Investor and Analyst Presentation



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Division President Automotive

London, 28 September 2015

Worldwide automotive semiconductor vendor ranking 2014; Infineon overtakes Renesas in H1 CY15

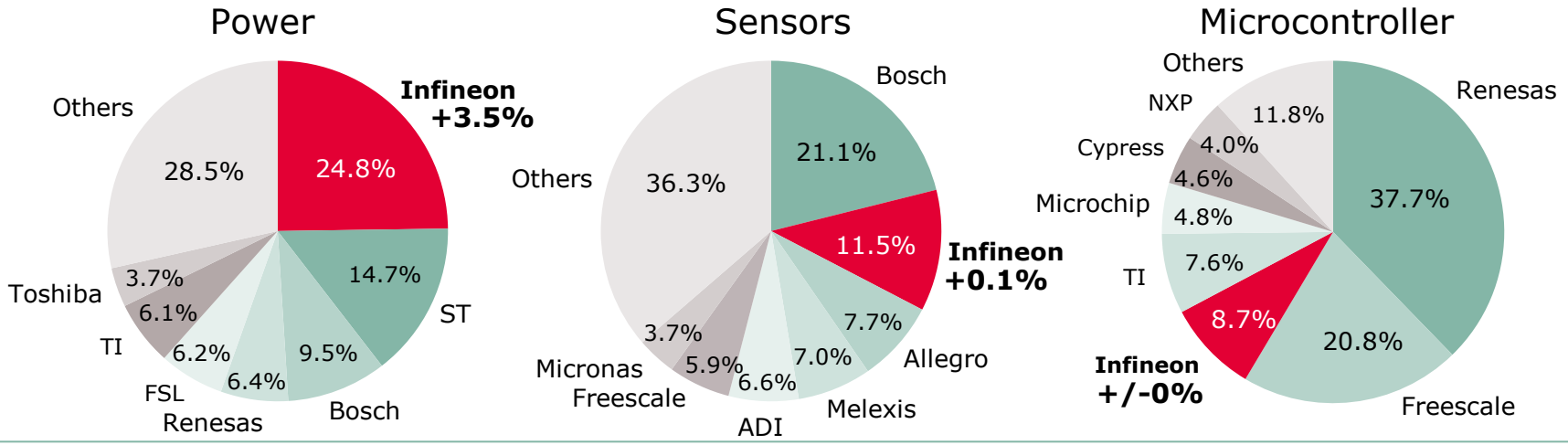
Global market shares

		2013	Delta	2014
1	Renesas	13.3%	-1.3%pt	12.0%
2	**Infineon**	**9.6%**	+0.9%pt	**10.5%**
3	STM	7.9%	-0.1%pt	7.8%
4	Freescale	7.4%	+0.1%pt	7.5%
5	NXP	6.5%	+0.3%pt	6.8%

According to financial figures, Infineon becomes **#1** in H1 CY15 reaching $1.362m* vs. $1.341m* for Renesas.

* Based on official Infineon currency rates.

Market shares by product



Source: Strategy Analytics, April 2015

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4 megatrends are shaping ATV market, significantly increasing the semiconductor content of vehicles

ADAS/Autonomous driving

- From ADAS to semi-automated and finally autonomous driving
- Every world region is striving for "0-accident"



xEV/eMobility

- Mandated CO_2 reductions make electrification of powertrain inevitable



- Advanced connectivity is driven by making the car part of the Internet
- The car will be fully connected (V2I, V2V, in-vehicle)



Connectivity



- Increased connectivity and software content increase risk exposure to hackers
- Internal/external connectivity must be secured

Advanced security

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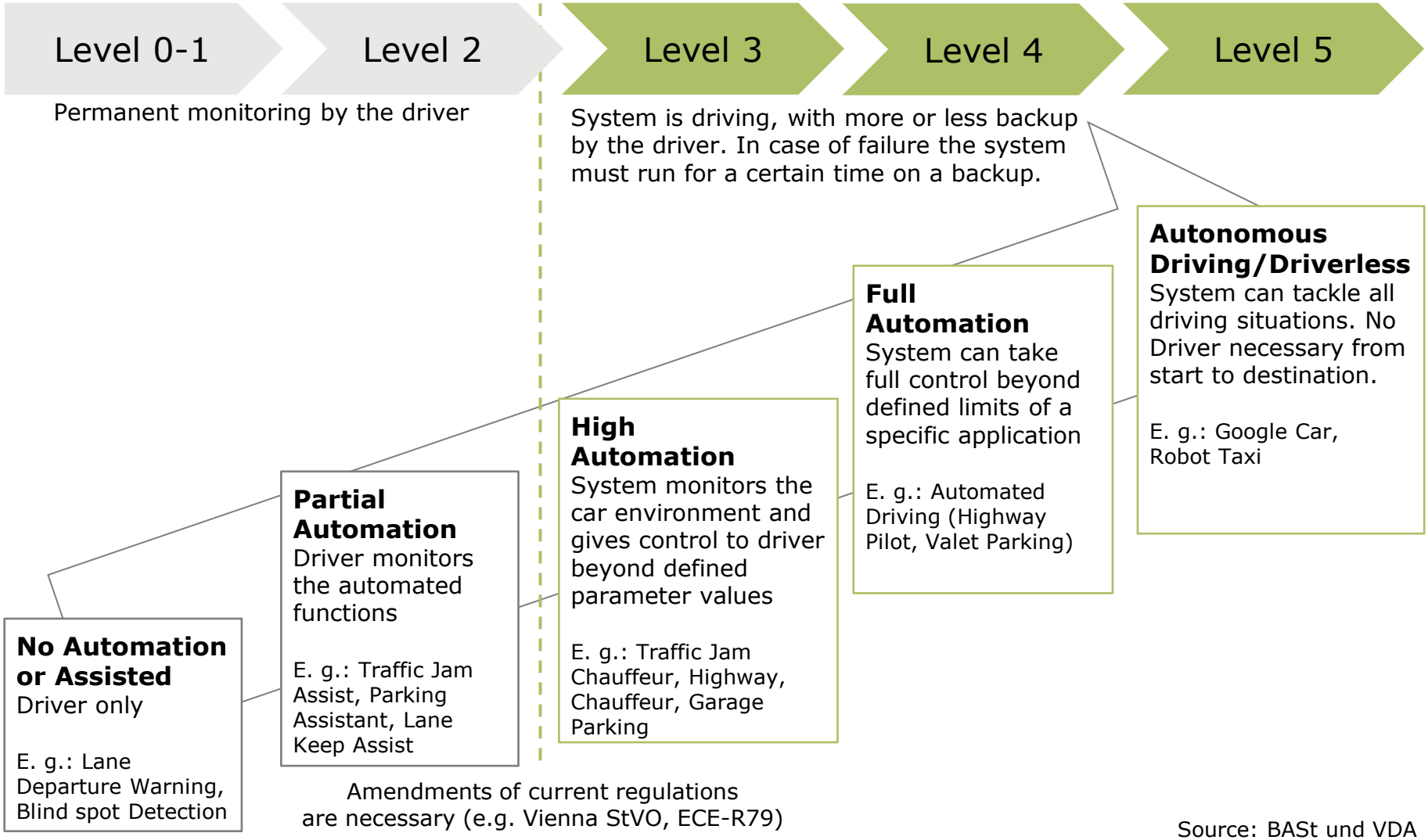
The 5 levels of increased automation (VDA/SAE definition)



Source: BASt und VDA

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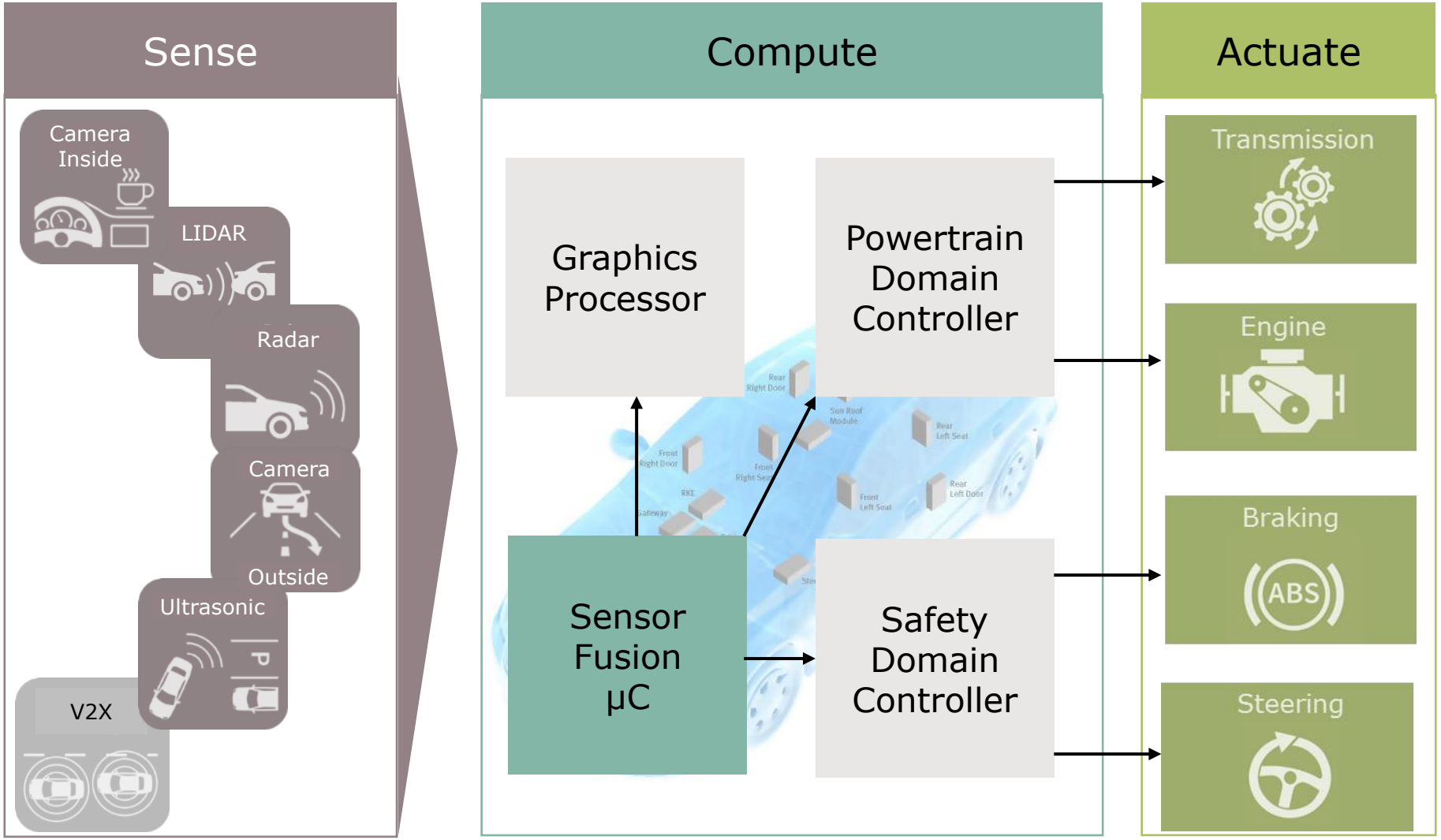
ADAS system overview



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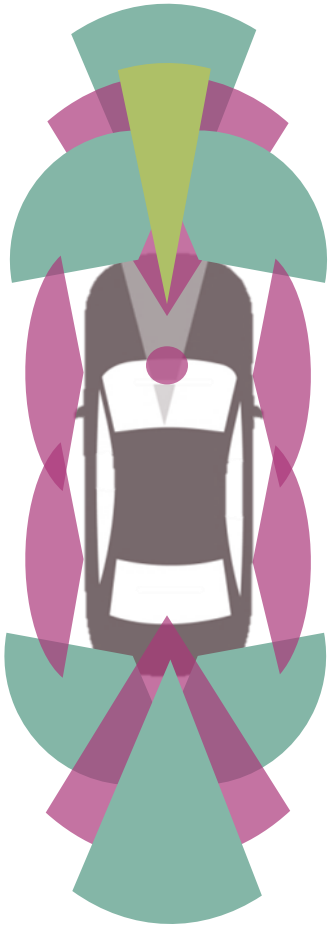
More sensors required for each automation level



Radar Camera Lidar

Sensor technologies	2015 Euro-NCAP*	2018 Euro-NCAP*	Level 2	Level 3	Level 4/5
Front looking camera	0.5	1	1	1	1
Front looking radar	0.5	1	1	1	1
Front looking lidar	–	–	–	–	1
Surround camera	–	–	–	–	4
Corner radar	–	2	2	4	4
Surround radar	–	–	–	–	4
Rear looking camera	–	–	–	1	1
Rear looking radar	–	–	–	–	1
Driver monitoring Camera	–	–	–	1	1
V2X Sensor	–	–	–	–	1
Ultrasonic sensors	10-12 sensors per car				
Surround Radar	8 radar sensors e.g. for garage parking				

* Euro-NCAP is focusing on collision avoidance, requirements are changing over time

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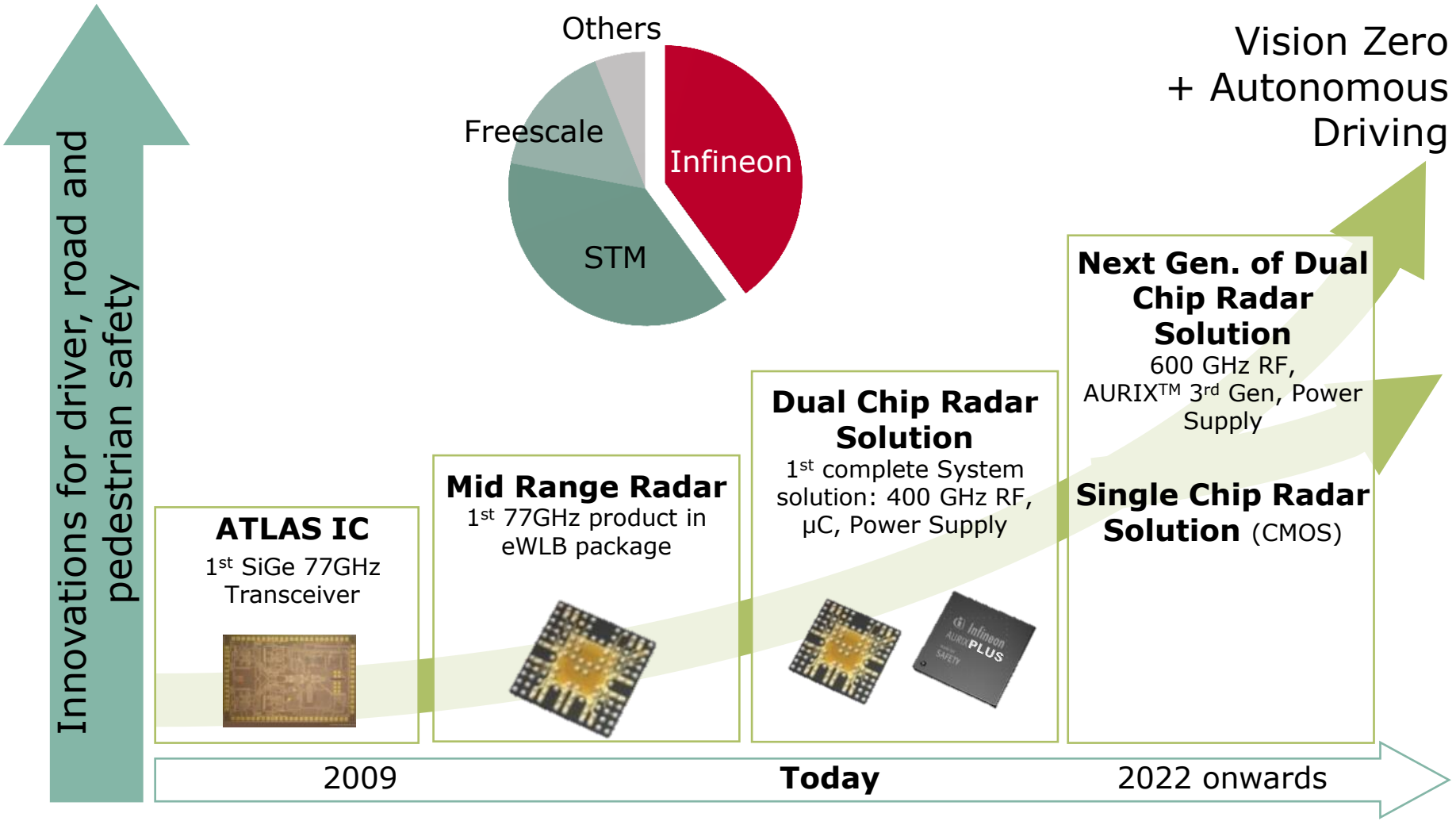
Infineon is the market leader in Radar, 10 millions chips shipped already

Sense



*Source: IHS ADAS Sensor Market Shares –2014

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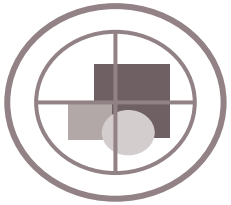
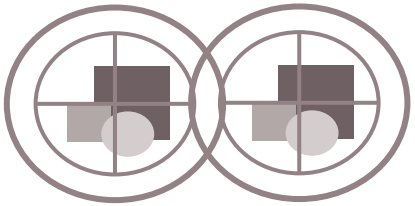
Camera system overview

AURIX™ as Host Controller

- Mono camera

 + Image processor (e.g. Mobileye, Nvidia) + 

- Stereo camera

 + Image processor/ FPGA + 

- Time-of-flight camera based on “REAL3™” image sensor

 + Image processor + 

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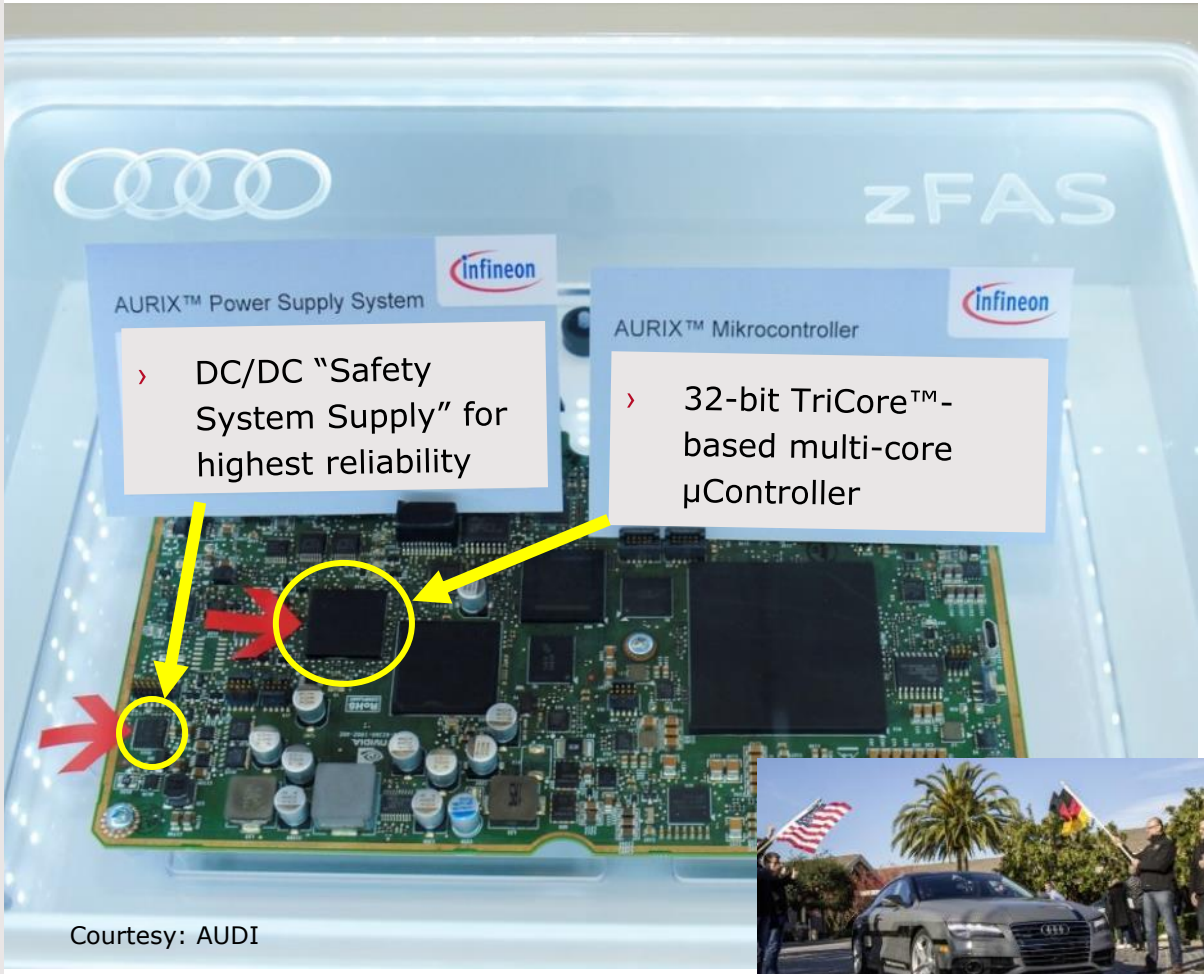
Infineon AURIX™ microcontrollers make autonomous driving reliable

Compute

During the CES 2015, Audi demonstrated their autonomous driving capabilities. Audi's piloted driving concept car "Jack", an Audi A7 Sportback, completed a 550 mile piloted drive from Silicon Valley to Las Vegas.

The central driver assistance ECU ("zFAS") is the core of future systems for piloted driving for Audi.

Within zFAS Infineon's AURIX™ is the interface to the car architecture, hosts different functions and acts as safety monitor.



* zFAS = zentrales Fahrerassistenzsystem = German term for central driver assistance ECU.

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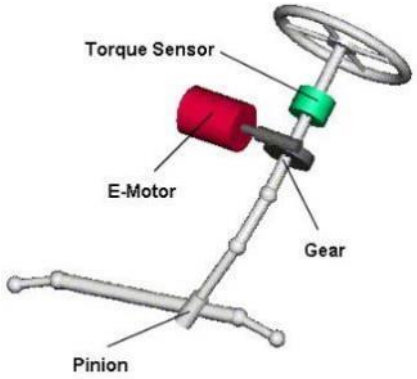
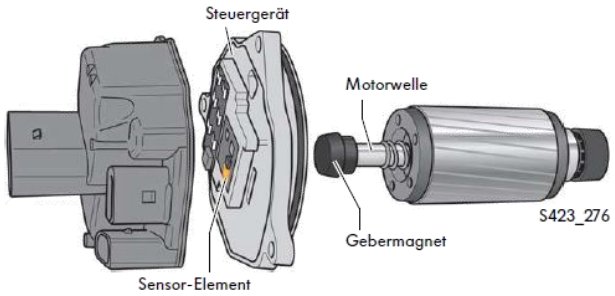
Fail operational actuators: BOM to grow by factor 1.3 with level 3 to 5

Actuate

EPS System



EPS E-Motor

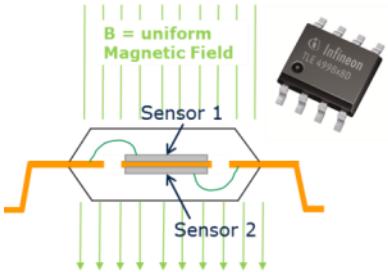


© ZF Lenksysteme

EPS Electronic control unit



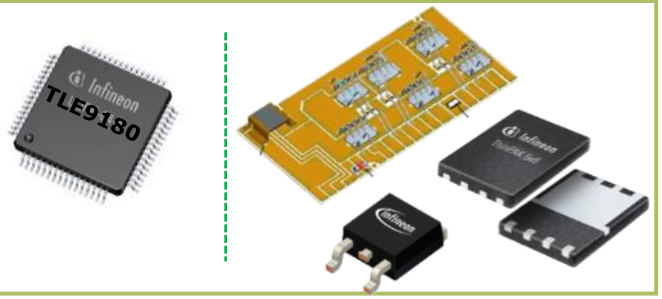
Sense



Compute



Actuate



Safe power supply

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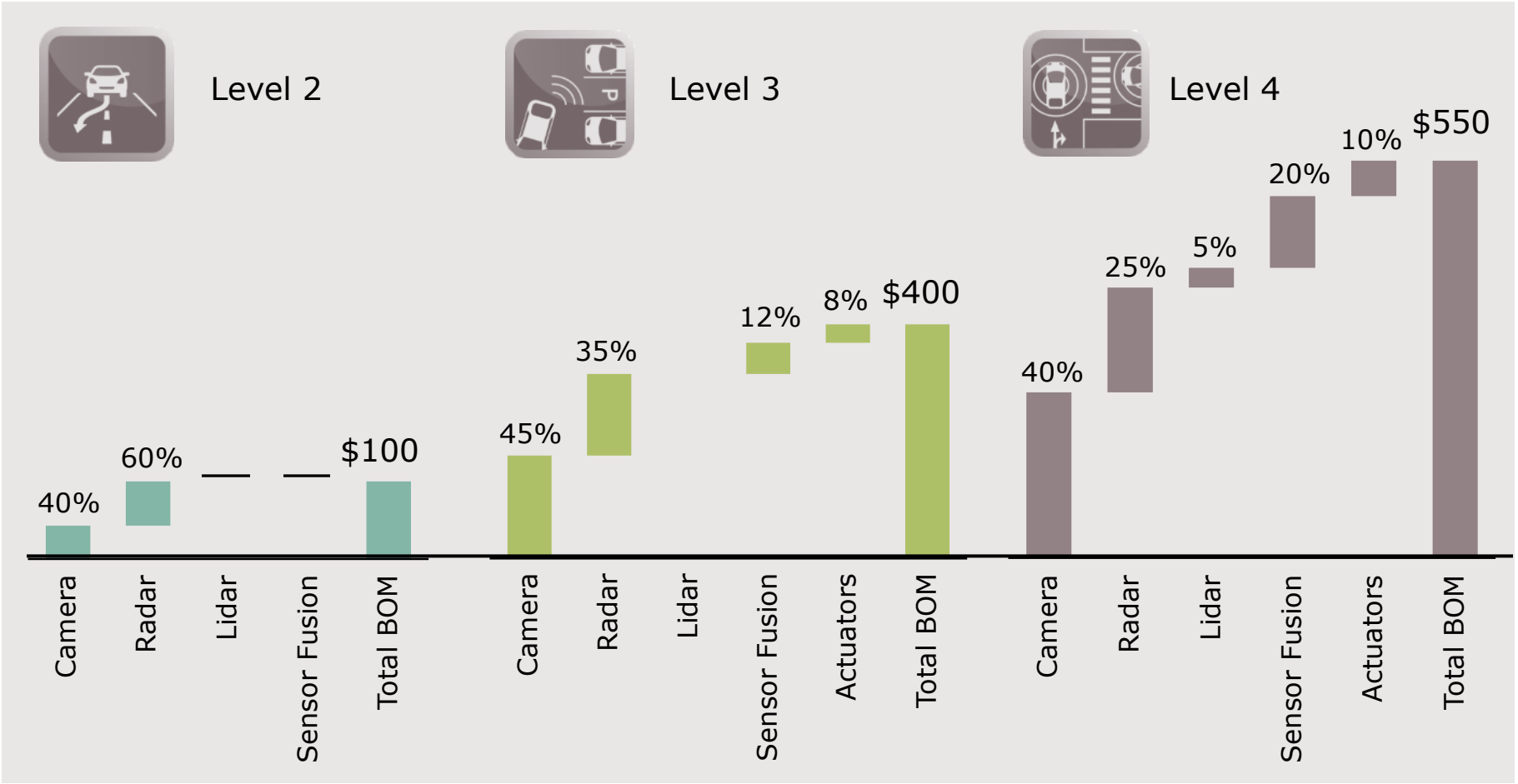
Semiconductor content itemized to automation levels

Average ADAS semiconductor content per level of automation



Source: Infineon own estimates

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Advanced security

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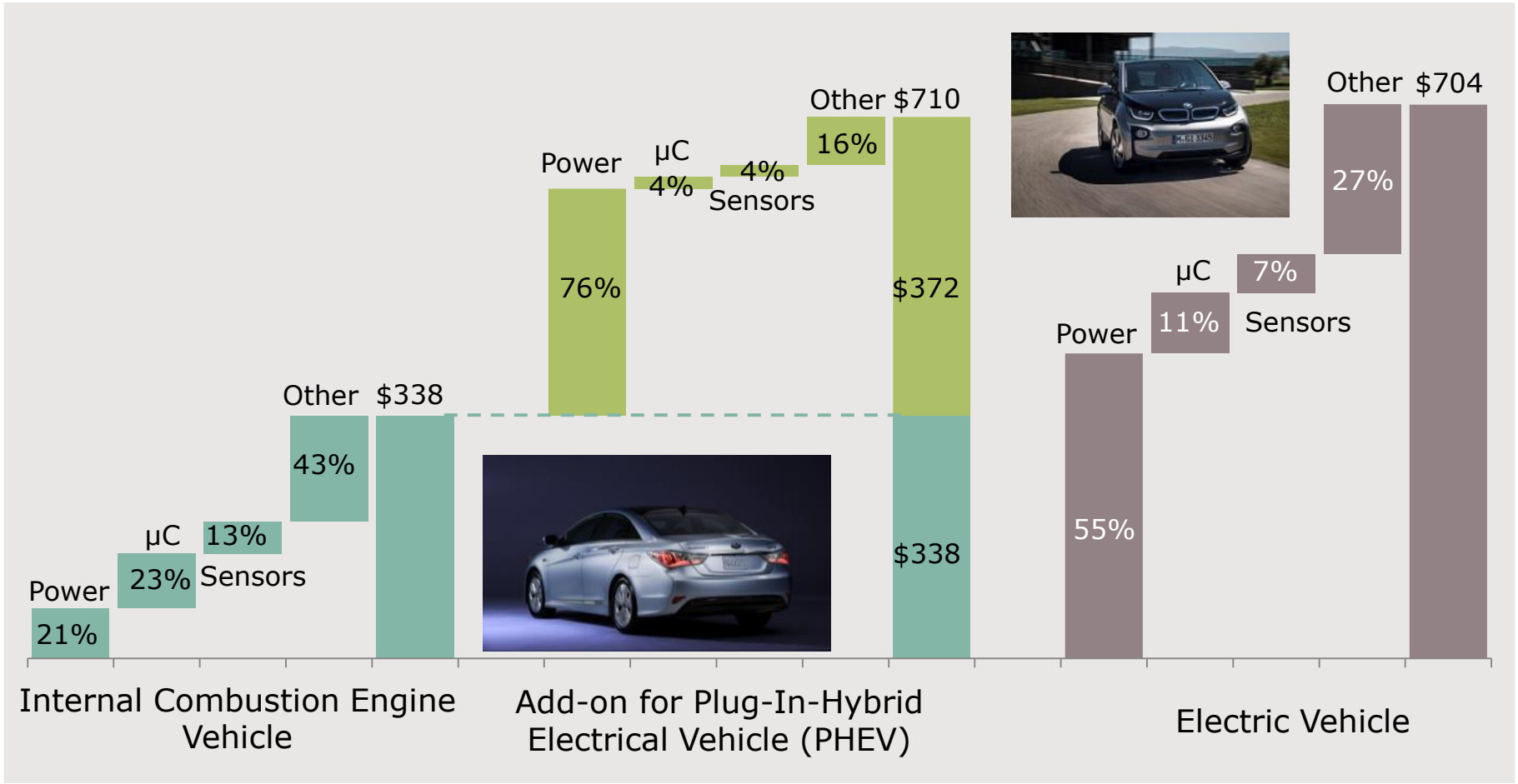
Semiconductor content of EV/HEV vehicles falls right into Infineon's core competence

Average semiconductor content



Source: Strategy Analytics, "Automotive Semiconductor Demand Forecast 2013 – 2022", June 2015

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Infineon is best positioned to benefit from xEV car ramp









1 Mass Market OEM
Focus
LaCrosse, Regal, Malibu
1 Premium OEM 2 Mass Market OEMs
Kangoo Twingo
Zoe
smart
A3 e-tron Q5 A6
1 Premium OEM
V60, S60, XC90
VOLVO
E-Class S-Class
B-Class
Passat, Golf Jetta
e-Golf e-up
335i - 535i 2 series - x3
Panamera Cayenne
PEUGEOT
508RHX 3008
i3 i8
JAGUAR LAND ROVER
Soul EV
FCEV
Ray EV ix35
Optima/Sonata Grandeur
M1 Tong Yue
EV50 EJ02
1 Mass Market OEM
BYD Qin
China
Hybrid Bus

HEV in Produc-tion
HEV Future SOP
EV in Produc-tion
EV Future SOP
Fuel Cell in Produc-tion

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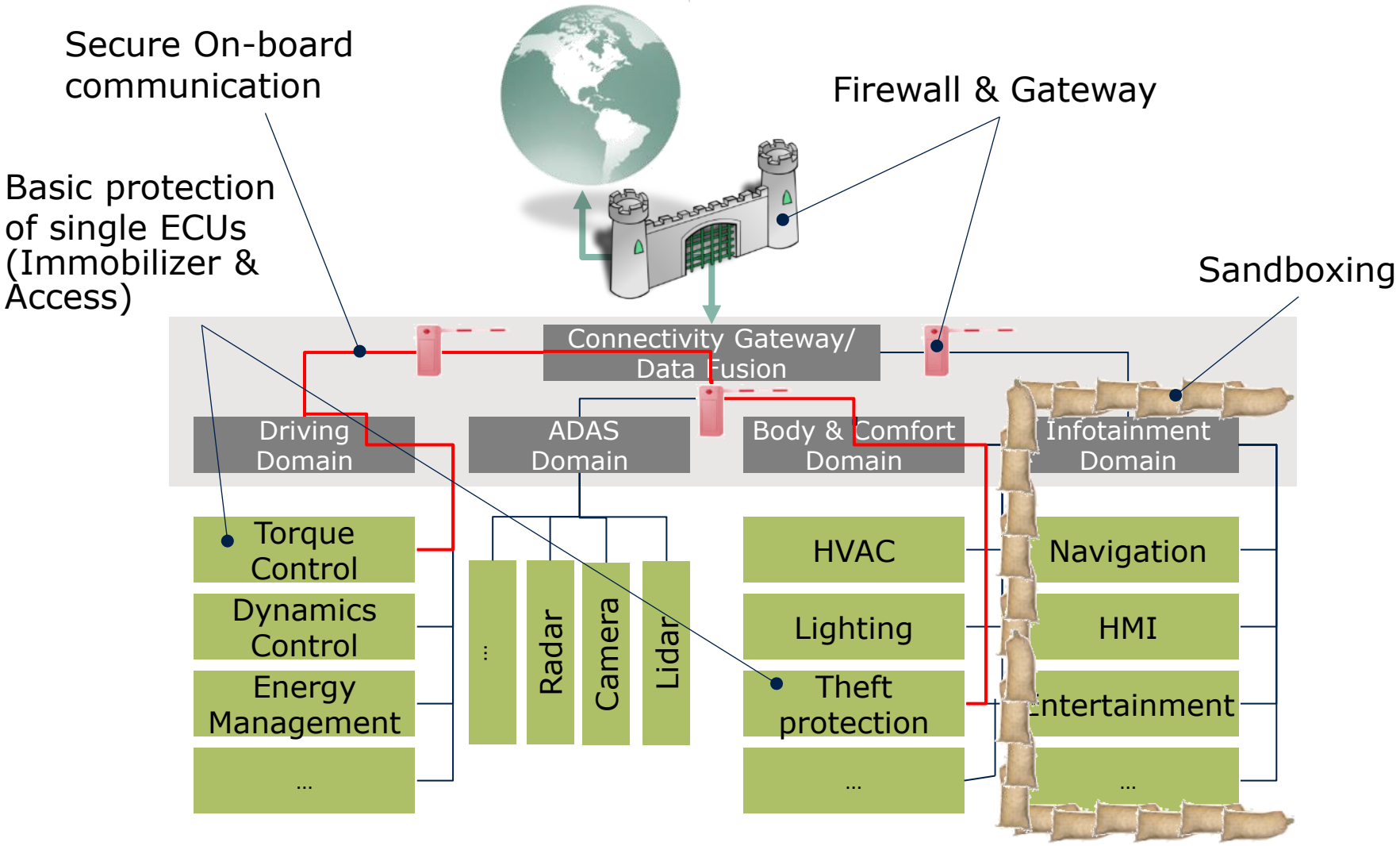
Basic security considerations



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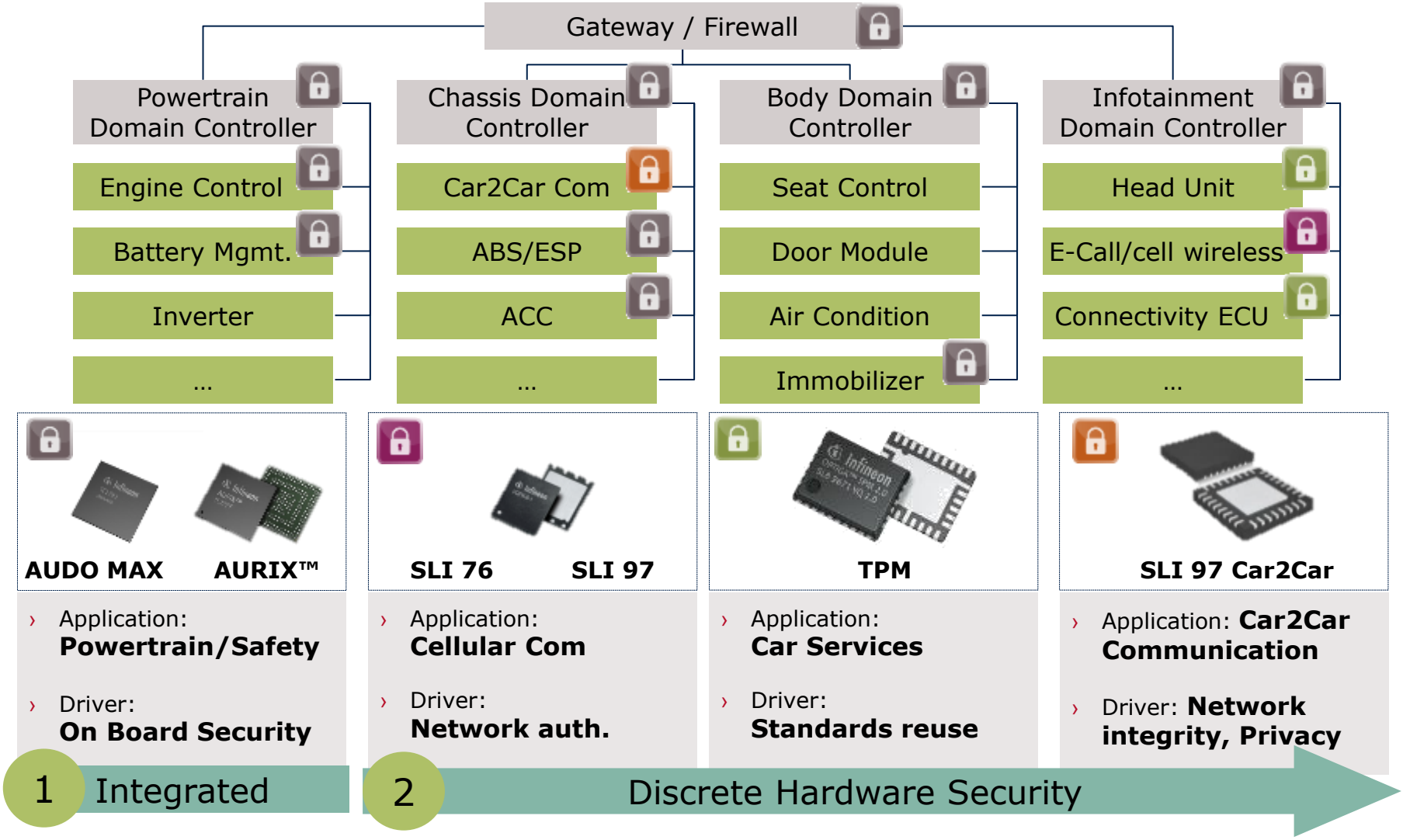
Infineon's product portfolio for security



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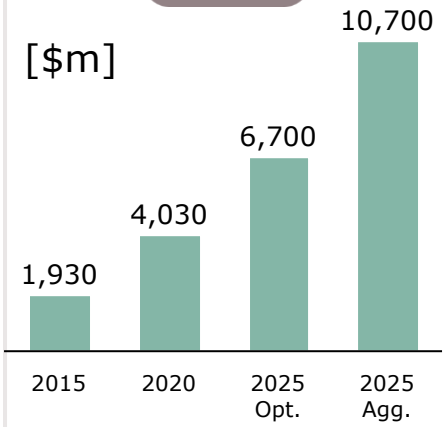
Infineon ideally positioned to benefit most from megatrends ADAS, xEV and security

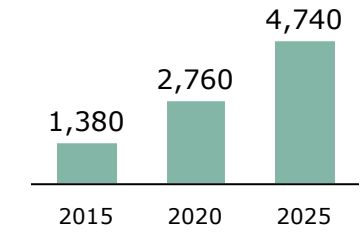
ADAS/Autonomous driving





xEV/eMobility

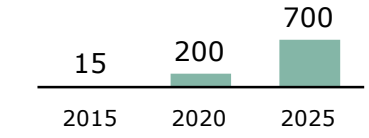




Biggest drivers for automotive

Advanced security

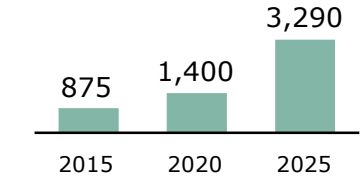




Key enabler for connectivity

Connectivity





Market shaped by mobile coms players

Source: IHS, Strategy Analytics, Infineon own estimates

* Total Infineon contribution considered. I.e. secure discrete elements form CCS Segment. For automotive µC only Hardware Secure Module has been taken into account, not the full µC BoM value.

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ADAS, CO_2 reduction and adoption of premium features drive Infineon growth

Vehicle production



- ~2% growth per annum
- highest growth in emerging markets
- Western Europe recovering, the US on high level

Drivers for semiconductor content per car

CO_2 reduction



- driven by legislation
- improvements of ICE (e.g. electric steering, electric pumps and motors)
- adoption of EV/HEV

Advanced safety



- current: crash avoidance
- next: assisted Driving
- future: autonomous driving

Comfort, premium



- premium cars are early adopters of high-end comfort and safety features
- trickling down to mid-range

Sources: IHS Inc., Strategy Analytics, Infineon

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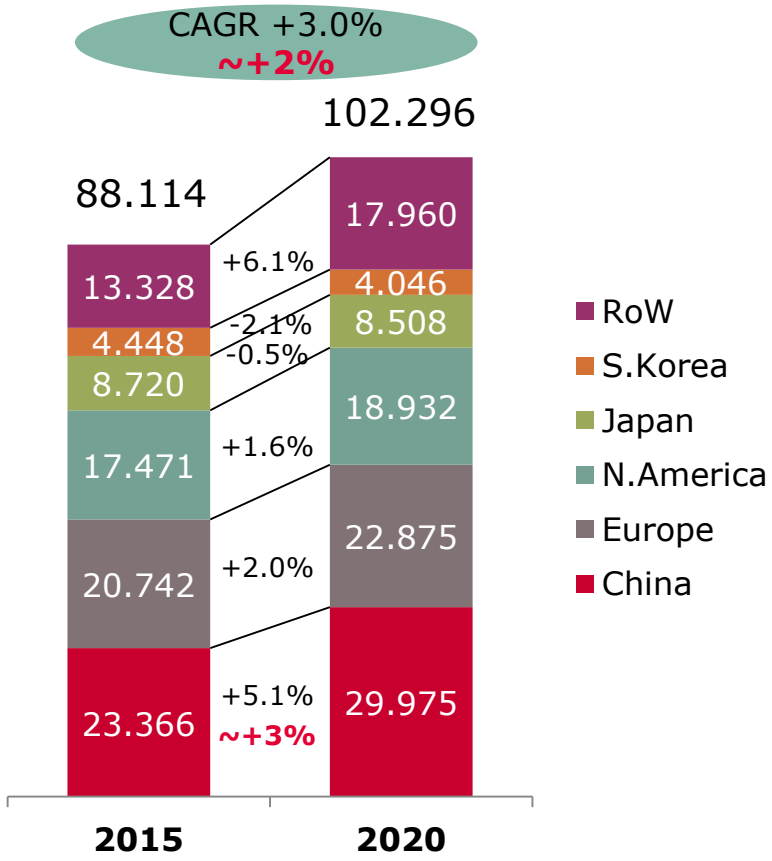
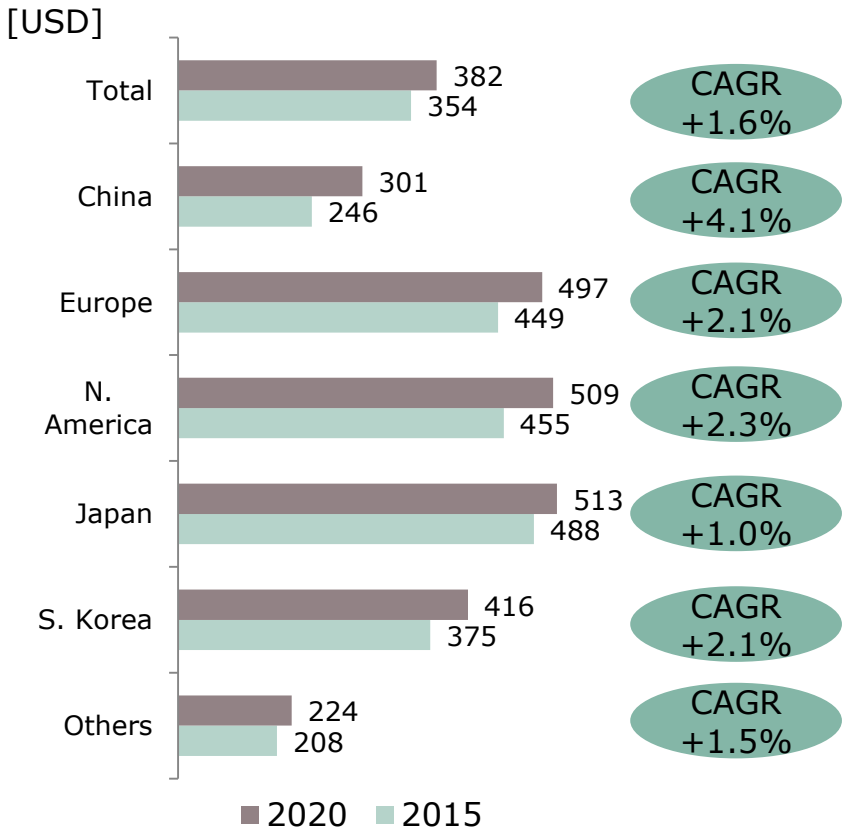
Market growth based on car production growth and increasing number of features

Light vehicle production forecast



Source: IHS, September 2015

Semiconductor value per car by region



Source: Strategy Analytics, based on LMC production forecasts Q1 2015

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Infineon is strong in all markets, balancing exposure to slower growth in China

World

1. Renesas 12.0%
2. **Infineon** (+0.9%pt) **10.5%**
3. STMicro 7.8%
4. Freescale 7.5%
5. NXP 6.8%

Europe

1. Infineon (+1.0%pt) **14.1%**

APAC & RoW(*)

1. Infineon (+1.2%pt) **10.9%**

North America

3. Infineon (+0.2%pt) **8.8%**

Japan

4. Infineon(*) (+0.9%pt) **5.2%**

China

3. Infineon (+0.7%pt) **8.9%**

Korea

1. Infineon (+1.3%pt) **14.6%**

(*: China, Korea, Russia, India, South America & further countries

Source: Strategy Analytics, April 2015

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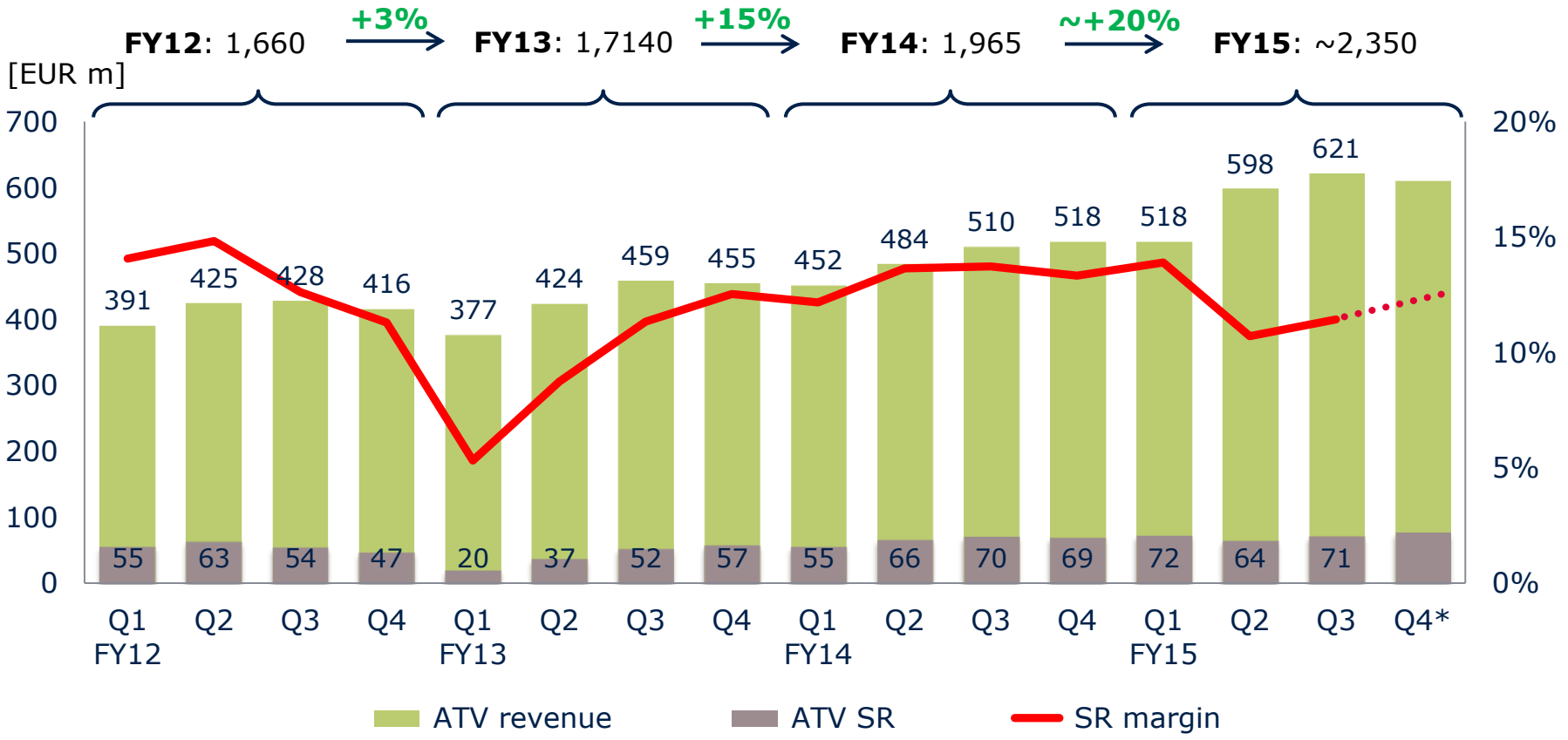
Automotive financials at a glance

Revenue and segment result development



* Based on Q4 guidance, as of 30 July 2015

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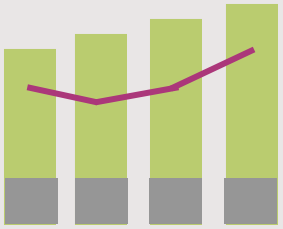
Summary



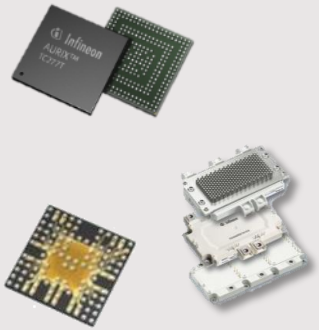
Automotive track record for 40 years:

- #2 in Automotive globally – first time double digit market share, closing gap to Renesas
- Consistent revenue growth and profitability



Growth drivers:

- Compound annual car production growth of ~2%
- Compound annual semiconductor content growth of 3%-4%
- CO_2 reduction, Advanced safety and comfort



Differentiators:

- System leader in Safety/ADAS, CO_2 reduction
- Security expertise
- Quality excellence
- Broad regional customer base

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Infineon

Glossary

ABS	Anti-lock braking system
ACC	Adaptive Cruise Control
AEB	Autonomous Emergency Braking
ADAS	Advanced driver assistance systems
ATV	Automotive segment
BASt	The Federal Highway Research Institute
CAGR	Compound annual growth rate
DC/DC	Direct current/Direct current converter
ECU	Electronic control unit
EMS	Engine management system
EPS	Electric power steering
ESC	Electronic stability control
EV	Electric vehicle
eWLB	embedded wafer-level ball grid array
HEV	Hybrid electric vehicle
IC	Integrated circuit
ICE	Internal combustion engine
PMD	PMD Technologies GmbH
ROW	Rest of world
SAE	Society of Automotive Engineers
SOP	Start of production
StVO	Road traffic act
VDA	German Association of the Automotive Industry
V2X	Vehicle to Infrastructure
xEV	EV and HEV

Disclaimer:

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