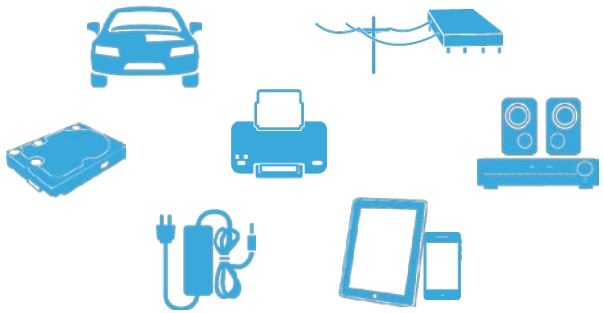


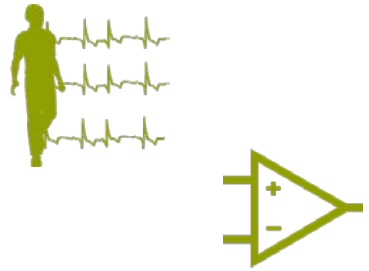
PIC Silicon

BCD Technology Segmentation

High Voltage BCD 700V – 6KV	SOI BCD 190V – 300V	Advanced BCD 7V – 100V	High Voltage CMOS 16V – 40V
BCD6s Offline (0.32µm)	SOI-BCD6s (0.32µm)	BCD8As – BCD8sP (0.16µm)	HVCMOS8 (0.18µm)
BCD6s HV Transformer (0.32µm)	SOI-BCD8s (0.16µm)	BCD8sAUTO (0.16µm)	HVG8A (0.18µm)
	SOI-BCD9s (0.11µm)	BCD9s – BCD9sL (0.11µm)	HVCMOS9 (0.11µm)
		BCD10 (90nm)	
		BCD11 (65nm)	







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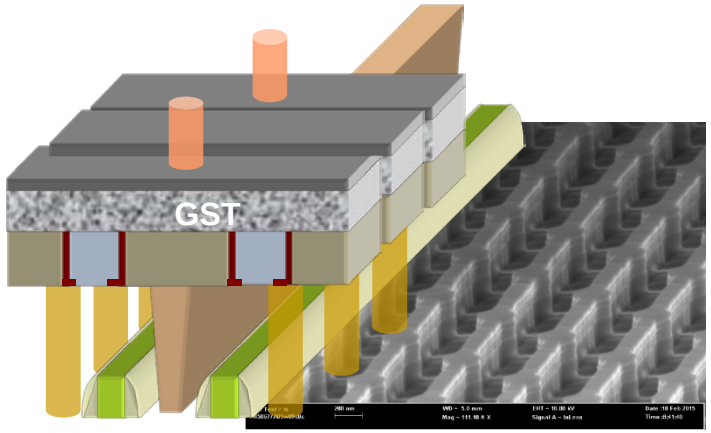
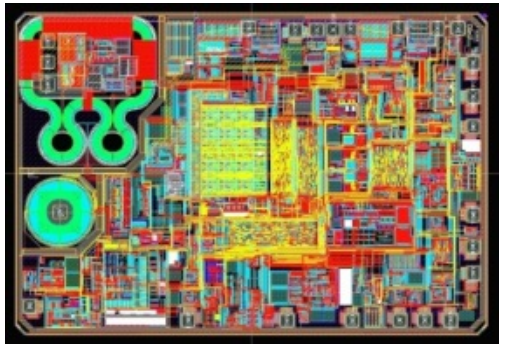
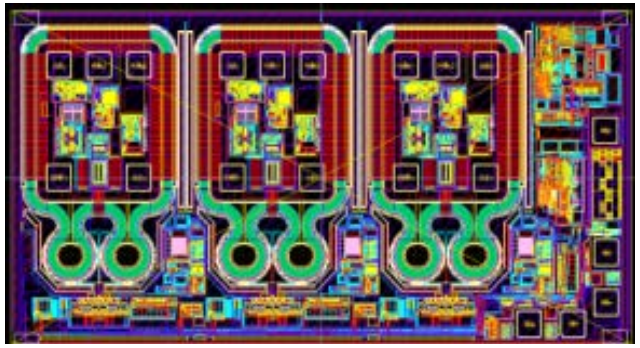
Differentiation in BCD Technology

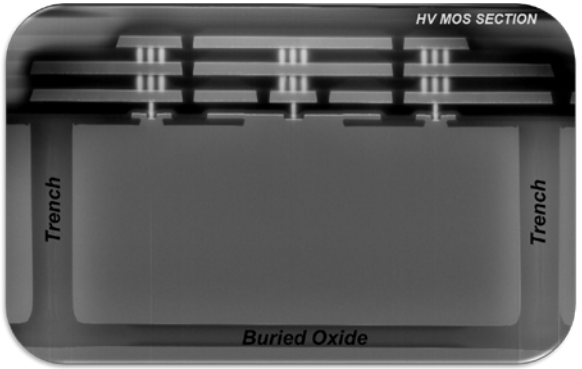


ePCM (Phase Change Memory)
in 110nm/90nm BCD Platforms for SOC

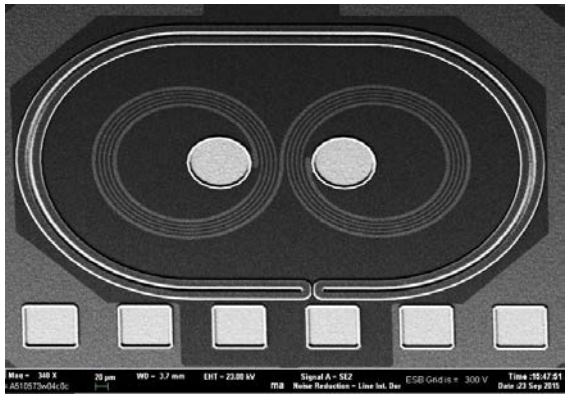




HV (600V to 1200V) Gate Drivers
on 0.32um BCD Platforms



HV on SOI (200V to 300V)
on 0.16um BCD Platforms



Galvanic Isolation (4KV to 6KV)
on 0.32um – 0.16um BCD Platforms

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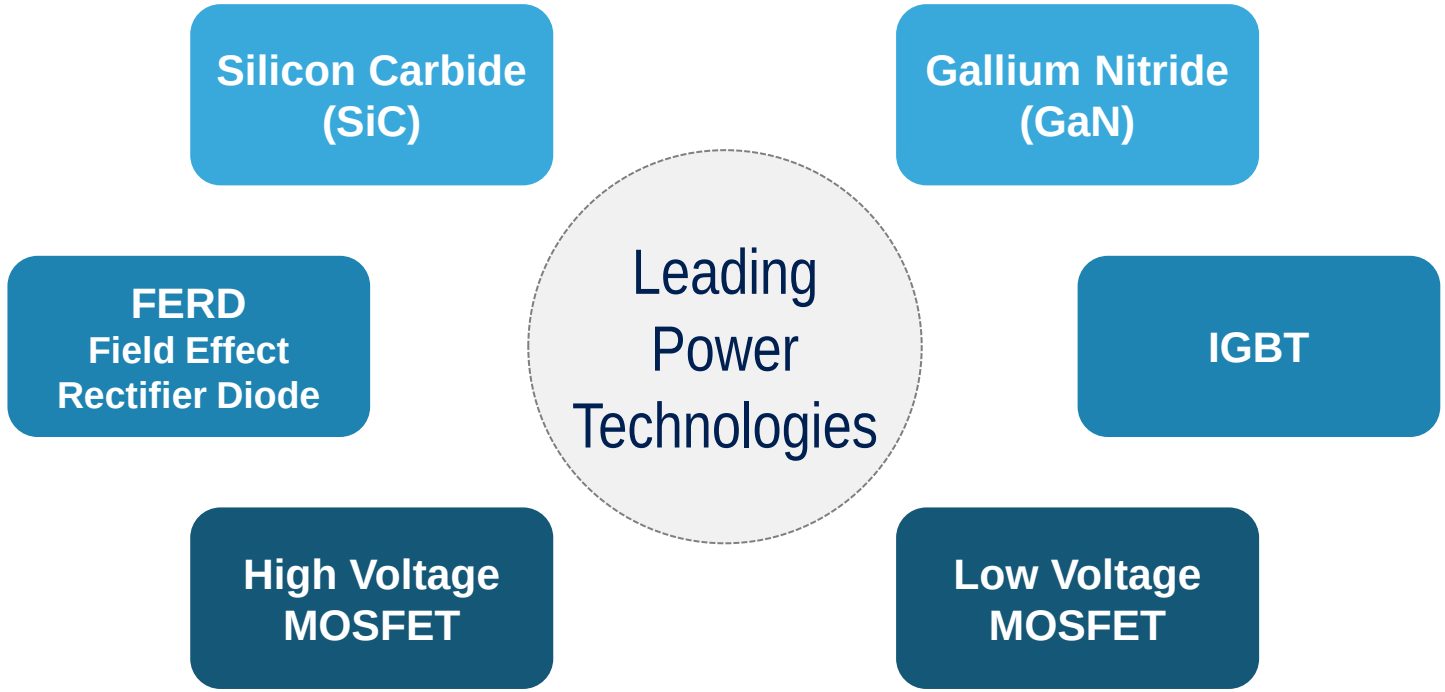
Power Discrete Technologies

Broad spectrum of technologies specifically tuned to the needs of final applications

Established **leadership** in **high-voltage** and **very-high voltage** MOSFETs

ST is **the only supplier now** qualifying **SiC MOSFETs** at **200°C** for 650, 1200 & 1700V

Introducing **new highly competitive IGBTs** and **Low Voltage MOSFETs**



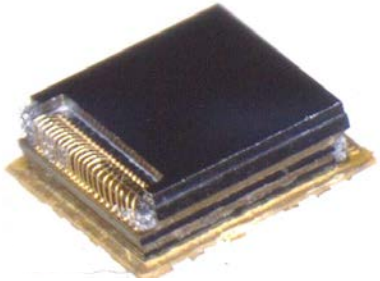
Unique Blend of Technologies

for sensors and micro-actuators

MEMS-specific process

New **materials**
(PZT, SiC & GaN, Graphene, …)

Packaging design
(Wafer Level Packaging, new interconnections, SIP)



Electrical & **Micro-Mechanical** design

CMOS process for **ASICs**

Sensor fusion engine & algorithms

Motion sensors
- Accelerometer
- Multi-axis inertial module
- Gyroscope
- Magnetic sensor

Environmental sensors
- Pressure
- Temperature
- Humidity
- UV

Microphones
- Analog & Digital

Micro-actuators
- Fluidics MEMS
- Piezo actuators
- Micro-Mirror

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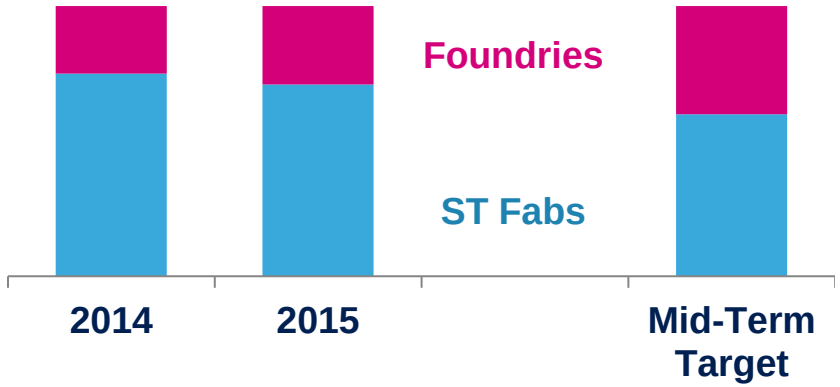
Digital Manufacturing Strategy

- Multiple sourcing through technology & manufacturing partnerships
- Rousset / Crolles clustering
- Crolles 300mm increase of scale on differentiated technologies according to demand

Targeting 40% outsourcing



Technology		Driver/First	Second
CMOS Bulk	≥40nm	Crolles 300	Foundry
	<40nm	Foundry	Crolles 300
CMOS FD-SOI		Crolles 300	Foundry
FinFET		Foundry	
Specialized Imaging		Crolles 300	
BiCMOS	≥90nm	Crolles 200	
	<90nm	Crolles 300	
Silicon Photonics		Crolles 300	
HCMOS9A		Crolles 200	Crolles 300
CMOS eNVM	≥90nm	Rousset 200	Foundry
	<90nm	Crolles 300	Foundry

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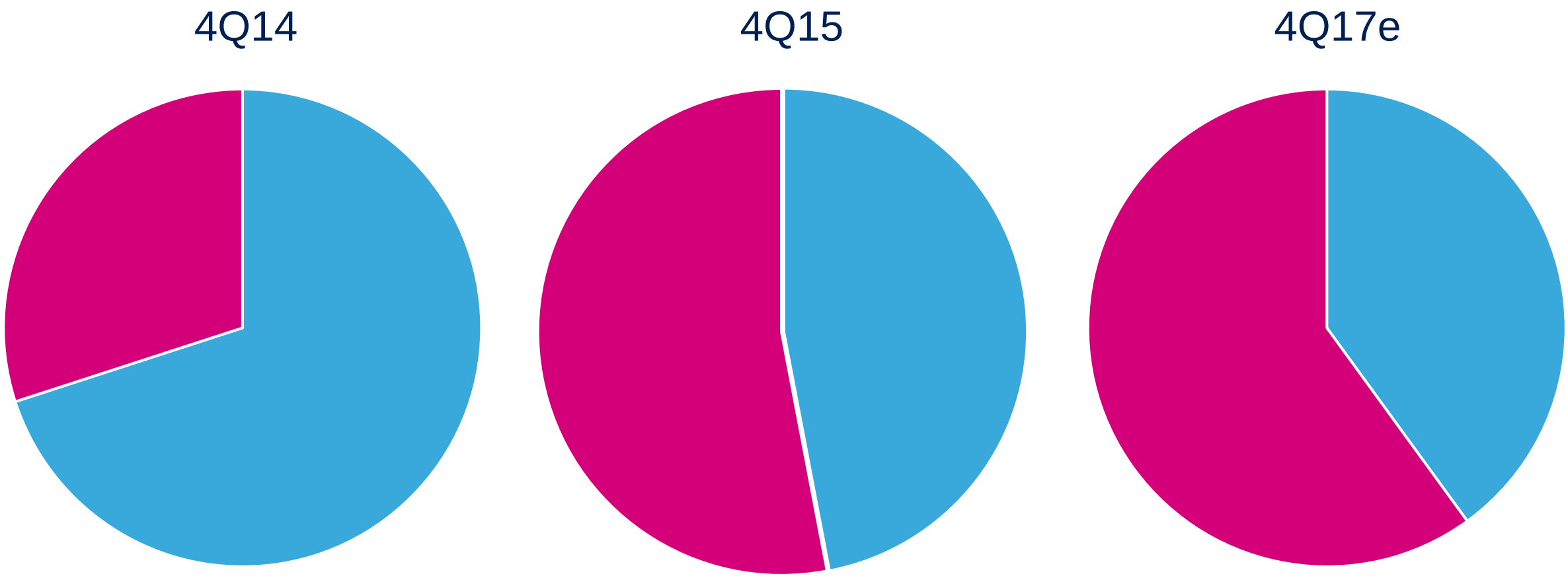
Crolles 300mm

Mix evolution with volume growth



Analog & Power Manufacturing Strategy

Leading Technologies

- Smart Power BCD9s automotive grade
- MEMS: motion, microphone, actuators, PZT
- Trench Power MOSFET
- SiC Power MOSFET automotive grade in 6”
- New Integrated Passive Devices in 8”

Cost efficiency

- Singapore - 8” expansion in Power discrete & BCD
- Catania - 8” expansion and 6” phase-out
- Flexibility at Foundries

4 Front-End sites

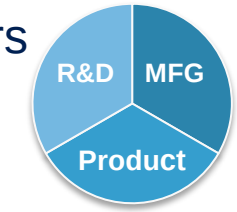
Tours	**Power Discrete Passive integration**
Catania	**Advanced BCD MOSFET and Silicon Carbide**
Agrate	**Advanced BCD MEMS**
Singapore	**Power Discrete BCD**

Integrated Manufacturing & R&D

Agrate & Catania excellence centers

Time to market – time to volume

Clusters of leadership



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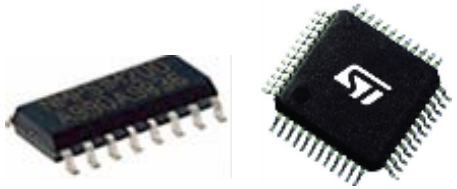
Innovation in Packaging

Lead frame package

Signal package (SO, QFP, QFN)

Power discrete (TO2XX)

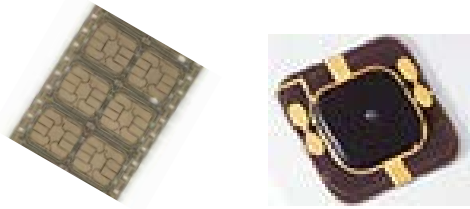
Power SMDs (PSO, PSSO, HiQUAD)

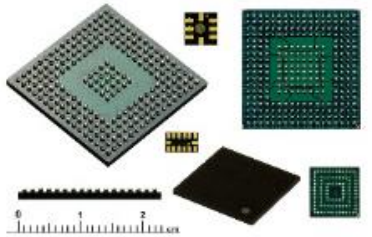


Laminate package

BGA

Micro-module

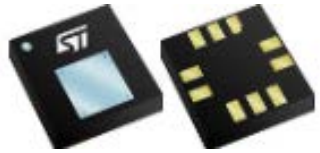


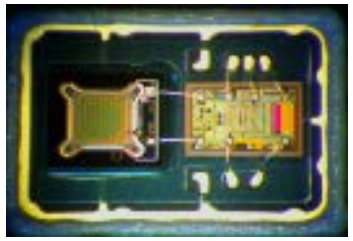


Sensor package

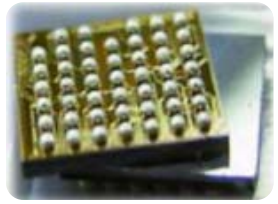
MEMS

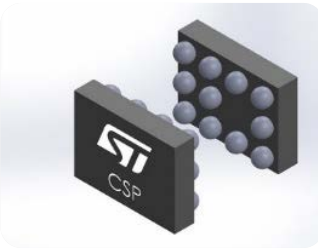
Time-of-Flight sensor

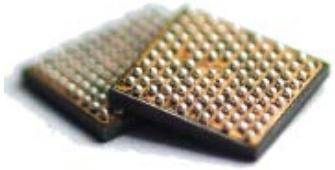




Wafer-level package







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Back-End Manufacturing Strategy

Leading Technologies

- System in Package (SiP), Motion MEMS, microphone, PZT
- Ultra thin wafers (< 50 micron)
- Very-low laminate substrates (<0.13mm)
- WLCSP
- 3D integration, flip chip interconnect
- Stacked die and Silver wires (0.8-2.0 mils) on lead frame package
- Super High Density lead frames (110mm width)

Cost efficiency

- Big Data analytics (predictive maintenance, time to yield, die pairing)
- Factory automation
- Material supply chain
- Flexibility at foundries

Integrated Manufacturing & R&D

Kirkop excellence center

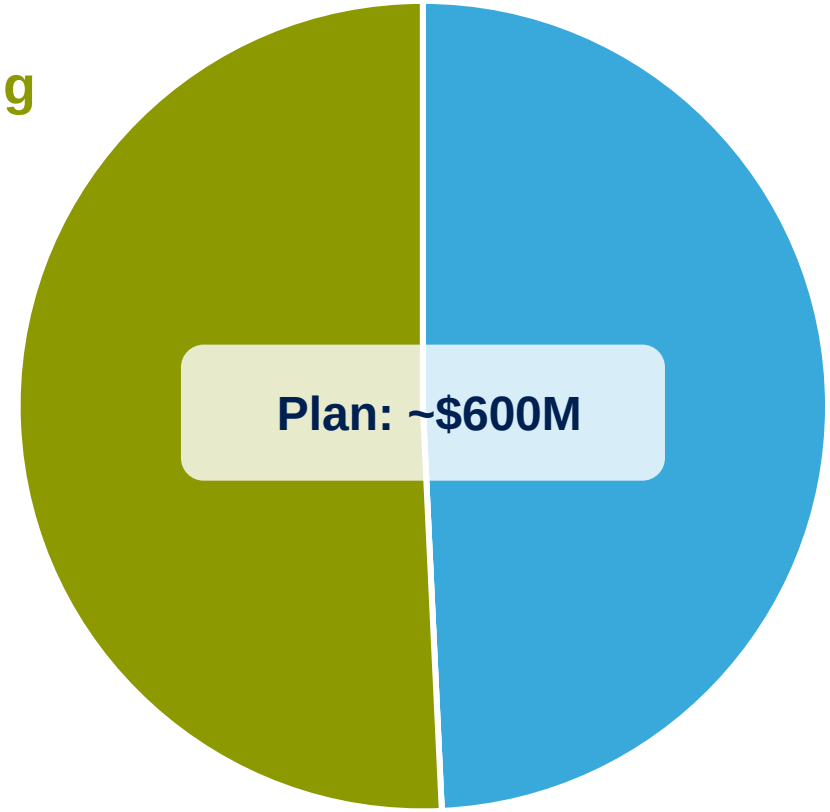
Time to market – time to volume

Design in quality

2016 Capital Spending

Probing, Assembly & Testing

- New packaging development
- Capacity growth in certain packages and testers
- Specific investment in factory automation and productivity improvement



Front-End Manufacturing/R&D

- New technologies in Crolles 300mm
- Mix evolution to advanced BCD and new MEMS actuators in Agrate
- Expanding 200mm advanced BCD, SiC in Catania
- Ramp-up 200mm in Singapore for Power Discrete & BCD
- Investment in capacity for new passive integration devices in Tours

Investments focused on:

Strategic business growth and key product ramps

Proprietary technology and manufacturing

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Technology & Manufacturing Takeaways

- Manufacturing and technology R&D fully aligned with application focus areas
- Combination of specialized and mass production offering with optimized internal and external allocation

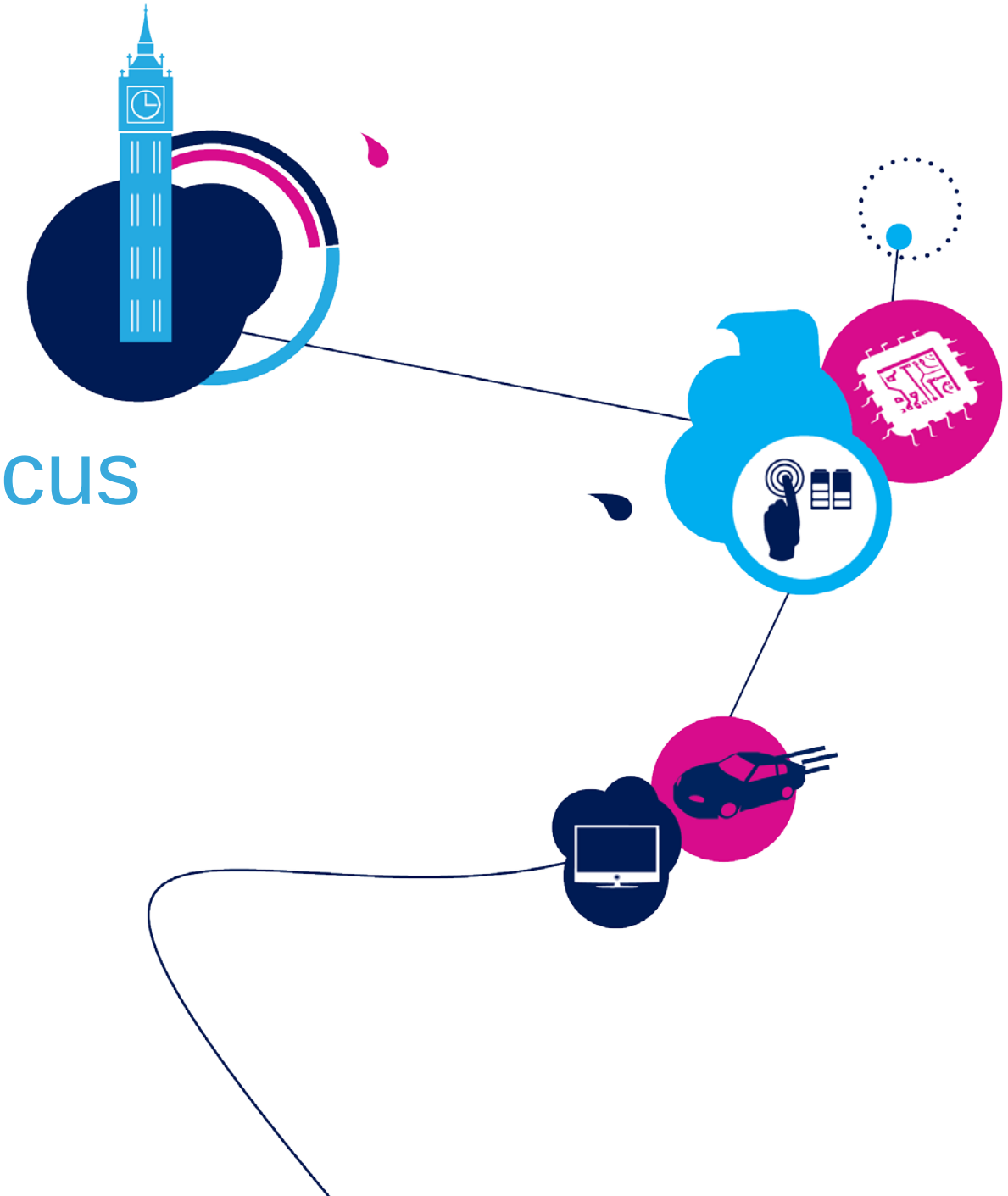
Key programs

- Strengthening FD-SOI and FinFET through foundry
- Proliferating eNVM
- BCD mix evolution and roadmap
- Differentiated technologies for Power Discrete, BiCMOS, MEMS and specialized imaging sensors
- Wafer Level Chip Scale Package through OSAT
- System in Package

Application Strategic Focus

Georges Penalver

Chief Strategy Officer



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Application Strategic Focus

The leading provider of products and solutions for Smart Driving and the Internet of Things

Smart Driving

Safer

More connected

Greener

Internet of Things

Smart Industry

Smart Home

Smart City

Smart Things

Addressing a Serviceable Available Market (SAM) of around $150B

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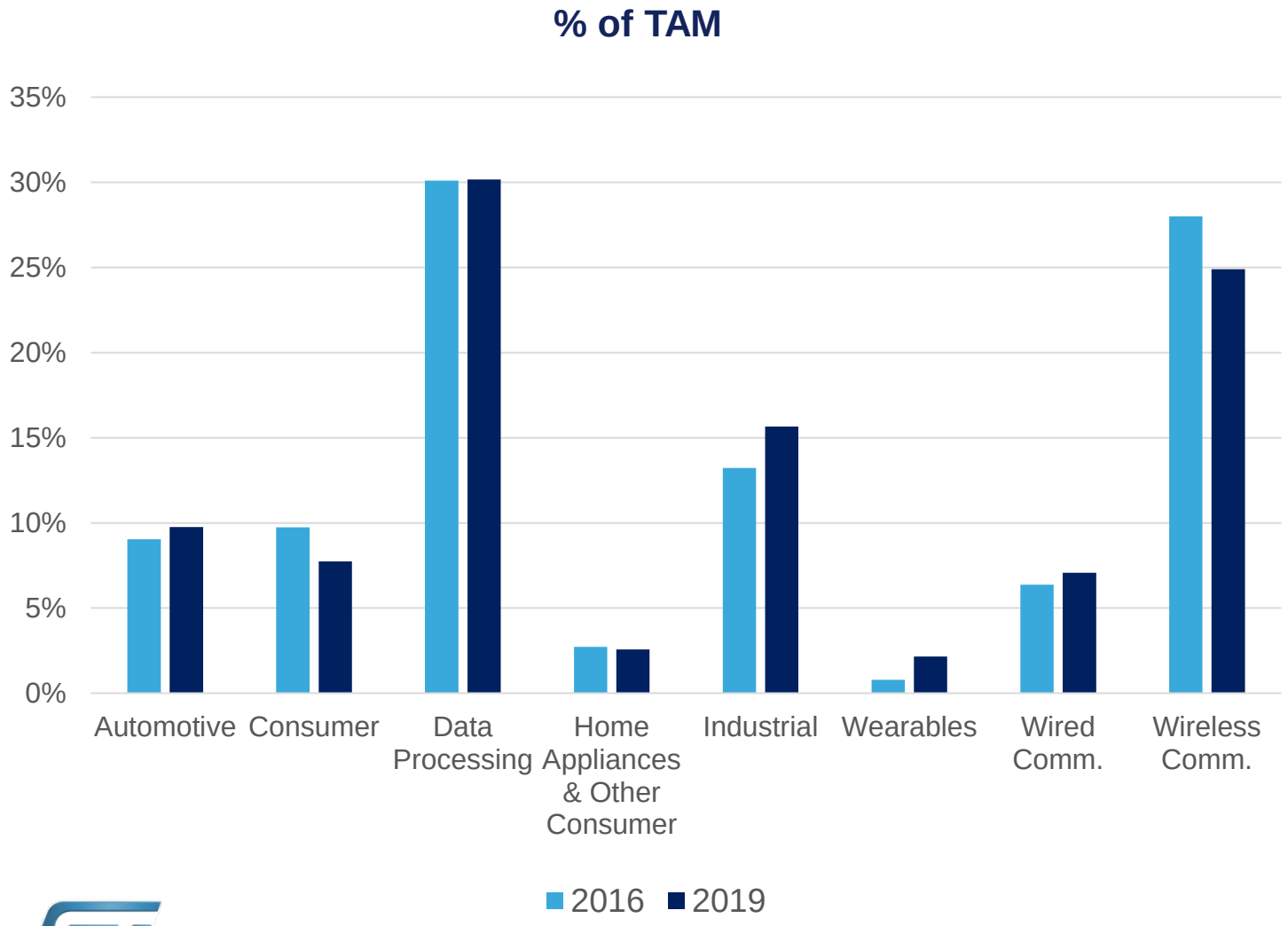
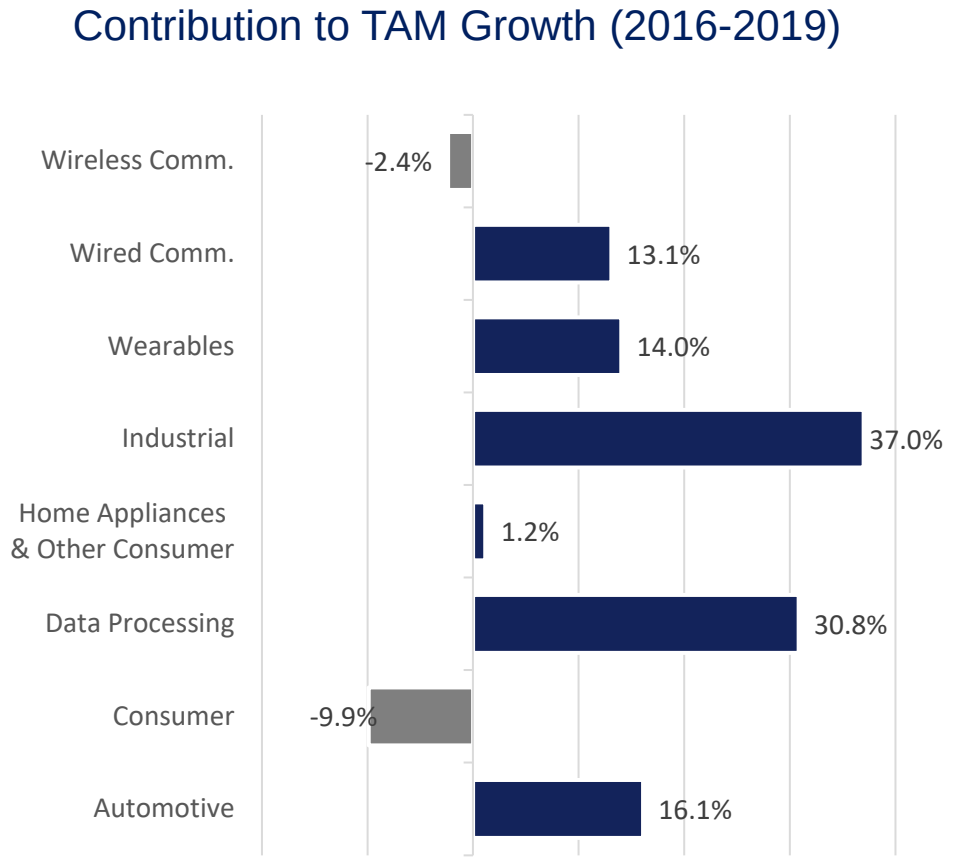
TAM Evolution by Application





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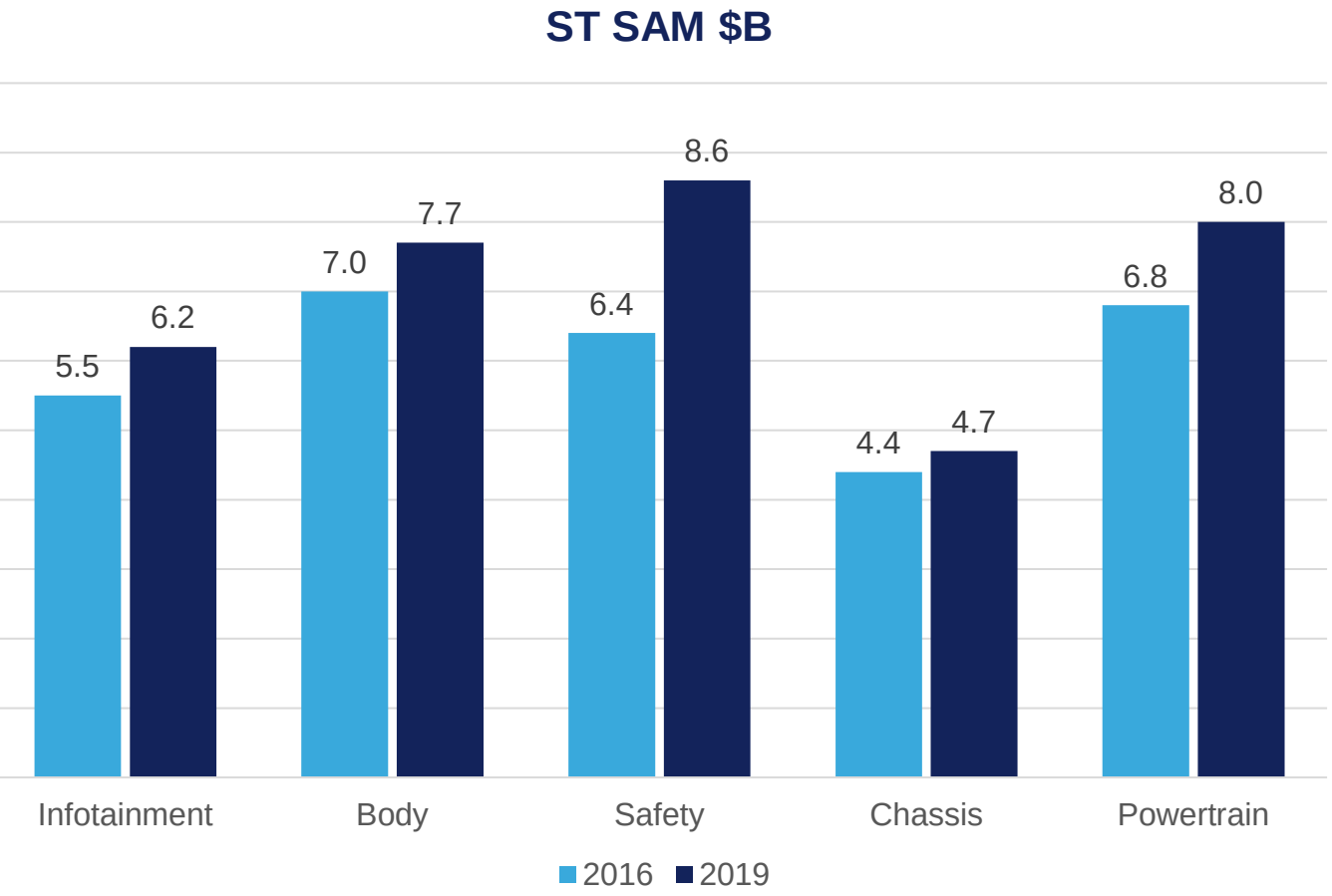
Source: WSTS

Smart Driving



Key Applications

Active Safety

Passive Safety

Electric & Hybrid vehicle Electrification

Infotainment

Telematics

Powertrain

Direct Injection Engine

Automatic Gearbox

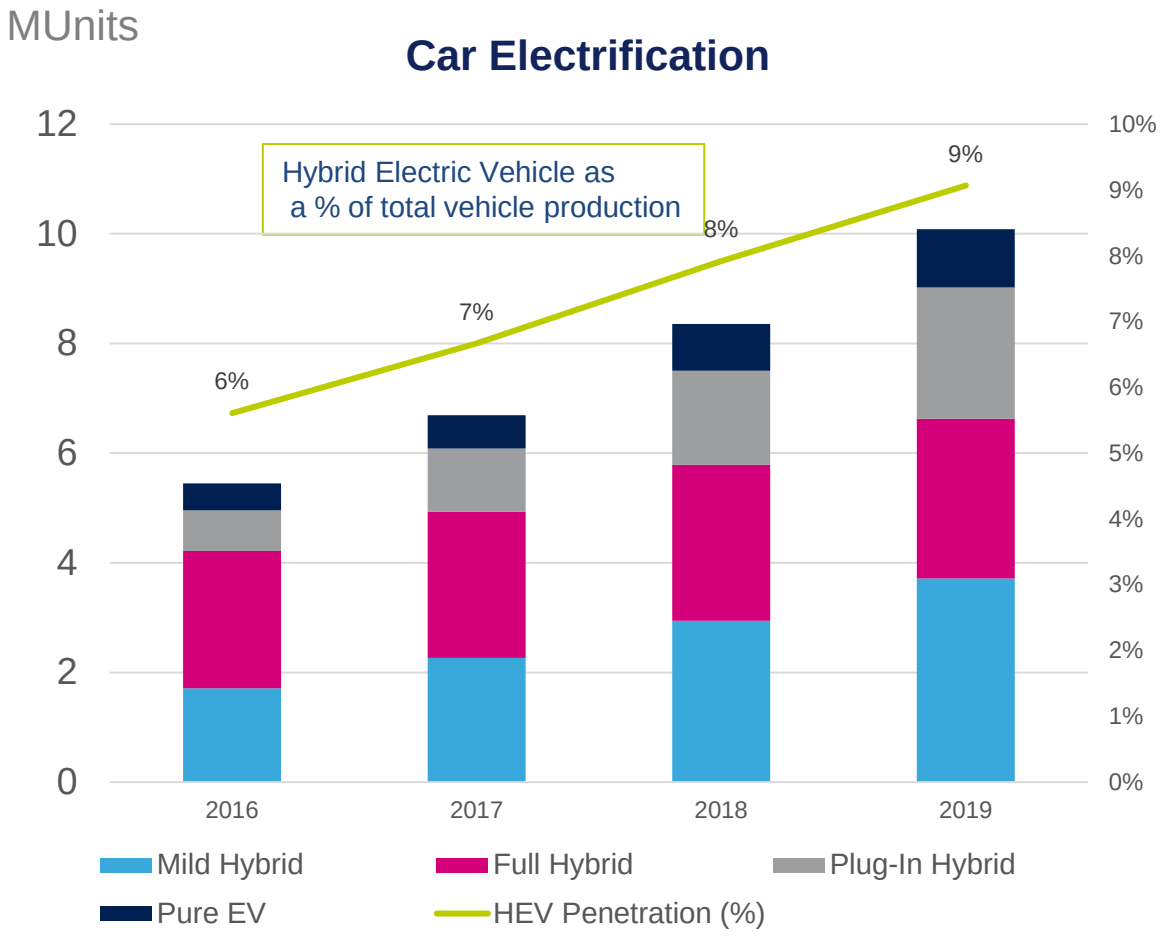
Braking

Steering

Source: Strategy Analytics

Smart Driving Application Focus

Electric & Hybrid vehicle Electrification



Battery Management

Charging

Power Conversion

Power & Smart Power

Digital processing 8/32-bit MCU & Multicore

Electric Pumps

Automated Transmission

Smart Grid Connection

Electric Traction

Start-Stop Systems

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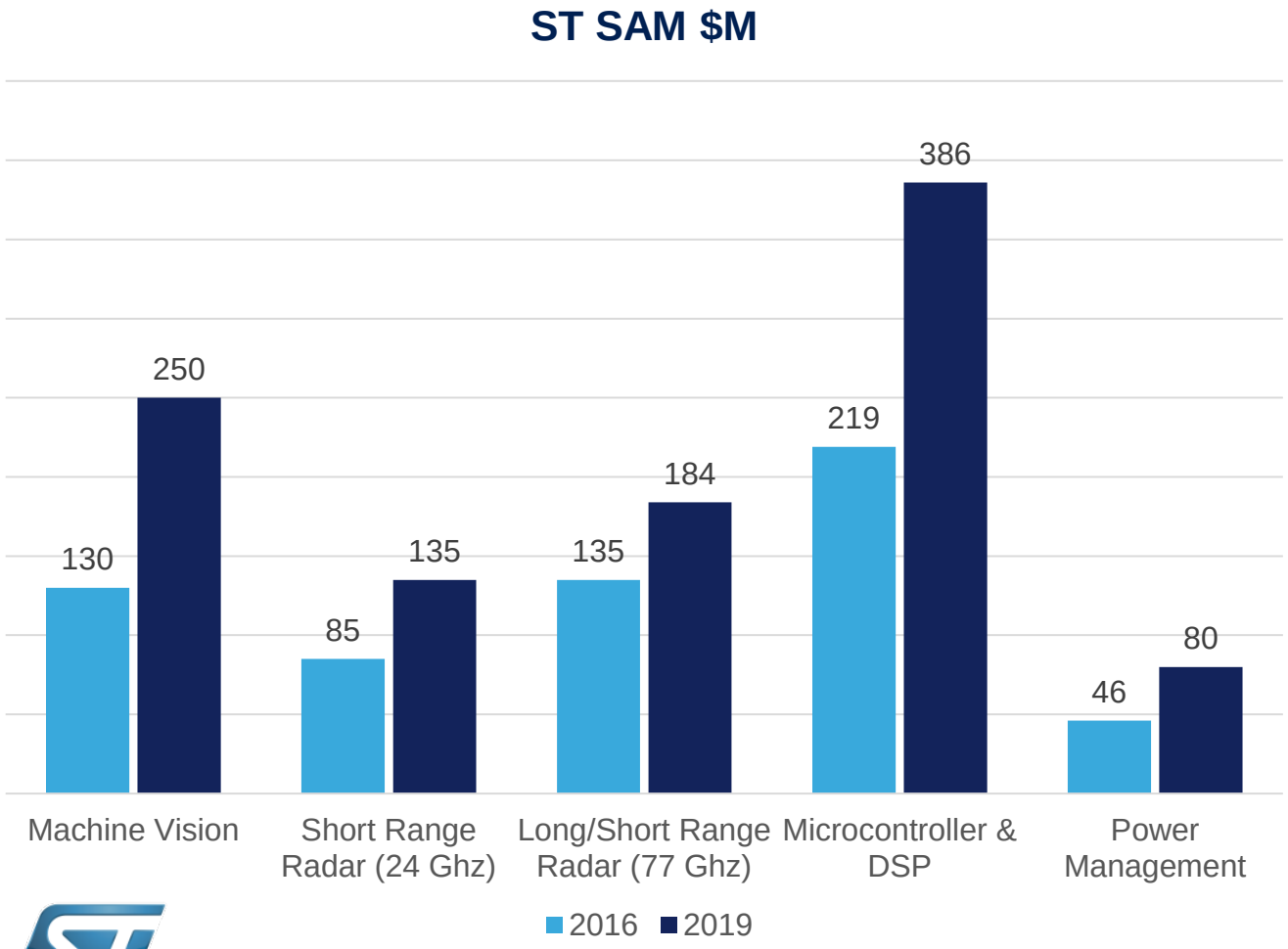
Source: Strategy Analytics

Smart Driving Application Focus

ADAS

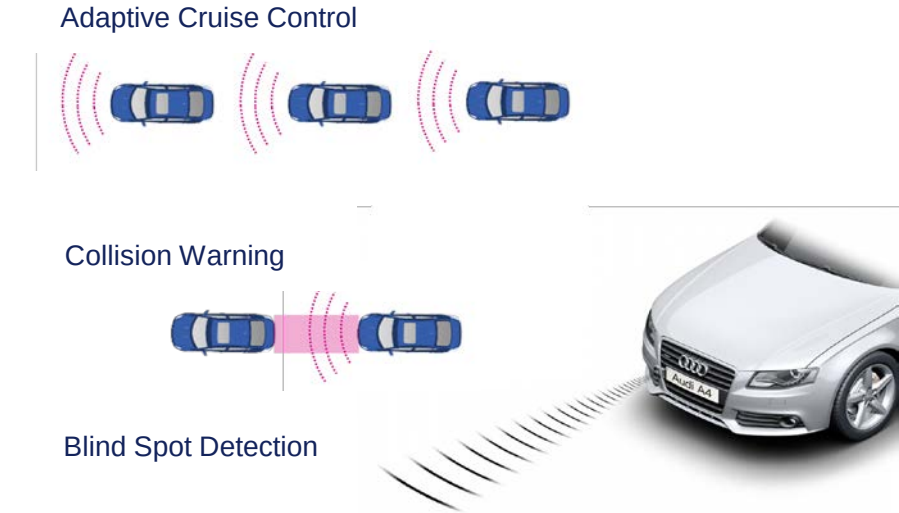


Sensors, Motion MEMS, Cameras

Power & Smart Power

Machine Vision, ASSP/Radar

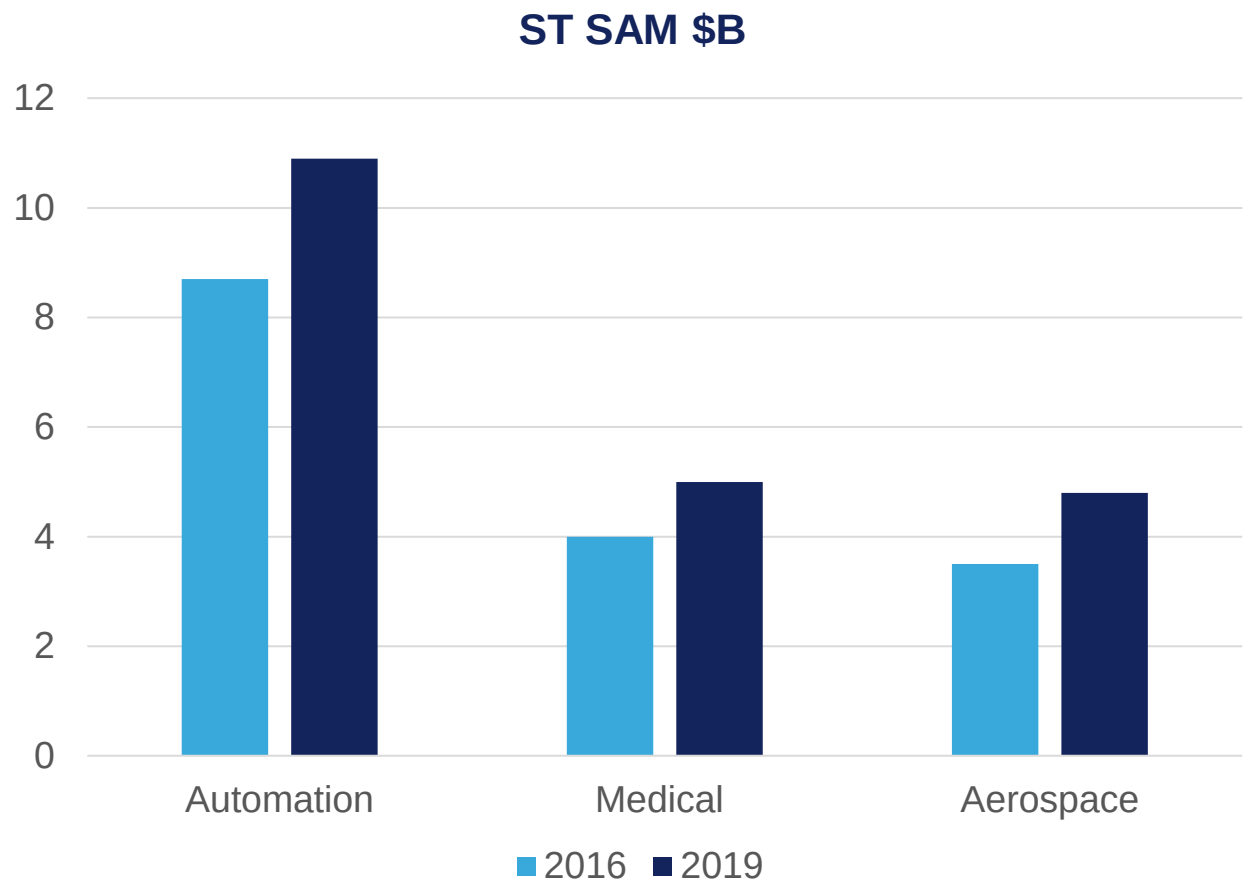
Digital processing 8/32-bit MCU & Multicore



Applications: Forward collision warning, lane departure warning, pedestrian detection, adaptive cruise control, blind-spot detection

Source: Strategy Analytics, ST

Smart Industry



Source: IHS

Key Applications

Smart Manufacturing

Factory Automation

Smart Motion Control

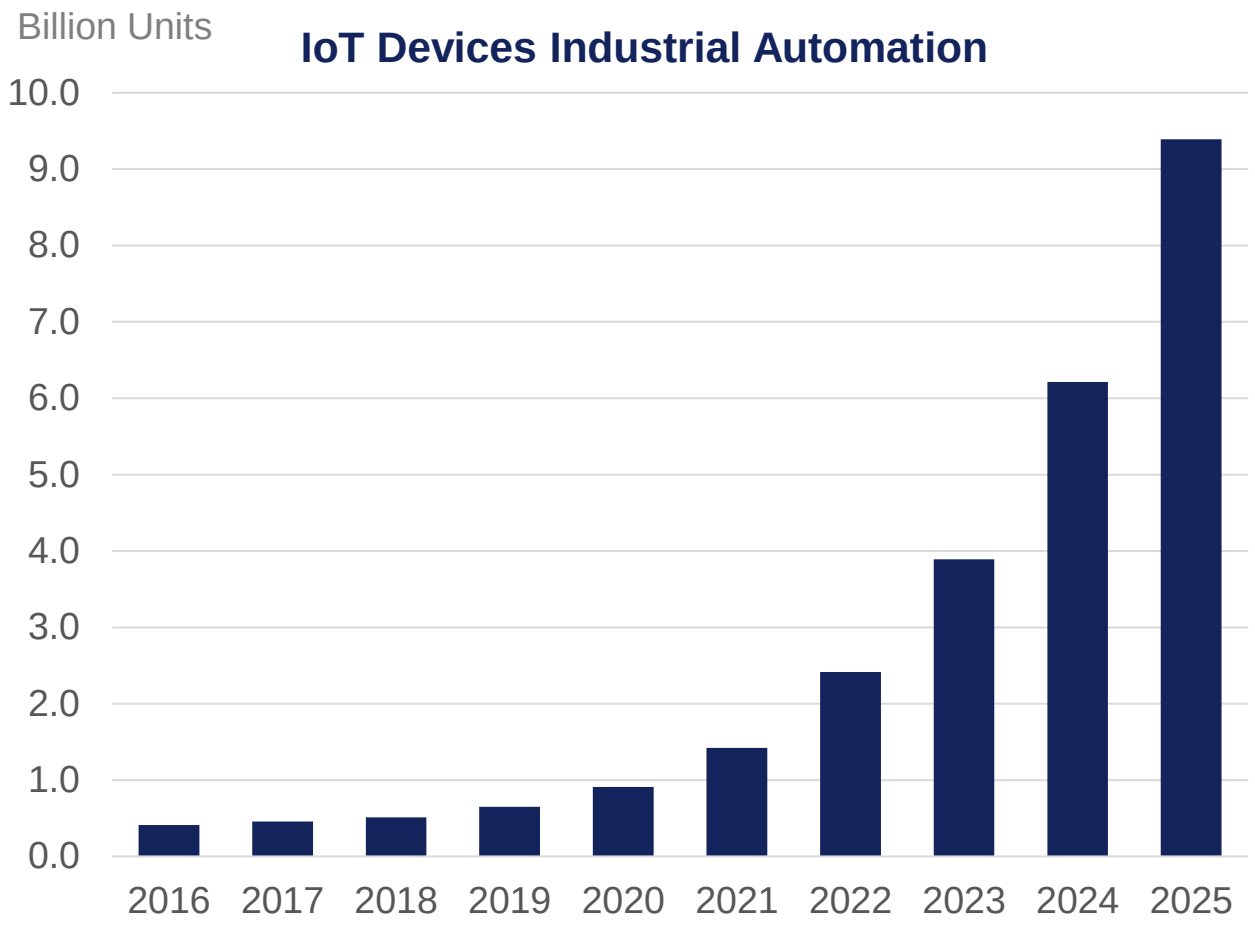
Industrial Robots

Industrial Lighting

Sensors for Industrial, Medical, Aerospace & Defense

Smart Industry Application Focus

Factory Automation



Smart Sensing

- Environmental sensors
- Motion sensors
- Acoustic MEMS
- Ranging sensors

Processing

- STM32 32-Bit MCU
- Secure MCU

Connectivity

- Power line modem
- Bluetooth modules
- Wi-Fi modules
- SubGHz connectivity (LPWA)
- I/O link
- NFC

Actuation & motor control

- Motor drivers
- Gate drivers
- Power switches

Power management

- AD/DC converters
- DC/DC regulators
- Analog & digital I/Os
- Protections

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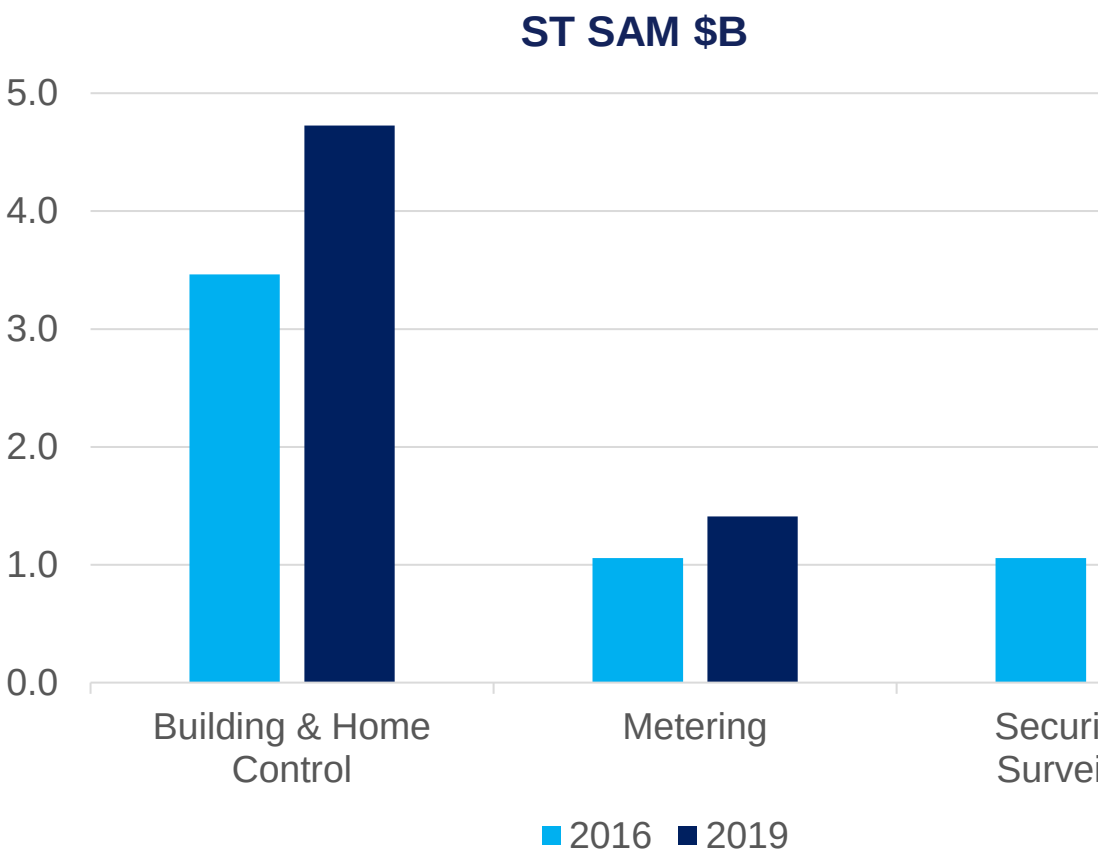
Source: IHS

Smart Home & City



Key Applications

Smart Transportation

Home & Building automation

Smart Metering

Security & Surveillance

Smart LED Lighting

Heating & Energy Control

Sources: IHS, ABI Research

Smart Home & City Application Focus

Smart Street Lighting

Smart Sensing

- Environmental sensors
- Acoustic MEMS
- Ranging sensors

Processing

- STM32 32-Bit MCU
- Secure MCU

Connectivity

- Power line modem
- Wi-Fi modules
- SubGHz connectivity (LPWA)

Power management

- Power MOSFET
- MOSFET driver
- DC/DC LED driver
- Digital Controller
- Protections

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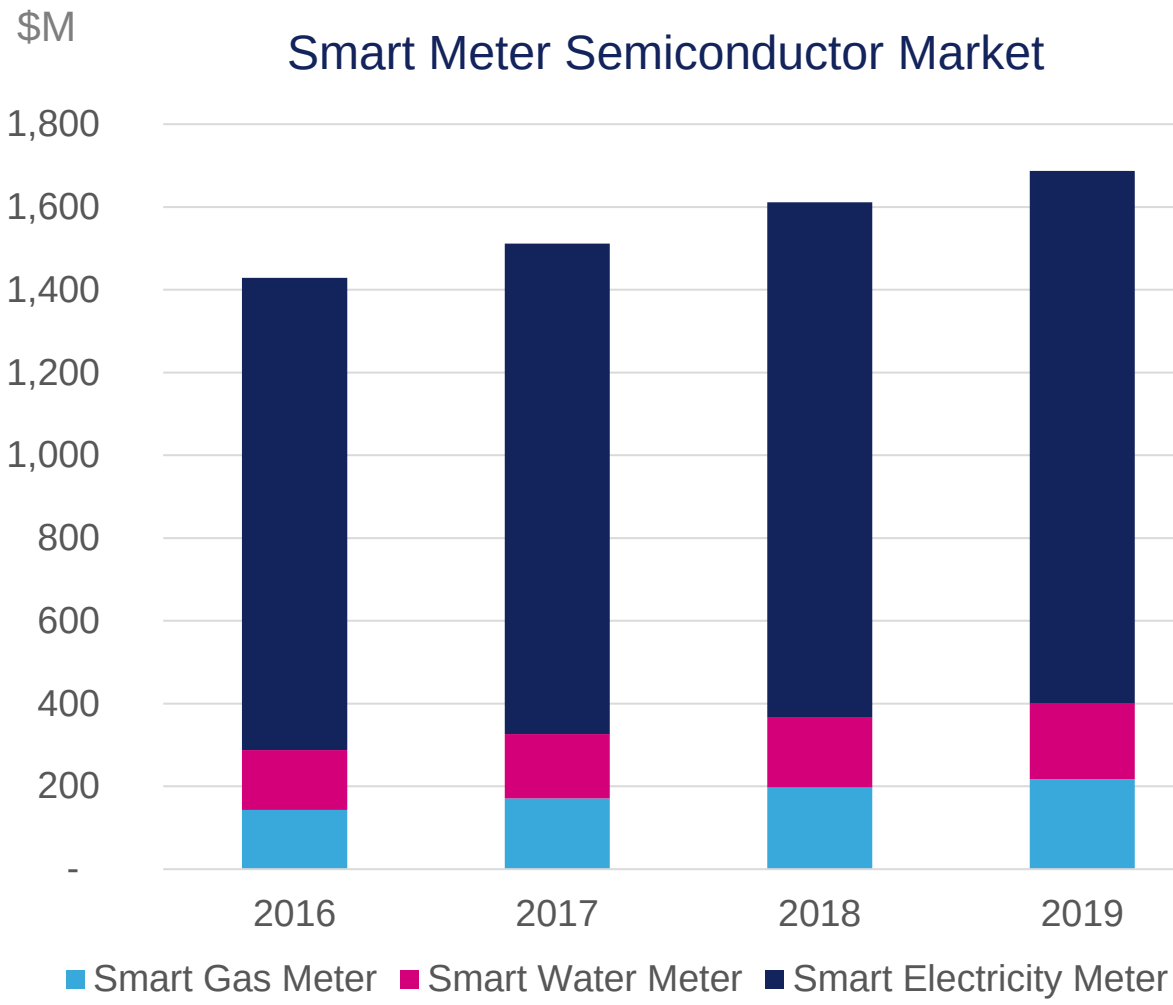
Source: ABI Research

Smart Home & City Application Focus

Smart Metering



Metrology

- Metrology for single and polyphase meters

Processing

- STM32 32-Bit MCU
- Secure MCU

Connectivity

- Power line modem
- SubGHz connectivity (LPWA)
- NFC and RFID

Power management

- Integrated SMPS
- AD/DC converters
- DC/DC regulators
- Protections

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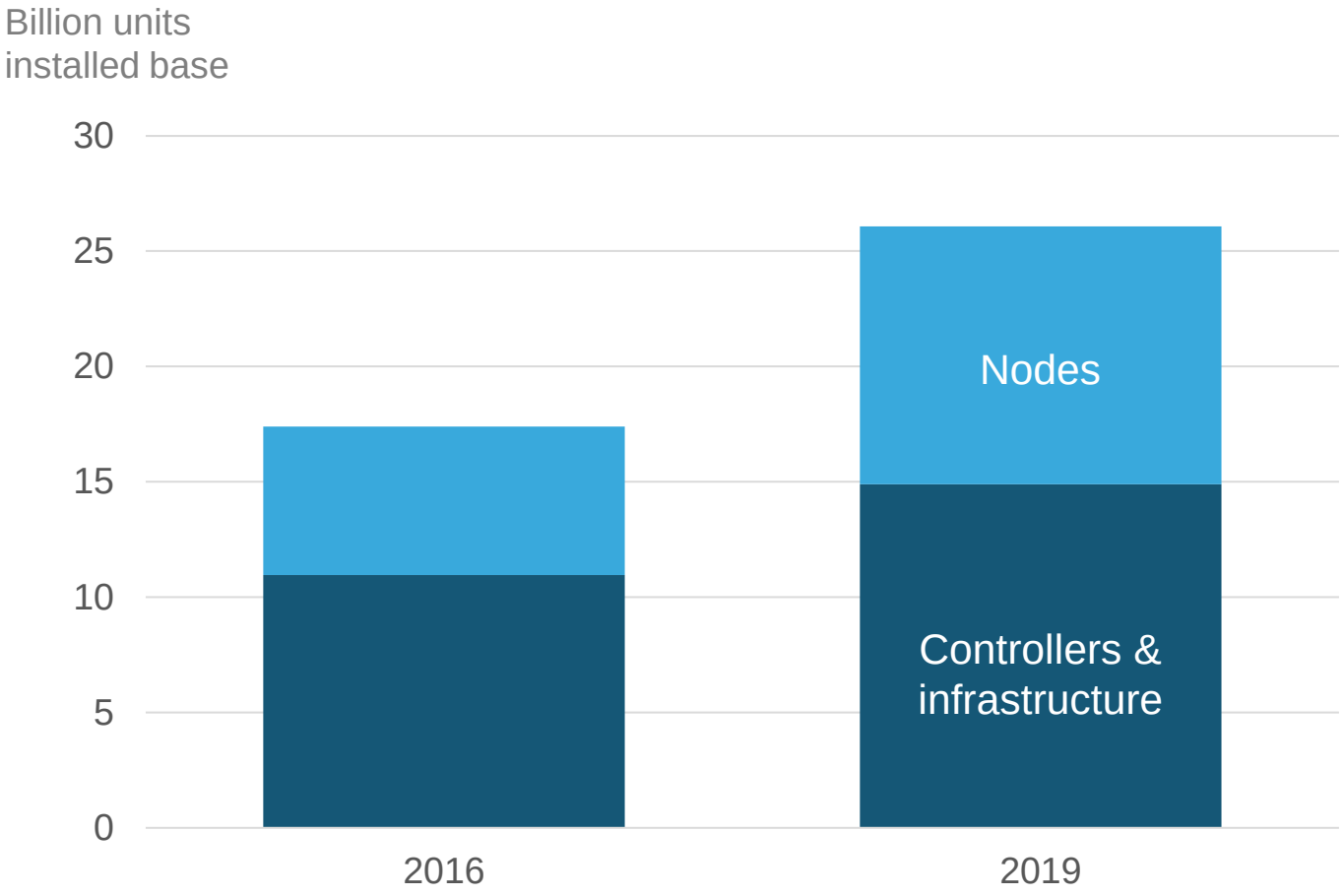
Source: IHS

Smart Things



Key Applications

Smartphones

Tablets

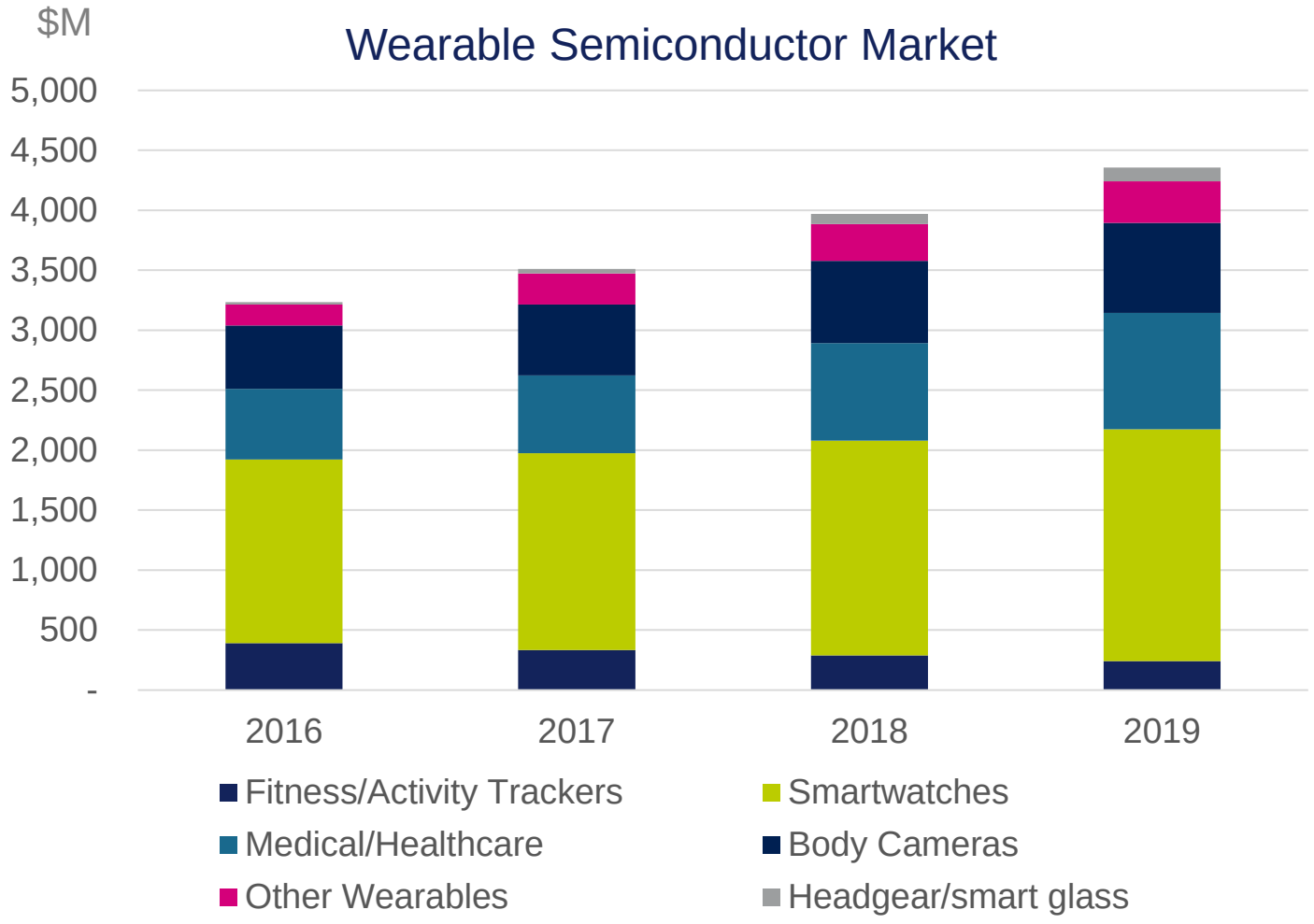
Wearable

Smart Things

Source: IHS

Smart Things Application Focus

Wearables



Smart Sensing

- Motion sensors
- Environmental sensors
- Acoustic MEMS
- Ranging sensors
- Micro-actuators
- Touch sensors

Processing

- STM32 32-Bit
- Secure MCU

Connectivity

- Bluetooth Low Energy
- Wi-Fi modules
- NFC

Power management

- Energy Harvesting ICs
- OLED power management
- Thin-film battery
- Power management ICs
- Protections

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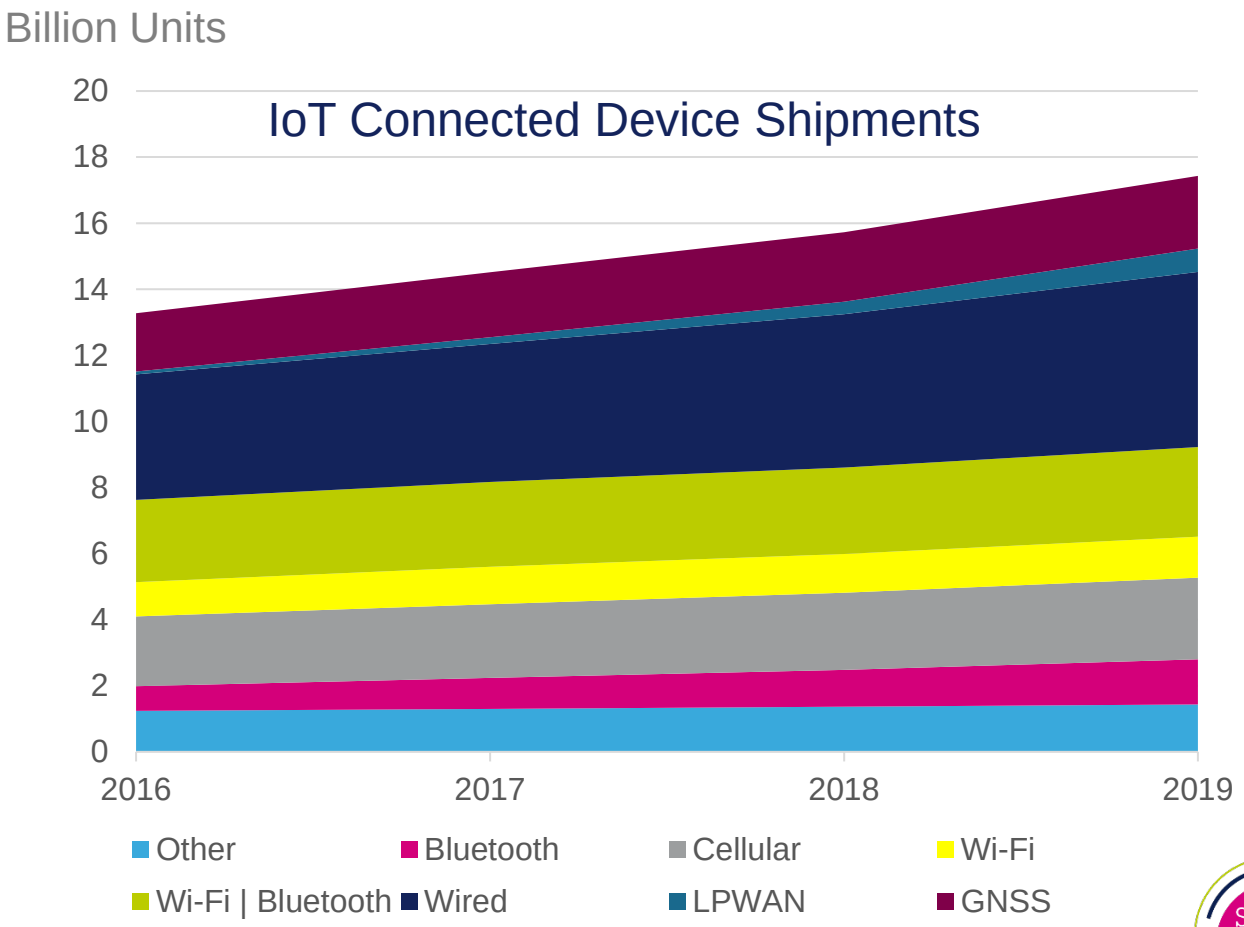
Source: IHS

Connectivity Needed Everywhere



Source: IHS, Mobile Experts, ST

Bluetooth & Wi-Fi

Bluetooth Low Energy

- BlueNRG - Highly energy-efficient network processor

Car Wi-Fi

- Partnership with Autotalks for V2X solutions

High data rate low-power RF

- Partnership for solutions targeting disposable devices

SubGHz

- **SPIRIT** - Very low power RF transceivers for SubGHz
- **LPWAN (Low Power Wide Area Networks) Partnerships**
  - **LoRa** – Partnership with STM32
  - **SigFox** – Partnering for SPIRIT2

GNSS

- TESEO – Multi-constellation GNSS solutions

Power Line Communications

- STARGRID & STCOMET - Solutions covering all the major power line communications protocols

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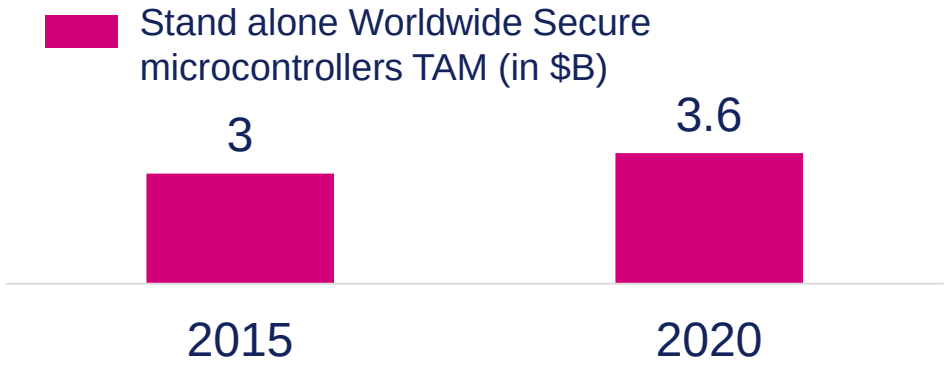
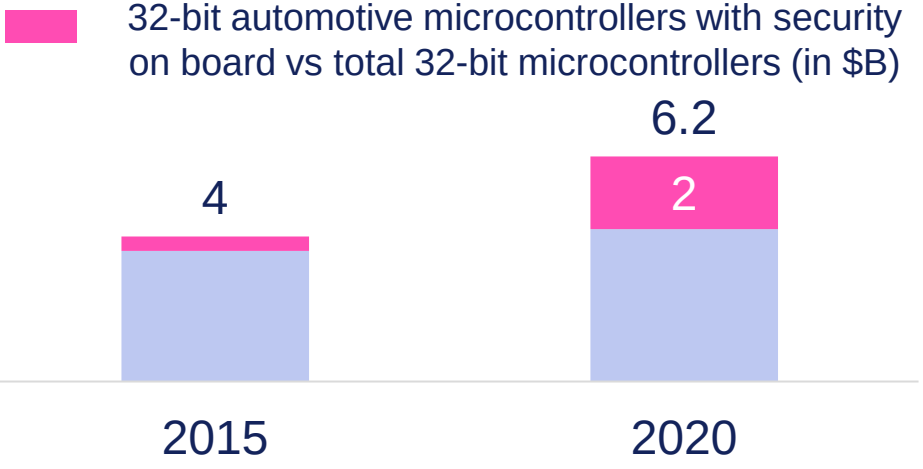
Security Needed Everywhere





Internet of Things

Smart Driving

Smart Driving

Secure MCU

ST54 for Secure Mobile Transactions

- Mobile devices & wearable
- Secure payment, transport, access control & biometry

STSAFE for Authentication & IP protection

- Brand protection, TPM, metering, accessories, LPWAN, Secure IoT

ST33 & ST33TPM for Automotive

- Secure communications among peripherals
- Secure firmware upgrade, secure boot
- Secure cellular connections

Secure Automotive Solutions

Automotive MCU

- SPC5 MCU with Crypto

Car Connectivity

- Wi-Fi Secured for Car-2-X

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Source: Strategy Analytics, WSTS

Application Strategic Focus

The leading provider of products and solutions for Smart Driving and the Internet of Things

Smart Driving

Safer

More connected

Greener

Internet of Things

Smart Industry

Smart Home

Smart City

Smart Things

Addressing a Serviceable Available Market (SAM) of around $150B

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Internet of Things
A Key Driver of Growth

Bob Krysiak
EVP, President, Region Americas, Global Mass Market & Online Marketing Programs

Claude Dardanne
EVP, General Manager, Microcontroller and Digital ICs Group

Benedetto Vigna
EVP, General Manager, Analog and MEMS Group

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IoT Strategic Focus

The leading provider of products and solutions for the Internet of Things

Internet of Things

Smart Industry	Smart City	Smart Home	Smart Things
			

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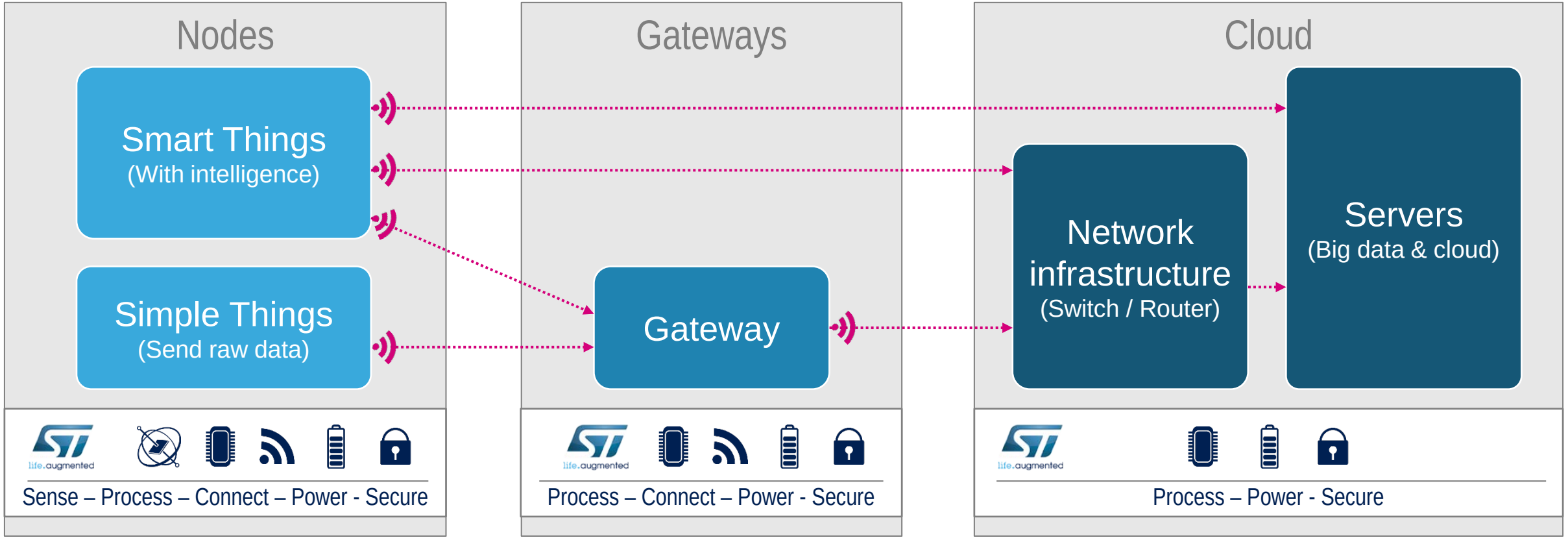
The IoT Movement

IoT is a movement where any system is able to leverage the Internet and its eco-system

Cloud computing – Low cost embedded computers – Explosion of reliable wireless connectivity – Rapid innovation of low cost sensors



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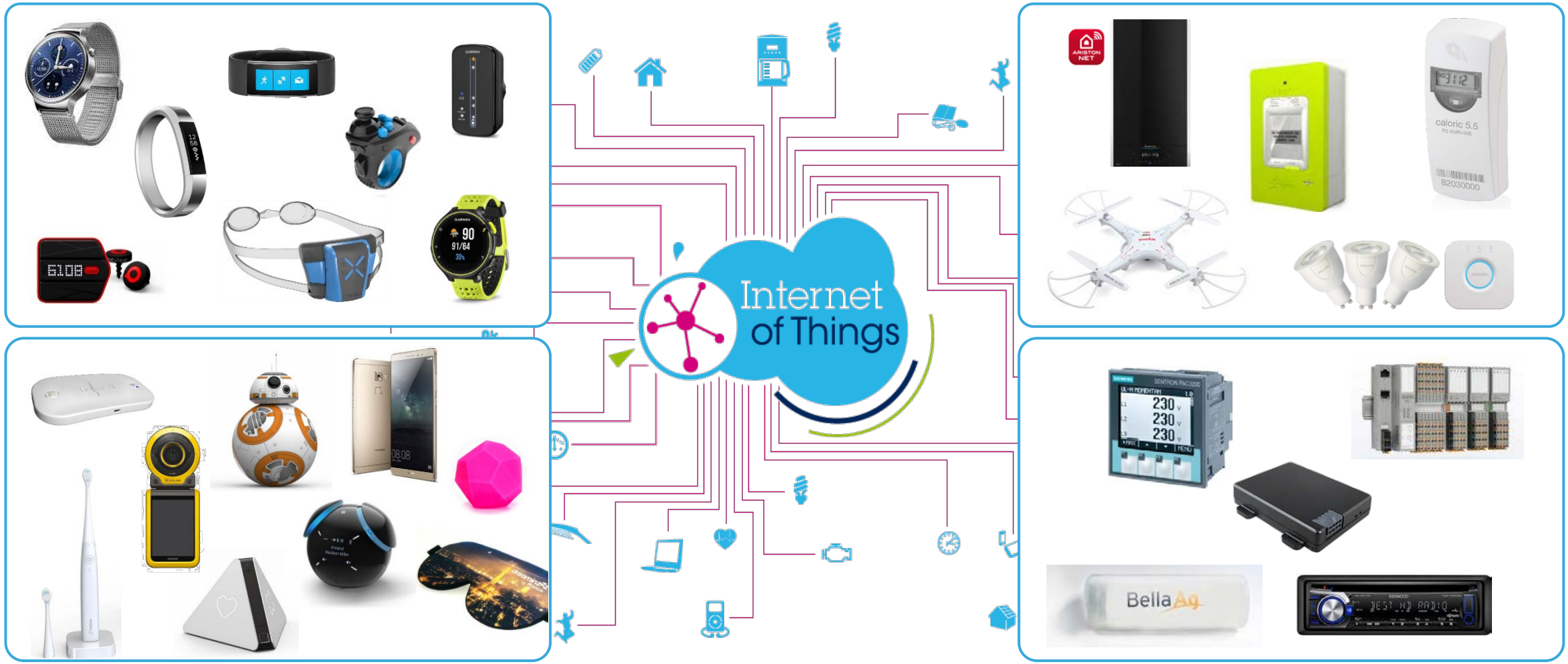
IoT Devices Come in Many Form Factors



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…but Their Needs are the Same

	Processing & Security	Sensing & Actuating	Connectivity	Signal Conditioning & Protection	Power & Energy Management
Smart Things	Ultra-Low Power to High Performance Scalable Security solutions	Full range of sensors and actuators	10 cm to 10 km	Nano Amps to Kilo Amps	Nano Watt to Mega Watt
Smart Home					
Smart City					
Smart Industry					

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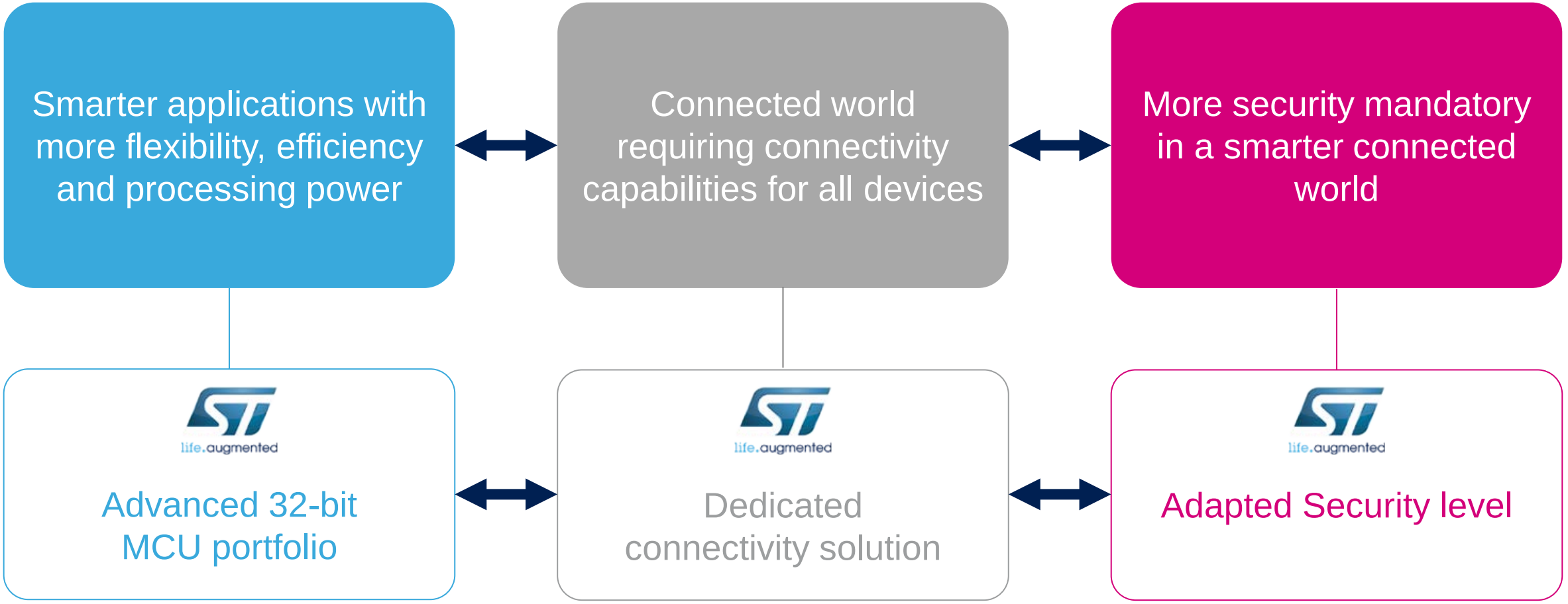
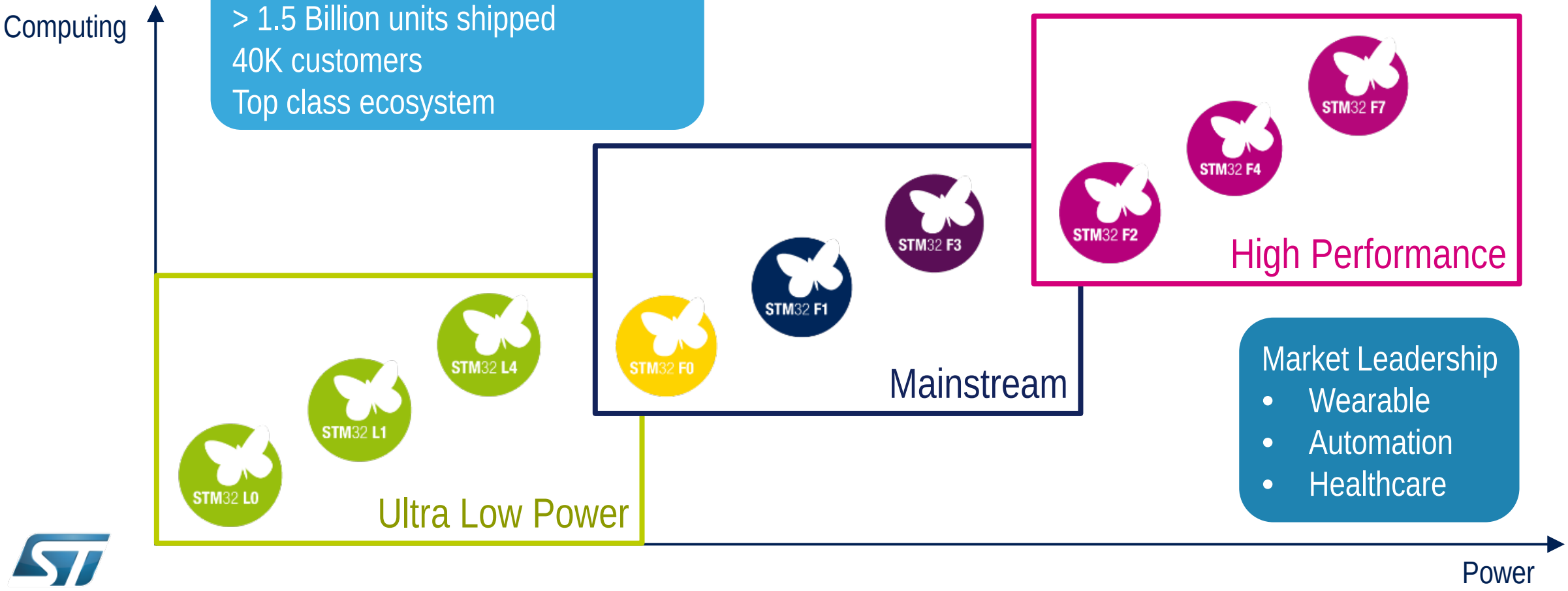
Microcontrollers Enabling IoT



STM32
Advanced 32-bit MCU portfolio

#1 WW 32-bit Microcontrollers supplier (excluding Automotive)

> 650 products → Broadest range
> 1.5 Billion units shipped
40K customers
Top class ecosystem



Market Leadership
- Wearable
- Automation
- Healthcare

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Adapted Security Level

Highest

Basic

Payment

Identification

Smart Grid, Industrial gateways

Healthcare

Smart meter

Appliances
Smart home

Wearables

Secure MCU

ST33/31 MCU

STM32 eSE

STM32 MCU ↔ STSAFE

STM32 MCU

STM32

STM32 MCU

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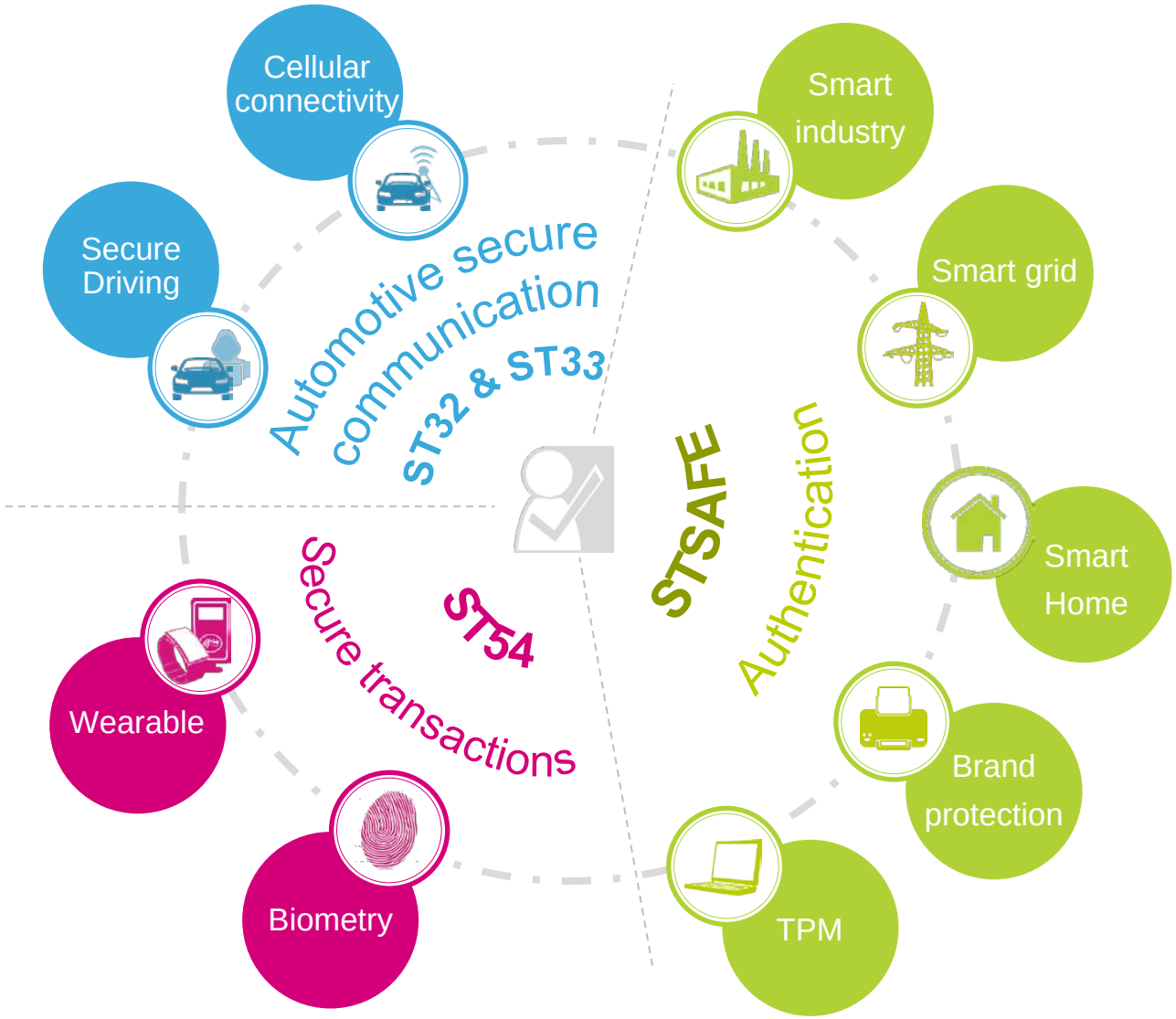
Secure Solutions for IoT



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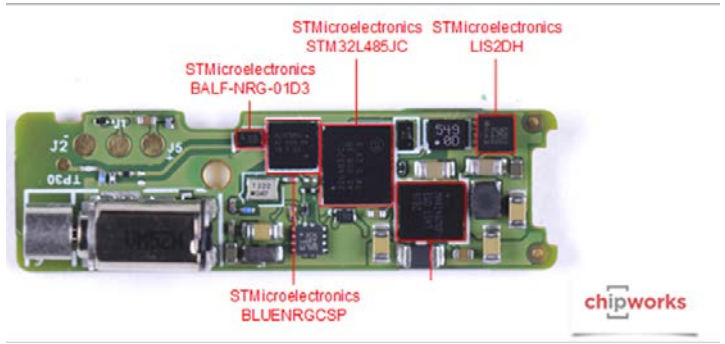
Sensing, Analog & Power

	Sensing & Actuating	Connectivity	Signal Conditioning & Protection	Power & Energy Management
Smart Things	Motion Pressure Temperature Humidity Microphone UV Light Touch sensors Micro-mirrors	Bluetooth Low Energy Wi-Fi NFC	Op Amps Comparators EMI Filtering ESD Protection	Display power drivers Energy Harvesting Power Management ICs
Smart Home				Power Management Digital power controllers LED lighting drivers Power Discretes Power Modules Galvanic isolated switches Intelligent Power Switches
Smart City		SubGhz (LoRa, Sigfox) Powerline communications		
Smart Industry	Motor Drivers	Powerline communications Industrial protocols		

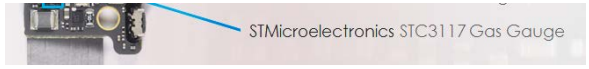
Smart Things

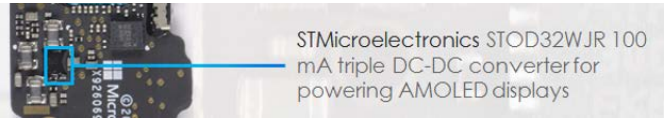
Fitbit alta



Microsoft Band II

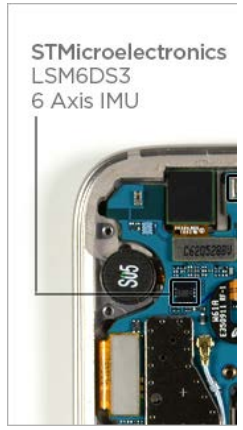
Device Type	Manufacturer	Part
Gyroscope and Accelerometer	STMicroelectronics	LSM6DS2
Barometer	STMicroelectronics	LPS25HB
UV Sensor	STMicroelectronics	No PKG marks





chipworks

Samsung Galaxy S7



gyroscope (STMicroelectronics) L2G2IS

chipworks

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Smart Home

ARISTON THERMO GROUP

Smart Water heater

Wireless Connectivity Module

QUNDIS™ ADVANCED MEASURING SOLUTIONS.

Heat cost allocator

Wireless Connectivity Module

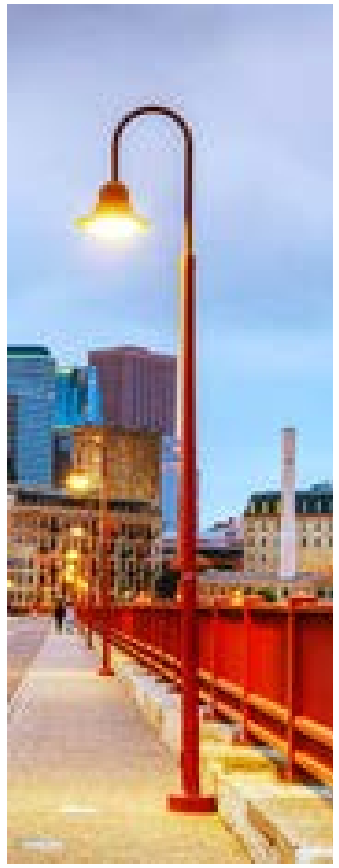
Source: Qundis GmbH

Smart City

End-to-end Smart Grid program in France

Large-scale Smart meter program in Italy

- STM32 Microcontroller
- STarGRID Power Line Controller
- STCOMET Smart Metering SoC
- Energy Metering IC



Over 100.000 Smart Street light installed in cities in Italy

Innovation smart city infrastructure around the globe

- STM32 Microcontroller
- STarGRID Power Line Controller
- SubGHz RF
- Energy Metering IC

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Smart Industry

SIEMENS

Reliable and precise monitoring of electrical power systems

The SENTRON PAC3200 is a powerful compact power monitoring device that is suitable for use in industrial, government and commercial applications where basic metering and energy monitoring is required. The meter may be used as a stand alone device monitoring over 50 parameters or as part of an industrial control, building automation or global power monitoring system.

Metering and monitoring applications range from simple analog volt and amp meter replacements to stand-alone sub billing or cost allocation installations with multiple tariffs. The SENTRON PAC3200 can also be used to support LEED certification and provide the needed energy metering data for federal/ local government energy reduction programs.

The SENTRON PAC3200 provides open communications using Modbus RTU/TCP and PROFIBUS-DP protocols for easy integration into any local or remote monitoring system. Simple configuration of the meter can be done from the front display or by using a PC with SENTRON powerconfig setup software, supplied with the meter.

Factory Automation
Motion Control
Smart Industrial Meter
Industrial Power Supply

Microcontrollers
EEPROM
NFC EEPROM

Wide Band Power line modem

Voltage / Switching regulator
Op Amp
Power MOSFETs
Power Diodes
Protection

PHOENIX CONTACT

Programmable Logic Controller

Communications Controller ASIC

Intelligent Power Switches
Galvanic isolated solid state relay

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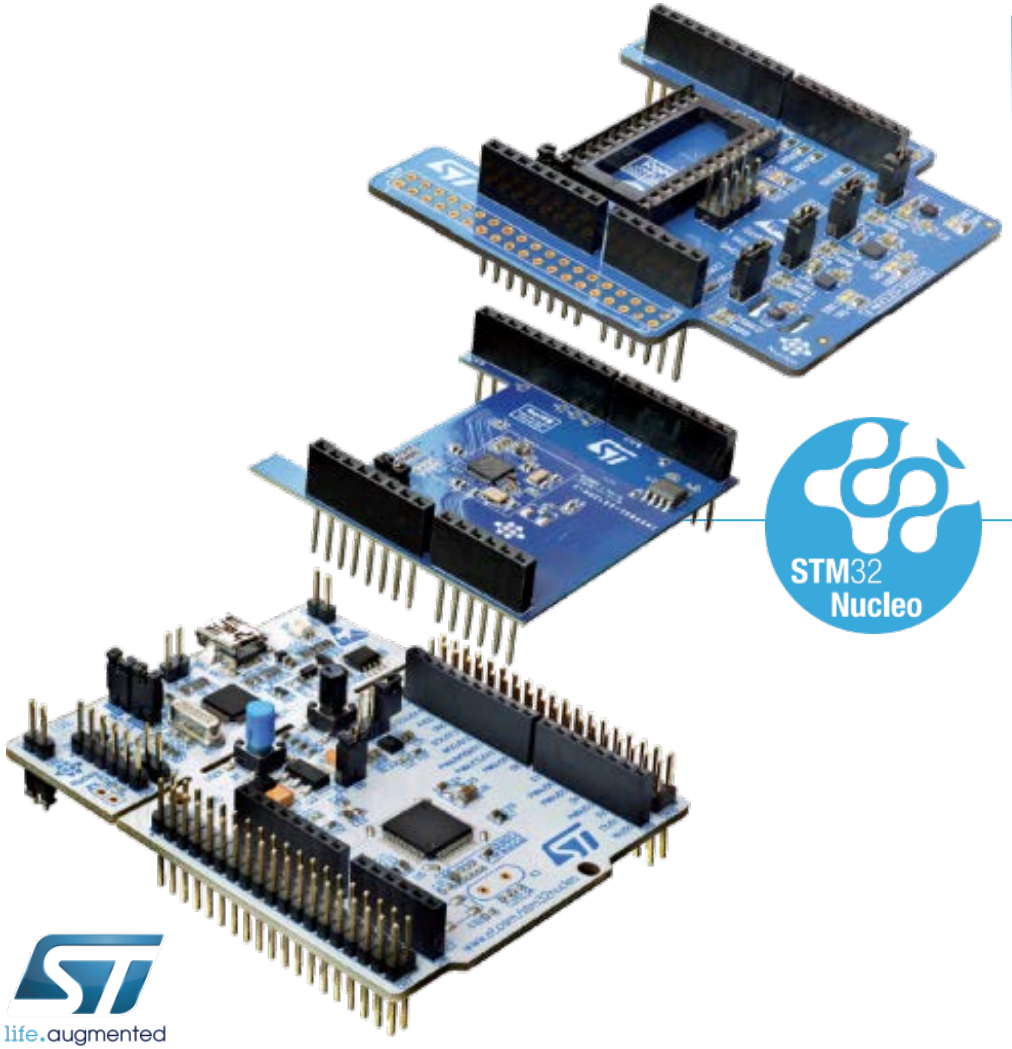
STM32 Open Development Environment

Fast, Affordable Development
and prototyping



STM32 Nucleo

Sense
Motion &
environmental sensors
Proximity sensor
Microphone

Connect
BLE
Wi-Fi
Sub-GHz
NFC

Power Drive
Power management
LED Boost

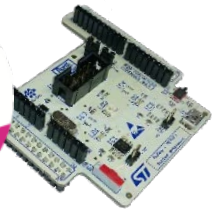
Move Actuate
Motor drive
Actuator

Translate
Audio
OpAmp

STM32 Cube

Processing
STM32

Scalable Security
Secure MCU



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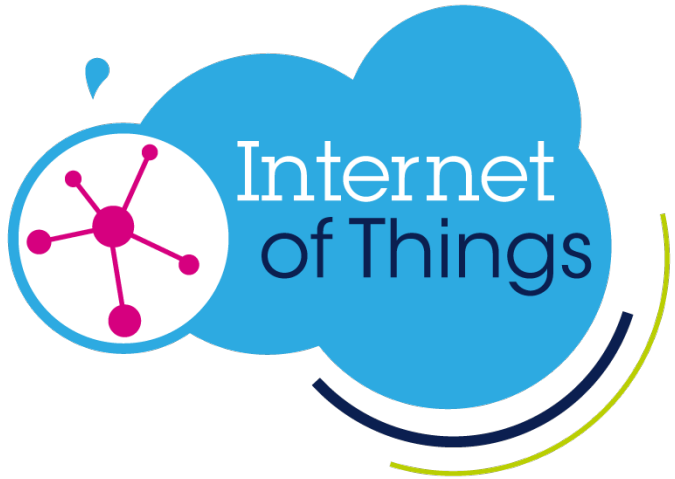
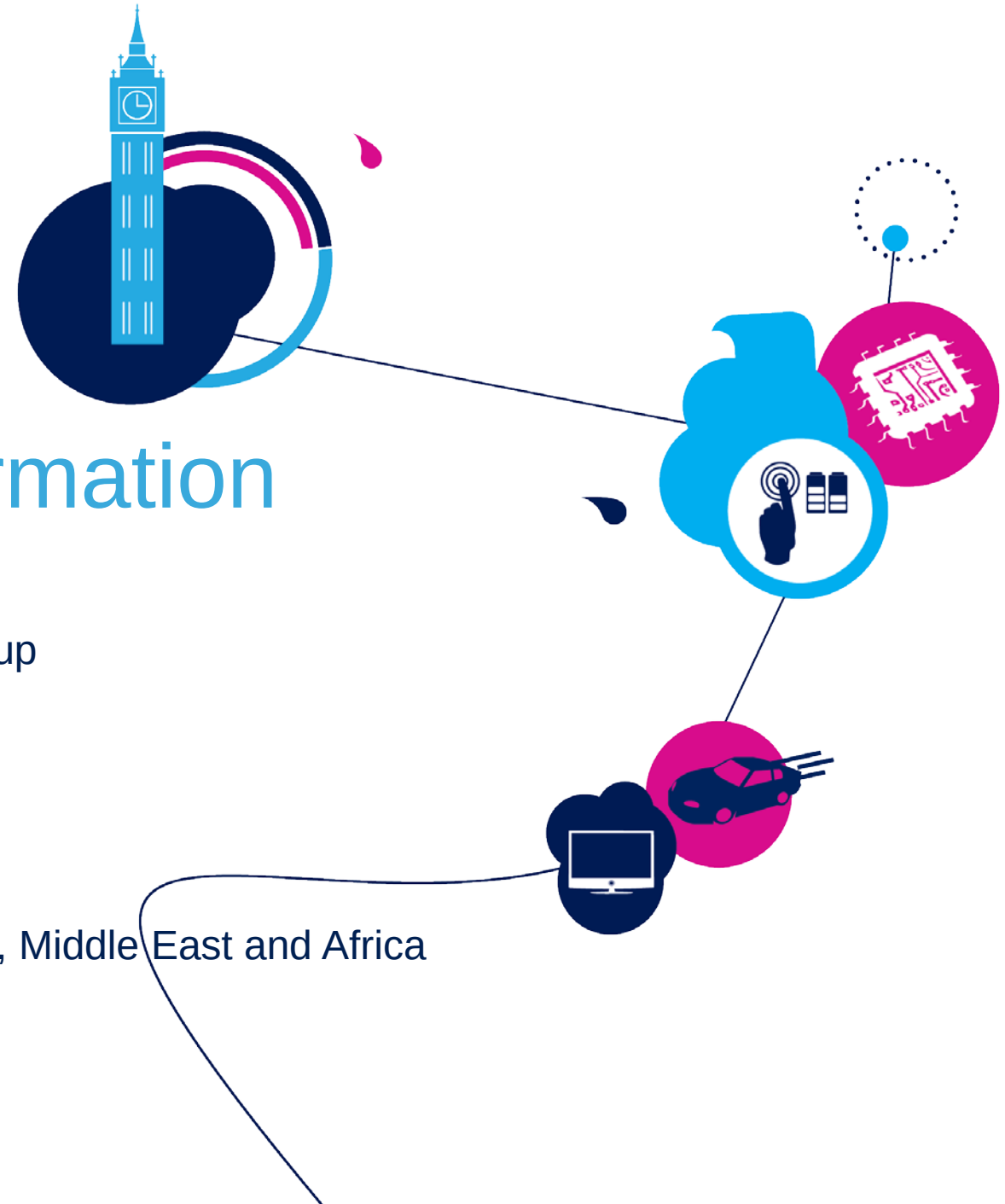
Takeaways

- Internet of Things presents a wealth of opportunities for ST
- ST has all the building blocks for the IoT adapted to the different needs of diverse applications
  - Processing and security
  - Sensing and actuating
  - Signal conditioning and protection
  - Wired and wireless connectivity
  - Power and energy management



- ST makes development of devices for the IoT fast and affordable

Smart Driving
ST Leading the Transformation



Marco Monti
EVP, General Manager, Automotive and Discrete Group

Marco Cassis
EVP, President, Region Asia Pacific

Paul Cihak
EVP, General Manager, Sales and Marketing, Europe, Middle East and Africa

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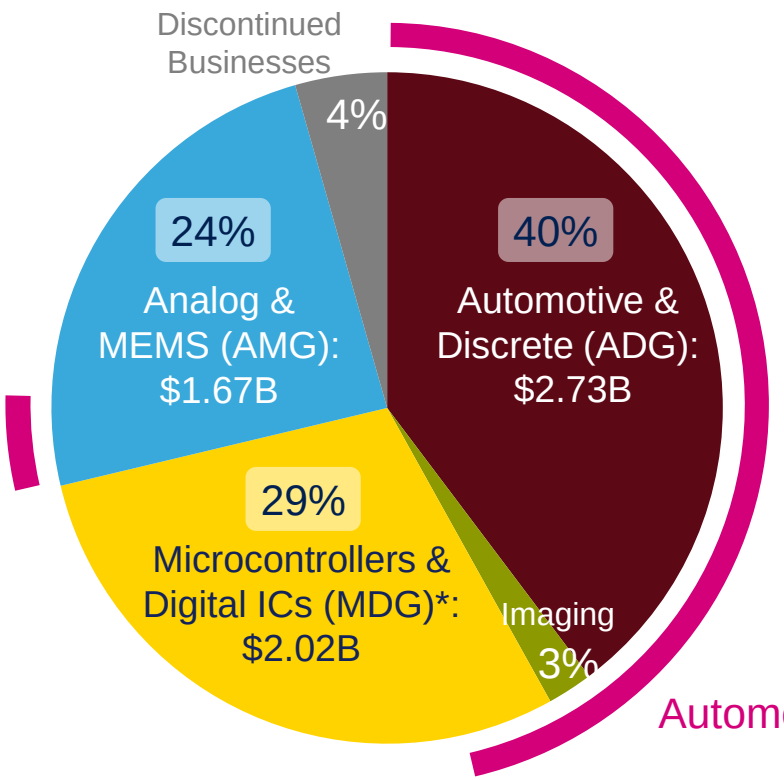
ST: a Global and Diversified Automotive Leader

with over 30 years experience



2015 Auto Revenues

$2.1B

2015 SAM Market Share

9%

Automotive

- Automotive Microcontrollers
- Infotainment and Telematics
- V2X
- Radar & Vision ADAS
- Automotive Sensors
- Power & Smart Power

- **#1** Engine Management
- **#1** Smart Power
- **#1** 24 GHz RADAR
- **#1** ADAS Safety
- **#1** Entry & Mid-end Telematics
- **#1** Car Audio Amplifiers
- **#1** GNSS
- **#2** Infotainment

Source: Strategy Analytics, ST

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The Rapidly Transforming Car

The automobile is being transformed by connectivity and technology
improving safety, enhancing the driver experience and lowering the environmental impact

Safer

- Assisted driving, autonomous driving
- Enhanced vision
- Precise positioning
- Active safety
- Adaptive lighting, auto braking

More Connected

- Vehicle to vehicle, vehicle to infrastructure communication
- Smartphone integration
- Enhanced telematics, insurance box
- Data and video streaming
- Cyber security

Greener

- Vehicle electrification
- Efficient engine management
- Eco Navigation
- Efficient LED lighting

Semiconductors are Driving Change

in the automotive industry

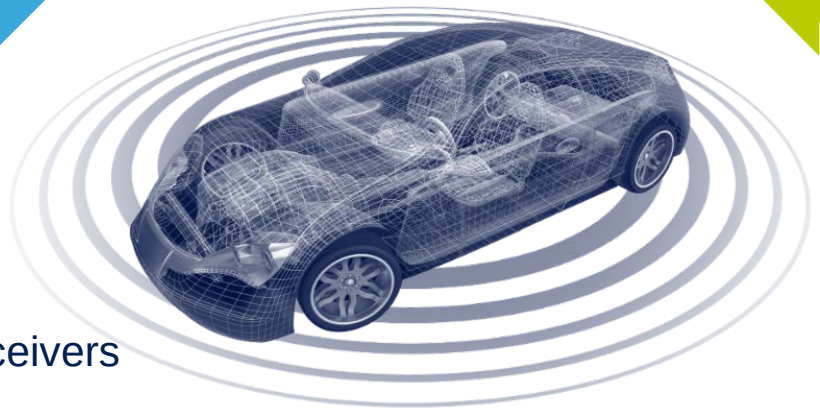
Safer | More Connected

Smart Driving

Greener

Car Digitalization

- Multicore microprocessors
- Sensor fusion
- Video processing
- Data streaming
- Infotainment processors
- Radio Frequency transmitters and receivers



Analog and Power Technologies

- High integration smart power
  - Power drivers
- High energy motor controllers
  - Battery managers
  - Video cameras
  - Sensors

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Semiconductor Content Increasing

Silicon Pervasiveness: 2015 semiconductor content per vehicle

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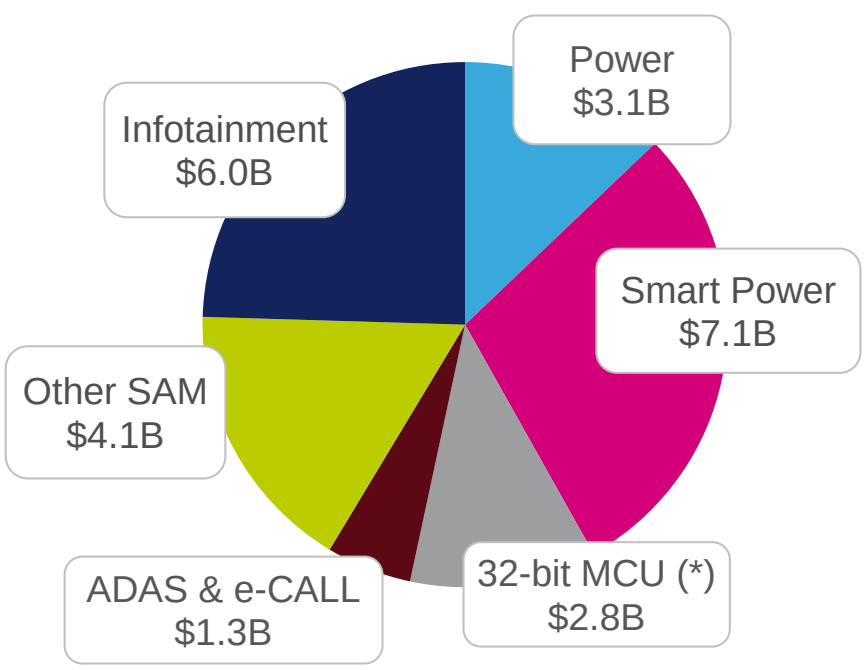
Source: Strategy Analytics, ST

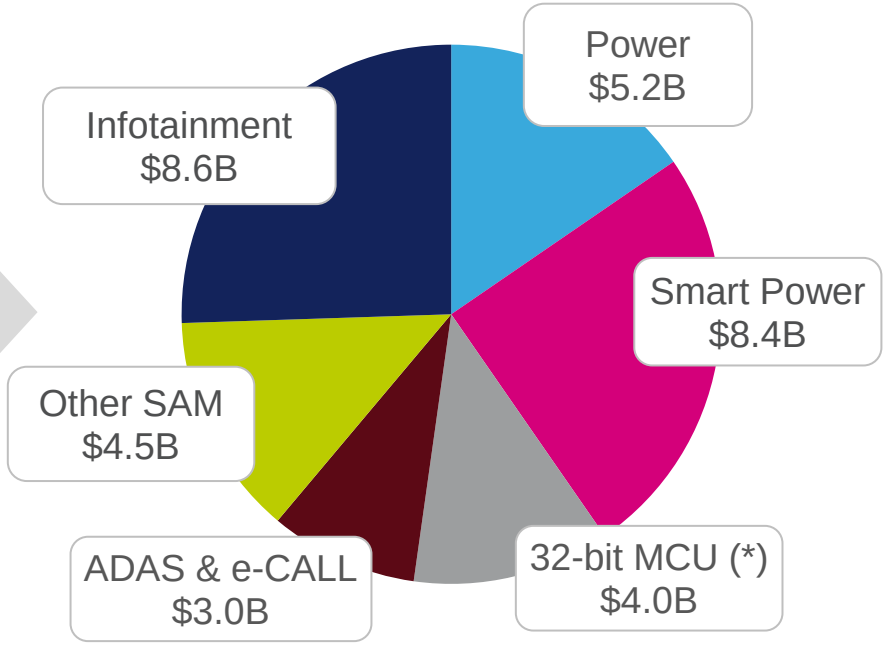
Semiconductor Market Growth

2015 Automotive Semiconductor market
TAM $27B



90% TAM addressed by ST

2020 Automotive Semiconductor market
TAM $38B



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(*) 32-bit embedded flash MCUs for powertrain, chassis, airbag, ADAS & body ; Infotainment included audio amplifiers

Source: Strategy Analytics, ST

ST have all the Key Technologies

to drive automotive change: digital, analog and power

Safer | More Connected

Car Digitalization

- Sensor fusion processors
- 77GHz/24GHz RADAR processors
- Machine vision processors
- 32-bit MCUs specific for automotive
- Infotainment processors
- Telematics processors
- Positioning, Wi-Fi, tuners
- V2X connectivity

Silicon technologies
Application knowledge
Key partners
Customer portfolio
Proprietary IP

Greener

Analog and Power Technologies

- Smart Power ASIC's
- Smart Power ASSP
- Image and MEMS sensors
- Battery management IC's
- Motor controllers/drivers
- HV MOS, IGBT power drivers
- Silicon Carbide diodes and MOSFETs

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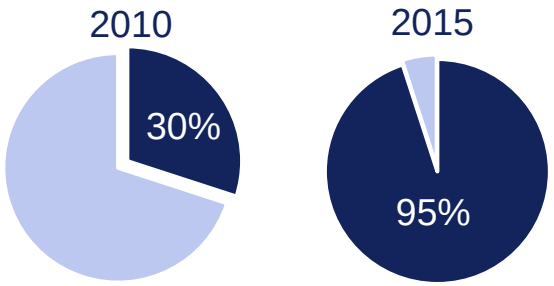
ST and ADAS
Wide application coverage



ST in ADAS Safety:
Application Coverage

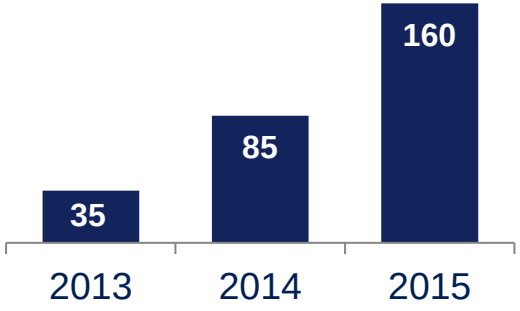
2015 ADAS Safety

TAM ~$550M (*) (**)

#1 in ADAS

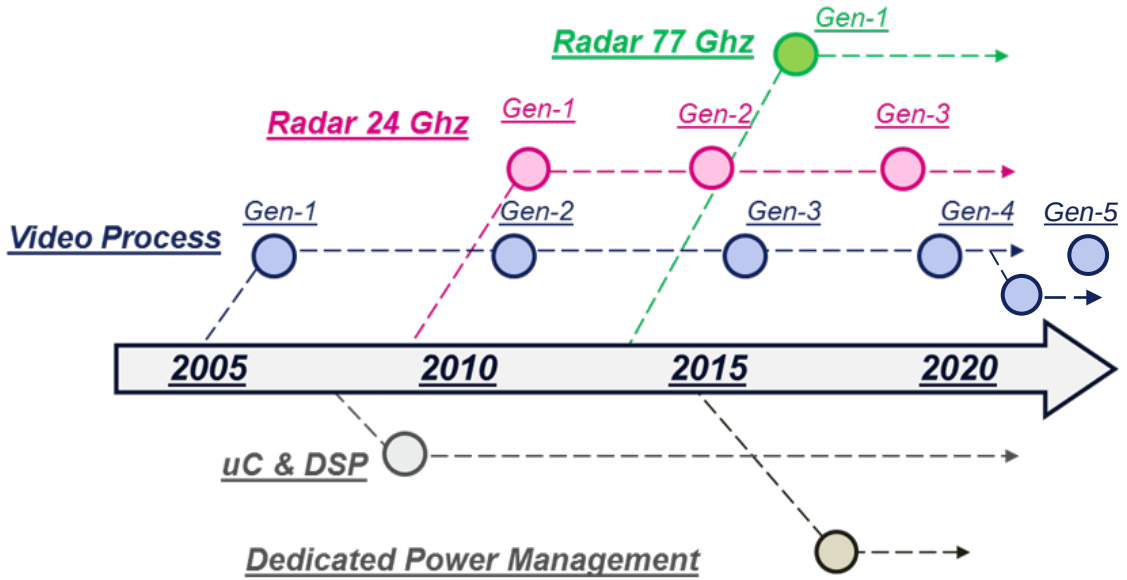
29% ADAS Safety market share in 2015

ST Sales in ADAS (M$)



FD-SOI Radio frequency for RADAR

Continuously evolving roadmap



Recent Press Announcements made with..

Autoliv · Mobileye · Autotalks · Audi

(*) Core apps: Forward collision warning, lane departure warning, pedestrian detection, adaptive cruise control, blind-spot detection
(**) TAM excludes camera, memories and optoelectronics

Source: Strategy Analytics, ST

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ST Leadership in ADAS

Estimated Market Share Evolution with business already won

ADAS System Components	2015	2020
Vision based TAM $300M (*)	68 %	Leader
Short Range Radar (24 GHz) TAM $150M (*)	60 %	Leader
Long/Short Range Radar (77 GHz) TAM $207M (*)	4 %	Mid teen
Microcontroller & DSP TAM $408M (*)	3 %	Mid teen
Power Management TAM $90M (*)	7 %	Mid teen

Vision Processing

270 car models equipped

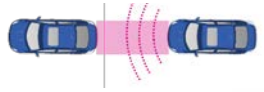
EyeQ4 — Assisted Driving

New!

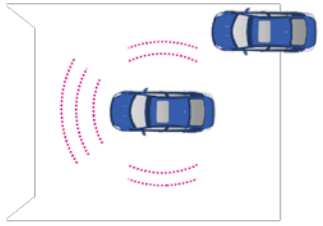
EyeQ5 — Fully Autonomous Driving

Adaptive Cruise Control

Collision Warning



Blind Spot Detection



24/77 GHz Radar System

(*) Estimated Market size in 2020 – Strategy Analytics , ST

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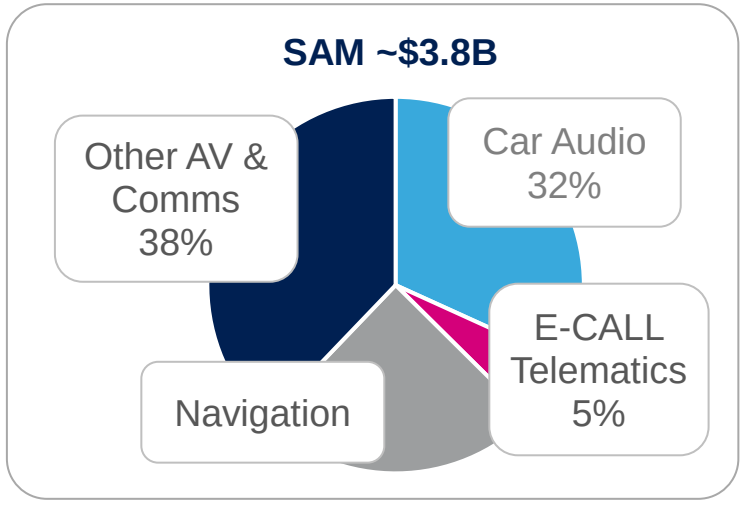
ST in Infotainment

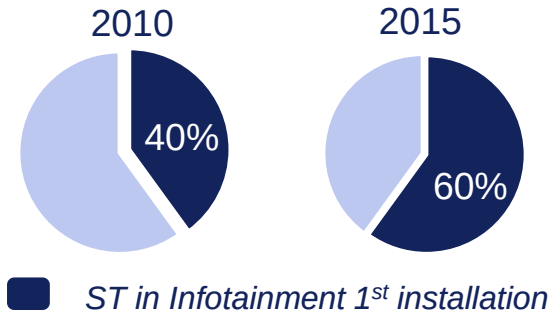
Addressing a growing and differentiated market

#2 in Infotainment

20% market share
in Infotainment specific ICs 2015



Changing our Strategic Positioning



Mid-teen Revenue Growth, driven by

1st Installation Entertainment
- Car Radio
- Display Audio
- Mid-end Entertainment

Intelligent Transportation
- V2X
- Positioning
- Telematics Processors

2015 → Increasing Share → **2020**

Audio Amplifier
#1 → #1

Data Processing
Entry & Mid Infotainment
%10 → %15

Receivers
Positioning #1 → #1
Tuners #2 → #2

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Source: Strategy Analytics , ST

More Connected

Additional $700M Opportunity by 2020(*)

Wi-Fi

Car-to-X: Craton2 with Autotalks

- Single chip automotive Wi-Fi processor
- V2X and internet hot-spot
- Remote SW-update ready
- Enabling cloud connectivity
- Awards from 4 major car makers targeting >50% of installed base by 2020

50% Installed base by 2020

45% market share 2015

Satellite

Navigation: Teseo III

- 3rd generation in production
- Multi-constellation, BeiDou-2 ready

ADAS: Teseo-P

- Sub-meter precision for ADAS

Satellite data stream

- SiriusXM partnership
- FD-SOI for low-quiescent current

Terrestrial Broadcast

- Market leader
- Digital tuner audio and data stream: Multi-standard digital radio receiver

20% market share 2015

50% Insurance box market share 2015

Cellular

Emergency Call and Insurance-Box: TELEMACO

- Multi-core ARM processor

Infotainment & Internet Access: Accordo 5

- Android auto & car-play ready
- Enabling cloud connectivity

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(*) 2020 market for eCall + Telematics box + V2X (ST internal data)

End-to-End Secure Product Portfolio

ST33 Secure Element

SPC5 MCU with Crypto

Secure Wi-Fi for Car-2-X

Firewall to cloud

Secure Gateway

Secure ECUs

Infotainment
Secured transactions

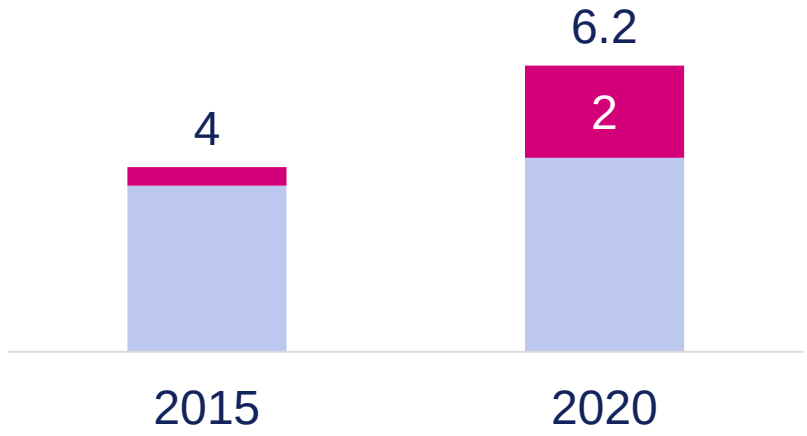
Secure communications among peripherals

Security in Automotive needs two levels of protection

1st Level: Authentication and a secure gateway with the external world

2nd Level: Data integrity and secure communication inside the car and in the car sub-systems

> $2B with security functions in 2020



32-bit automotive microcontrollers with security on board vs total 32-bit microcontrollers (in $B)

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Solid Progression in 32-bit MCUs

2013 +50% 2014 +60% 2015 >50%

ST sales progression in 32-bit MCUs for auto

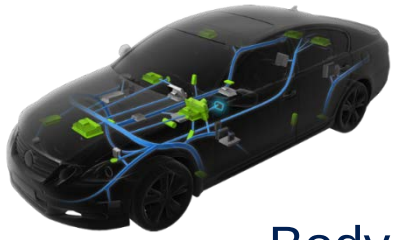
Estimated Market Share Evolution with 4B$ business already won

32-bit MCU	2015	2020
Body and Gateway TAM $0.7B (*)	6%	Leader
Powertrain TAM $1.2B (*)	4%	Low teen
Chassis and Safety TAM $2.1B (*)	1%	Low teen

ADAS and Powertrain

High performance multicores with dedicated timing, security and ASIL D safety

New ARM multicore with 5x performance vs current offer



Security

80% 40nm devices with hardware security

Body and Gateway

Largest scalable family covering all body applications

Key enablers

- Power architecture
- ARM V8-R architecture
- Security
- Crolles 300 manufacturing
- Scale factor with GP MCUs
- Customer network
- System knowledge
- Unique differentiated technology (28 FD-SOI & PCM)

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(*) Estimated Market size in 2020 – Strategy Analytics, ST

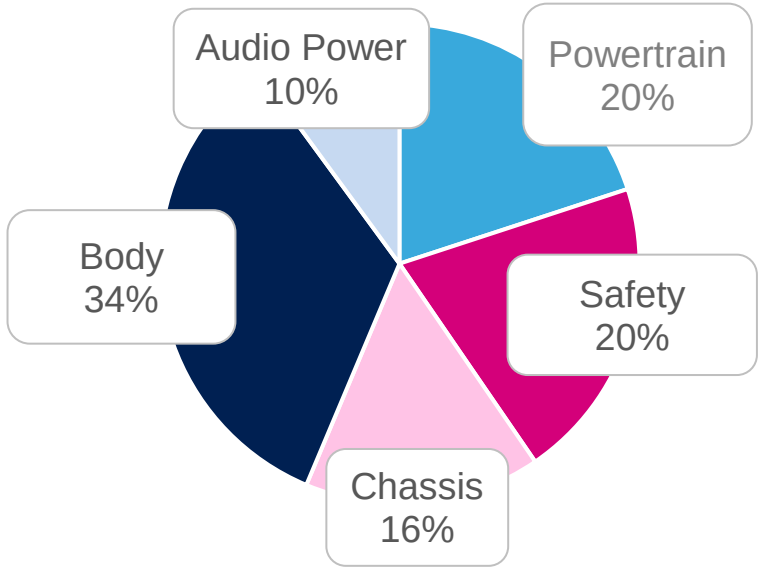
Leaders in Automotive Smart Power

Market leader in a large TAM sector with steady growth

#1 in Smart Power

2015-2020 market
CAGR: 3.2%

2015 Smart Power
TAM ~$7.4B



Estimated market share evolution with business already won

Analog contents	2015	2020
Powertrain Smart power TAM $1.7B (*)	26 %	Leader
Safety and chassis Smart Power TAM $3.2B (*)	11 %	Leader
Body and Audio Smart Power TAM $3.7B (*)	20 %	Leader

Technology enablers

- BCD9 110nm production
- M07 180nm production
- BCD10 90nm R&D
- M09 130nm R&D

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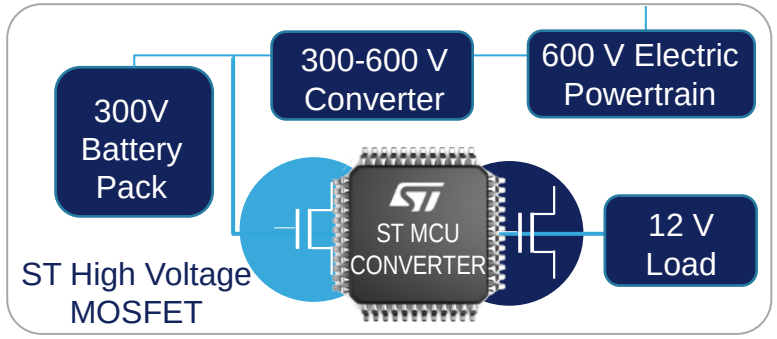
(*) Estimated Market size in 2020 – Strategy Analytics

Car Electrification

a great opportunity to expand market TAM

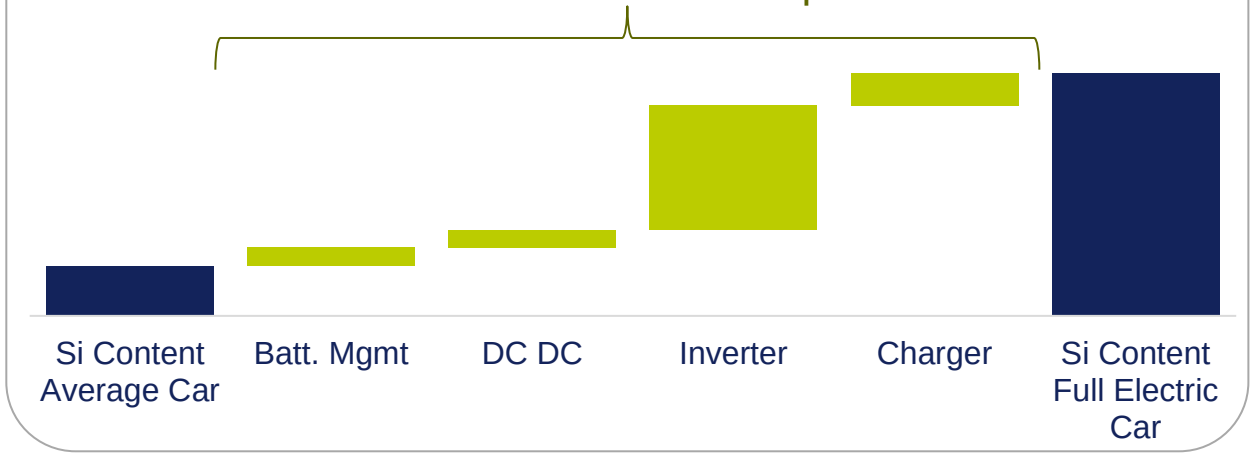
ST is already a strong player in
car electrification leveraging its strategic partnerships

TOYOTA

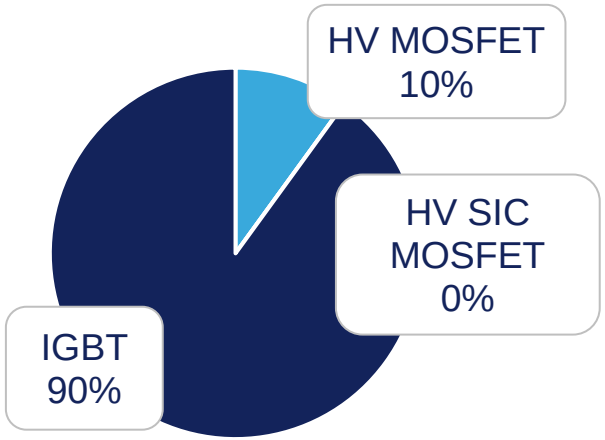


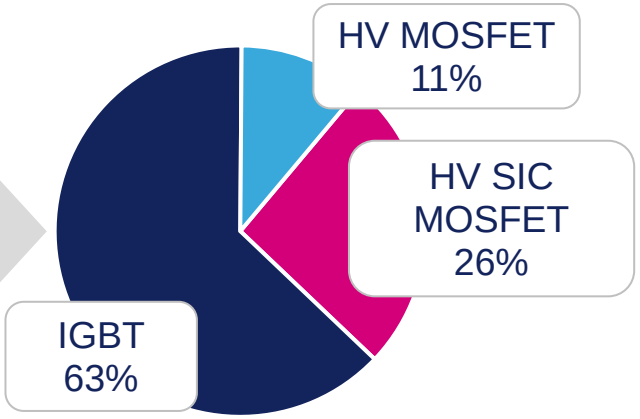
Silicon Pervasiveness in Car Electrification

500+ $ Silicon Content per Car



2015
TAM* $140M





2020
TAM* $600M

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(*) Pure EVs, Hybrid Plug-in

Key Challenge in Electric Vehicles

Mileage extension

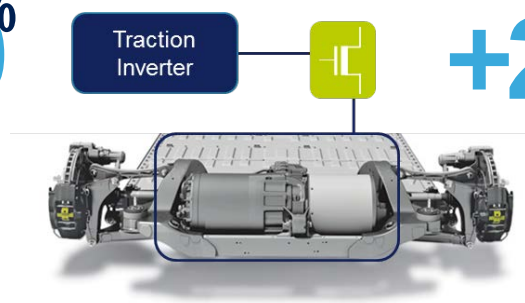
Industry Challenge	Market Trends and Benefits	ST Positioning

Mileage Extension

More Efficient Power Conversion (*)

Reduced Battery Cost **-20%**

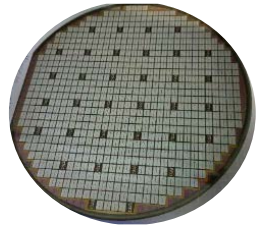
Extended Mileage **+20%**



SiC MOSFETs

4X more efficient than IGBT

SiC Diodes



6 inch wafers from 2017

Cost competitiveness

Smart Battery Controllers

Extended Mileage **+8%**

Smart Power ICs

Innovative active cell load balancing

(*) 20% power savings can result in gains of over $6,000 in battery cost, or 8% of the vehicle cost

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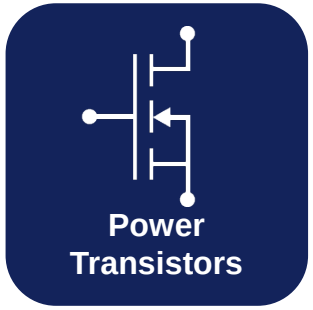
ST Strong Focus on Car Electrification

Estimated Market Share Evolution
with business already won

Power Content	2015	2020
Silicon Carbide MOS TAM $300M (*)	- -	Leader
MOSFET & IGBT (**) TAM $2.4B (*)	4%	High single digit
Battery Management TAM $100M (*)	15%	Leader

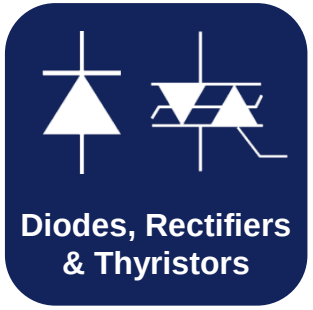


HV MOSFETs
300V – 1700V

LV MOSFETs
OFT from 30 up to 150 V

Silicon Carbide (SiC)
From 650 up to 1200V

IGBT
HEV and motor control
up to 1700V



Silicon Carbide Diodes

Silicon Diodes

Field Effect Diodes

HV Triacs

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(*) Estimated Market size in 2020 – Strategy Analytics , ST
(**) Break Down voltage above 400V

Takeaways

- ST is a global leader in the Automotive market
- Car connectivity, increased safety and green concerns are rapidly boosting the semiconductor content per car
- ST is leader in ADAS technologies and in Infotainment, ready to enable autonomous driving and the pervasion of car connectivity
- ST is leader in smart power technologies and will extend its market share profiting from car electrification

Automotive and Discrete Group (ADG)

Marco Monti

Executive Vice President, General Manager, Automotive and Discrete Group

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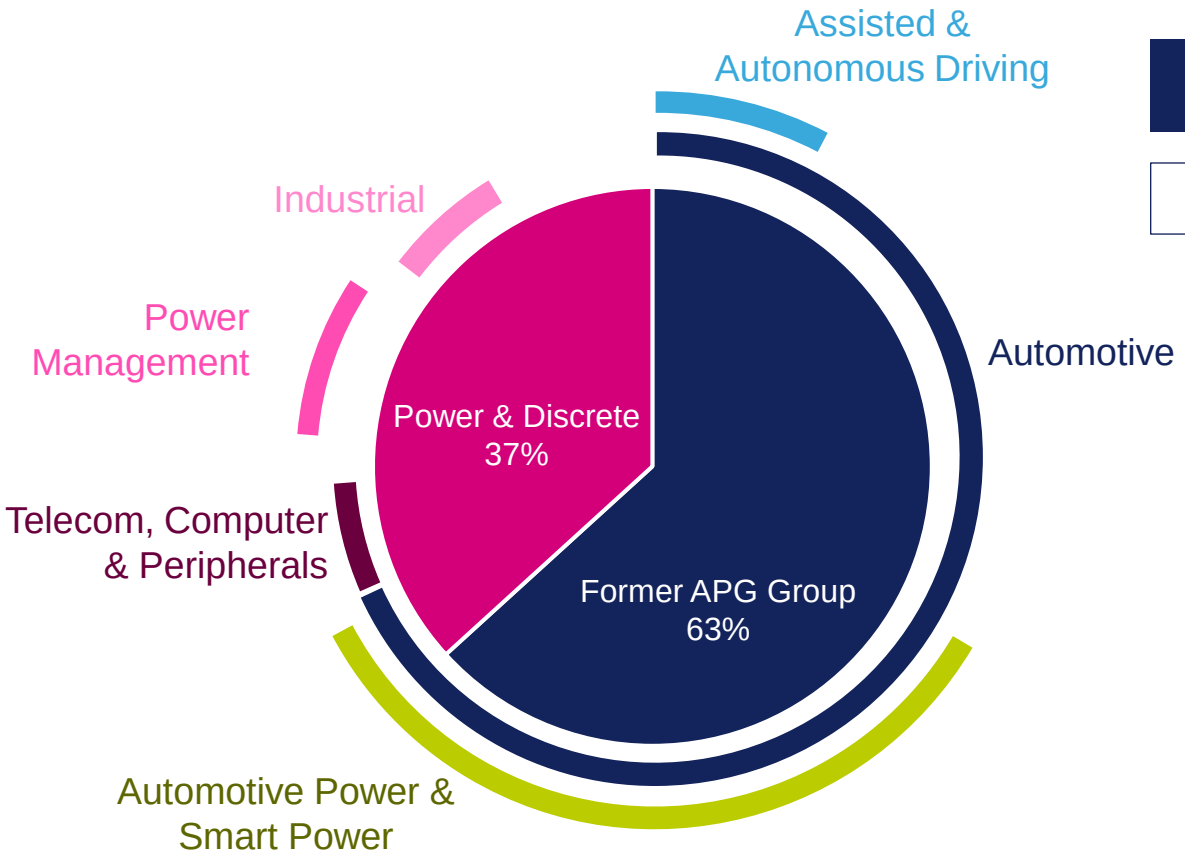
From APG to ADG: $2.7B in FY'15

Group Revenues by Core Application

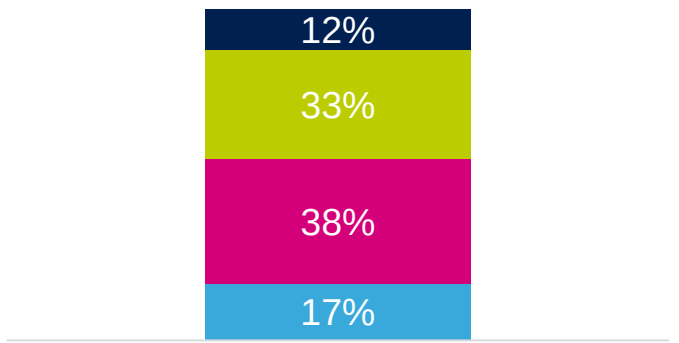


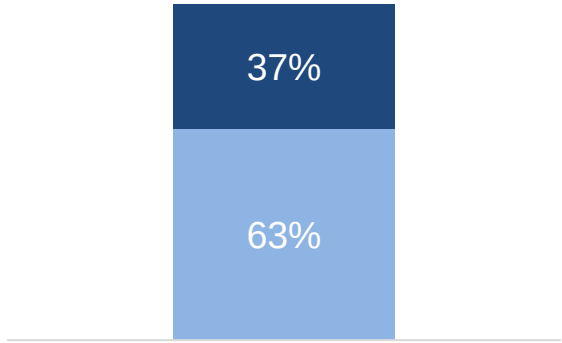
AUTOMOTIVE

FY '15 Revenue: $1.9B

POWER & DISCRETE (**)

FY '15 Revenue: $0.8B





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(*) Power Schottky, Ultrafast & SiC diodes EOS, ESD, Lighting protections & IPAD's

(**) Non Automotive

New Organization Synergy

Boost Top Line

Product Synergies

- Increase focus in automotive leveraging on traditional APG system know-how, customer intimacy and extended set of portfolio technology and product

Expand Customer Base

- Increased customer presence and efficiencies leveraging on combined marketing and support teams

Capture opportunities in new markets for ADG product derivatives

Competence Synergies

Manufacturing

- Wafer probing assets optimization

Technology

- Centralized technology R&D, exploiting synergies between MOSFETs, SiC, VIPower and Smart Power in automotive and other markets

Quality

- Rationalization in quality and supply chain to address automotive segment

Extended R&D bandwidth and synergies

Portfolio delivering complementarity for target end markets, and synergies in R&D and manufacturing

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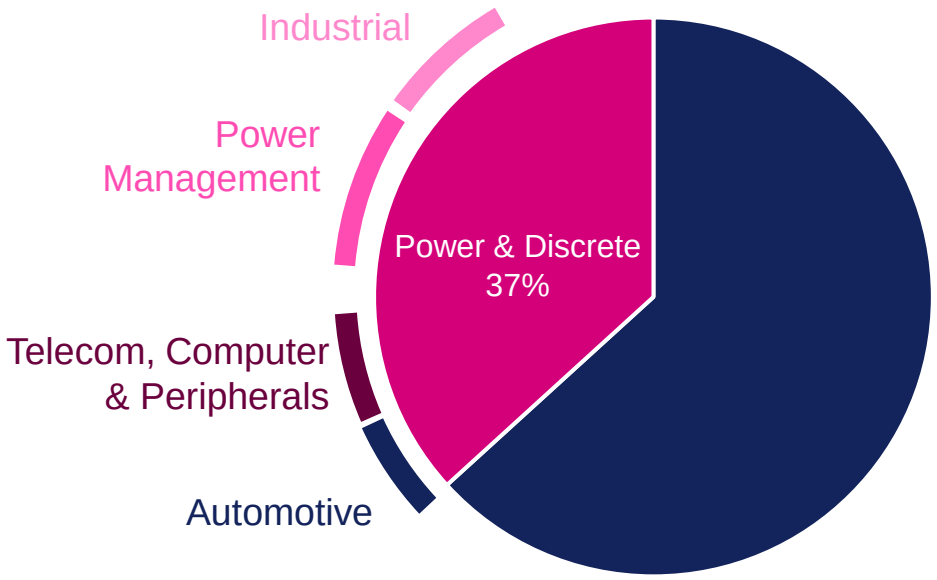
ADG: Power & Discrete



#1 High Voltage Power MOSFETs
#1 Thyristors and Triacs
#1 Power Rectifiers SAM*
#1 Protection and IPAD SAM*

- **Application driven product development strategy with objective of growing in differentiated products vs competition**
  - Fast portfolio renewal (>20% of sales on new products)
  - Capitalize past investments in new emerging technologies (SiC/GaN)
  - Focus on new **Power Packages** for high-power applications with optimized power density including **Intelligent Power Modules, High Power Modules**
- **Wide and scalable product offer to support customer as one stop shop**
- **Strong cooperation with distributors to boost demand creation in mass market**
  - Tangible results in STM32 associated product program (1+x)
- **Focus program to boost sales in standard products**

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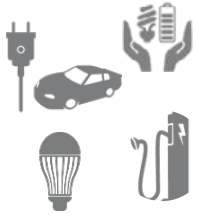
(*) Power Schottky, Ultrafast & SiC diodes EOS, ESD, Lighting protections & IPAD's

ADG: Power & Discrete

Group Focus	Application Segment		Selected Technology
Automotive Electric Charger **Industrial Motor Control**	Up to 1500V	Industrial Motor Control, Solar Factory Automation, Metering, Fast Automotive Chargers 	IGBT, SiC MOSFETs, Power MOSFETs (MDmesh™) ACEPACK™ Power Bipolars
SiC for Automotive Traction	Up to 700V	Home Appliance, Power Management, LED Lighting, Automotive Electric Traction 	Power MOSFETs (MDmesh™) IGBT, SiC MOSFETs Intelligent Power Module (SLLIMM™) Power Bipolars
	40V - 150V	Automotive Electronics, E-Bikes, UPS Power Mgmt 	Power MOSFETs (STripFET™) Power Bipolars
Server Farm	Up to 60V	Server, Computer Peripherals, Telecom 	

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Protection, Integrated Passive & Active Devices

Market & Positioning

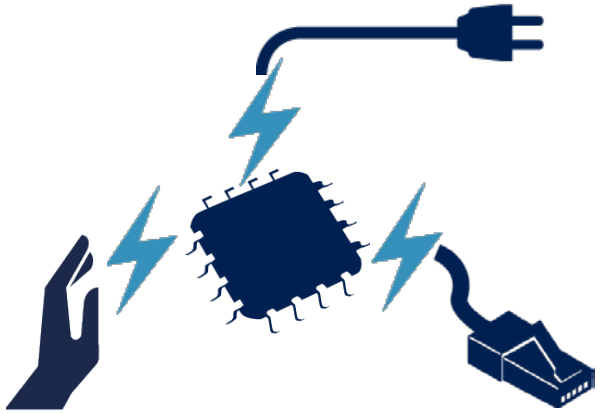
2015

TAM ~$640M

#1 Protection SAM
EOS,ESD, Lighting

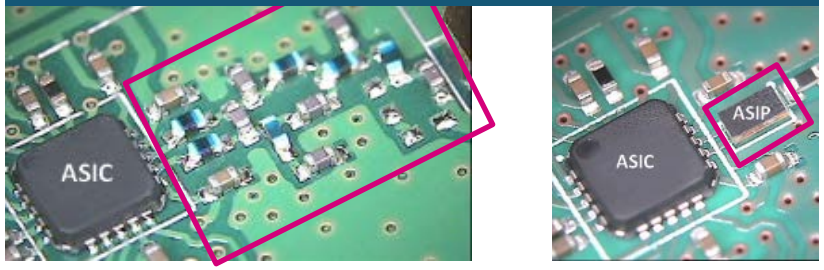
#1 IPAD™

Industry Domain



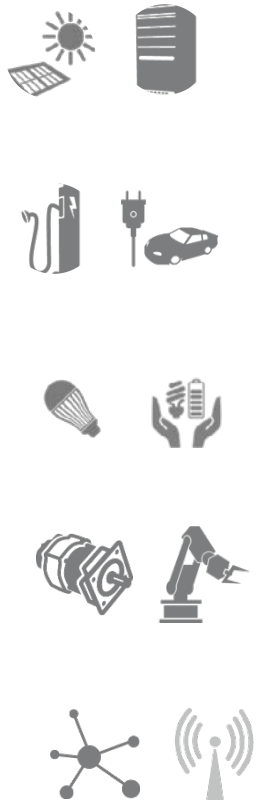
IPAD™ Integrated Passive & Active Devices

Automotive Ethernet



Improves performance and drastically reduces space (-70%)

Selected Technology



**EMI Filtering,
Signal Conditioning,
RF IPDs**

Antenna Tuning
RF Coupling interfaces (WiFi-BT)
Signal Filtering

Protection Devices

Consumer high-speed ports,
Automotive CAN, LIN, FlexRay

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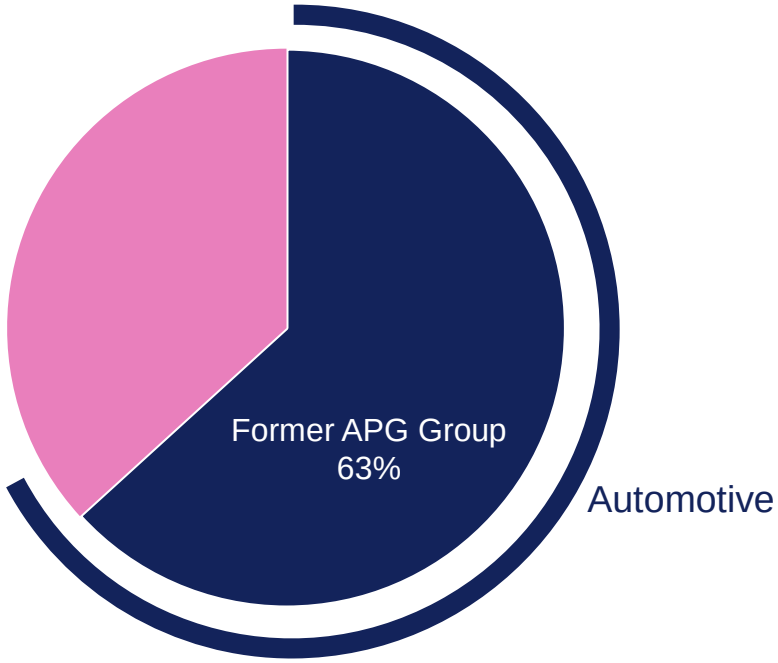
ADG: Automotive



2015 Auto ADG

$1.9B

Power & Non-Power Analog

14%

2015 ADG SAM

$24B

Automotive Digital

7%

- Strong Market presence
  - 30+ years leadership in automotive
  - Continuous gains in market share in all regions
  - ADG provide 90% of ST revenue in automotive
- Significant Innovation breakthroughs
  - Strong focus on new materials for power electronics (SiC), advanced digital products for ADAS, 32-bit MCUs and solutions for telematics, eCall,V2X...
  - Reinforcing strong smart power market position with the introduction of the most advanced BCD and VIPower technologies in the industry
  - Proprietary and independent manufacturing, mastering quality and automotive requirements
- Strong cooperation with car makers and market leaders

Automotive Microcontrollers | **Power & Smart Power** | **Automotive Sensors** | **Infotainment and Telematics** | **Radar & Vision ADAS** | **V2X**

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Source: Strategy Analytics, ST

The Rapidly Changing Car

The automobile is being transformed by technology and connectivity.
ST is making driving safer, greener and more connected through a fusion of technology.

Safer

- Assisted driving, autonomous driving
- Radar and machine vision
- Precise positioning
- Active safety
- Adaptive lighting, intelligent braking

Greener

- Vehicle electrification
- Efficient engine management
- Eco navigation
- LED lighting

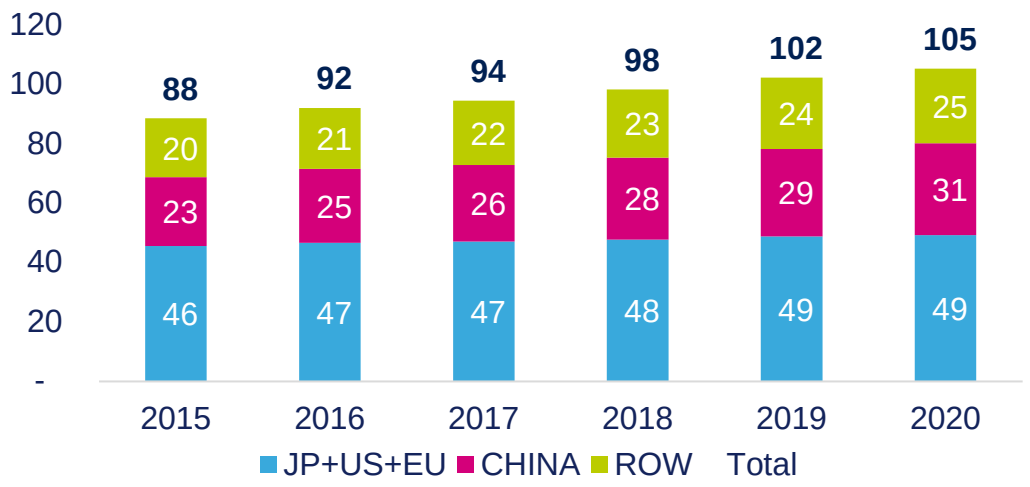
More Connected

- Vehicle to vehicle communication
- Smartphone integration
- Premium telematics
- Data and video streaming
- Full digital entertainment
- Greater communication security

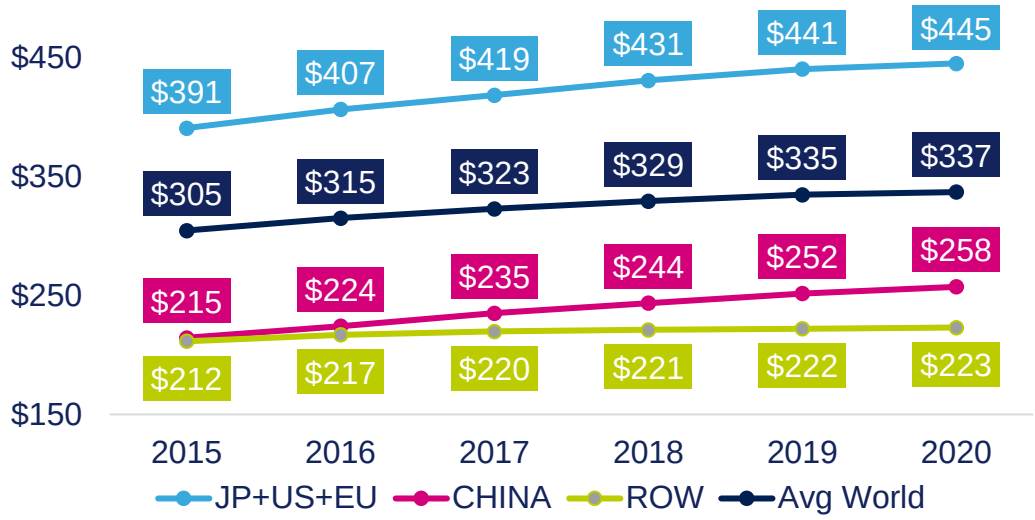
Automotive Market: Solid Foundations

Continuous steady market growth

Vehicle Production



Silicon Content Value per Vehicle



’15-’20 CAGR @ 3.5%

’15-’20 CAGR @ 6.0%

’15-’20 CAGR @ 2.0%

’15-’20 CAGR @ 3.7%

#1 in China | #2 in EMEA & USA | #3 in Japan & Korea

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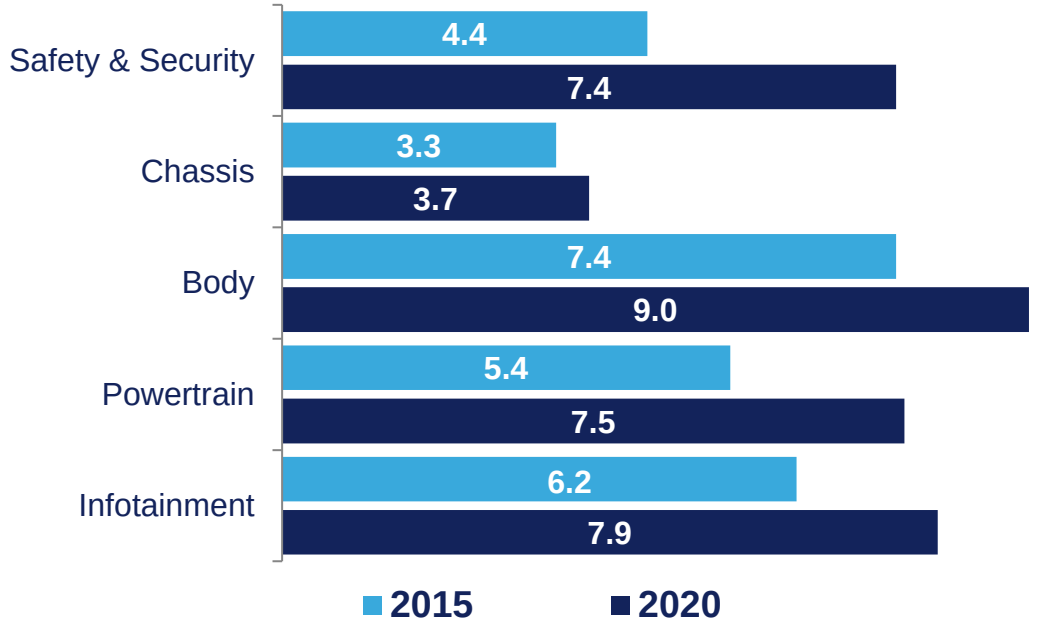
Source: Strategy Analytics

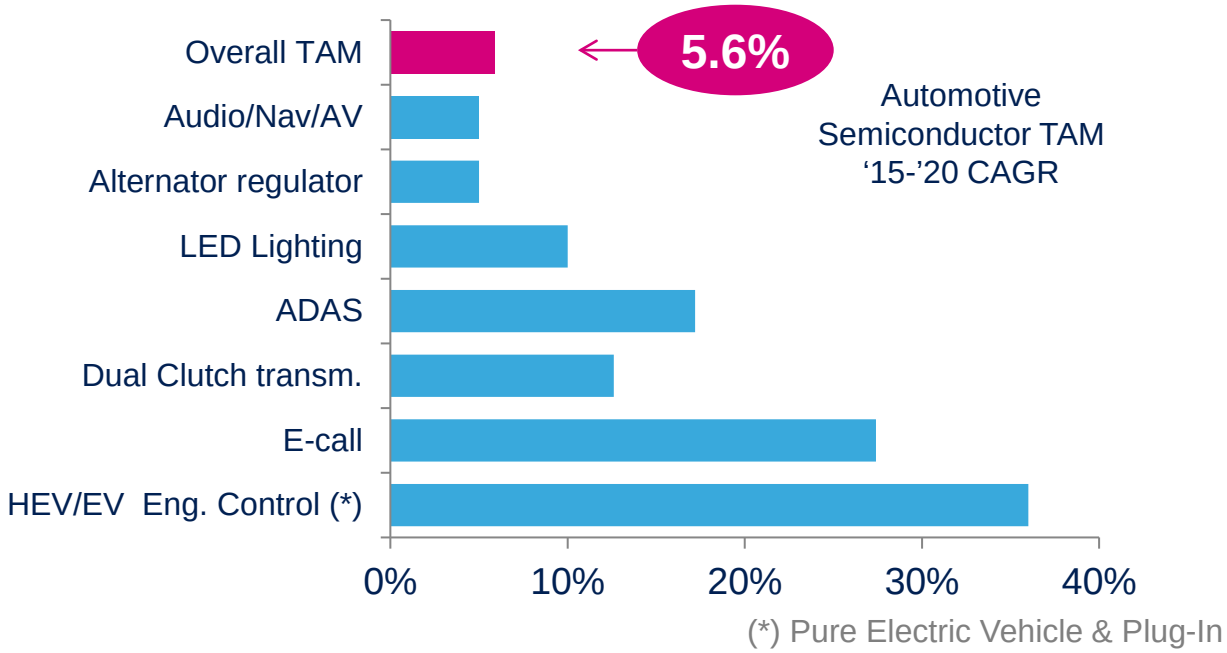
Automotive Market: The right place to be

Addressing a $27B market

All Segments Growing B$



Emerging Applications



(*) Pure Electric Vehicle & Plug-In

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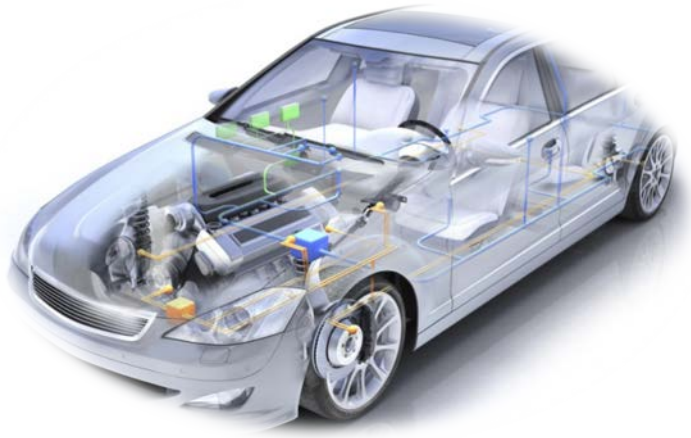
Source: Strategy Analytics, IHS, full market excluding sensors

ADG: Broad Coverage of Automotive Applications

Car Infotainment & Connectivity

- Car Radio
- Satellite Radio
- ADAS
- Digital Tuners
- Car Infotainment Processors
- Positioning
- V-to-X Connectivity
- Car Wiring and Networking
- Telematics
- Road Tolling
- Secure Communications
- Wireless Connectivity

On average **120** independent ECU's per vehicle



Automotive Electronics

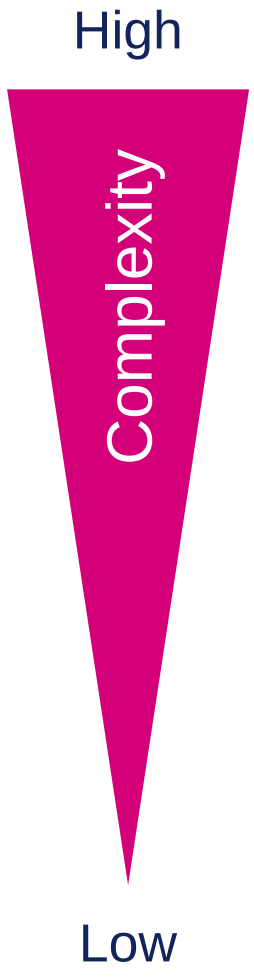
- Thermal Engine Control
- Electrical Engine Control
- Automatic Transmission
- Charging (12V)
- Airbag
- Braking (ABS, VDC)
- LED Lighting
- Adaptive Lighting
- Body Control
- Door & Mirror control
- Suspension
- Steering (EPS)

ST portfolio covers the majority of control unit requirements

Comprehensive Product Portfolio to Lead in Focus Markets

from commodity to super-integrated ASICs

- Super-integrated ASICs
- 8/16/32-bit auto-grade microcontrollers
- Vehicle dynamics controllers
- GPS/GNSS low-noise amplifiers & receivers
- Secure modules
- Analog, digital and satellite tuners
- DC, stepper and multiphase motor controllers
- HD imaging ICs
- Auto MEMs, gyroscopes, accelerometers
- Car networking ICs
- LED and active lighting drivers
- Communication transceivers
- Alternator and voltage regulators
- Configurable drivers and switches
- Protections



- Telematics processors
- Vision and RADAR based processors
- Radar 24/77GHz transceivers
- Engine control and power management ICs
- Ignition controllers and drivers
- Analog and digital audio processors
- Car network (wired and wireless) ICs
- Braking/ABS drivers
- Power Discrete (SiC, MOSFETs, IGBTs)
- Audio amplifiers
- Passive safety sensors and controllers
- Car power management
- Door module drivers
- Internal external light controllers
- Memory ICs
- Operational amplifiers

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Leadership in Smart Power

Market and Positioning

2015 SMART POWER

TAM ~$7.4B

#1 ST in Smart Power

26% Share in Powertrain

48% Share Lighting

11% Share Chassis & Safety

Key Products and Design Wins

Engine Control: Direct injection system increasing semiconductor content (+40%) per Car

- Dedicated ASSP & ASIC product roadmap to meet EURO-6 requirements

Dual Clutch Transmission

- Fully Integrated ASSP market solution for high-performance automatic transmission

Passive Safety

- 130+ M$ award for high-end (up to 40 loop) airbag U-chip for a premium Japanese carmaker
- 110+ M$ ESC U-chip award for leading braking supplier in Japan

Body & Lighting

- Full deployment in volumes of drivers for lighting with 350nm VIPower technology
- Roadmap expansion on LED lighting solutions

Key Customers

BOSCH

Continental

Autoliv

DENSO

HITACHI

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Key Asset

Functional Safety ISO 262262 Compliant

Unique proprietary **IP Portfolio**

BCD 110nm production, 90nm Under Development

ViPower 180nm production, 130nm under development

30+ years **Strategic Patnership** with system leaders & OEM

Power for Electrification

Market and Positioning

2015 Electrification

TAM ~$3B

#1 in High Voltage MOSFETs

#1 in Thyristors and Triacs

#1 in Power Rectifiers(*)

#5 in Automotive Power Transistors

Key Products and Design Wins

SiC MOSFETs

- New 650V product family tailored for motor control
- Full internal manufacturing for quality & competitiveness
- 75% improvement on power losses vs IGBT
- 200°C junction temperature for improved reliability

LV MOSFETs

- STripFET F7 LV MOSFET trench product family perfectly fitting automotive motor control applications
- Optimized diode performance for motor control applications
- High robustness and reduced emissions
- Large package portfolio

SiC Diodes

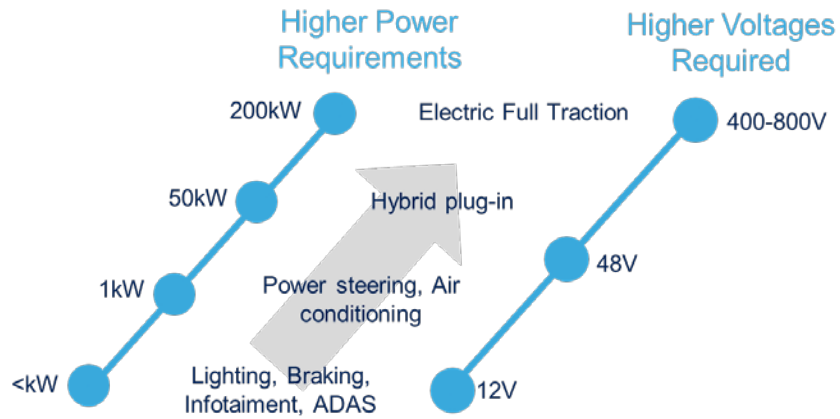
- Fast, Efficient, High temperature
- Chargers and DC-DC converters

TRIACS, Thyristors

- Largest product portfolio in the industry
- For on-board charges to limit in-rush current at system connection

Focus Applications

- Plug-in / On-Board Chargers
- Power Converters
- Traction Inverters
- Steering
- Braking



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(*) Power Schottky, Ultrafast & SiC diodes

Automotive 32-bit MCUs

Market & Positioning

Fastest Growing Product Family in ADG

5B$ 2015 TAM in Automotive

75% TAM coverage with focus on Body, Powertrain, Chassis and Safety

4B$ Business awarded since 2007

Key Products and Design Wins

- Strong progression in design wins on existing and new products reaching 4B$: Secure gateway, ADAS and powertrain are main driving applications
- Announced new 40nm product family to address gateway and body application leveraging on 2x performance vs previous generation, large family scalability, multiple high speed interfaces and embedded security module
- Continuous expansion of product family with Power Architecture guaranteeing customer scalability to current solution to address ADAS, powertrain, gateways and body segments
- Started the design of new high-end family with ARM v8R core, embedded phase change memory in 28nm node in cooperation with a leading tier-1

SPC5

Key Customers

Continental, BOSCH, UAES, Valeo, LEAR CORPORATION, ZF TRW

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Key Assets

- **Power Architecture** & **ARM** V8R Core
- **Customer Intimacy** & System Knowledge
- **Internal Manufacturing** Crolles 300
- Low Power **FDSOI 28** & embedded Phase Change Memory

Advanced Driver Assistance

Market and Positioning

2015 ADAS Safety

TAM ~$550M (*) (**)

#1 ADAS Safety Segment in 2015

#1 Machine Vision in 2015

#1 in 24Ghz RADAR RXTX

#2 in RADAR Transceivers Market in 2015

Key Products and Design Wins

Machine Vision

- Machine Vision MPU is the core enabler for autonomous driving
- EQ4 samples to customer on-time
- ST and Mobileye announced the start of development of EQ5, the most advanced MPU to enable Stage 4 autonomous driving

RADAR

- Focus on BiCMOS technology to ensure customer best performance in range and precision
- Major award on 77GHz transceivers with leading market player
- 24GHz adoption growing due to system costs lower than 77GHz

ADAS ASICS

- Started design of products for new application fields

Power Management

- Most advanced solution to enable application miniaturization designed to address major players need
- Sampling majority of machine vision and RADAR unit manufacturers

Microcontrollers

- New awards by major players for 24GHz/77GHz (Processing and fusion MCU)

Key Partners

MOBILEYE®

Autoliv

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(*) TAM excludes camera, memories and optoelectronics

(**) Core apps: Forward collision warning, lane departure warning, pedestrian detection, adaptive cruise control, blind-spot detection

Infotainment

Market and Positioning

2015 Infotainment

SAM ~$3.8B

#1 in Positioning

#2 in Infotainment ASSPs

#1 in Audio Amplifiers

#1 in Digital Tuners

Key Products and Design Wins

Accordo & Telemaco: Infotaiment and telematics processors

- Accordo 2 strong pipeline of awarded business. Aftermarket in production, OEM production start in Q3'16
- Accordo 5 samples delivered to early adopters within Q2'16
- Telemaco 2 starting production in Q3'16

Class D Amplifiers

- Larger product portfolio and development pipeline than any competitor. 80+ M$ awards in the pipe, OEM programs

Terrestrial Tuners

- STAR and DOT family offering system flexibility vs competition for multi-standard receivers. STAR production starting in Q4'16 with several leading OEM

Satellite Tuners

- Extended cooperation with SiriusXM on next generation satellite receiver as leading strategic supplier

Positioning

- Leading multi-constellation technology with excellence in dead reckoning sensor fusion
- Opening the new frontier of precise positioning for autonomous driving in parallel with car manufacturers

Key Customers

Accordo, TELEMACO, BOSCH, BOSE, Continental, FDA, Clarion, DOT, STAR, HARMAN, JVC KENWOOD, Pioneer, Teseo, Teseo DRAW, SiriusXM SATELLITE RADIO

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The most comprehensive and technically advanced offering for V2X Market

V2X

TAM ~$200M in 2020

V2C
(Vehicle-to-Cloud)

V2I
(Vehicle-to-Infrastructure)

V2V
(Vehicle-to-Vehicle)

V2P
(Vehicle-to-Pedestrian)

\+ Security

\+ GNSS
Precise Positioning
< 20cm

- Supports the reduction of road fatalities by more than 90% when combined with other ADAS technologies
- Best technical solution to address the challenge of volume V2X technology deployment
- Most advanced solution to handle cybersecurity risks
- Secured participation in trials preparing technology introduction into the market
- Sampling V2X 11-p Wi-Fi processor to Autotalks in Q3’16

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Leadership Technology & Manufacturing

Power and Analog

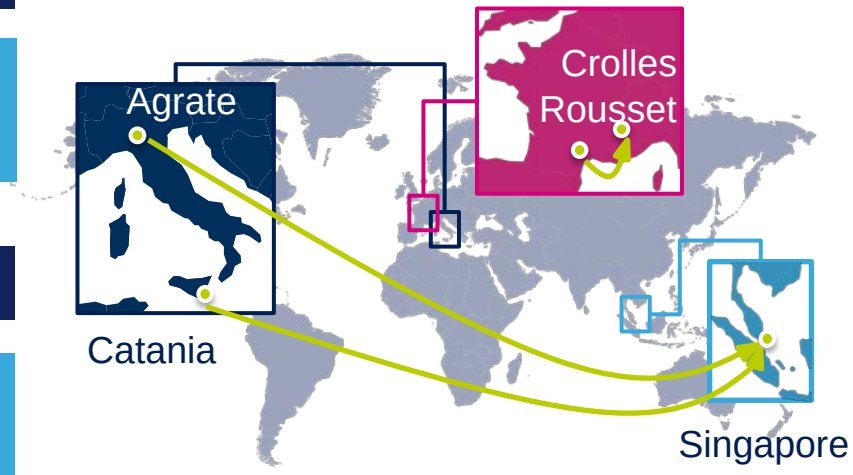
Power Transistors
(LV, SiC & SJ MOSFET, GaN)

Other Discrete
(FERD, Si)

Mixed Signal

BIPOLAR CMOS DMOS
(90nm ePCM)

Vertical Smart Power
(110nm)



Digital

Advanced CMOS FD-SOI (28nm)

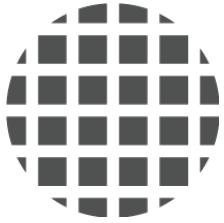
Specialized **CMOS Imaging Sensor**

eNVM
GP & secure MCU Automotive MCU EEPROM
(FD-SOI 28nm ePhaseChangeMemory)

AMS/RF CMOS
(40nm RF)

BiCMOS
(FD-SOI28 ePCM)

6” SiC



8” Smart Power, Power, BiCMOS

12” CMOS and eNVM

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ADG Revenue Growth and Operating Margin Improvement

Key Objective

Grow revenues and achieve >10% margin in mid term

Revenue Drivers

- Continuous expansion of ADAS portfolio
  - Machine vision processor
  - Radar 24GHz, 77GHz
  - Power Management
- Market share gain in 32-bit microcontrollers
- Pervasion of Infotainment
  - Entertainment with Accordo2/5, Tuners, Satellite radio, Digital Audio
  - Telematics with Telemaco, GNSS (Teseo), V2X
- Power and Discrete market share growth
  - Automotive (car electrification driven by SiC, MOSFET)
  - Server farm and industrial applications (35~40V, 700V MOSFET)

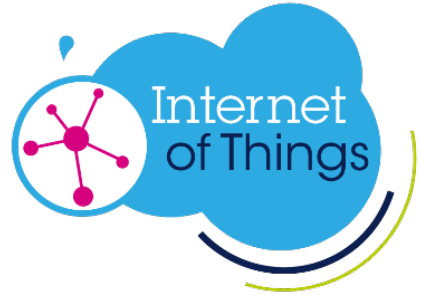
Operating Margin

- ADAS, Entertainment, Connectivity revenue growth
- Smart Power 110 nm (BCD9)
- New generation 55/40nm 32-bit Microcontrollers replacing oldest generation
- Power and Discrete new product generations
  - SiC
  - STripFET/MDmesh
  - IPAD
- Increase sales in distribution and full system solution in the mass market

Takeaways

- ADG organization creates new opportunities for growth, especially in the automotive market, and cost efficiency across functions
- Three Pillars: Automotive Application Specific products, Multimarket Power Discrete and Protections aligned to Smart Driving and IoT strategy
- Smart Driving
  - Focused on 3 main market drivers (connectivity, safety and green) - can outperform competition by leveraging our digital-power synergy
  - ST's value proposition value has attracted a large and growing network of leading partners among Tier-1's and car makers
- Internet of Things
  - Power Discrete: Differentiated offer vs competition to take leadership in energy conversion efficiency and create stable long term growth drivers.
  - Proving cost effectiveness for SiC, with release to market of SiC product on 6" wafers as a first step
  - Protection & Integrated Passive & Active Devices: Extended sales at customers with complementary functions enabling better system reliability and end product miniaturization

+



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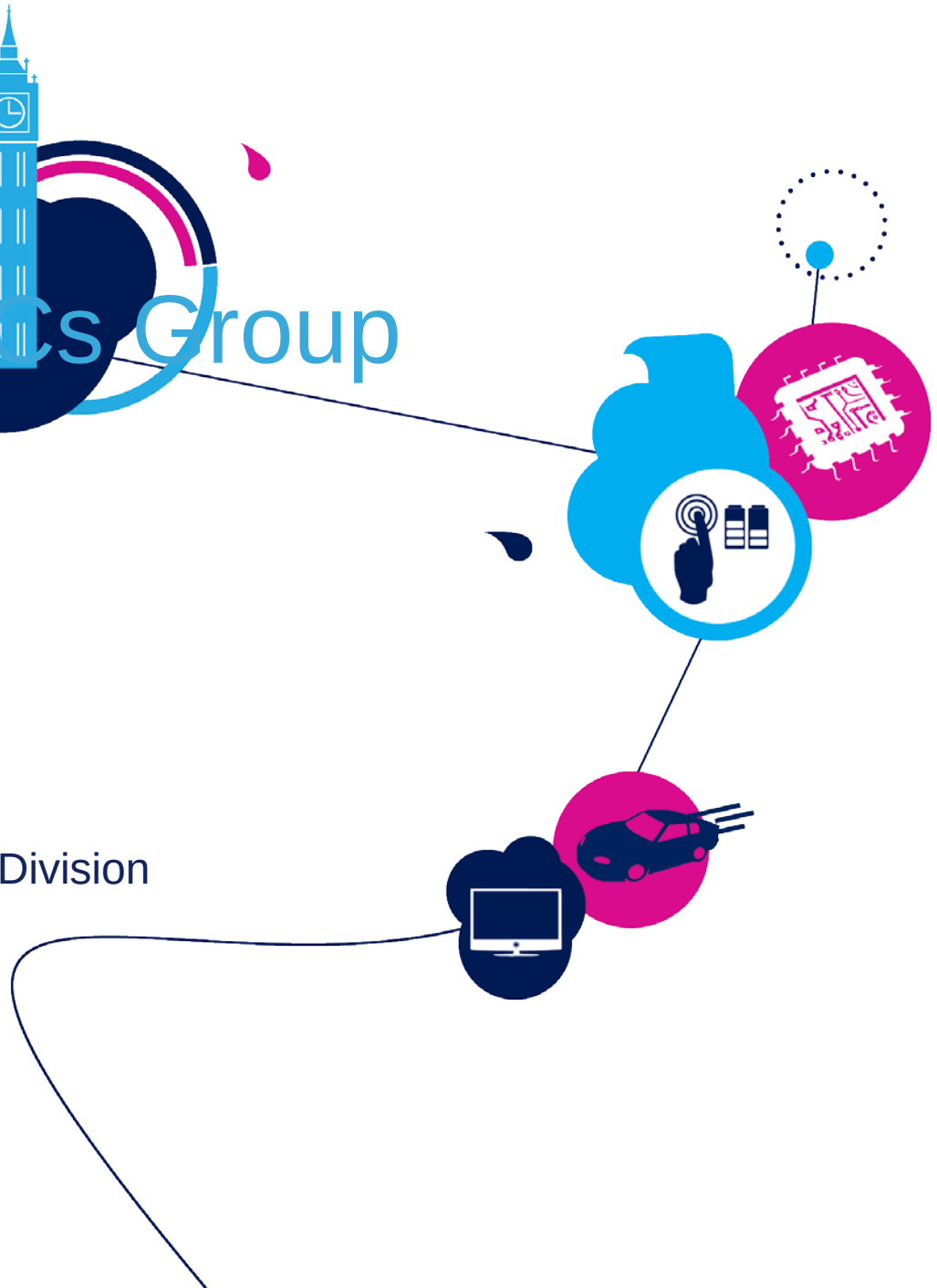
Microcontrollers and Digital ICs Group (MDG)



Claude Dardanne
EVP, General Manager, Microcontroller and Digital ICs Group

Flavio Benetti
Group VP, General Manager Digital and Mixed Processes ASIC Division

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Agenda

- General
- Microcontrollers
- Digital & Mixed Signal ASICs
- Takeaways

Microcontrollers and Digital ICs Group (MDG)

Product Lines

General Purpose Microcontrollers

- STM32 – 32-bit MCUs
- Ultra-low-power / High performance
- Broad choice of peripherals
- Broadest portfolio
- 10 years longevity for industrial applications

Secure Microcontrollers

- Mobile Security (SIM, eSIM, NFC ctrl and e-SE)
- Automotive grade Secure MCUs
- Banking, ID and transport
- Authentication for secure IoT & anti-counterfeiting
- Turnkey solutions including certified HW+SW

Serial & RF Memories & Readers

- High-performance & high-endurance EEPROM
- HF and NFC RFID tags, RF readers
- Advanced packaging options → Wafer Level Chip Scale Package (WLCSP)
- Automotive grade

Digital & Mixed Signal ASICs

- Electronic & photonics ICs for optical interconnect
- RF-SOI for mobile front end
- RF ICs for base stations and P2P backhaul
- High complexity digital ASICs for networking
- State-of-the-art in house FD-SOI advanced process

MDG Positioning in 2015

EEPROM memories

#1 Worldwide supplier 2015

General Purpose Microcontrollers

#3 Worldwide supplier 2015

Secure Microcontrollers

#3 Worldwide supplier 2015

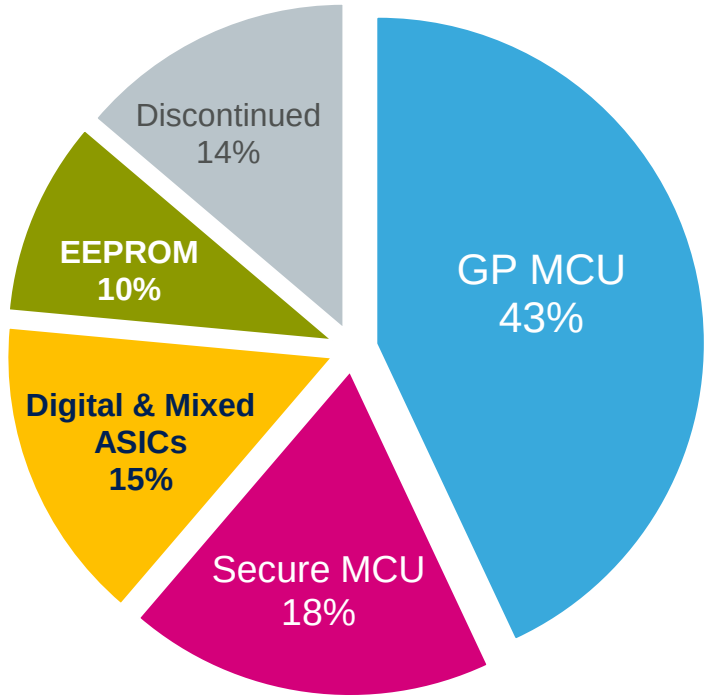
Consolidated MCU

#3 Worldwide supplier 2015

Digital & Mixed Signal ASICs

Leading silicon optical ICs supplier

MDG 2015 Business by Activities



Major growth opportunity :
General Purpose MCU + Secure MCU

- *Discontinued includes business of Set-Top Box & former ST-Ericsson Products*
- *Microcontrollers excluding Automotive*

Source: IHS iSuppli CLT March 21st 2016

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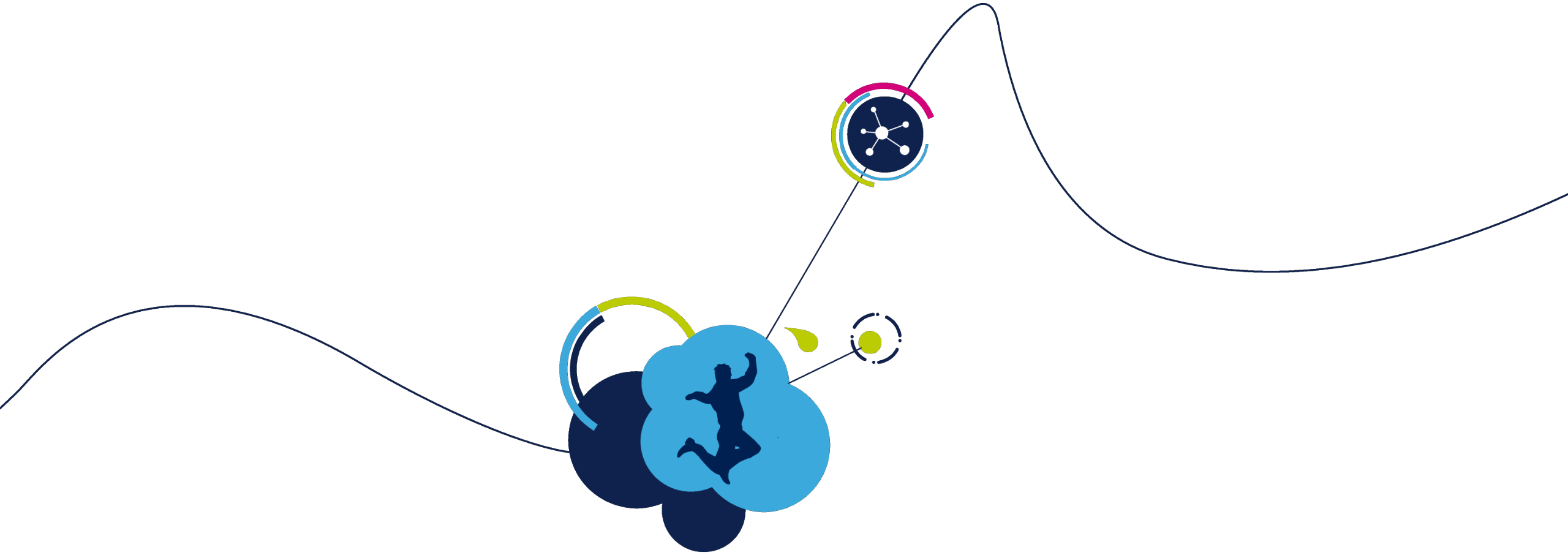

Microcontrollers

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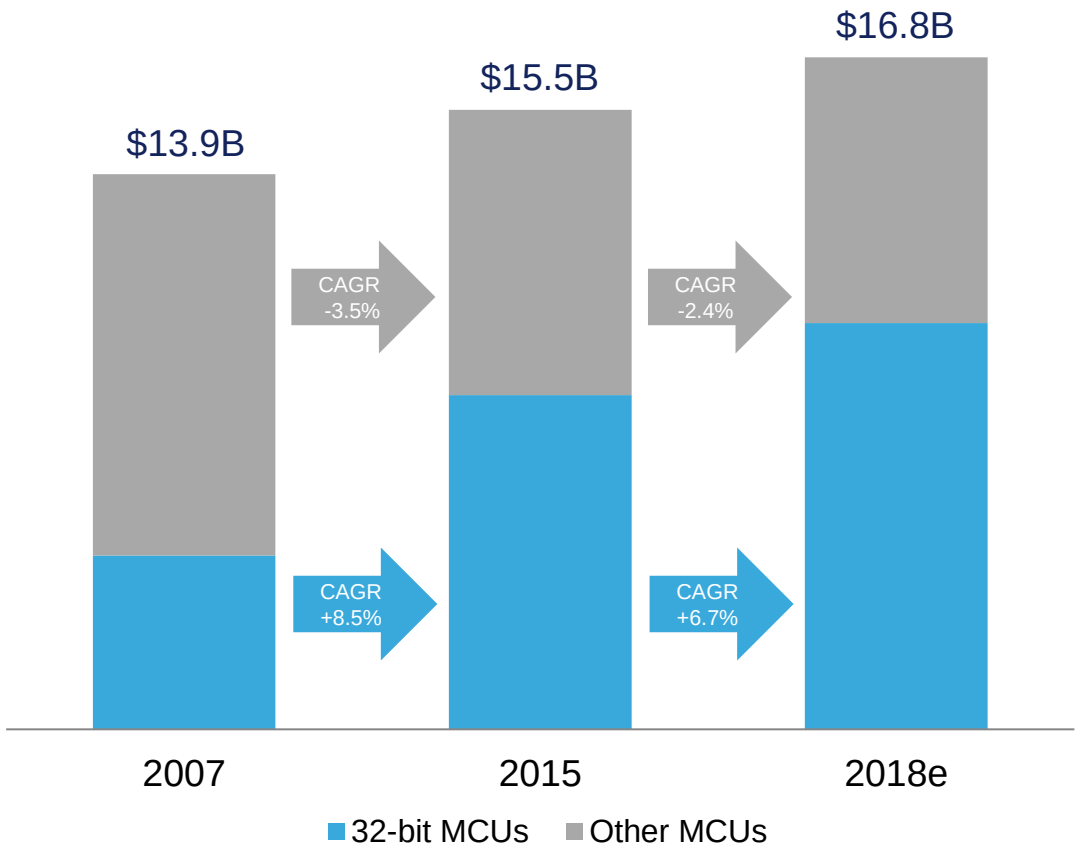
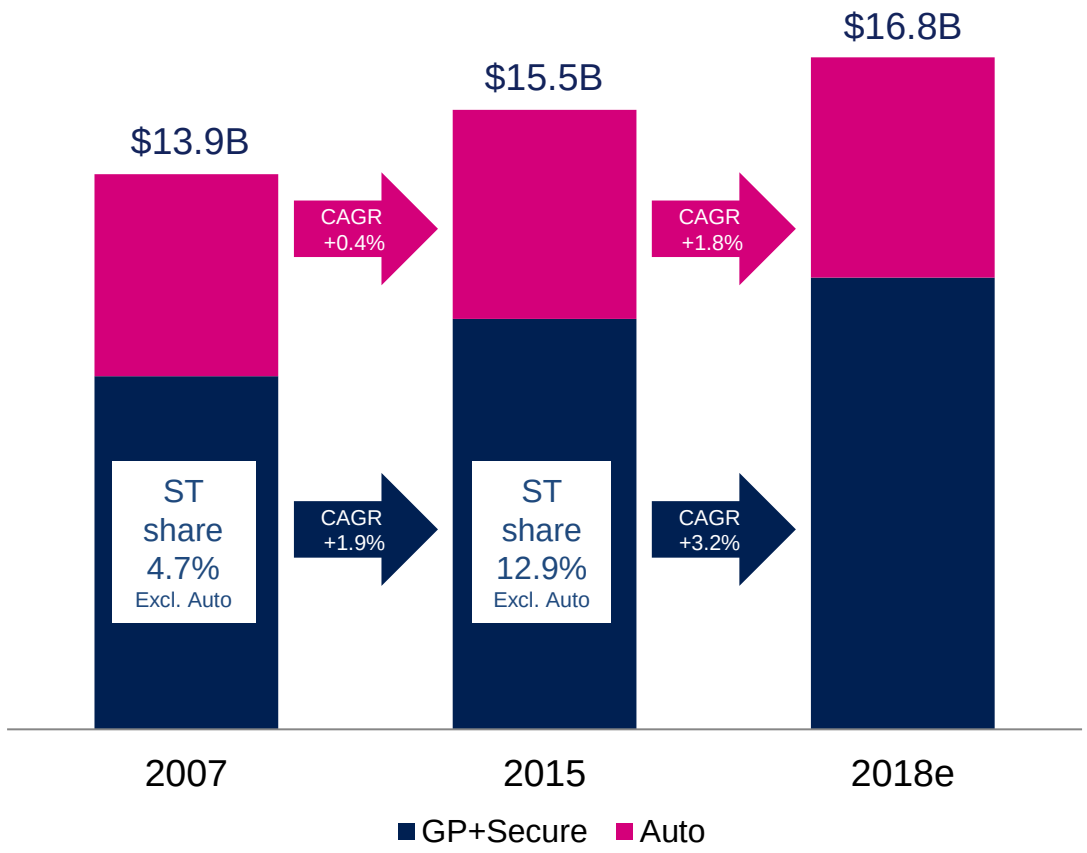
Microcontrollers Market Trend

Market growth driven by General Purpose & Secure 32-bit microcontrollers → ST Worldwide Leadership





WW MCU TAM (General Purpose + Secure + Automotive)

Source: WSTS

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GP & Secure MCU Market Trend

Growth driven by IoT deployment

Market Dynamics

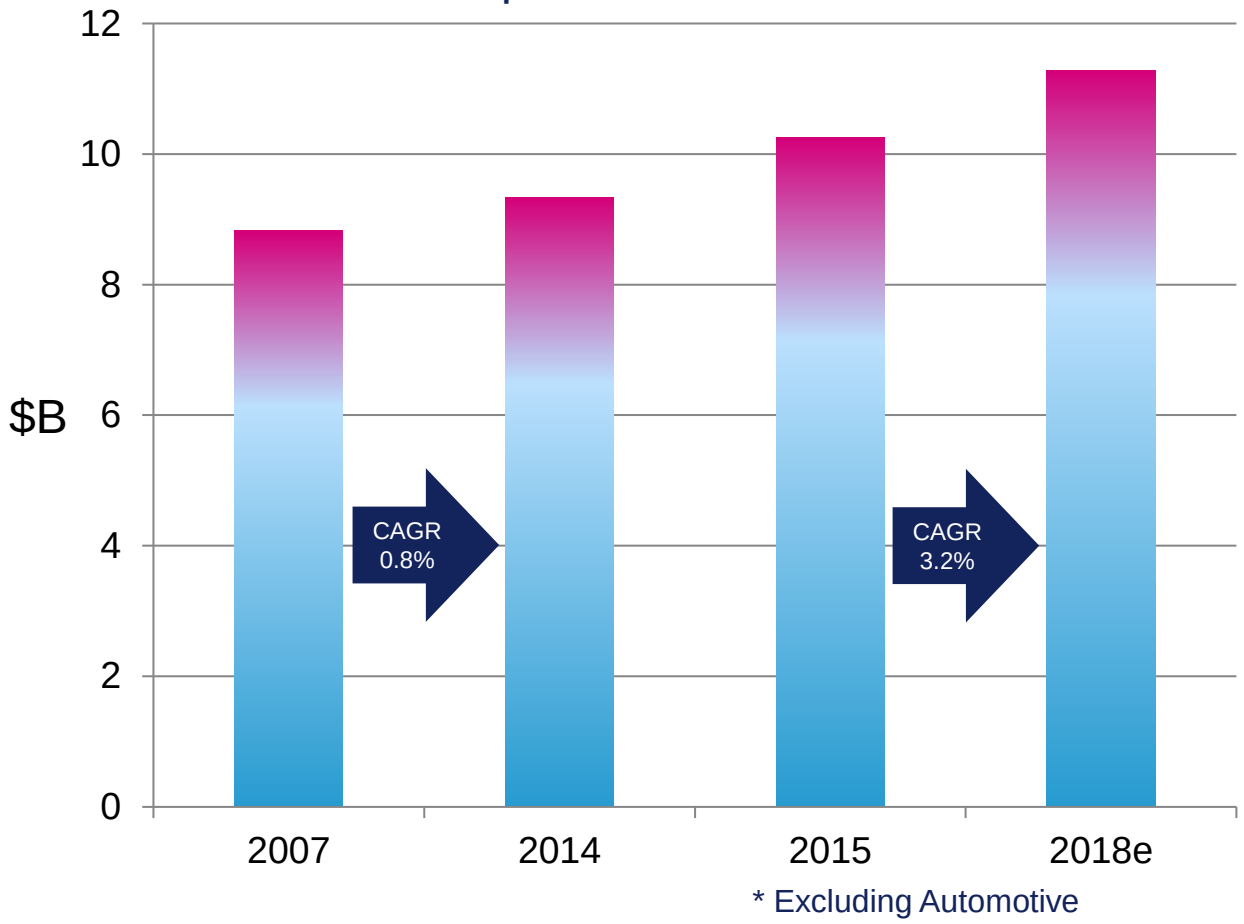
2007 – 2014: Limited growth

- General Purpose MCU revenues impacted by $ ASP trend
  - ✓ 32-bit proliferation
- Secure MCU
  - ✓ Secure Smartcard solutions : Banking, ID
  - ✓ Authentication and IP protection

2015 – 2018: Significant growth

- General Purpose Microcontrollers embedding advanced connectivity and security features
  - ✓ Wearables, smart home, smart city …
- Secure Microcontrollers
  - ✓ Mobile transactions: NFC/Contactless migration...

General Purpose + Secure MCU TAM*



* Excluding Automotive

Source: WSTS

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General Purpose Microcontrollers

- Addressing multi-application, multi-customer
- STM32 platform with added value

Performance
- Higher computing power
- Advanced peripherals
- More connectivity & security

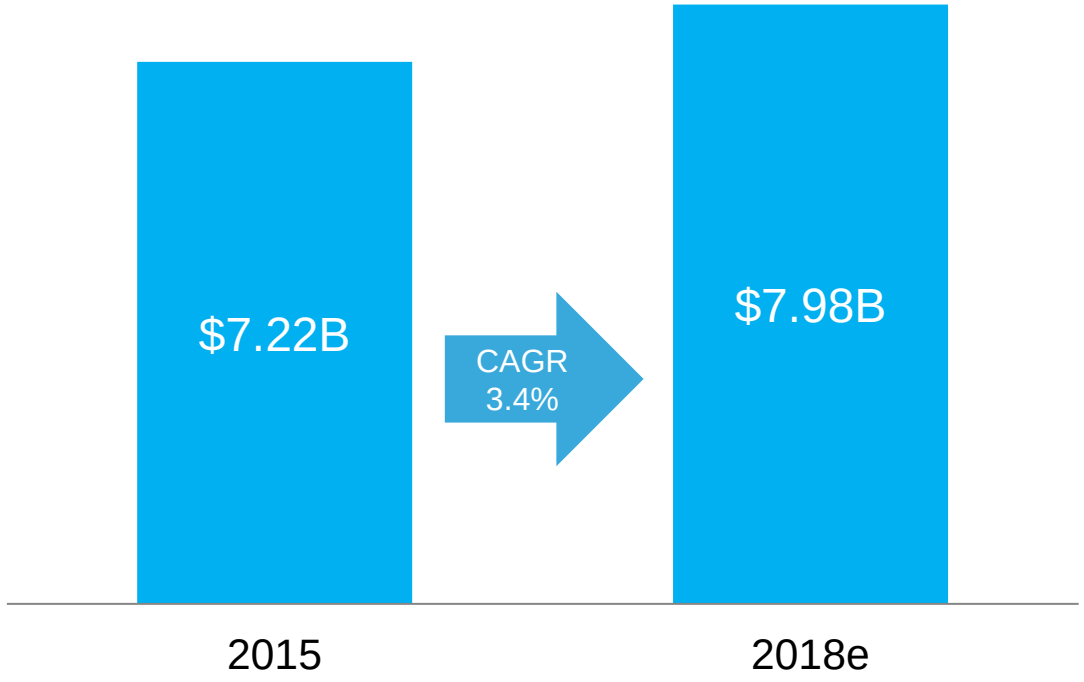
Ultra low power
- Low power consumption
- Optimized functional modes
- Smaller form factor

Easy development
- Extended ecosystem
- Low entry barrier
- Open development environment

Cost effective
- High level of integration
- Reduced development efforts
- Easy application upgrades

Above features fitting perfectly IoT needs

SAM GP MCUs*



* Excluding Automotive

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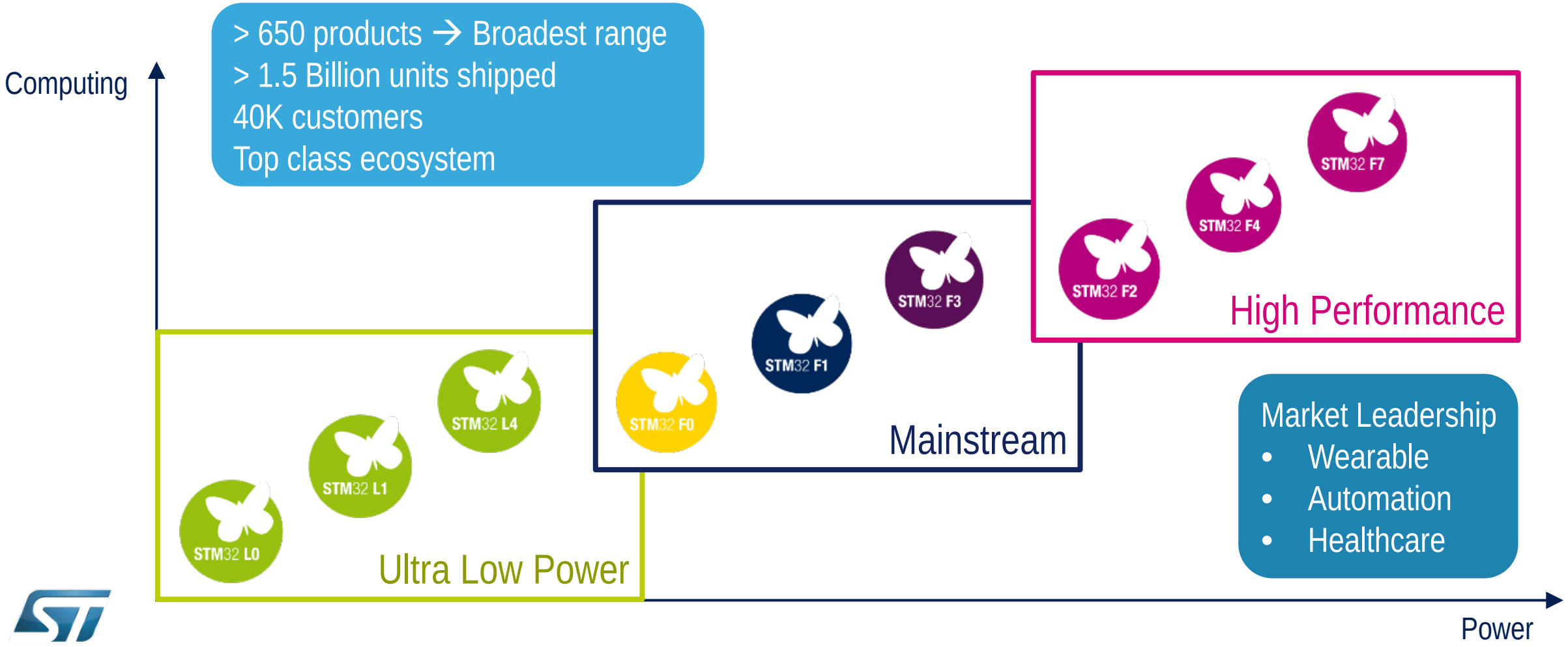
Source: WSTS

STM32
Advanced 32-bit MCU Portfolio

#1 WW 32-bit Microcontrollers supplier (excluding Automotive)



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Secure Microcontrollers

- Secure Element & Contactless
- ST31 & ST33 platforms with added value

State-of-the-art security
- Certified HW solutions
- High performance crypto accelerators

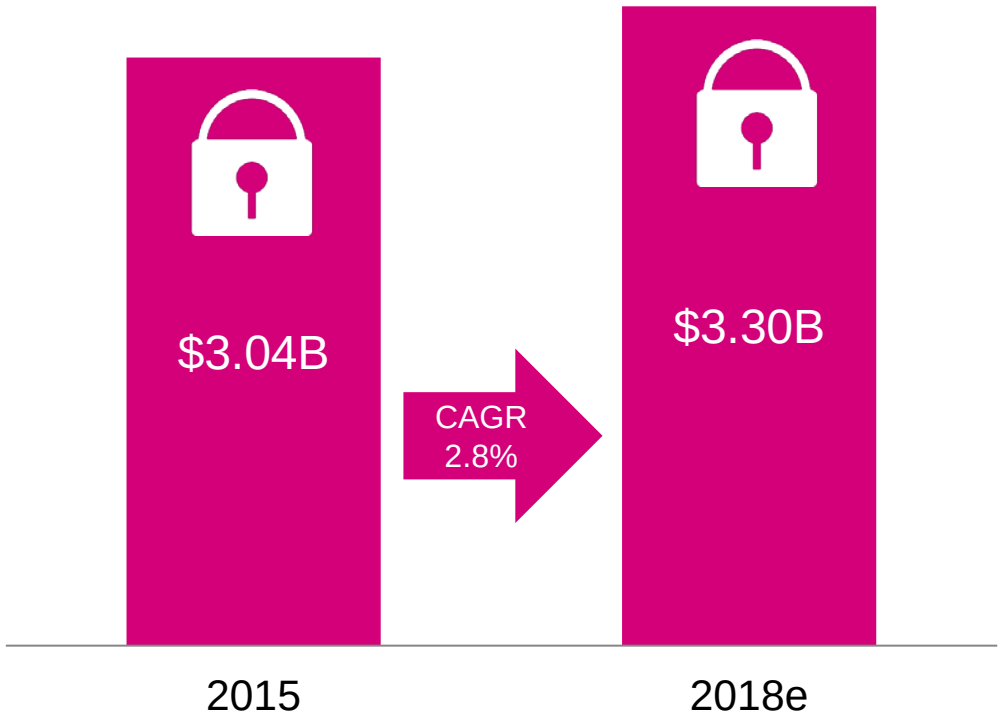
Connectivity
- Best interoperability
- Highest robustness

Turn-key solutions
- Certified HW & SW solutions
- Dedicated development tools & support team
- Product customization and personalization services

Cost effective
- Products based on state-of-the-art Flash process
- Reduced development effort
- Easy application upgrades
- Advanced packaging options

Above features fitting perfectly IoT needs

SAM Secure MCUs



Source: WSTS February 2016

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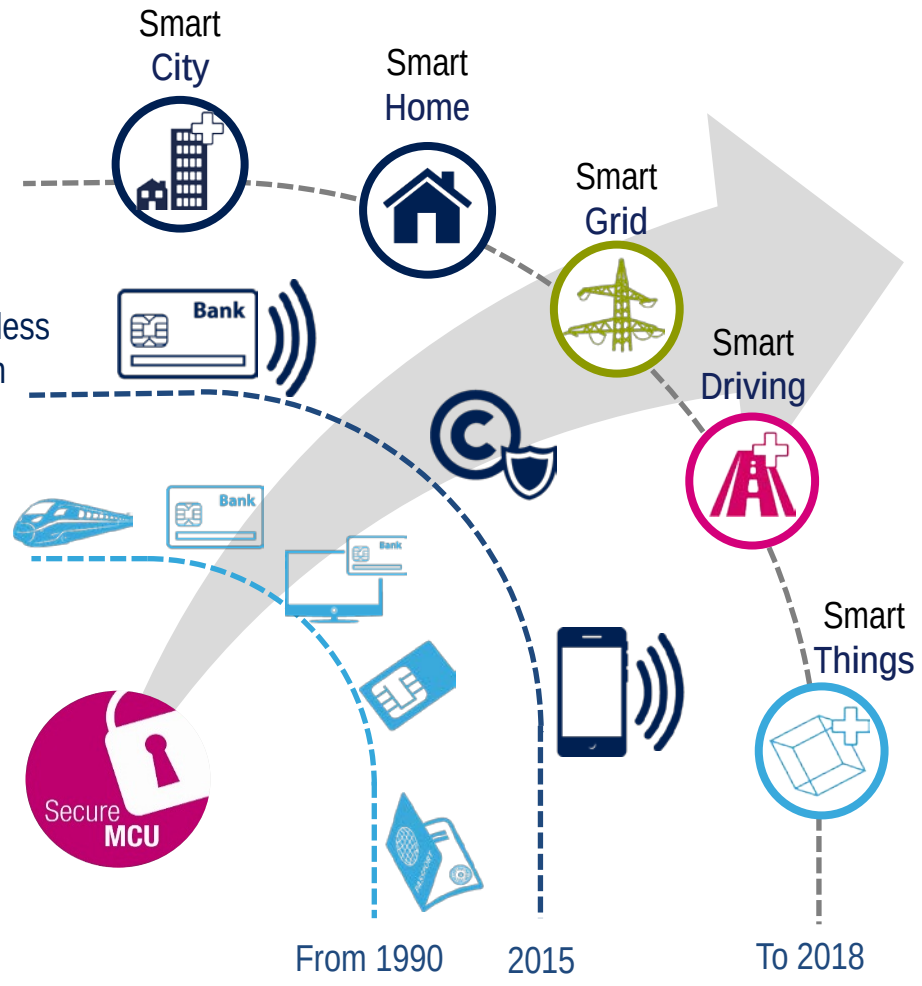
Market Dynamics Secure MCUs

- Authentication
- Healthcare
- Payment
- Fitness

- Banking contactless
- Brand Protection
- NFC – eSE

- Transport
- Banking
- Pay TV
- SIM
- Identification



~ 2.8 % CAGR 2015-18

- Growth initially driven by the “Smartcards” business market
- 2nd generation addressing contactless payment and mobility as Mobile payment, NFC, M2M
- 3rd generation embedding security is emerging in home automation, Trusted Platform, brand protection and all connected devices

Customers

- Few tens of traditional card makers
- New OEMs require highly secure turnkey solutions (application software in secure hardware platform)
- Mass Market to consider for IoT

Technology & features drivers

- Strong security (certified and high performances)
- Cost effective solution
- Turnkey solutions
- Secure solution combined with standard MCU

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Complete Secure MCU Portfolio

Turnkey Secure Solution

ST33

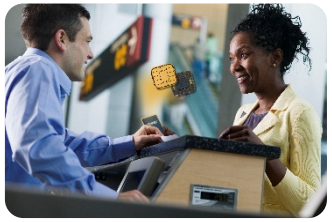
Computer Trusted Platform Module
Device & accessory authentication
consumer brand protection

ST23

Home automation
Smart Grid

Turnkey Secure Solution

Security Know-how



ST31

Banking
Identification
Transport

Secure MCU
Turnkey Secure Solution

ST54

NFC Full Solution
Controller,
Secure Element

Mobile security
NFC transactions

ST33

M2M industrial, automotive

Secure MCU

ST33 based on ARM® SC300® Secure CPU core
ST31 based on ARM® SC000® Secure CPU core

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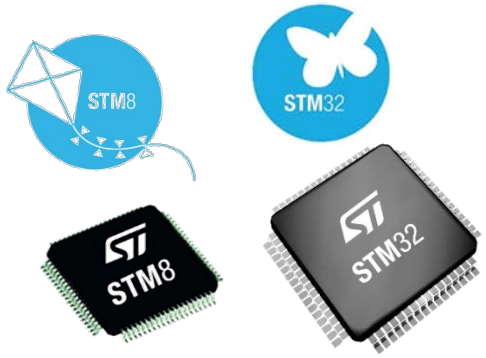
Products & Tools
to match IoT market trends

Market Trends

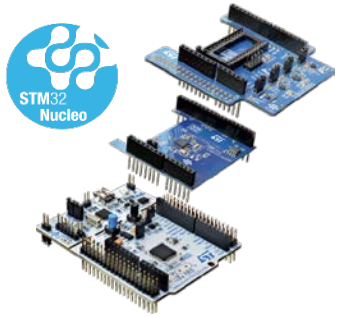
Smart Things	Smart Home	Smart City	Smart Industry
			
Ultra-low power Processing power	Short-range connectivity Advanced peripherals	Long-range connectivity Smart peripherals	Security features and certification

ST Offer

Broad MCU offer



Accessible ecosystem for application development



STM32 Nucleo development kits

STM32 Nucleo expansion boards for connectivity, sensing, actuating

Free SW platforms for all OSes

Educational Programs & MOOC

Secure MCU

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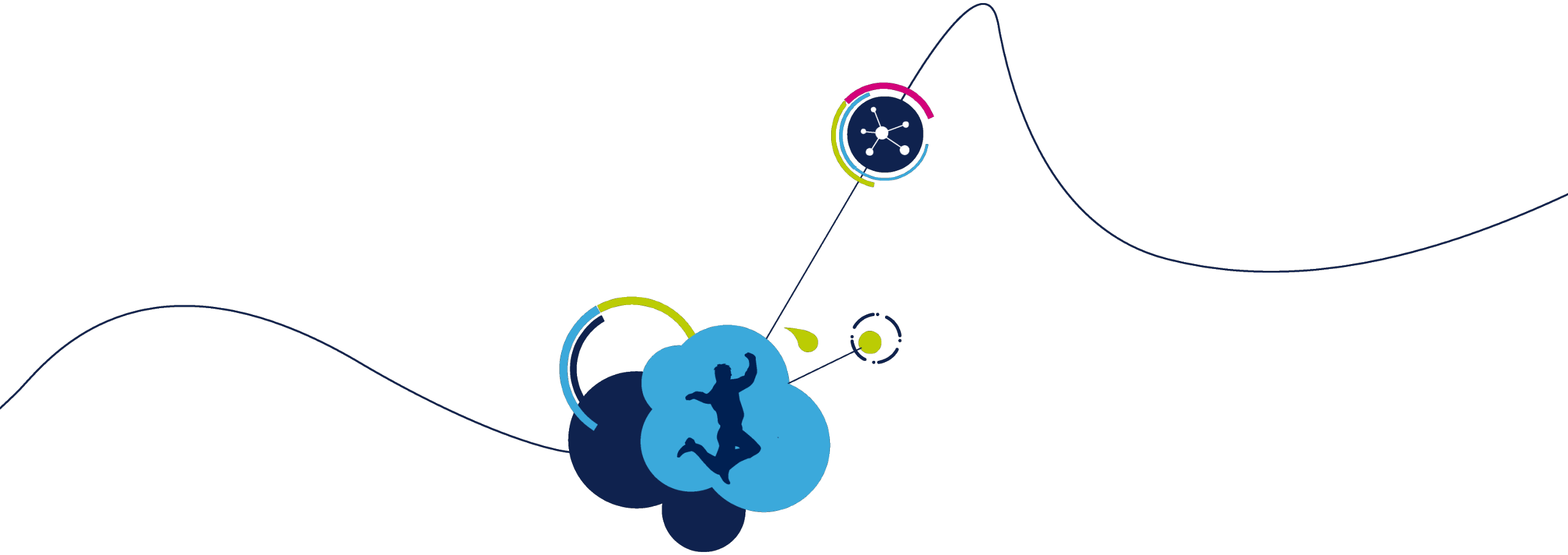

Digital

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Digital and Mixed Processes ASICs

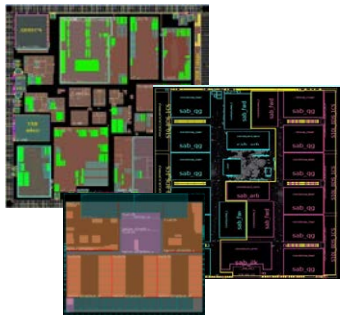
Market Segments

Switching / Routing

Networking

Consumer

IoT



Digital ASICs

Digital & Mixed Processes ASIC

RF Infrastructure

Optical Interconnect

4G/5G Base Stations

Telecom

Data Centers

Datacom

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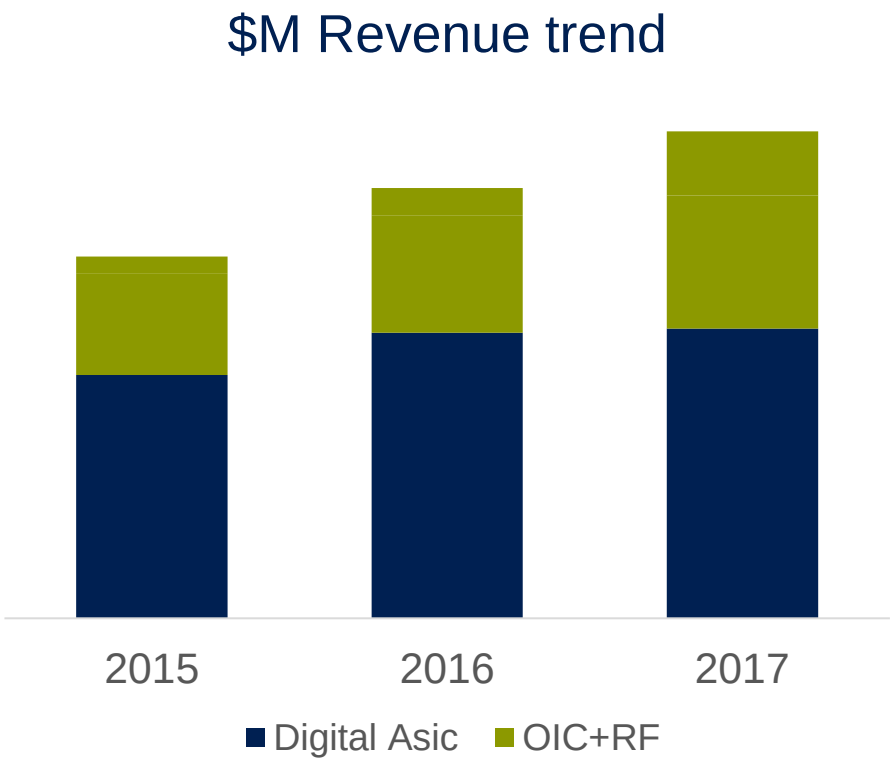
Added Value: The Technologies

	BiCMOS7/9	BiCMOS55	PIC25	28 FD-SOI
Optical Interconnect	ASIC/COT	ASSP ASIC/COT	ASSP TurnKey	
RF Infrastructure	ASSP ASIC/COT	ASSP ASIC/COT		
Digital ASICs				ASIC

Revenue Growth Drivers



Infrastructure
Mobile & data center traffic growth

- 100G optical modules volume growth
- Silicon photonics optical engines
- RF mobile FEM and base station synthesizers and transceivers

Increasing performance and complexity

- Advanced digital ASICs for Terabyte board switching
- Metro and long-haul coherent digital engines
- IoT position trackers

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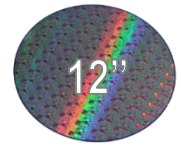
ICs for Optical Interconnect

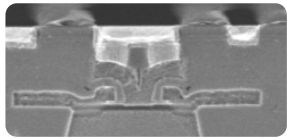
- ST continue to be leading supplier of ICs for optical modules
  - **~300M modules powered by ST BiCMOS technologies in the field today**
  - Solid revenue growth continues enabling broad range of applications 10Gbps, 25Gbps, 40Gbps, 100Gbps / SR, LR and Parallel Optics
  - Serving the leaders in the market
  - BiCMOS55 gaining strong market traction
- Enabling the market with
  - ASIC/COT model with BiCMOS technologies
  - ASSP products for 10G Transceiver and CDR
  - ASSP in Silicon Photonics technology domain

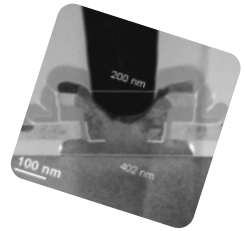


BiCMOS55
55nm CMOS
SiGe-C HBT
f_T > 300 GHz
f_{MAX} > 400 GHz

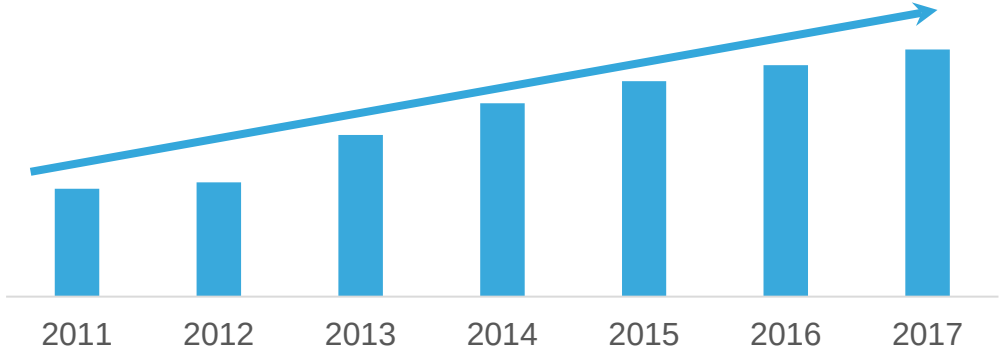
BICMOS9MW
0.13µm CMOS
SiGe-C HBT
f_T = 220 GHz
f_{MAX} = 280 GHz

BICMOS9
0.13µm CMOS
SiGe-C HBT
f_T = 160 GHz
f_{MAX} = 160 GHz





Revenue trend
CAGR 14%



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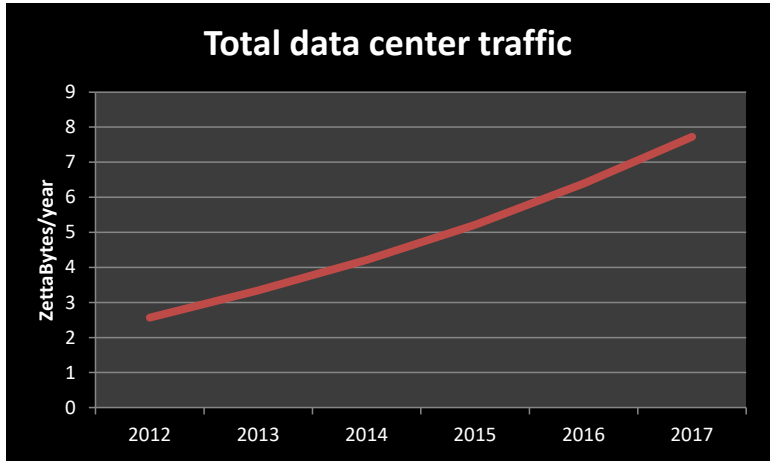
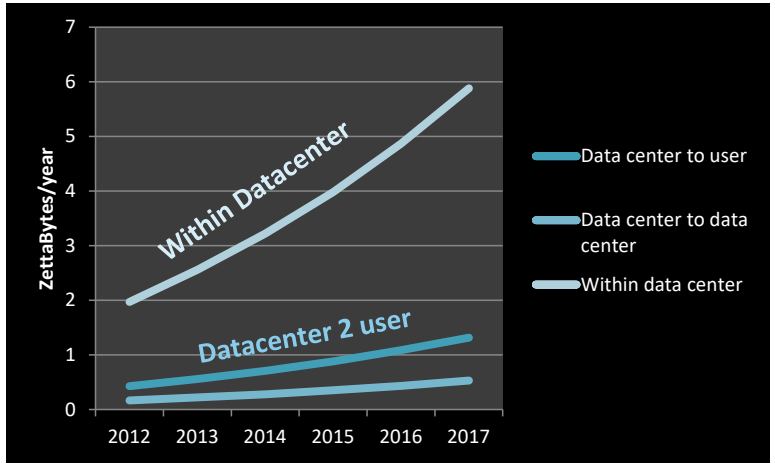
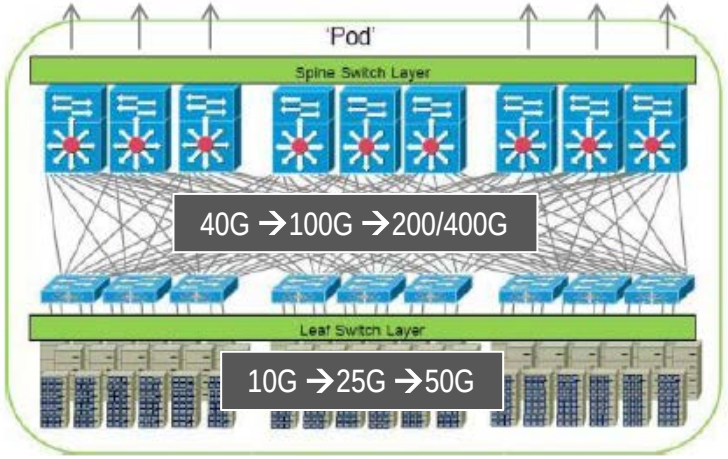
Hyperscale Data Centers
the growth driver

Global Traffic is doubling every 3 years

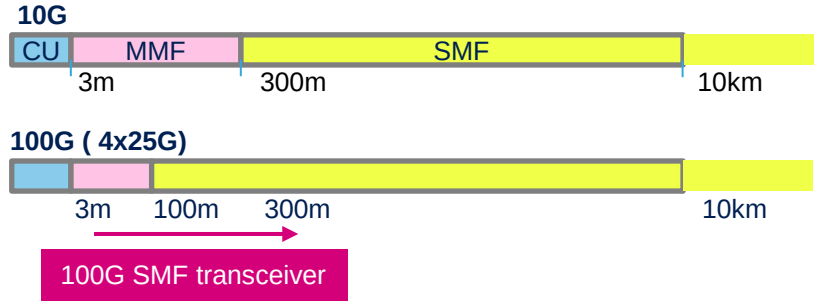




- The explosive traffic growth requires bandwidth
  - Server to TopOfRack 10G → **25G** ; distance: <5m
  - Switch to Switch 40G →**100G ;** distance: 85%<500m



- From Multi Mode Fiber interconnect to 100G Transceiver over Single Mode Fiber
  - 100G SR4, VCSEL reach its limit to <100m, not suitable for 100G Switch to Switch links
  - New MSA solutions introduced :
    - PSM4 over parallel SMF @500m
    - CWDM4/CL4 over duplex SMF@2km



- **Single Mode Fiber** infrastructure **is the choice in all Data Center**
  - 100G →200G →400G keeping same optical network infrastructure

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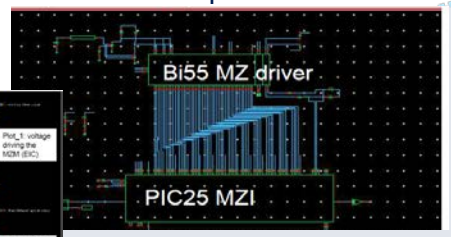
Integrated Si Photonics Optical Engine

from development to prototype

Schematic Capture



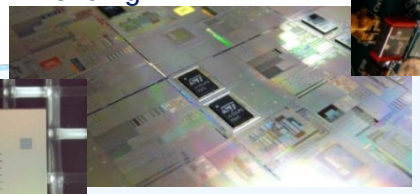
CAD simulation

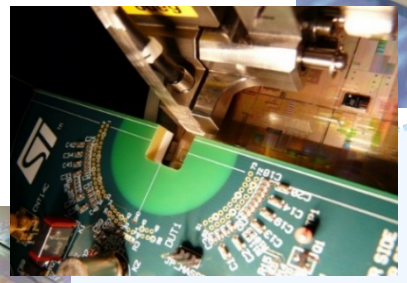
Crolles 200 and 300mm Wafer Fab

Integrated 3D Optical Engine

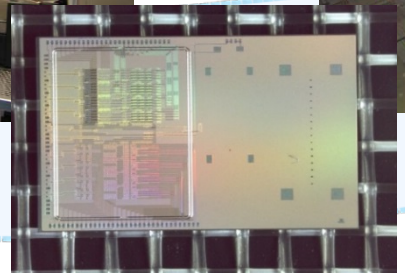
Inline photonics test bench

Chip on Wafer Bonding



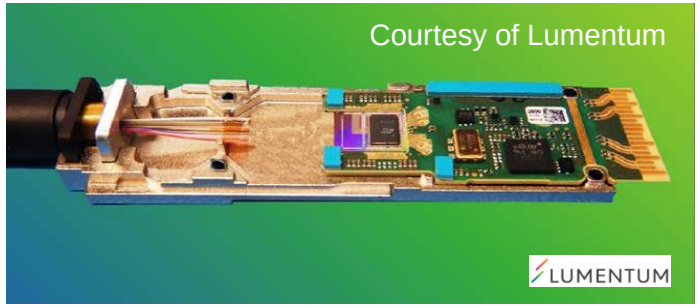


Electro Optical Wafer Sort



Optical Die

- Silicon Photonics integrated technology is today a reality. It is ramping production in H216
- Use of Silicon Photonics based optical engine in 100G QSP28 shows an outstanding Bill of Materials reduction and assembly ease
- The best way for optical modules to get close to the targets data center applications are looking for



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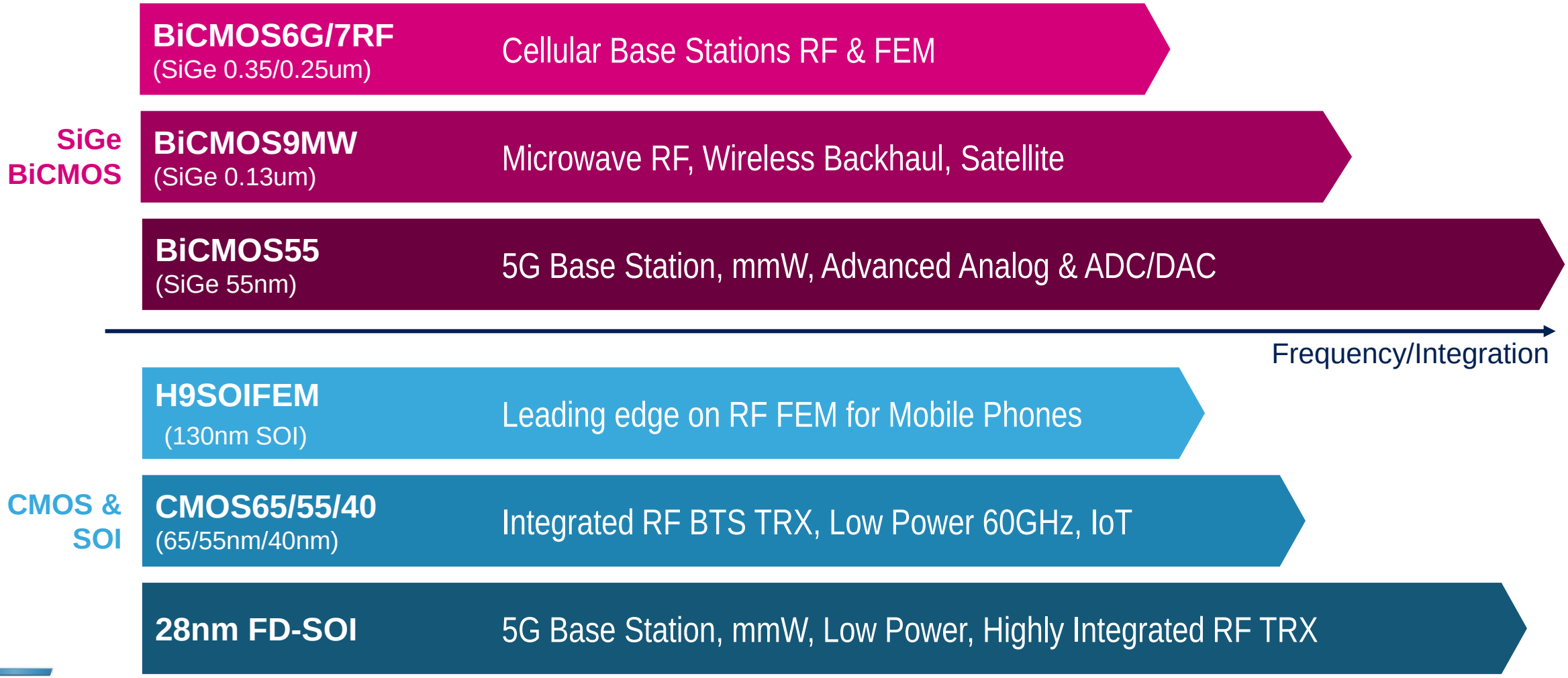
RF product line



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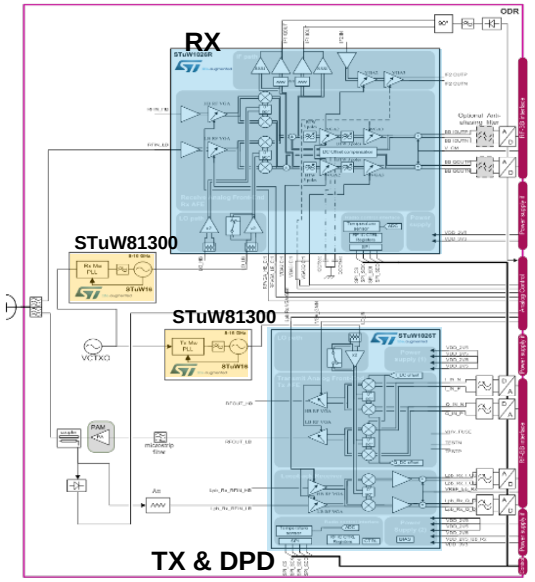
Microwave Transceiver in BiCMOS

Integrated, cost optimized solution for P2P radio link

STuW1026 10-26GHz integrated transceiver
STu81300 synthesizer

- Point-to-Point microwave bands
- Targeting direct conversion architecture
- Full outdoor and split mount radios
- Support for super-heterodyne mode
- Supports up to 4096-QAM and 112MHz channel bandwidth



An ST ASSP system kit fully based on ST BiCMOS9MW and BiCMOS55 technology

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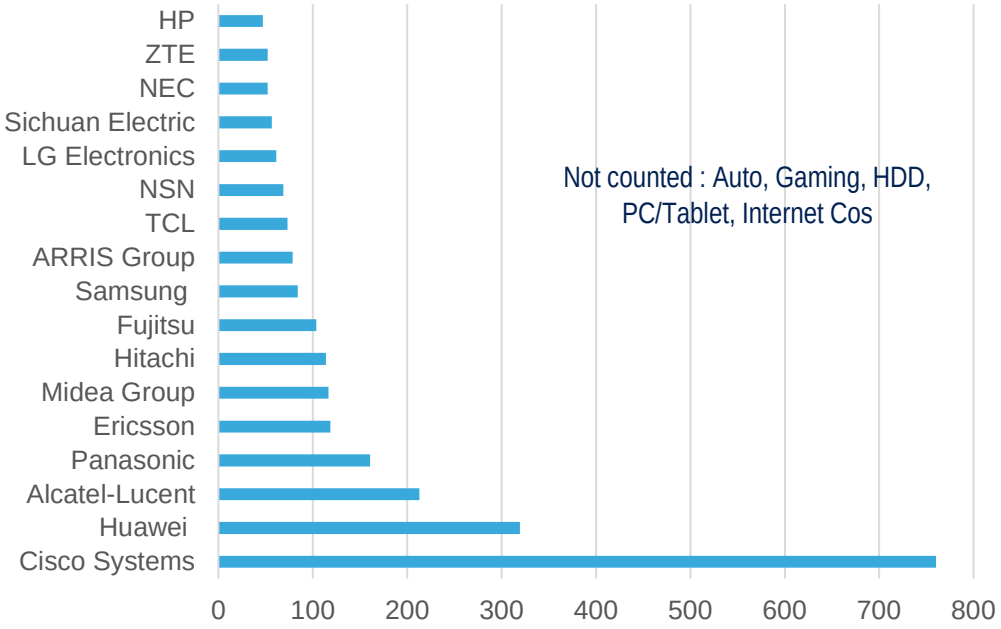
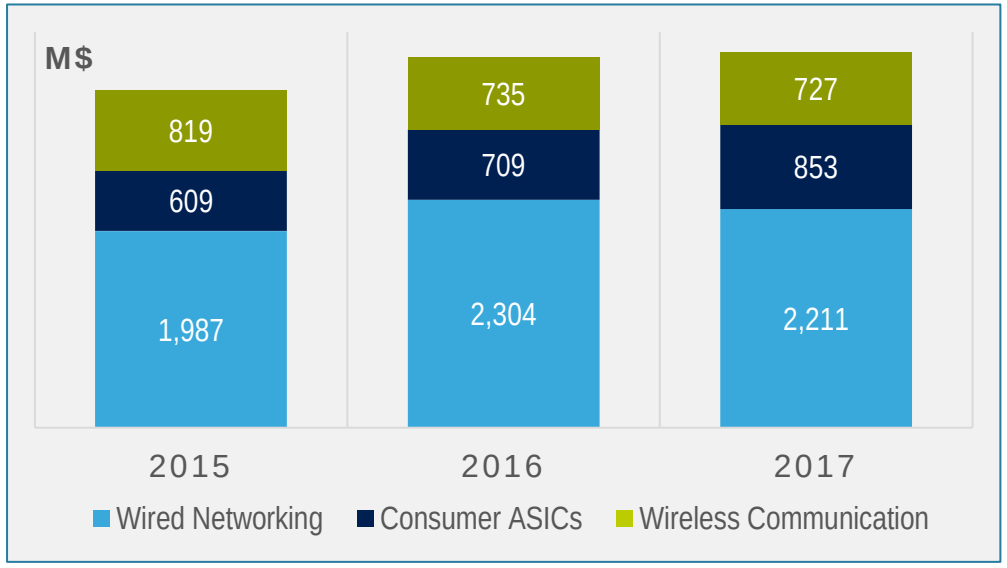
Digital ASIC market





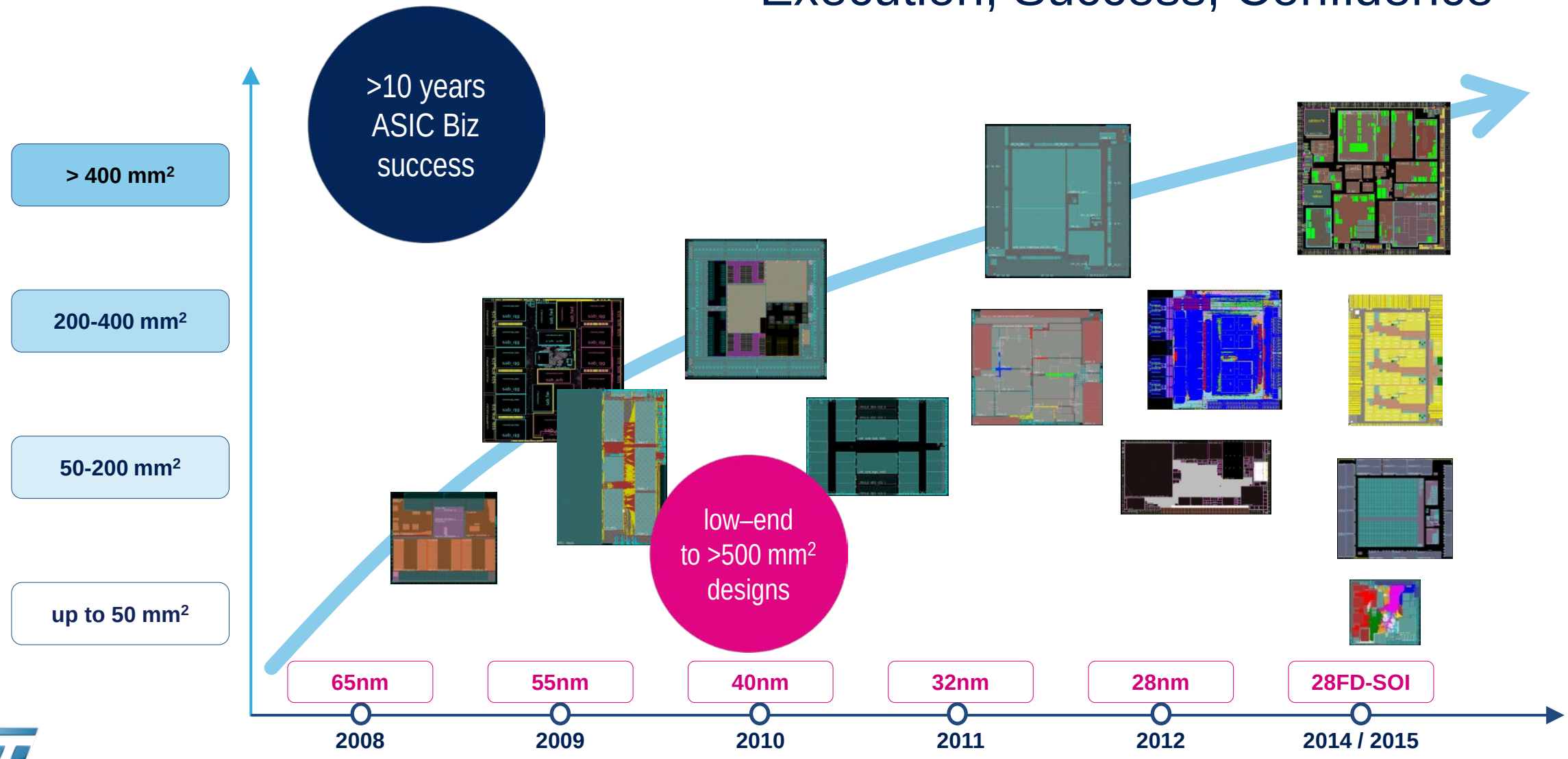
Competitiveness in Networking ASICs market is driven by:

- Ability to integrate ASICs with die size exceeding 300mm^2
- SerDes availability to allow switching bandwidth up to terabyte throughput.
  Very high count of SerDes at speed up to 56Gbps
- Ability to design advanced packaging with ball count in the range of thousands also managing high power consumption in the range of 100W and more
- Fast prototyping cycle times and complex supply chain management

Sources: IHS

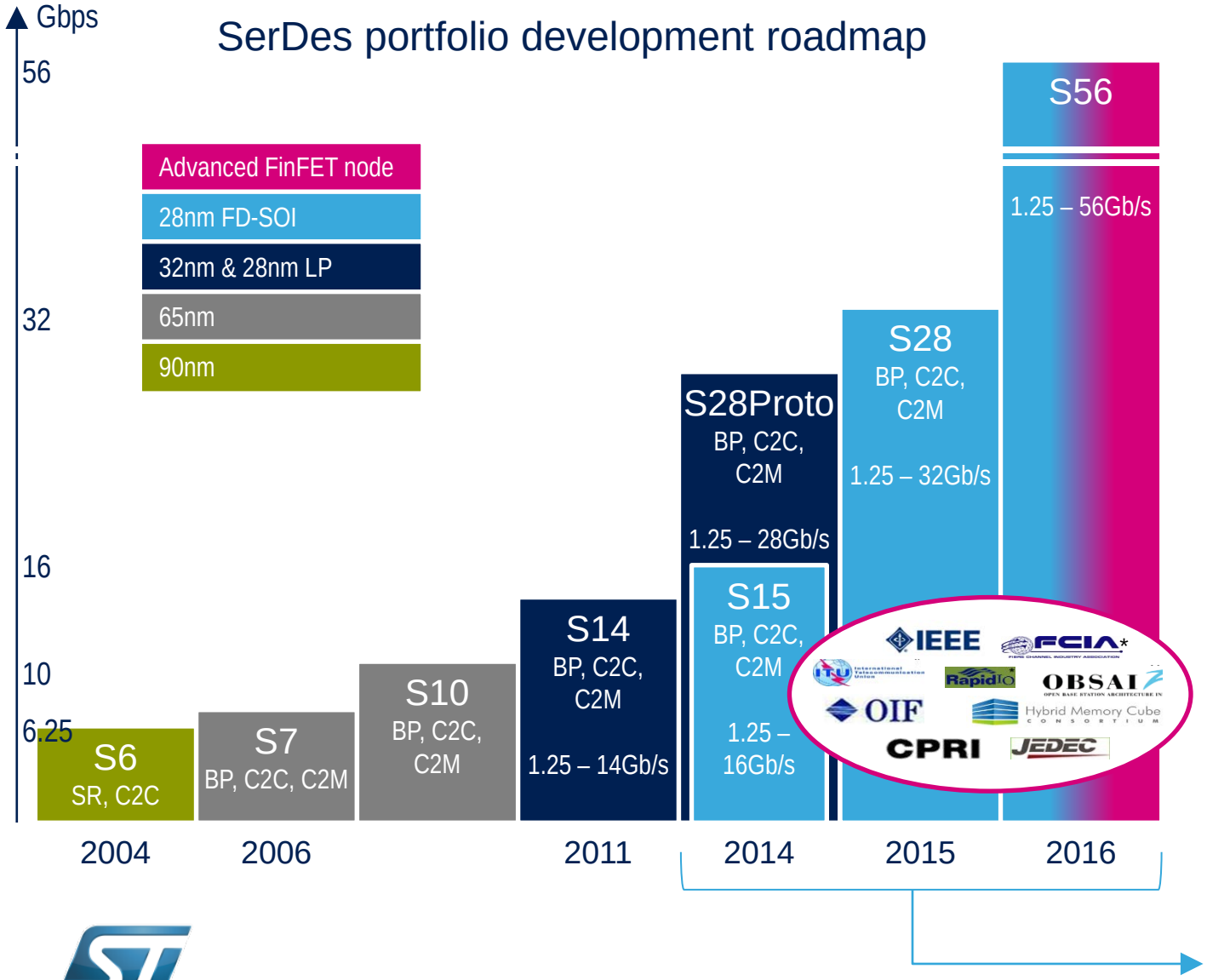
Advanced CMOS ASICs

Execution, Success, Confidence



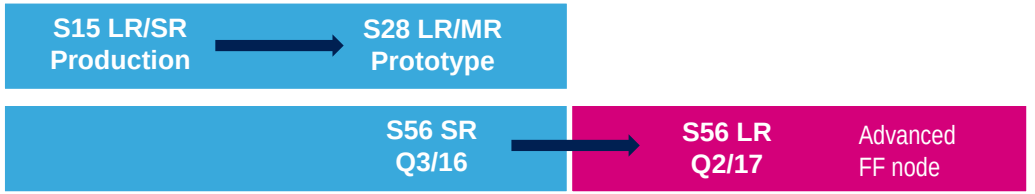
IP for Networking

SerDes portfolio development roadmap



ST Networking IP

- Broad variety of SerDes up to 28Gbps (available now) and 56Gbps prototype in Q3/16
- DDR 2/3 and 3/4
- USB2 and USB3
- PCIe, SATA and Ethernet
- ARM 32-bit and 64-bit processor family
- ADC/DAC
- TCAM
- UHS SRAM



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MDG Revenue Growth and Operating Margin Improvement

Key Objective

Grow revenues and achieve >10% margin in mid term

Revenue Drivers

- Leverage on technology leadership in eNVM, FD-SOI and RF
- General Purpose STM32 MCU
- Advanced Secure Element
- Secure contactless: banking / ID
- RF EEPROM
- Digital ASICs on FD-SOI
- Optical module ICs leveraging Silicon Photonics and BiCMOS

Operating Margin

- Leverage on revenue growth
- Technology mix in Crolles 12” (eNVM)
- 8” to 12” products evolution
- Assembly cost and yields
- Value-add and differentiated new products
- Low margin discontinued products (Set-Top-Box)
- Execution of Set-Top Box restructuring
- Favorable currency effects

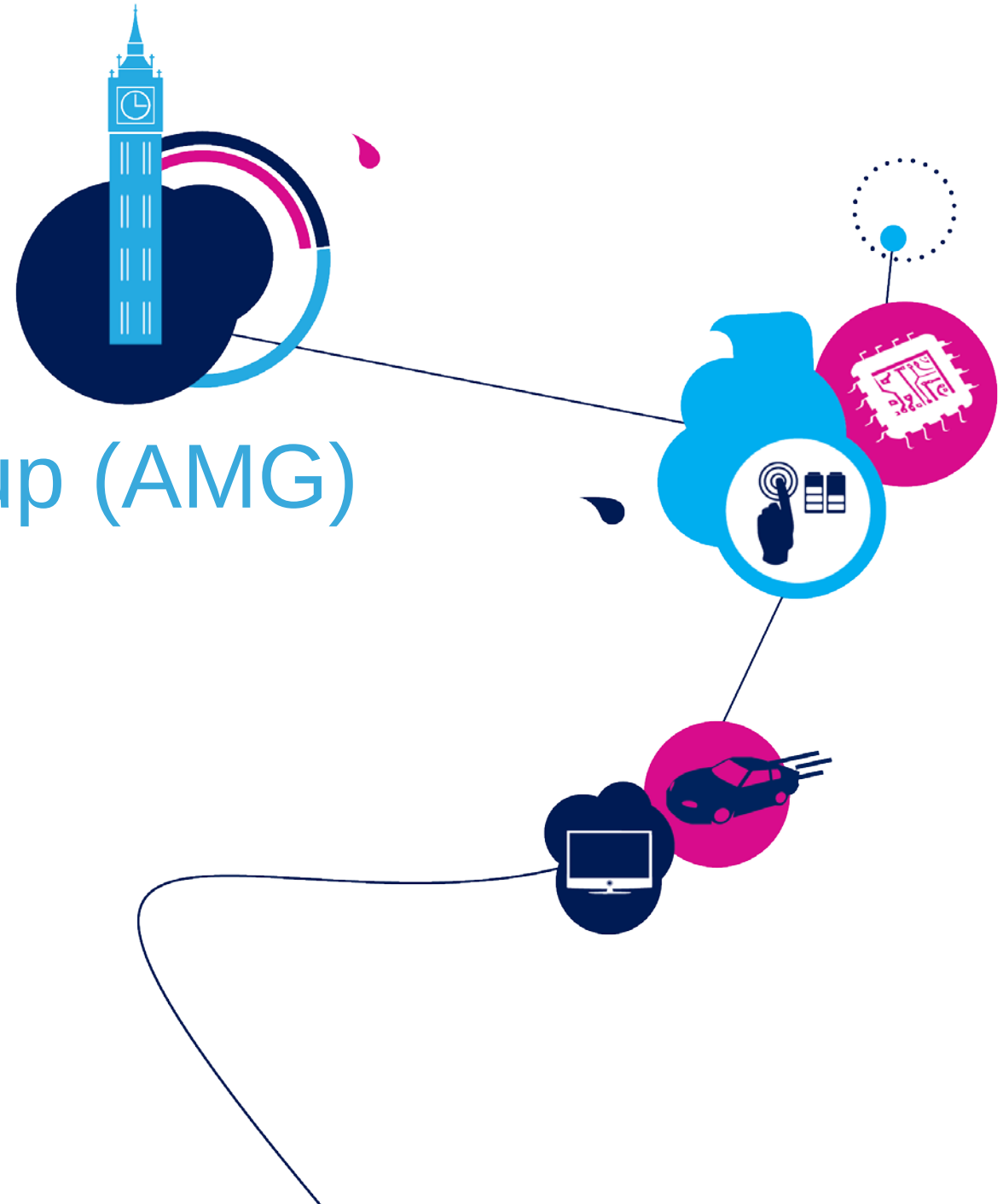
Takeaways

MICROCONTROLLERS

- Pursue double digit-profitable growth and market share gain capitalizing on solid foundation
- Maintain worldwide 32-bit platform leadership
  - General Purpose MCU
  - Secure Element
- Capitalize on application & system knowledge
  - Reinforce & proliferate advanced connectivity solutions
  - Deploy secure software solutions
- Address the microprocessor market to complete our offer
- Drive evolution of IoT market embedding more connectivity and security on top of General Purpose MCU

DIGITAL

- Accelerate current redeployment to secure profitability ASAP
- Secure Set-Top-Box plan execution
- Capitalize on advanced in-house BiCMOS technology to address the market drivers able to generate significant business growth
  - Data center traffic
  - Mobile infrastructure
- Focus on optical interconnect ICs
- Capitalize on state-of-the-art in house FD-SOI advanced process
- Focus on advanced Digital ASICs dedicated to Networking solutions



Analog and MEMS Group (AMG)

Benedetto Vigna

Executive Vice President
General Manager, Analog and MEMS Group

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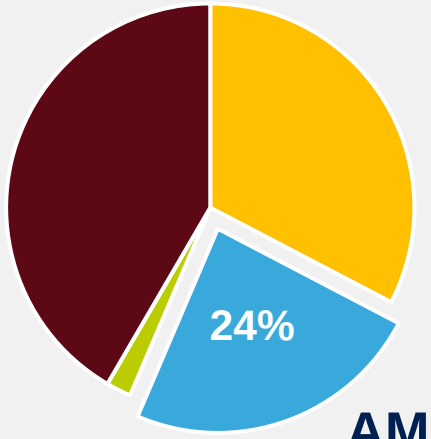
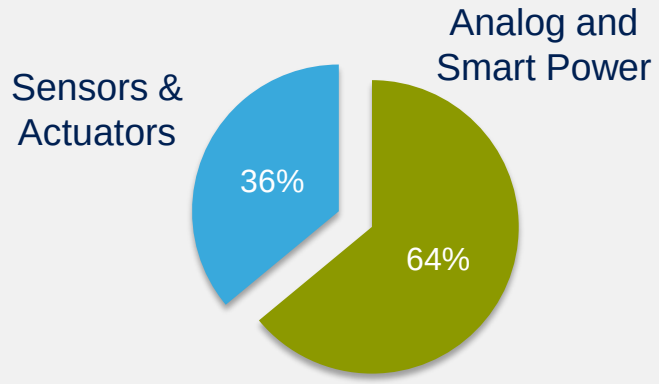
Analog and MEMS Group (AMG)

Contribution to ST revenues 2015





Portfolio

Sensors and Actuators

- Motion Sensors
- Environmental Sensors
- Microphones
- Actuators
- Sensor Hub & Sensor Fusion

Analog and Smart Power

Industrial

- Motion Control ICs
- Industrial Analog ASSP
- Energy Management ICs
- Digital Power Conversion ICs
- AC-DC Power Supply
- Lighting ICs

Custom Analog

- PMIC for Data Storage & Server
- Portable Power management

General Purpose Analog

- Analog Front-End
- RF ICs

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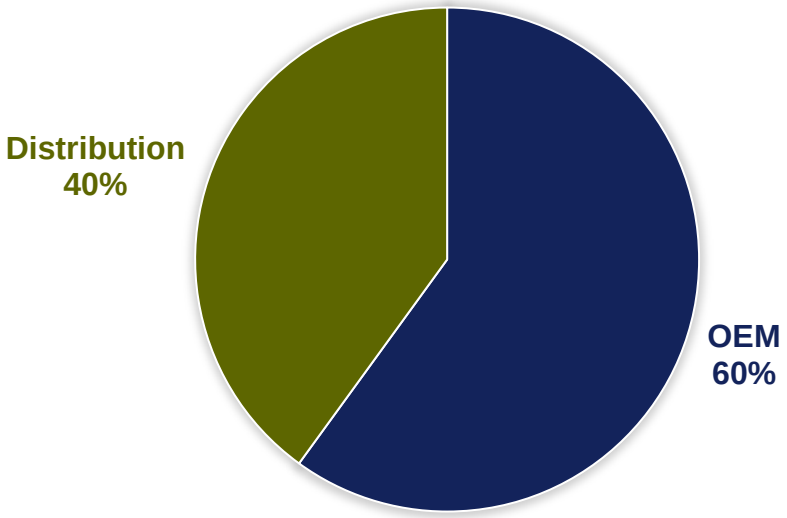
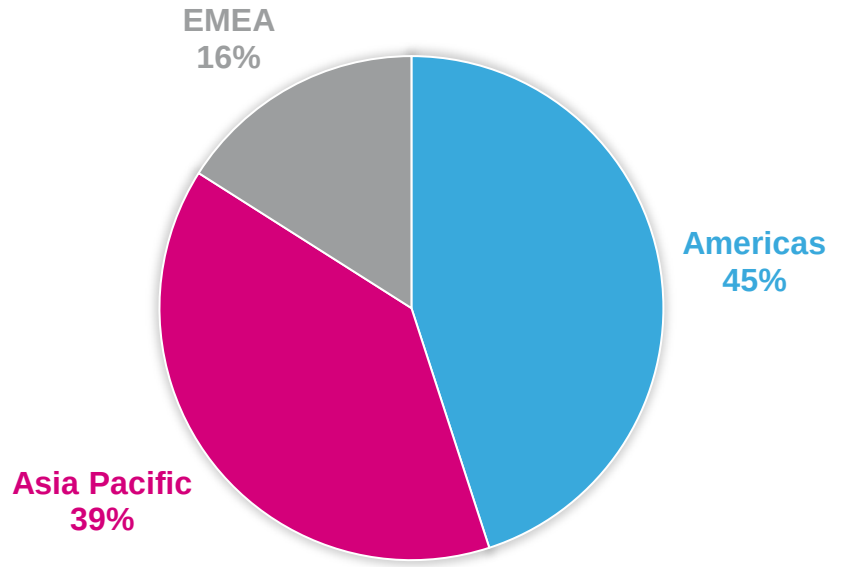
A Broad and Diversified Customer Base

Well balanced across customer types and markets

2015 Revenue by customer type



2015 Revenue by region of origin



24% of ST Revenues in 2015

- More than 5200 available products

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Source: ST

AMG at a Glance

Leadership Areas

 # 1 in MEMS Sensors for Consumer and Mobile

 # 1 in AMOLED Display Power Supply

 # 1 PMIC for Data Storage

 # 1 in Power Line Modem for Smart Metering

 # 2 in MEMS Micro-Actuators

 # 2 in LED Driver ICs

 # 3 in Industrial Analog ASIC and ASSP

Innovation driven

- **More than a quarter** of sales with products < 2 years old
- **124** new patents filed in 2015
- **220** patents granted in 2015
- **> 134** new silicon lines introduced in 2015

Broad product portfolio

- Focus on high-end analog
- Sensors and actuators, power management, wireless connectivity
- Ultra-low power, highest accuracy, sensitivity and integration
- Best-in-class product for leading OEMs

Established worldwide ecosystem for mass market

- Strong system **know-how** to support a global **customer base**
- **> 400** evaluation boards and associated development tools
- **> 1200** software evaluation licenses distributed in the last 6 months

Source: WSTS, IHS , ST

AMG Dynamics in 2015

What did not go to plan

- Intense price pressure in consumer MEMS sensors
- Loss of touchscreen controller in a flagship phone
- Loss of microphone revenues due to:
  - ✓ subcontractor issue
  - ✓ demand reduction
- Hard-disk drive market dynamics

Where we made progress

2012 Diversification strategy started to yield results:

- Reshaped motion MEMS product portfolio
- Strong growth and key design wins in automotive and industrial
- Continued traction in piezo micro-actuators
- Start of volume sales for low-power connectivity in wearables and smart home

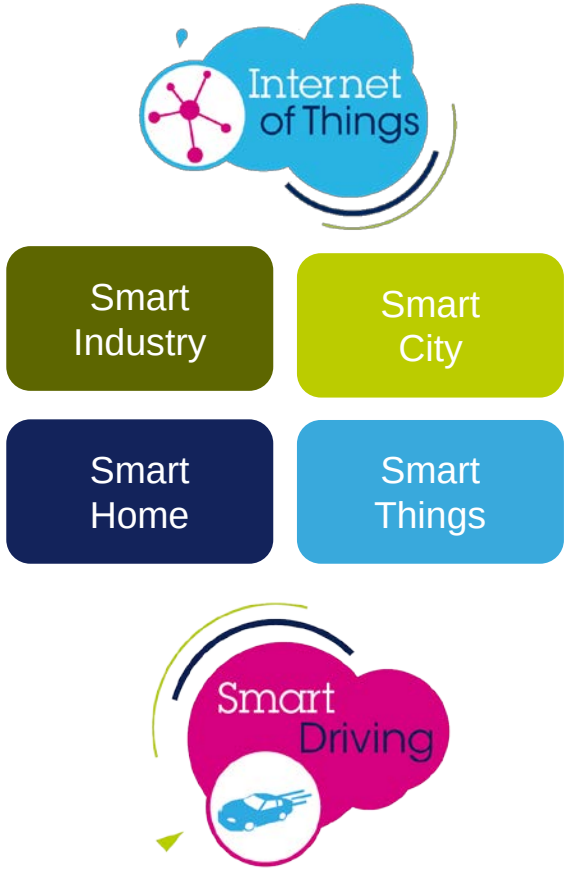
AMG Turnaround Strategy

Key Objective

Revenue growth and mid to high single digit operating margin in mid term

Actions

- **MEMS sensors and micro actuators – Maintain volumes while diversifying**
  - Maintain volumes on consumer MEMS (motion, microphones and environmental)
  - Expand in Automotive (motion and microphones) and industrial MEMS (motion and environmental)
  - Grow in micro-actuators (Piezo)
- **General purpose Analog – Grow market share**
  - Additional Sales & Marketing initiatives with aggressive goals targeting the mass market
  - New dedicated organization to increase focus
- **Dedicated Analog products - focus on Smart Meter solutions, Power Management ICs and AMOLED**



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Application Strategic Focus

IoT applications are changing the way we work and live by saving time and resources, and opening new opportunities for growth, innovation and knowledge creation

Smart Industry

Factory Automation
Motion Control
Industrial Robots
Industrial Lighting

Smart Home

Home & Building Automation
Smart Appliances
Smart LED Lighting
Heating & Energy Control
Security System

Smart City

Traffic control
Smart Transportation
Smart Metering
Street Lighting

Smart Things

Wearable
Smartphones
Tablets
Smart consumer

Shaping our future with analog, sensors, smart power and connectivity to drive the evolution of IoT

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Smart Industry
Success Stories

Standardized production environments

SIEMENS

Factory Automation
Motion Control
Smart Industrial Meter
Industrial Power Supply

- Processing ICs
- Communication ICs
- Power Management

PHOENIX CONTACT

Programmable Logic Controller

- Processing ICs
- Peripheral ICs
- Communication ICs

Smart Sensing & Actuating
- Environmental sensors
- Motion MEMS
- Acoustic MEMS
- Ranging sensors

Processing
- MCU or BUS ASIC
- Secure MCU

Connectivity
- Powerline
- SubGHz
- Bluetooth modules
- Wi-Fi modules

Peripherals
- ESD & EMI Protections
- I-O devices

Energy management
- Galvanic Isolated IPS
- Power Discretes and modules
- AC/DC & DC/DC regulators
- Power management ICs

Motor control
- Motor Driver
- Gate driver
- Power switches

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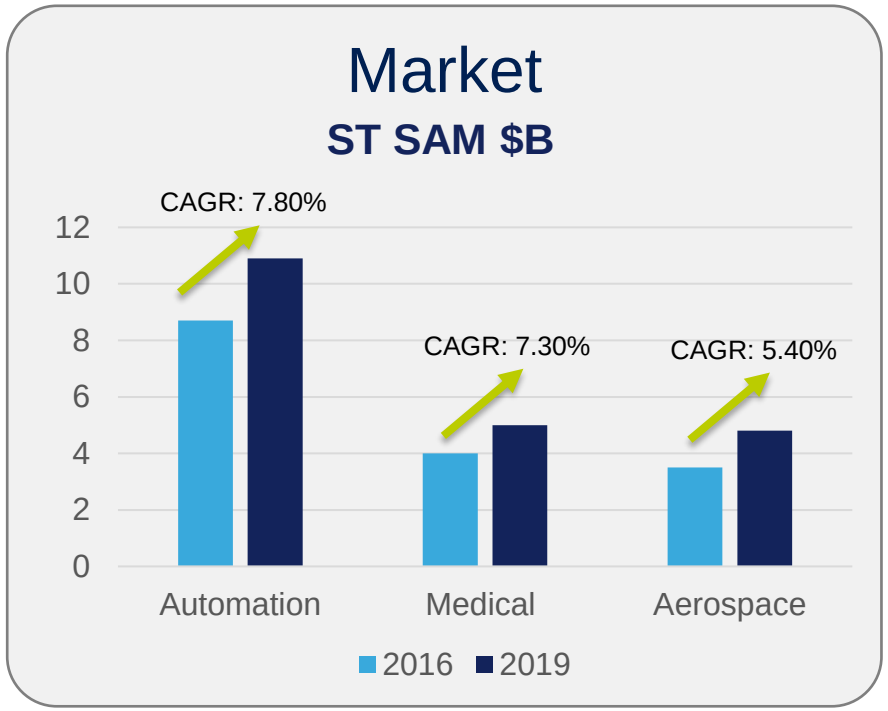
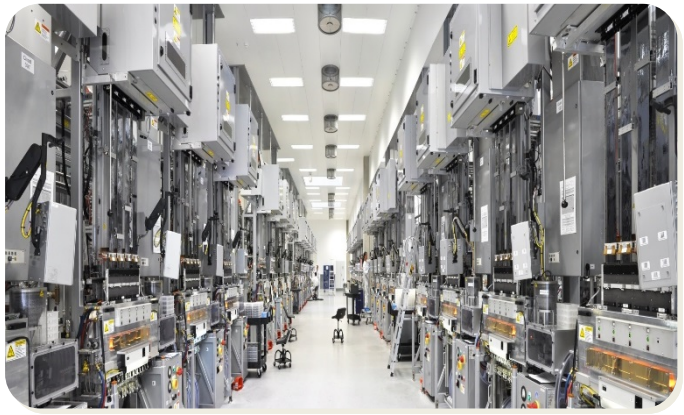
Smart Industry

Smarter, safer and more efficient factories and workplaces



Key Applications



Factory Automation

Industrial Robots

Industrial Lighting

Key Enabling Products and Technologies

- BCD with Galvanic Isolation
- Real-time Communications & Interface

Market Leading positions

- Motor Control ICs
- Industrial Analog ASIC

Key success factors

- Wide range of Industrial protocols supported
- Safety-relevant protocol support
- Advanced motion control know-how

Source: IHS

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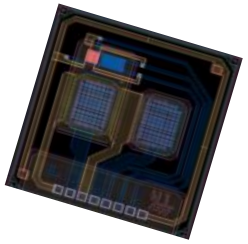
Smart Industry

Key products

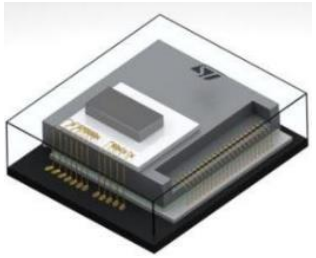
Smarter, safer and more efficient factories and workplaces

Sensors and Analog Front End

Industrial **sensors** to monitor process variables (proximity, level, flow, pressure, temperature)



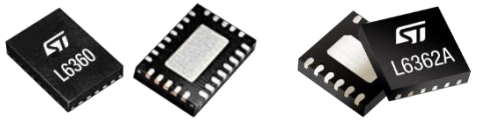
Environmental Sensors



Motion MEMS (Inertial Motion Unit)

Real-time Communication

Wired real-time Communication for control and safety multi-standard and **galvanic isolation** (4 kV, 6 kV and 10 kV)

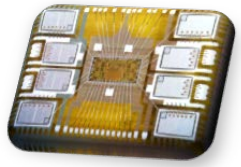


IO-Link

Intelligent power switch with galvanic isolation

Motion Control

Modular, scalable and robust **motor solutions** covering wide operating voltage, current and temperature ranges for industrial applications



STPower System-in-Package Motor driver

Galvanically isolated gate driver

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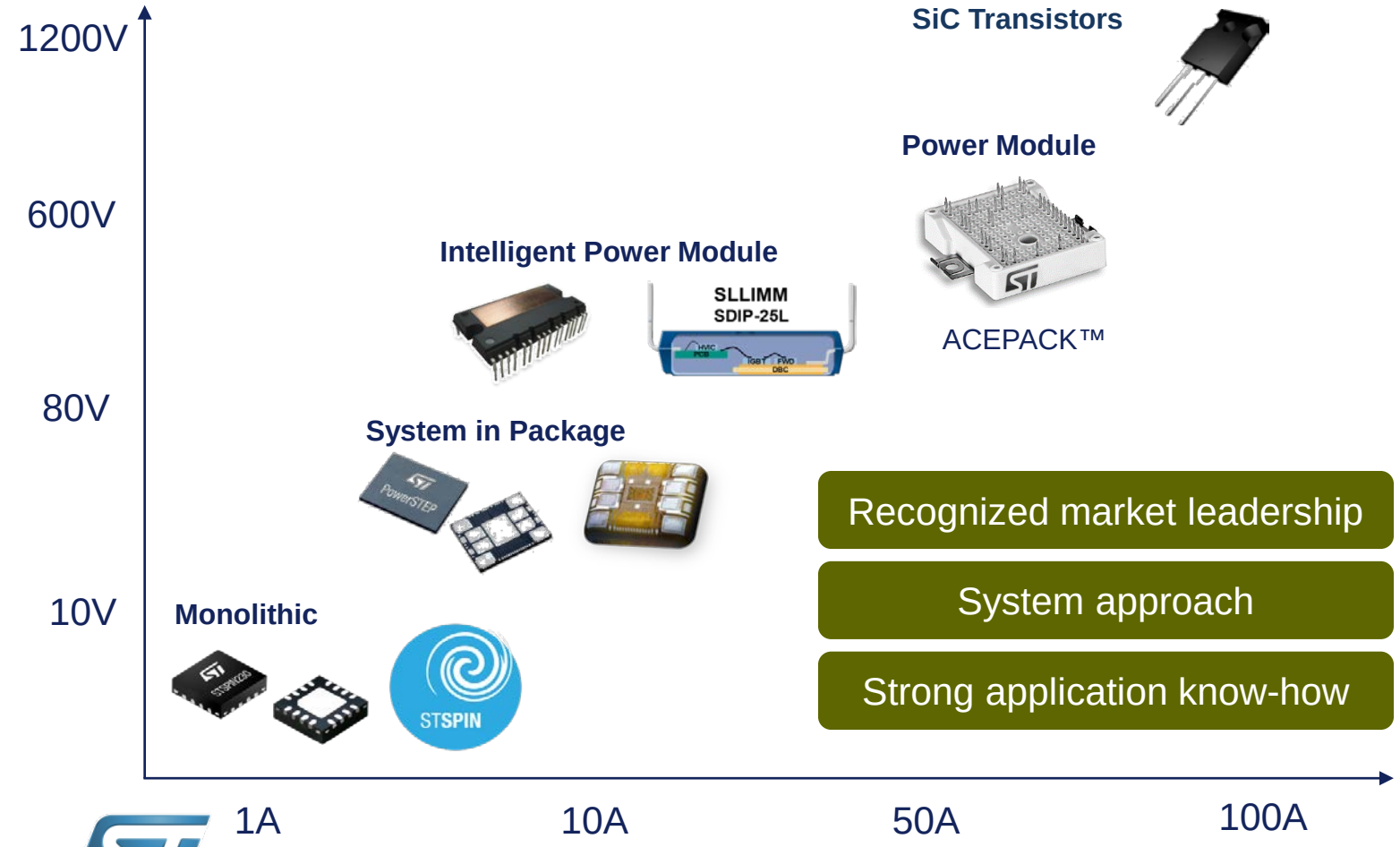
Leading the Evolution of Motion Control

Enabling Smart Industry



Automation

$ 8.7B TAM in 2016

$ 10.9B TAM in 2019

Source: IHS

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Buildings where people Live – Smart Appliances

ARISTON THERMO GROUP

ARISTON NET

Smart Water Heater

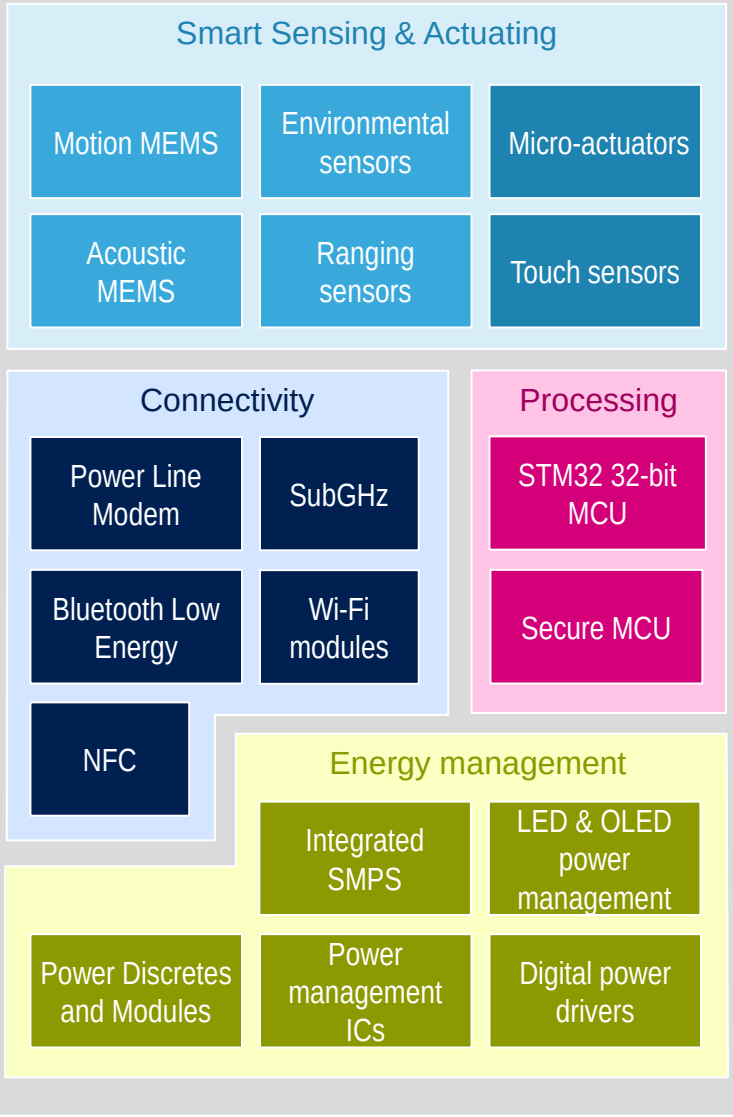
Wireless Connectivity module

QUNDIS™ ADVANCED MEASURING SOLUTIONS

Source: Qundis GmbH

Heat Cost allocator

Wireless Connectivity module



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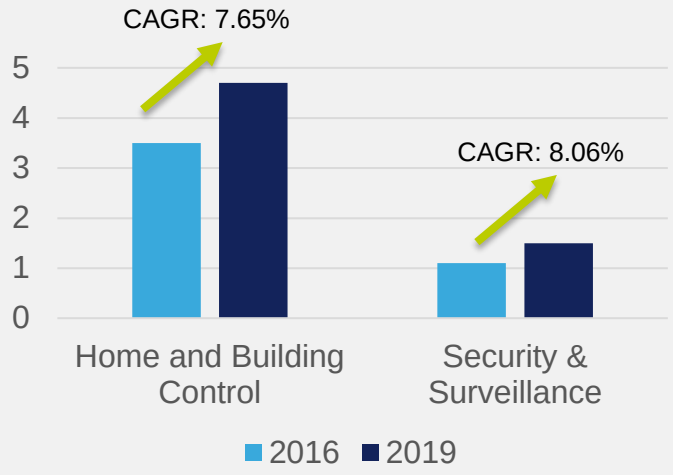
Smart Home

For better living, higher security, and less waste

Market

ST SAM $B



Key Applications

Heating & Energy Control

Smart Appliances

Security Systems

Home & Building Control

Key Enabling Products and Technologies

- Low-power wireless connectivity
- Power management & precision analog ICs
- Motion & Environmental Sensors

Market Leading positions

- LED driver ICs
- Motion MEMS
- Motor control ICs for Appliances

Key success factors

- Wide variety of connectivity standards to support various application needs
- Expertise in digital security technologies
- Application Know-how

Sources: IHS, ABI Research

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Smart Home

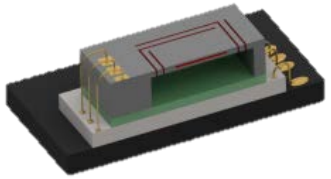
Key products

For better living, higher security, and less waste

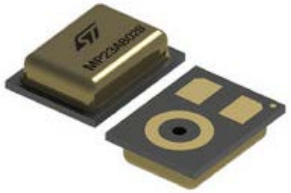
Sensors and Analog Front End

Detecting movement, pressure, light, humidity, proximity, gas and audio with MEMS, Biotechnologies and new materials to increase safety and security

Humidity Temperature Sensor



Pressure Sensors



Microphones

Connectivity

Low-power radio for short, medium and long distance with the best ratio between data rate and energy consumption, covering all available technologies and standards (subGHz, Bluetooth Low Energy, Wi-Fi, 6LowPAN)

SubGHz Tx/Rx Radio

Bluetooth Low Energy and Wi-Fi Modules

Power Management

Highest-efficiency products targeting zero standby power mode for lighting, computing and many other home appliances

VIPER Plus PM IC

PowerStep (STSPIN) Motor Control System-in-Package

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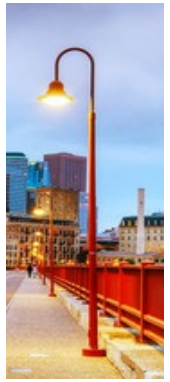
Urban environments - smart meters, street lighting

Smart Metering

Processing & Metrology

STarGRID PLC



Street Lighting

Processing & Metrology

SubGHz connectivity

Gas Flow Meter

Processing

SubGHz connectivity

Smart Metering IC

Smart Sensing & Actuating

- Motion MEMS
- Environmental sensors (Temperature, humidity, UV)
- Acoustic MEMS
- Ranging sensors
- Micro-actuators

Connectivity

- STarGRID™ PLC
- NFC
- Wi-Fi Modules
- SubGHz

Processing

- STCOMET Smart-Meter on-chip
- 32-bit MCU & Secure MCU

Energy management

- Smart Metering ICs
- Digital power drivers
- Power MOSFET
- Energy harvesting ICs
- Power management ICs

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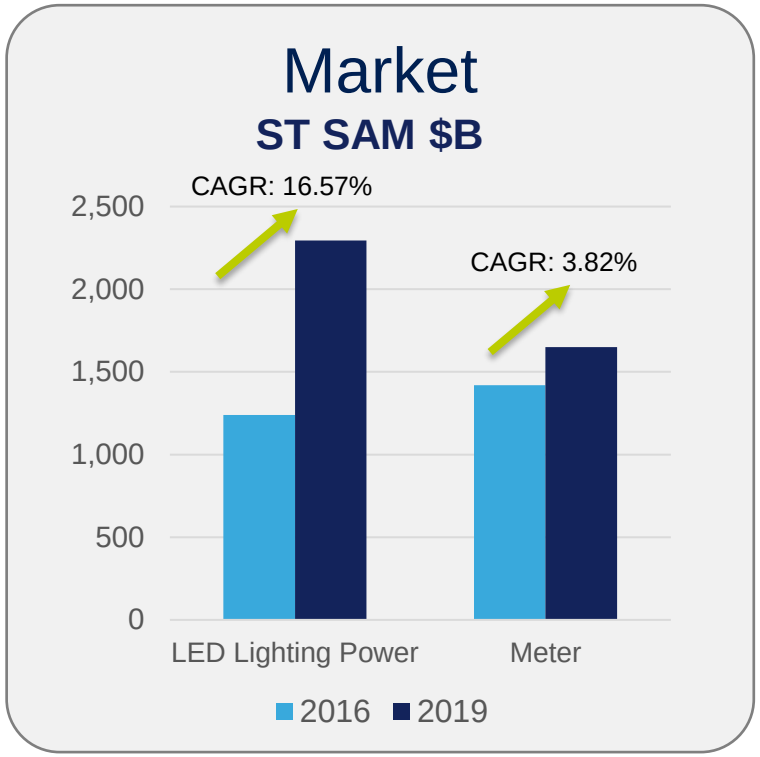
Smart City

Enabling cities to make more of available resources



Key Applications

Smart Metering

Street Lighting

Smart Transportation

Multi-Service

Key Enabling Products and Technologies

- Wireless & power line connectivity
- Environmental sensors
- Smart Power technologies

Market Leading positions

- Power Line modem for smart metering
- LED driver ICs
- High voltage power management

Key success factors

- Multi-sensor network connectivity
- Expertise in digital-security technologies
- partnership with utilities and service providers, and system integrators

Sources: IHS, ABI Research

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Smart City
Key Products

Enabling cities to make more of available resources

Sensors and Analog Front End

Detection of movement, pressure, light, sound, humidity, proximity and dangerous gases

Environmental Sensors

Motion MEMS

Connectivity

From wired power line communications to ultra-low power radio technologies (subGHz, 6LoWPAN, Meters & More, PRIME, G3, WM-Bus, SigFox)

Power Line Modem

Power Management

From **mW to kW** with the highest efficiency for energy saving, renewable energy management and hybrid & electric vehicles

STLUX digital lighting controllers

Galvanically Isolated Gate Driver

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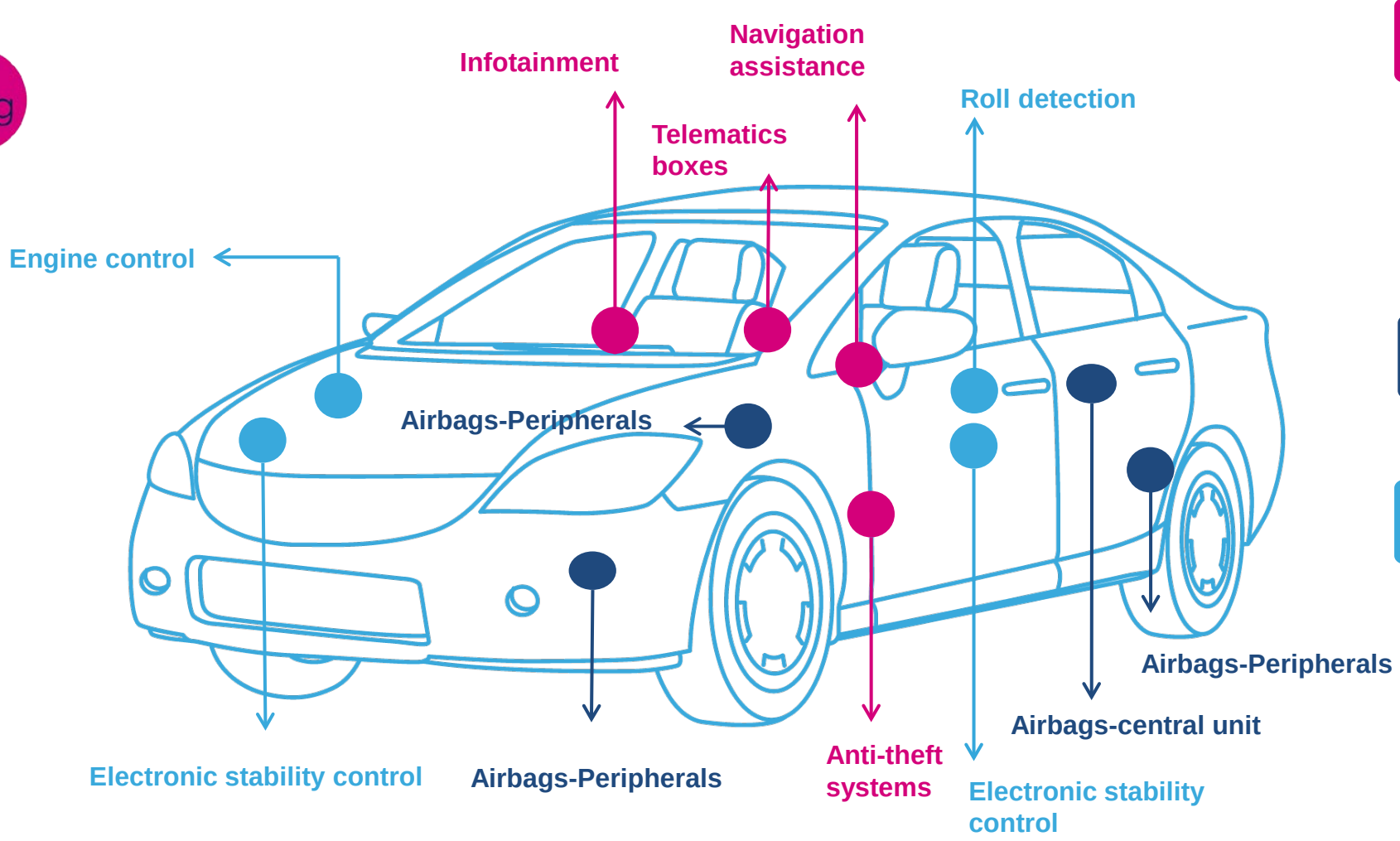
Sensor Technologies for Smart Driving

Making intelligent cars aware



NON-SAFETY

- Accelerometers
- Gyroscopes
- Inertial Measurement Units
- Environmental Sensors
- Microphone

PASSIVE SAFETY

- Accelerometers

ACTIVE SAFETY

- Inertial Measurement Units

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Motion MEMS Leadership

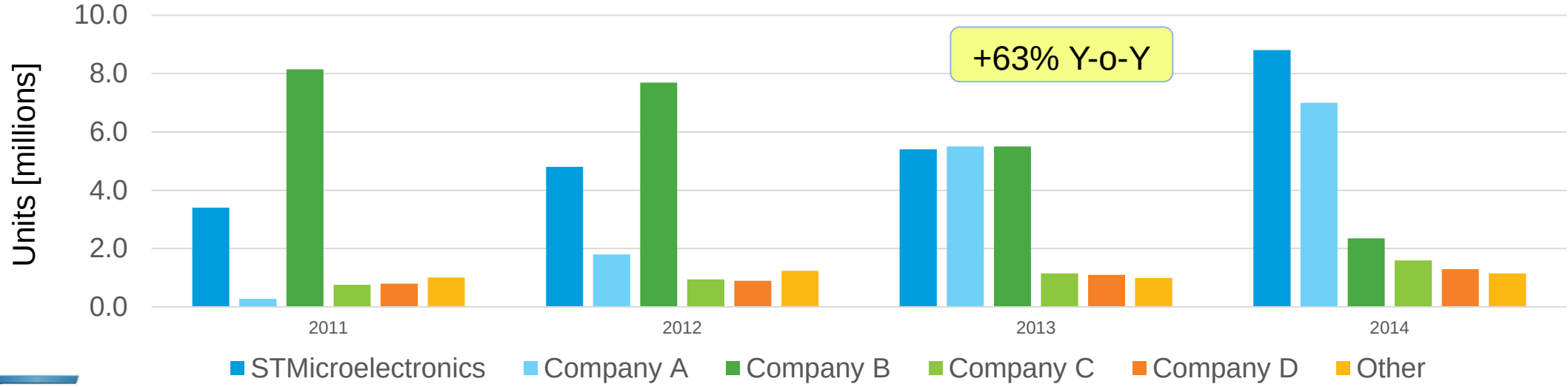
Automotive Non-Safety

Press release

T3714D

STMicroelectronics Identified by IHS as Fastest Growing Automotive-Sensors Supplier

Geneva, November 10, 2015 – STMicroelectronics (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronics applications, has been recognized by IHS, the leading global source of information and analytics, as the leader in automotive sensors for navigation and telematics, as well as the fastest growing automotive-sensor supplier worldwide.[1]



Source: IHS 2015

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Sensors for Smart Driving

A wave of new products to fuel innovation

Non-Safety

A3G4250D

First 3-axis gyroscope for automotive market

AIS324DQ

3-axis accelerometer for e-call and telematics

ASM330LXH

6-axis SiP (3D accelerometer + 3D gyroscope)

Addressing existing and new applications and markets

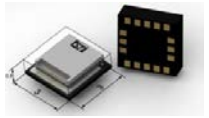
Safety

AIS1200PS

3-axis accelerometer for Peripheral airbags

AISx120SX

Single- and dual-axis accelerometer for Airbag Control Units



ASM330LXH

6 Degrees of freedom Inertial Measurement Unit for Electronic Stability Control

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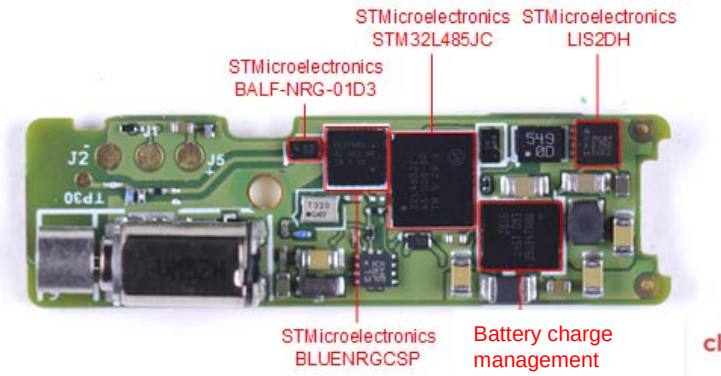
Fitbit Alta



Source: Chipworks

Samsung Galaxy S7

Source: Chipworks

Smart Sensing & Actuating

- Motion MEMS
- Environmental sensors
- Fluidic MEMS Micro-mirrors
- Acoustic MEMS
- Ranging sensors
- Touch sensors
- Signal conditioning

Connectivity

- Bluetooth Low Energy
- NFC
- Wi-Fi Modules
- SubGHz

Processing

- STM32 32-bit ULP MCU
- Secure MCU Secure Elements

Energy management

- Digital power drivers
- LED & OLED power management
- Thin-film battery
- Energy harvesting ICs
- Power management ICs
- Low Voltage MOSFET

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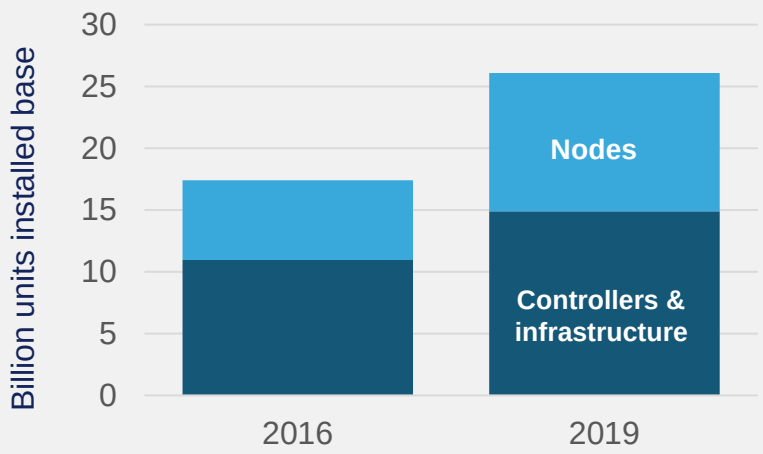
Smart Things

Making everyday things connected and more aware of their surroundings

Market



Key Applications

Wearable

Smartphones

Tablets

Smart consumer

Key Enabling Products and Technologies

- MEMS
- Power and Smart Power technologies
- Ultra-low power radio for Bluetooth and subGHz
- CMOS

Market Leading positions

- MEMS sensors & micro-actuators
- Power supply ICs for AMOLED display

Key success factors

- Unique, full range of sensors & micro-actuators
- Free and easy-to-use software libraries for activity and gesture recognition
- Ecosystem of cloud partners for easy integration

Source: IHS

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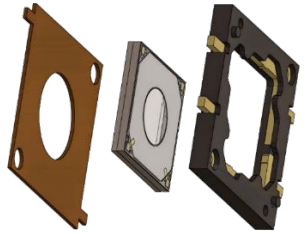
Smart Things

Key Products

Making everyday things connected and more aware of their surroundings

Sensors and Analog Front End

From motion MEMS to environmental sensors, from microphones to MEMS micro-actuators, the largest portfolio of products, IP and technologies on the market



Accelerometers and Gyroscopes

Microphones

Connectivity

Ultra-low power radio for Bluetooth Low Energy and Wi-Fi applications with the lowest standby current, enabling the longest battery life

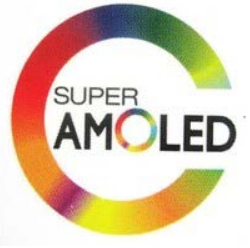
Bluetooth Low Energy

Wi-Fi Modules

Power Management

The best mix of Power and Smart Power technologies for the highest energy density and miniaturization - addressing traditional and new applications like Wireless Charging and power management ICs for mobile

Wireless Chargers



Power supply ICs for AMOLED

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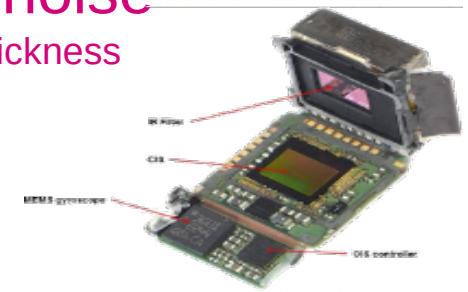
Motion MEMS Evolution

Low-noise
low-thickness

Optical Image Stabilization (OIS) For Smartphones



New Market penetration
Cost effectiveness

Recreational & Professional Drones

Addressing existing and new applications and markets

Wearable

Ultra-low power
For always-on wearable devices

2015

Virtual Reality
Augmented Reality

High accuracy

2016

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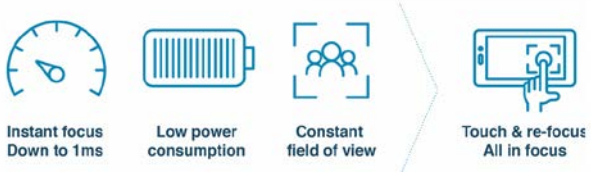
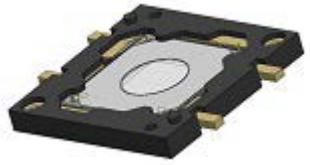
MEMS Micro-actuators

Micro-mirrors



Thin-film Piezo-electric MEMS



3D scanning

- In production with multiple OEMs for Intel RealSense™ Depth Camera
- Opportunities for other micro-mirror applications

Camera Autofocus

- Lower power consumption and higher speed versus Voice-Coil Motor (VCM) based solution
- Partnering with innovative lens maker PoLight for autofocus actuator in smartphones

Printing

High-speed inkjet print head for commercial and industrial applications

- High-viscosity materials
- Different printing materials

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Winning With Major Accounts

Deep, long-term relationships, strong innovation pipeline with timely new product development execution, solid system and application know-how & support

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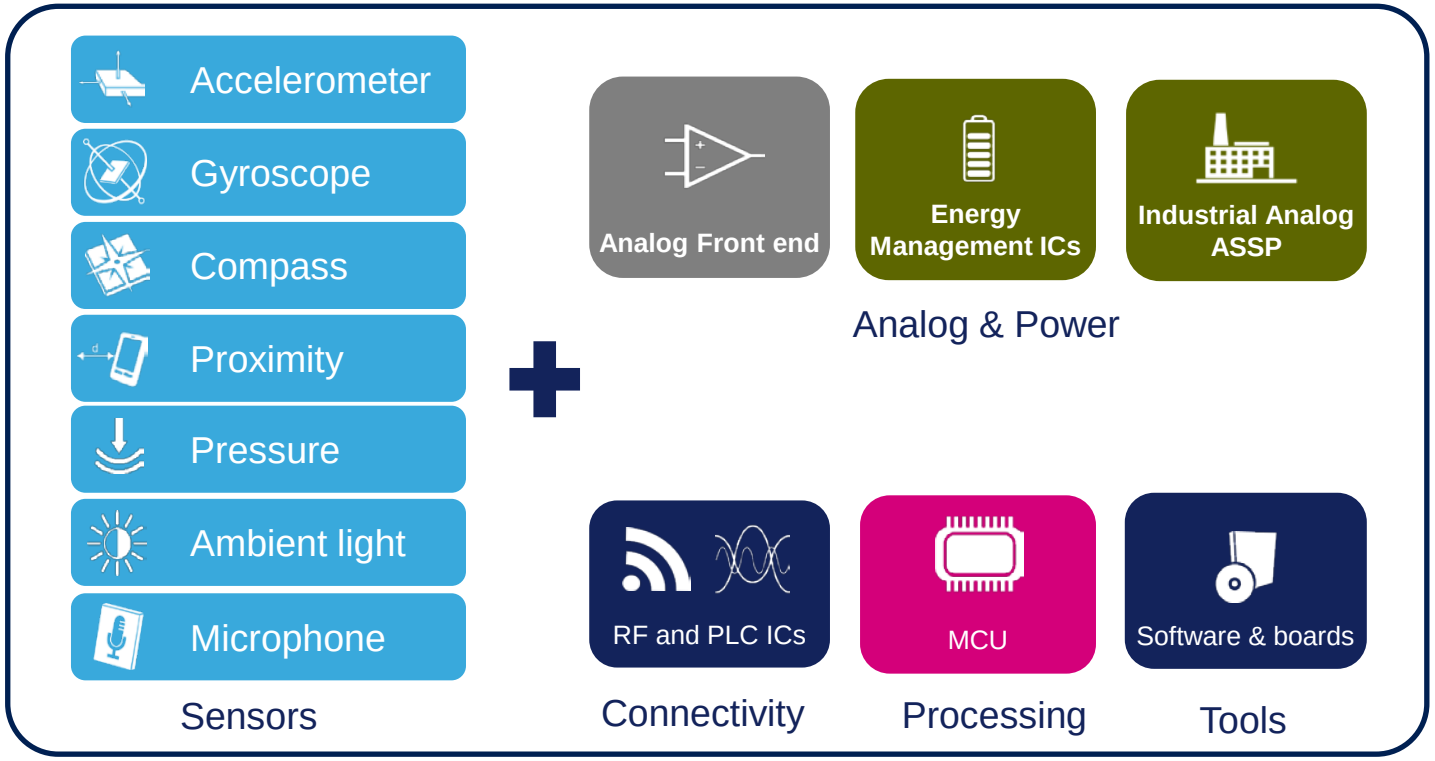
AMG for Mass Market

A broad Ecosystem



- **Mass Market offers a great opportunity to grow**
  - Stability of demand thanks to multiple market segments
  - Higher margin
- **Unique position to win in the Mass Market**
  - A wide range of platforms and reference designs (SW and HW)
  - Partnership with third parties
  - Supporting design environment with selectors, design and simulation tools

Mass Market

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AMG Revenue Growth and Operating Margin Improvement

Key Objective

Grow revenues and achieve mid to high single-digit operating margin in mid term

Revenue Drivers

- Wired and Wireless connectivity for IoT
- General purpose analog
- Power management in servers, smartphones and industrial
- Dedicated Analog ASICs for industrial, including metering
- MEMS
  - Automotive & Industrial MEMS
  - Piezo Micro-actuators
  - Maintain Consumer MEMS volumes

Operating Margin

- Leverage on revenue growth
- 6” to 8” conversion in Power and Analog Fabs
- 8” to 12” Products Evolution
- Assembly Cost and Yields
- Value-add and Differentiated New Products
- Favorable Currency Effects

Takeaways

- AMG turnaround strategy already in full execution
- Enriching our sensor portfolio to address automotive and industrial markets, while maintaining leadership in the consumer markets
- Well positioned to ride the next MEMS wave of Micro actuators
- Boosting sales of industrial and general purpose analog products in mass market.
- Focus and selective engagement with major accounts through development of dedicated analog and PMIC products.
- Enlarging our connectivity portfolio with wired and wireless solutions to address IoT