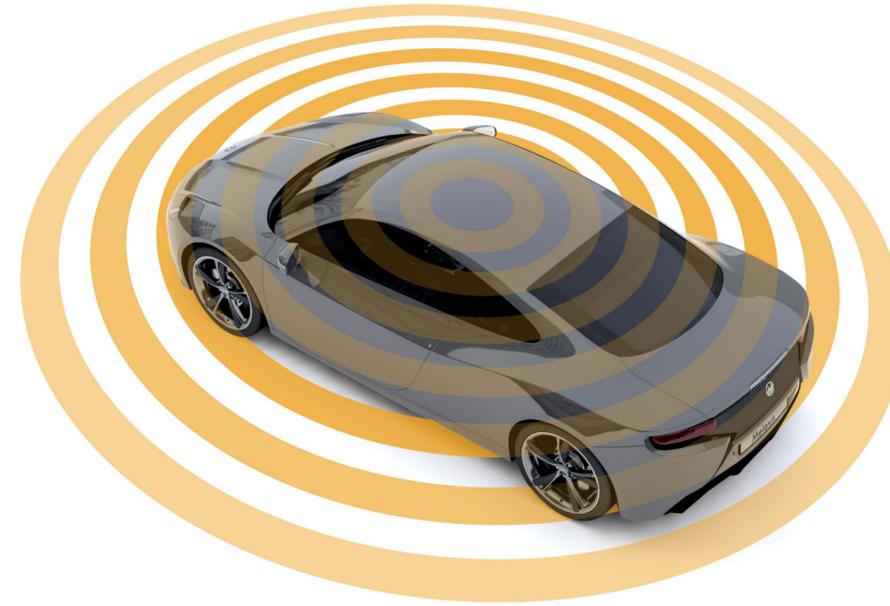
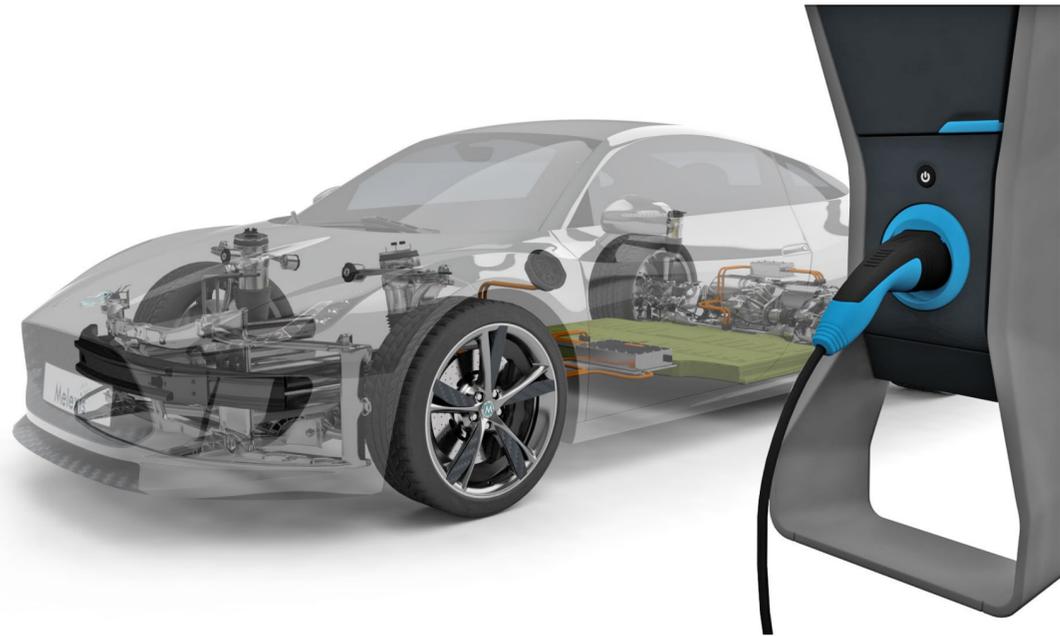


# Booth sessions



## Melexis analyst day 2018

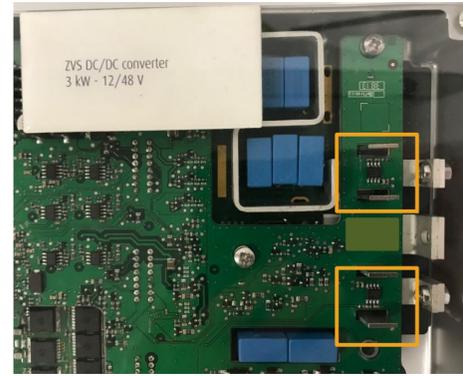
BMW Brand Store - Boulevard de Waterloo 23, 24 Waterloolaan - 1000 Brussels

- GEN 1  
GEN 2  
GEN 2.5
- 2018 - **MLX91216/17** pushing the thermal stability limits further
  - 2016 - **MLX91210** opens new Plug&Power™ portfolio
  - 2015 - **MLX91208** Very High Field for traction Inverters
  - 2014 - **MLX91208** High Speed Portfolio (Low & High Field)
  - 2013 - **MLX91209** introducing patented lifetime stability
  - 2012 - **MLX91206/07** programmable ASSP for Inverter
  - 2011 - **MLX91206/07** programmable ASSP for Battery/DCDC
  - 2007 - ASICs for industry & automotive
  - 2005 - **MLX91205** IMC-Hall® technology for industrial applications

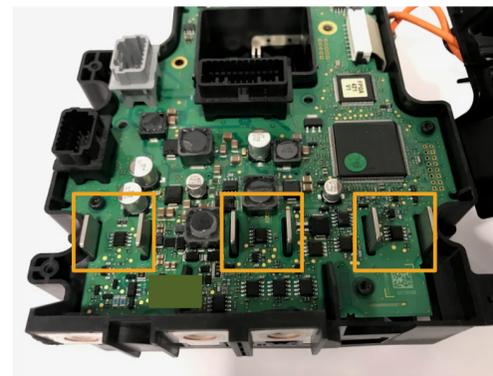
OEM inverter (Small Drive Unit)

**Conventional Hall**  
MAX >2kA

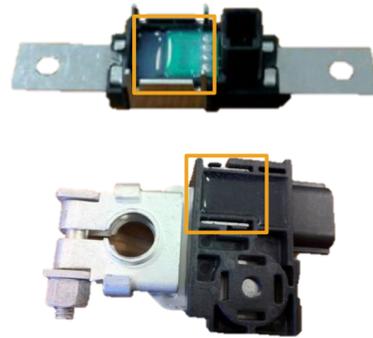
Downsizing & easier integration + lighter



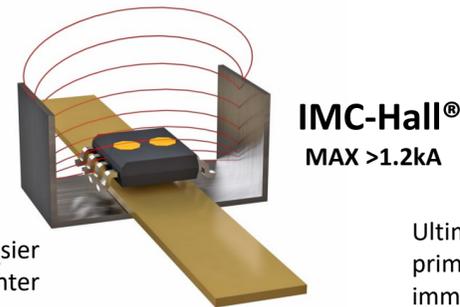
DCDC converter 48/12V



OEM EV Inverter



OEM  
Battery Monitoring 12V / HV Junction Box

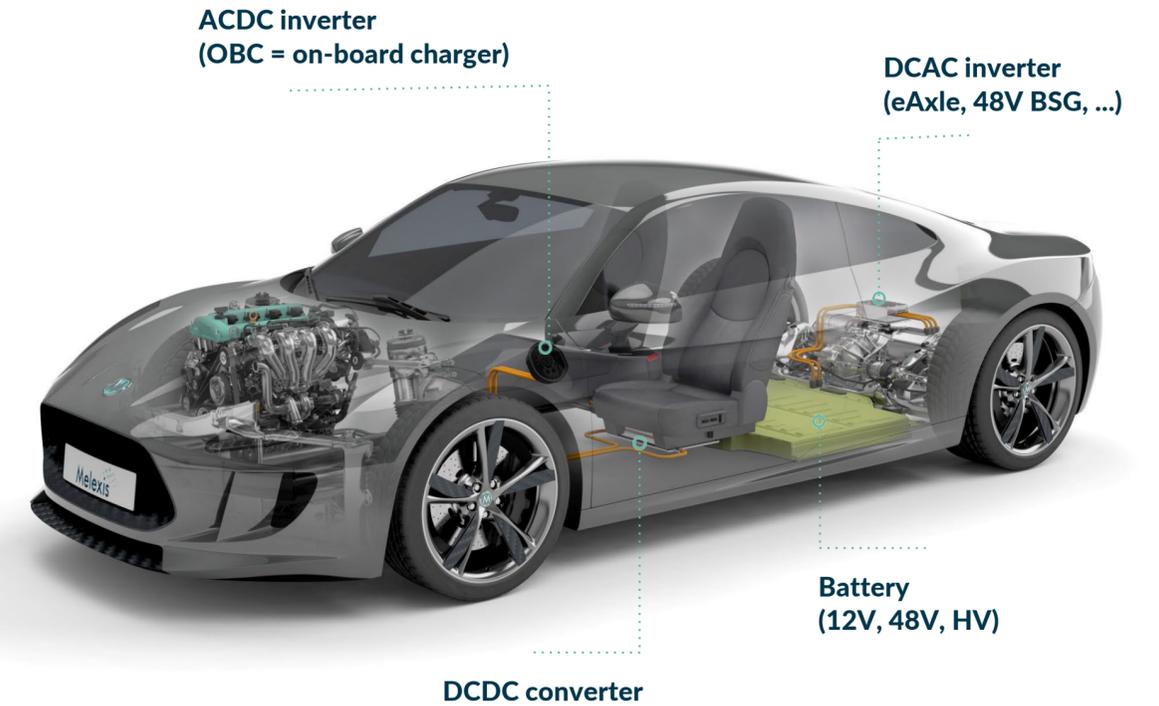
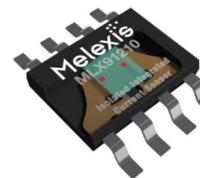


Ultimate Integration: CMOS + primary + isolation + stray field immunity in standard footprint



Adjacent market:  
Electric motor control,  
Solar and Eolian

**Plug&Power™**  
MAX 50A



## Fit for adjacent markets

- Industry electric motor control (automation) and automotive traction motor control have very similar requirements → single product development amortization
- Solar market is volatile, but under permanent growth in the green energy mix
- Plug & Power portfolio is ultimate integration for <50A

## Broad Hall effect sensor portfolio

- 2nd Generation on the market (being) designed in at nearly all OEMs
- Proprietary IMC-Hall® technology brings advantages for designers
- New product range Plug&Power™ unlocking new markets (OBC, HV-DCDC...)
- Market leading sensor accuracy (thermal & lifetime)

## Conclusion

1

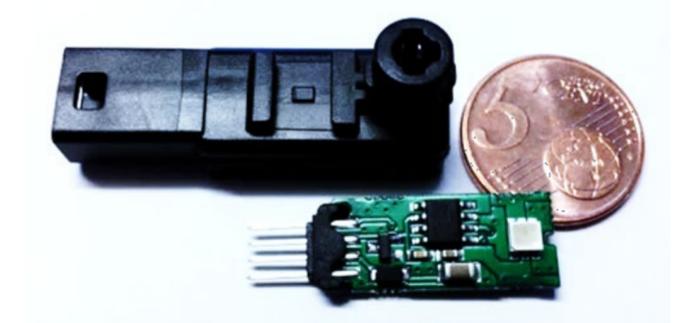
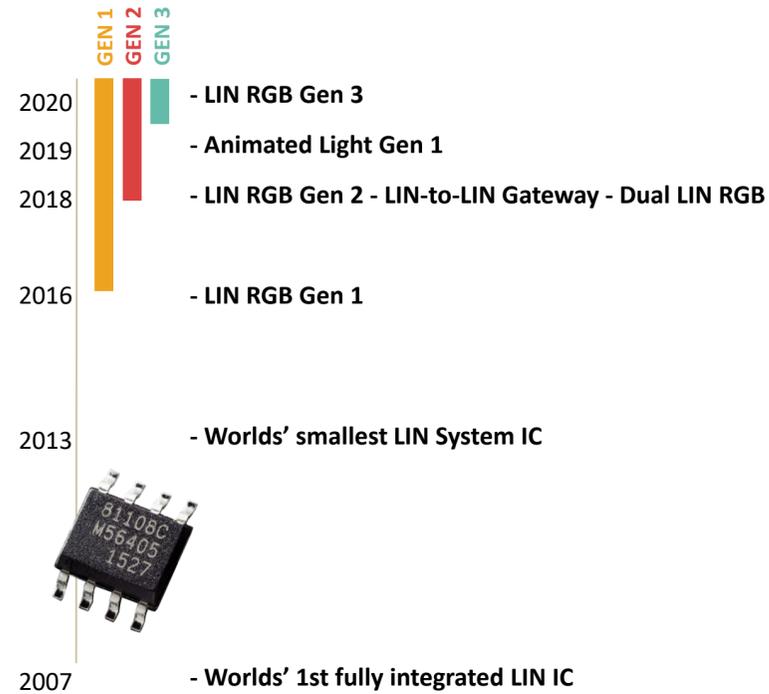
Incumbent position at renowned TIER2 & TIER1

2

Conventional Hall & proprietary IMC-Hall® for battery and inverter applications, as well as DCDC converters. Extensive portfolio – factory programmable sensors

3

Plug&Power™ new portfolio addressing new applications (module power monitoring, OBC, HV DCDC converters)



### Key benefits

01	02	03	04
Fully integrated system solution with very limited external components	Small footprint through high integration factor	Full color-control by end user through high programmability	Lowest system cost of market available solutions
ease of use	space	user experience	cost



## Broad and growing product portfolio

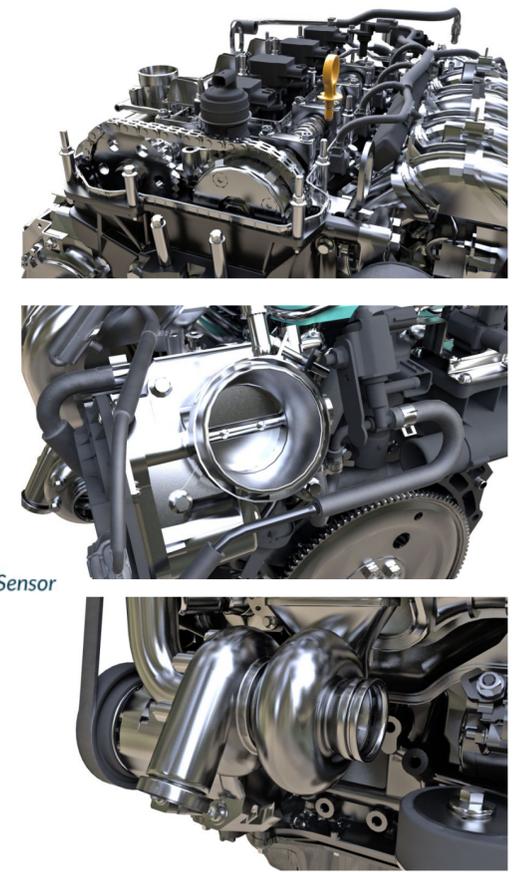
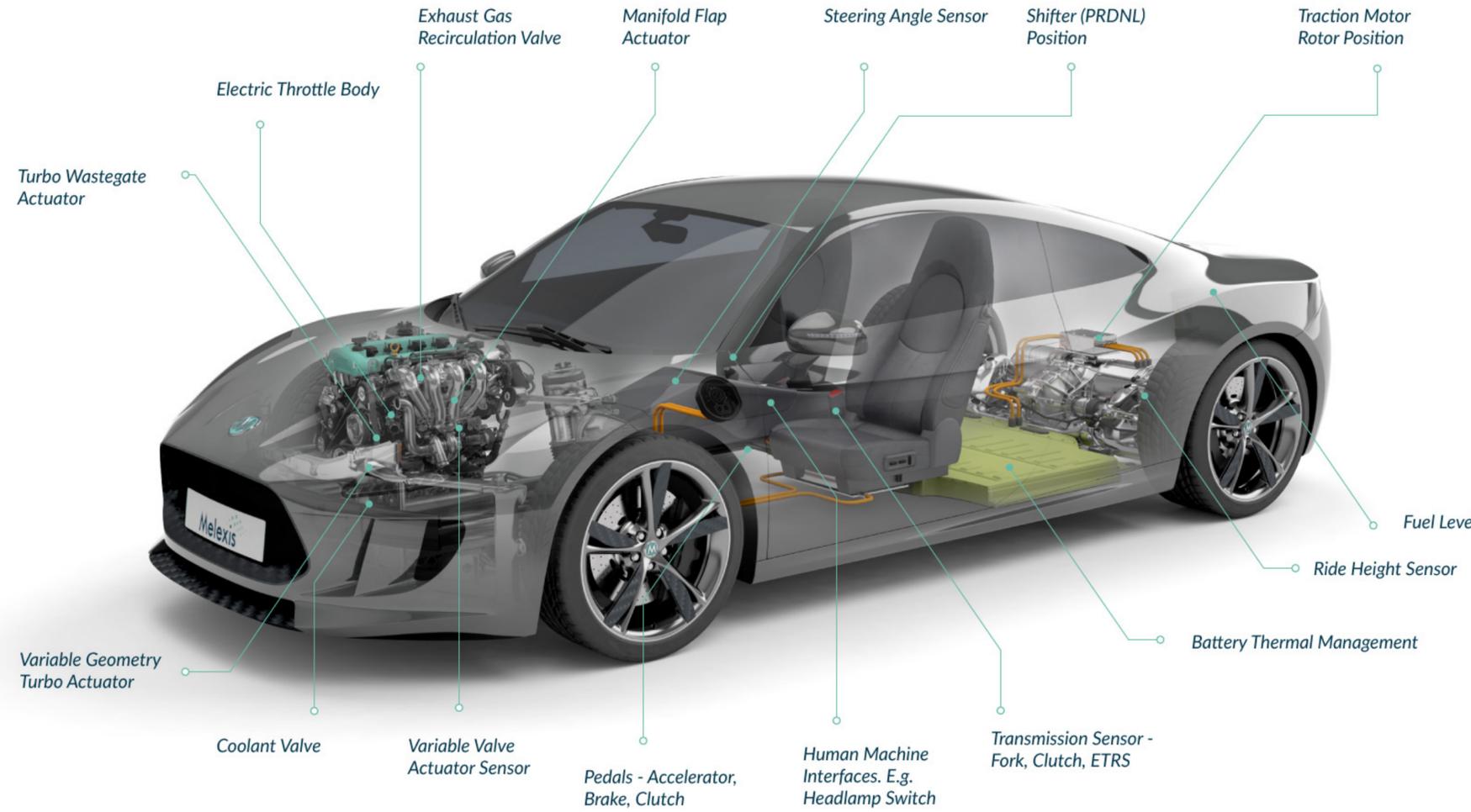
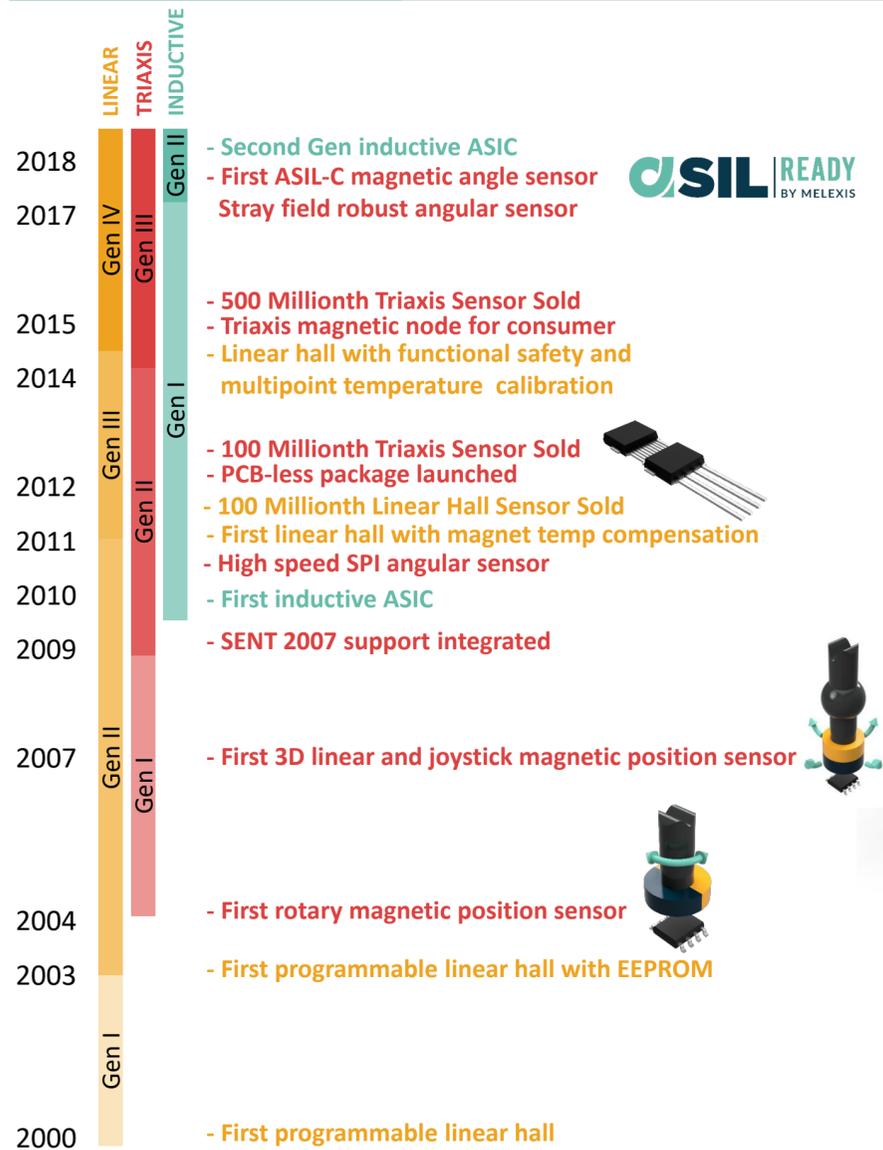
- Melexis is #1 worldwide for RGB ambient light controller ICs
- Successful re-use of system on chip integration since Gen 1
- Easy development of new family members
- Leading integration by using best in class SOI technology

## Target applications

- Automotive RGB ambient lighting
- Animated RGB ambient lighting
- Surface integrated lighting
- Automotive exterior lighting

## Conclusion

1	Full programmability through integrated Flash based microcontroller
2	Strong focus on user experience usable for all types of vehicles (including electric)
3	Broad fit for automotive interior and exterior lighting applications for all OEMs
4	Integrated system solutions to overcome LIN-bus limitations



### Fit for adjacent markets

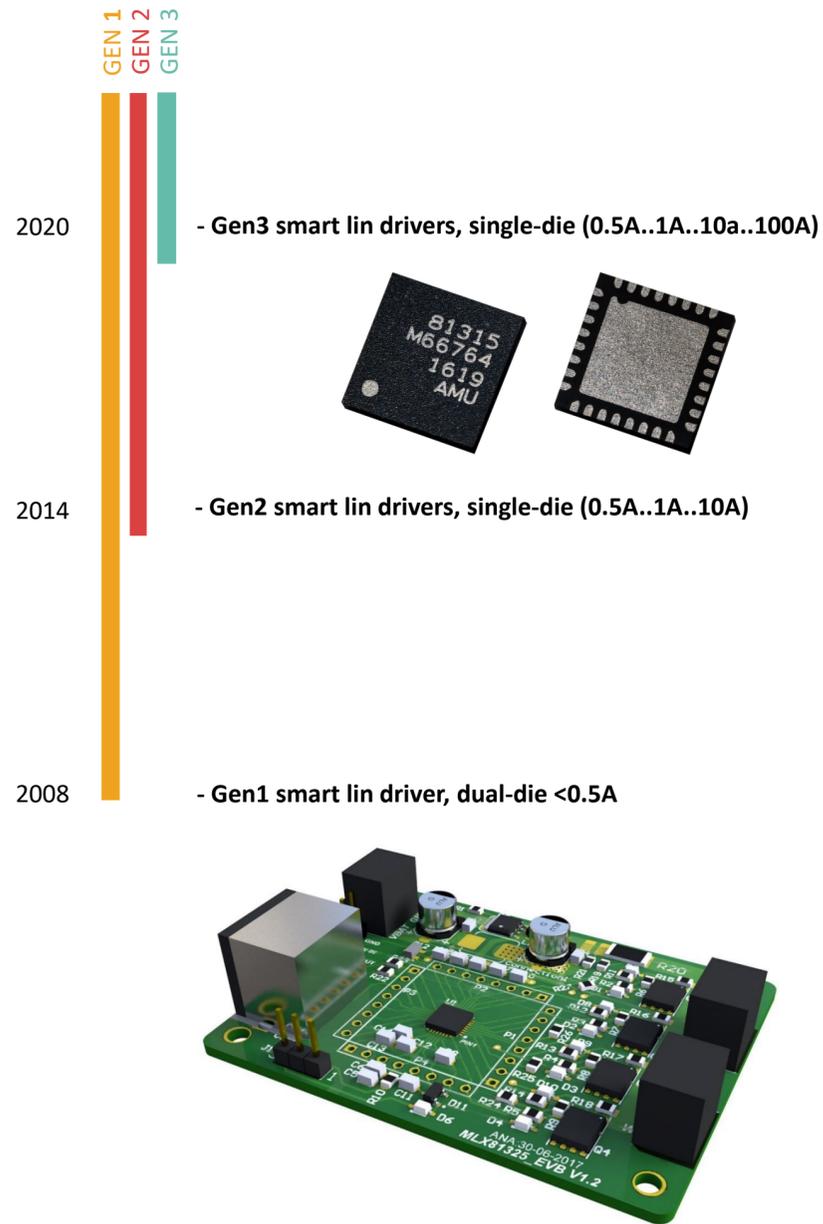
- Low power versions allow for battery operation enabling internet connected, always-on sensing
- Flexible nature (3D sensing) removes design constraints in placement of the magnet and sensor

### Broad position sensor portfolio

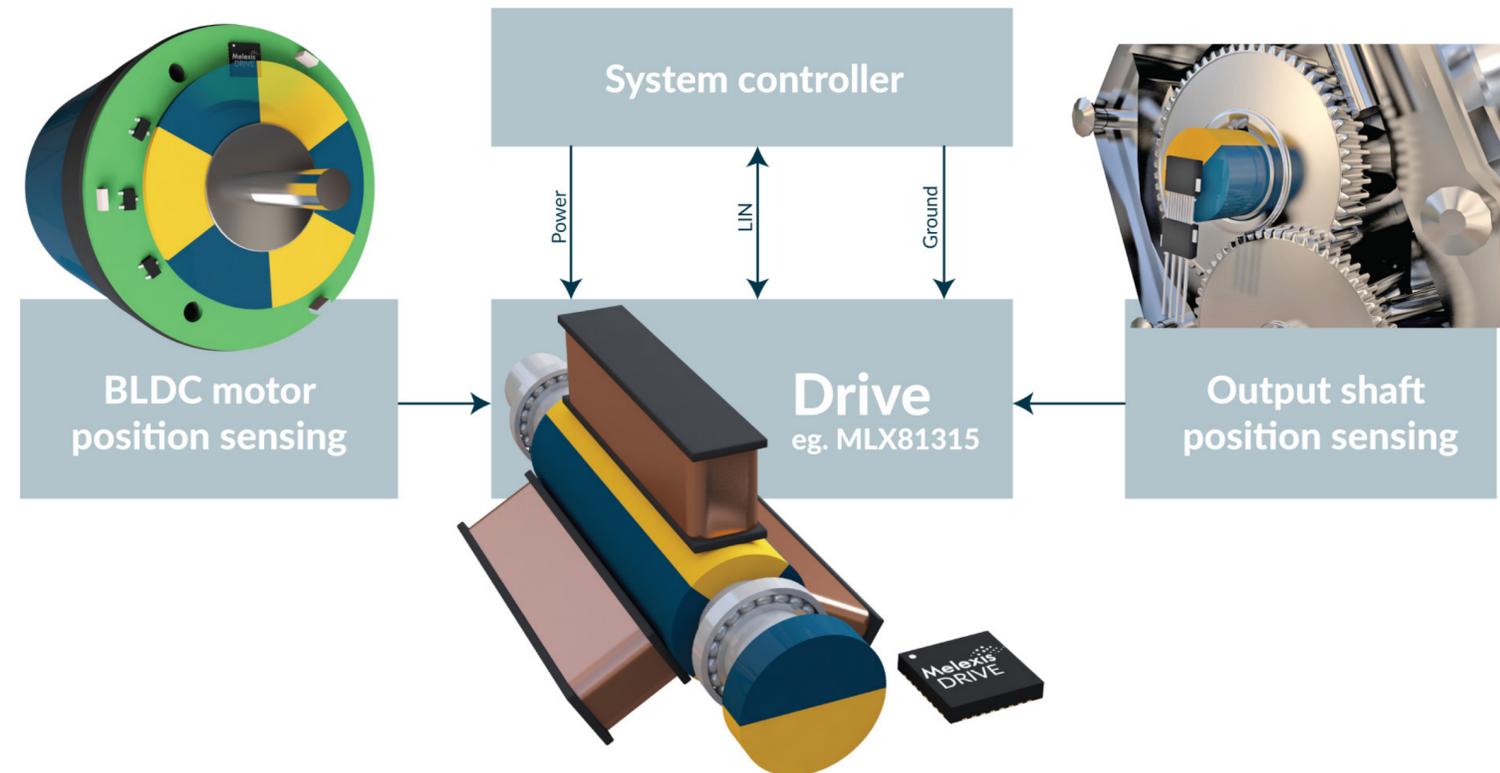
- Unique packaging options (PCB, PCB-less) enable meeting customer size, shape and weight requirements from large trucks to small personal transports
- Functional safety (ASIL) capability enables integration into safety-conscious applications like autonomous vehicles
- Creation of stray field robust magnetic allows for growing together with the increasing number of electrified vehicles

### Conclusion

- 1 Best in class performance angle sensors for nearly every current and future automotive position sensing application
- 2 Wide portfolio enabling angle position sensing with a variety of packaging options, output types, and safety levels for both automotive and adjacent markets
- 3 Focused on the future to support electrification, autonomous driving, and adjacent market trends and requirements



<p><b>&lt;10W</b></p> <p>AFS headlight</p> <p>Grille shutter</p> <p>HVAC flap</p>	<p><b>&lt;100W</b></p> <p>Smart Valve</p> <p>Small waterpump</p> <p>3-phase fan</p>
<p><b>&gt;100W</b></p> <p>HVAC Blower</p> <p>Pumps</p>	<p><b>&gt;100W</b></p> <p>Engine Cooling Fan</p> <p>Window Lift, Sunroof</p>



## Unique areas of expertise

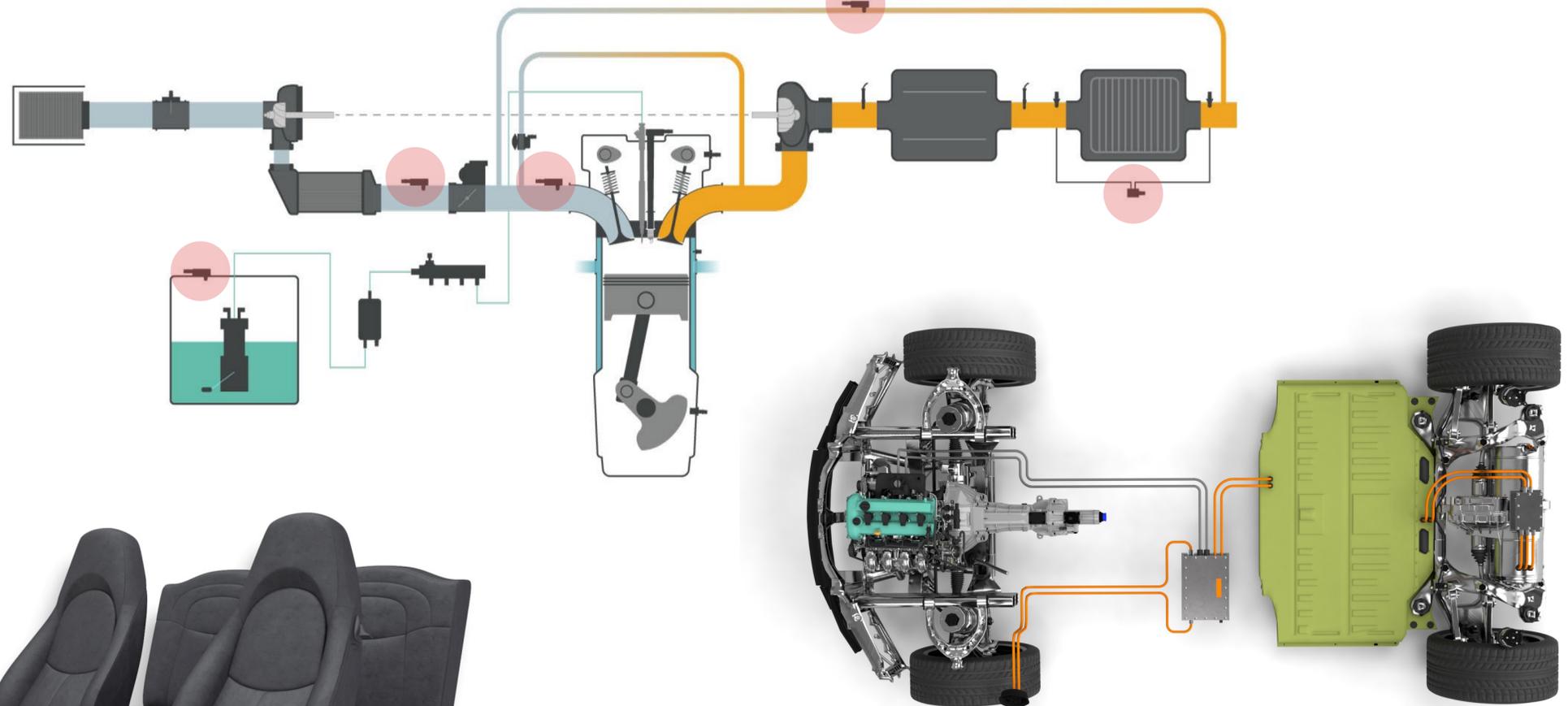
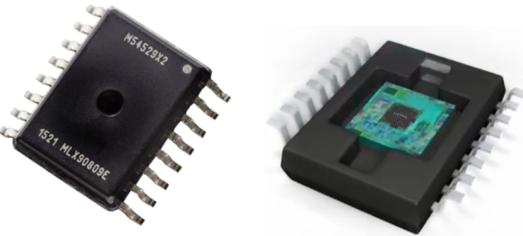
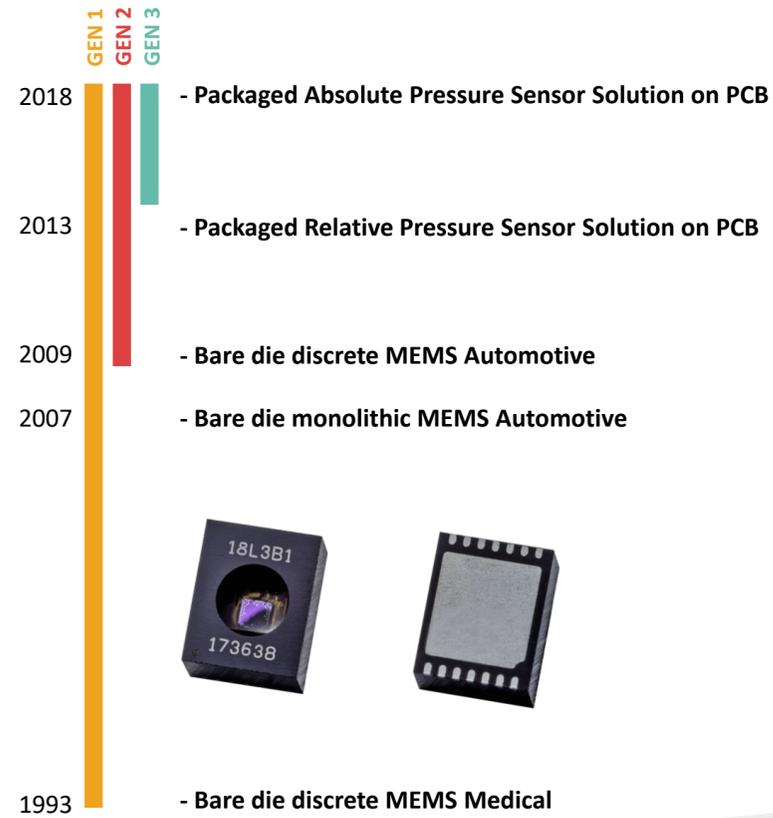
- Enable motor drive with lowest heating and lowest acoustic noise
- Enable low cost, small size mechatronics with digital interface
- Sense & Drive concept, integration of motor driver and sensors
- World-class hw+sw solution support by our application engineers

## Broad motor driver IC portfolio

- Smart embedded drivers for 1W...1 KW
- Supporting all motor types BLDC, DC, Steppers
- ECU communication via LIN / PWM interface
- Melexis IP for silent sensorless motor drive

## Conclusion

- 1 Enabling smart & small, plug & play mechatronics
- 2 Excellent IC portfolio match for the next generation of electrical and hybrid cars
- 3 World class technology: smallest single die, high temperature Flash memory, robust LIN cell, reliable motor sensing



## Fit for adjacent markets

- Primary focus on automotive powertrain for ICEs and hybrid vehicles
- Same devices can be used for in-cabin comfort applications
- Same devices can be used for white good applications

## Broad pressure sensor portfolio

- Absolute Pressure
- Relative Pressure
- Mid Pressure
- Sensor Interfaces ASSPs

## Conclusion

1

Full solutions including MEMS, sensor interface, package & calibration

2

Strong focus on harsh media automotive requirements

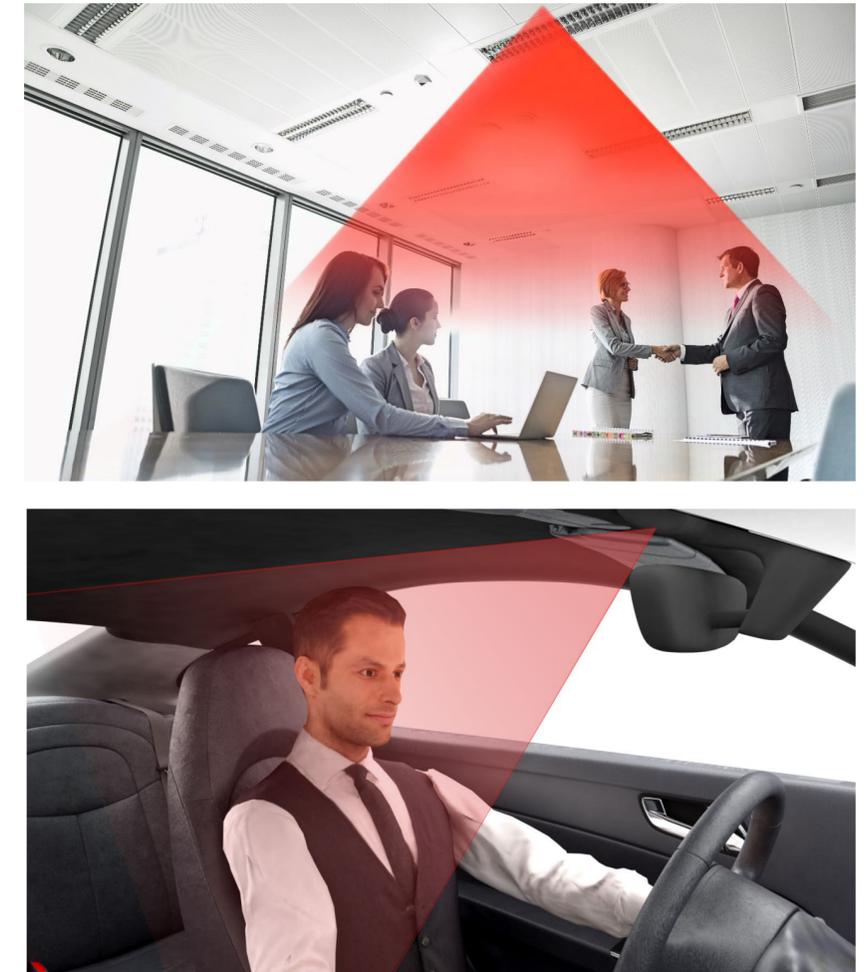
3

Unmatched performance and robustness

digital thermometer IC  
thermal array  
SMD

2018  
2017  
2016  
2011  
2009  
2007  
2003  
2000

- High operating temperature 16x12 array
- SMD package
- 32x24 pixel thermal array
- First thermal array (16x4)
- Medical grade & mini TO-can
- Fully integrated solution
- Factory calibrated digital module
- Discrete analog sensor



## Single pixel temperature sensing

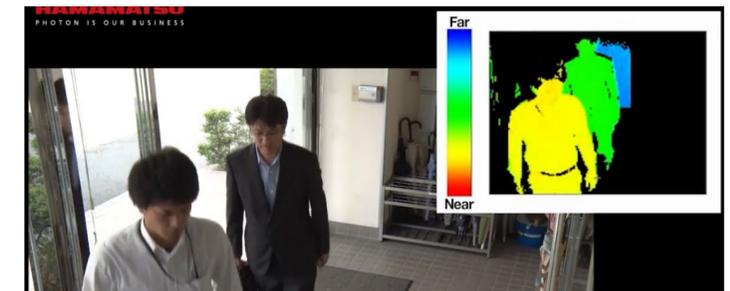
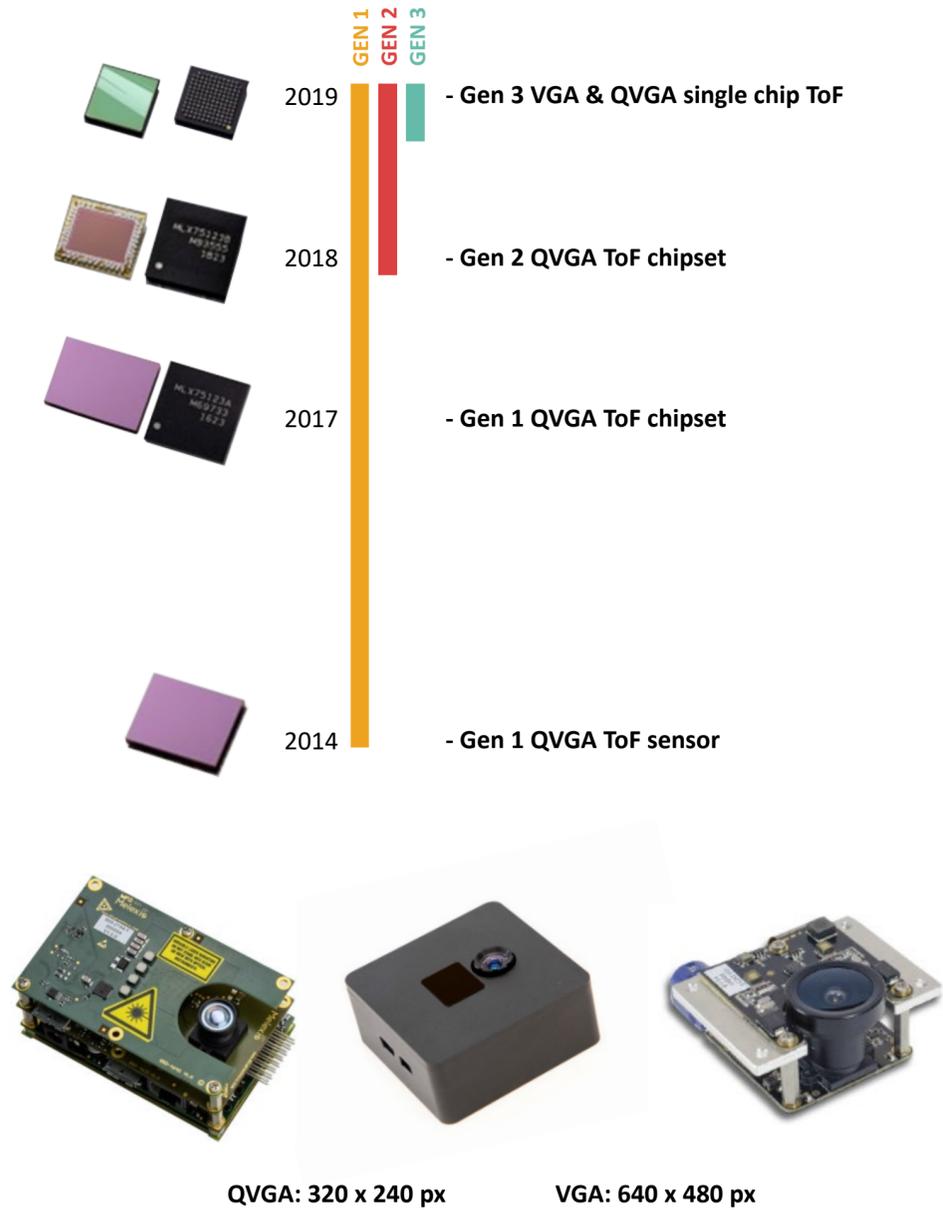
- Digital & factory calibrated, easy to use
- Broad temperature range & medical grade
- Miniaturization & SMD: high performance & small size

## Thermal array portfolio

- Unique price vs. resolution vs. performance point
- People detection, counting and location for smart building
- Safety applications (overheating prevention)

## Conclusion

- 1 World class performance & innovation since 2000
- 2 Strong focus on adjacent markets with broad application portfolio
- 3 Cost efficient thermography and miniaturization enable new applications and markets



## Conclusion

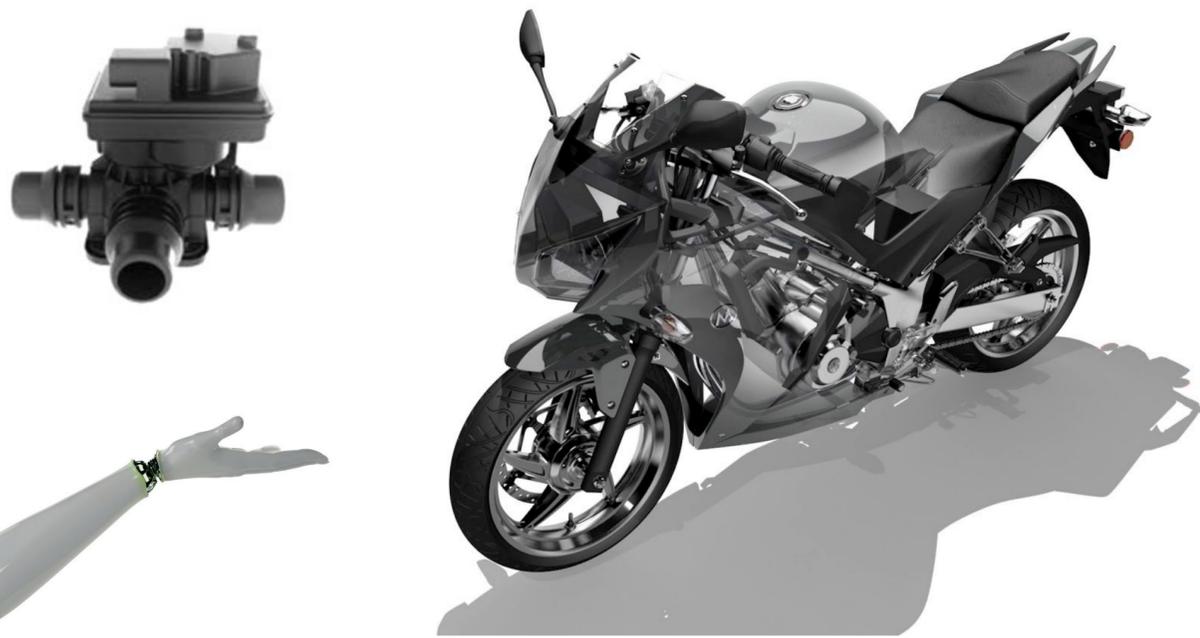
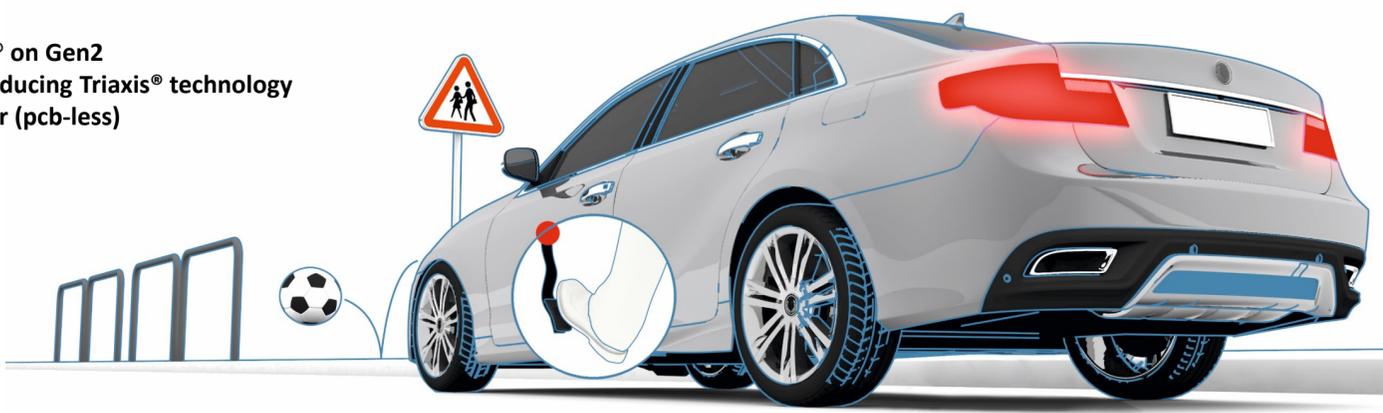
- 1 Leadership in automotive-grade Time-of-Flight sensors
- 2 Widest product portfolio, with QVGA and VGA resolution
- 3 Designed for automotive. Applied to in-cabin sensing, exterior sensing, robot vision and more.

## Fit for adjacent markets

- Same IC designed for automotive, applicable also for adjacent markets (robot navigation, security, ...)

## Broad TOF sensor portfolio

- Gen2 as cost-effective QVGA solution
- Gen3 with VGA resolution for wide field-of-view sensing, comfort & safety
- Focus on automotive



### Fit for adjacent markets

- Same IC designed for automotive, re-used for adjacent markets (industrial, white goods, 2-wheelers).
- Ideal fit for drive applications with Melexis actuator chipset

### Broad hall effect sensor portfolio

- Successful re-use of platform & generation concepts since 1993
- 2 billion sensors in the field
- High rate of new product launches thanks to platform concept
- Clear USPs (low power) ensuring growth and enabling customized ASSPs

### Conclusion

1	World class performance and broad application coverage since 1993
2	Strong focus on electrification, safety & product customization
3	Broad market fit, technologies designed for automotive, easily re-valued in adjacent markets (white goods, 2-wheelers)

# Acronym list

Poster	Acronym	Description
<b>Current</b>	CMOS	Complementary Metal-Oxide Semiconductor
	TIER1	A tier one company is the most important member of a supply chain, supplying components directly to the original equipment manufacturer (OEM) that set up the chain.
	IMC	Integrated Magneto Concentrator
	OBC	On Board Charger
	HV	High Voltage
	ADAS	Advanced Driver Assistance Systems
	DCDC	Direct Current to Direct Current
	EV	Electric vehicle
	OEM	Original Equipment Manufacturer
	<b>Opto</b>	TOF
VGA		Video Graphics Array
QVGA		Quarter Video Graphics Array
<b>LIN RGB</b>	IC	Integrated Circuit
	LIN	Local Interconnect Network
	RGB	Red, Green and Blue
<b>Embedded motors</b>	SOI	Silicon On Insulator
	B-EMF	Back Electromotive Force
	UVW	3 terminal pins of BLDC motor
	BLDC	Brushless DC
	DC	Direct Current
	ECU	Engine Control Unit
	PWM	Pulse Width Modulation
	IP	Intellectual Property
	AFS	Adaptive Front-Lighting System
	HVAC	Heating, Ventilation, and Air Conditioning
<b>L&amp;S</b>	HW	Hardware
	SW	Software
	TSOT	Thin Small Outline Transistor
	EEPROM	Electrically Erasable Programmable Read Only Memory
	ASIL	Automotive Safety Integrity Level defined in ISO 26262 standard
<b>Temperature</b>	PCB	Printed Circuit Board
	SMD	Surface Mount Device
<b>Pressure</b>	RF	Radio Frequency
	MEMS	Micro-Electro-Mechanical Systems
	ASSP	Application Specific Standard Product
<b>Position</b>	ICE	Internal Combustion Engine
	SENT	Single Edge Nibble Transmission
	SPI	Serial Peripheral Interface. A communications protocol for use between two integrated circuits
	I2C	Inter-Integrated Circuit. A communications protocol for use between two integrated circuits
	DMP-4	Dual Mold Package, 4 pins
	PRDNL	Park, Reverse, Neutral, Drive, Low (automatic transmission positions)
	ETRS	Electronic Transmission Range Selection
	EMC	Electromagnetic Compatability
	G	Gauss, Unit of magnetic field
mT	millitesla, Unit of magnetic field	