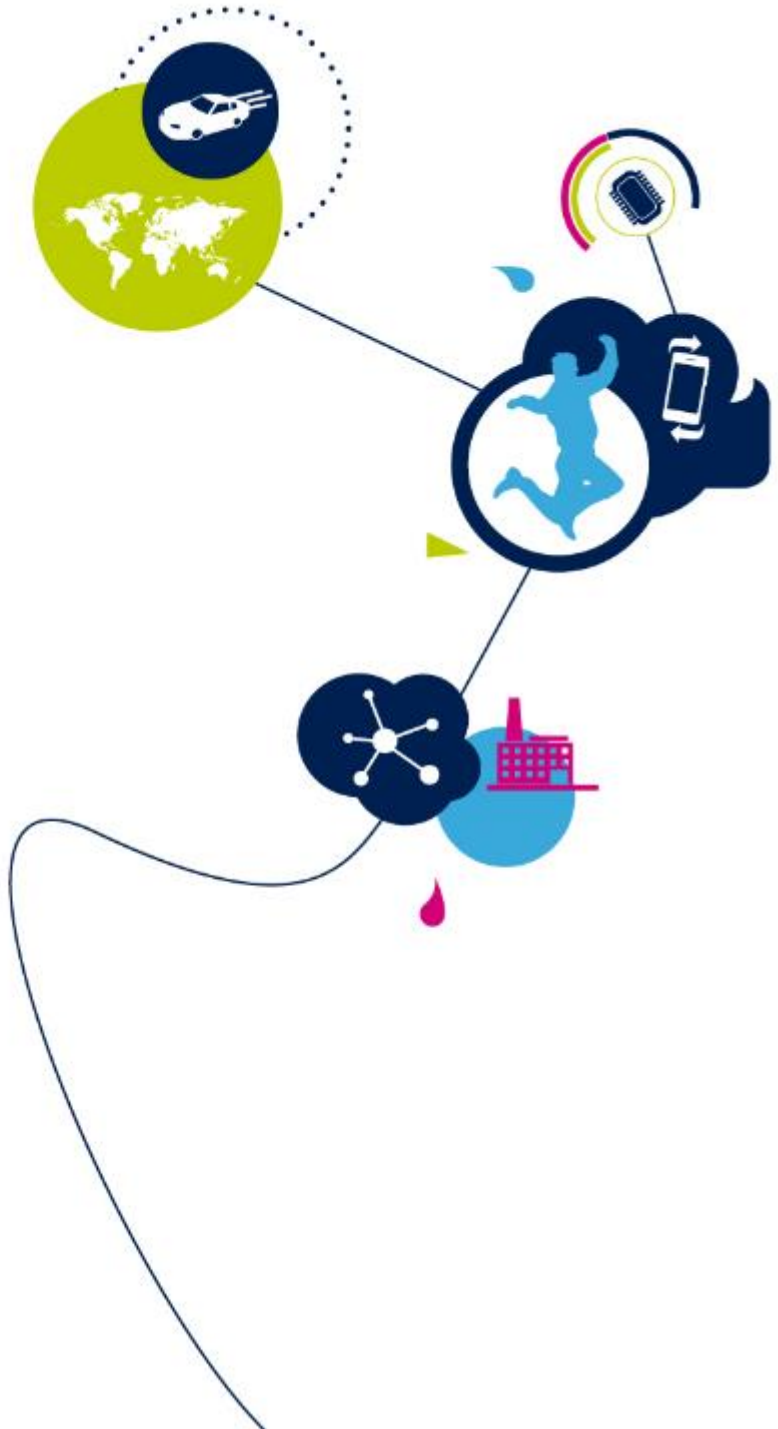

Bob Krysiak

Executive Vice President
President, Americas Region
Global Mass Market and Online Marketing Programs

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Who We Are

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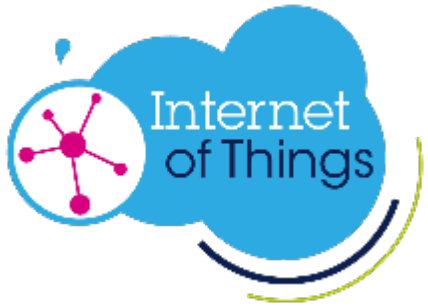
ST stands for life.augmented

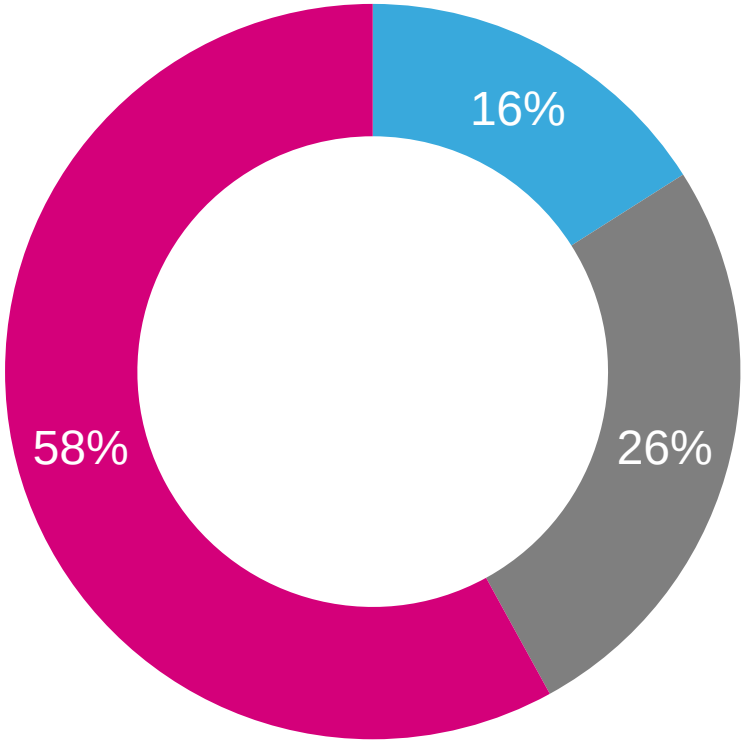
Everywhere microelectronics make a positive contribution to people's lives, ST is there



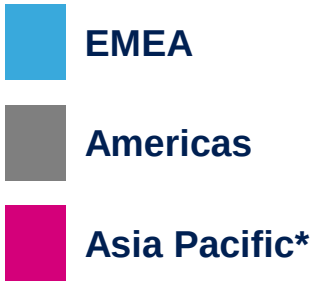
- A global semiconductor leader with an application strategic focus
- 2015 revenues of **$6.90B**
- Listed: NYSE, Euronext Paris and Borsa Italiana, Milan
- Approximately **43,200** employees worldwide
- Approximately **8,300** people working in R&D
- Portfolio of over **9,400** patent families
- **11**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

A Global and Well-balanced Business…

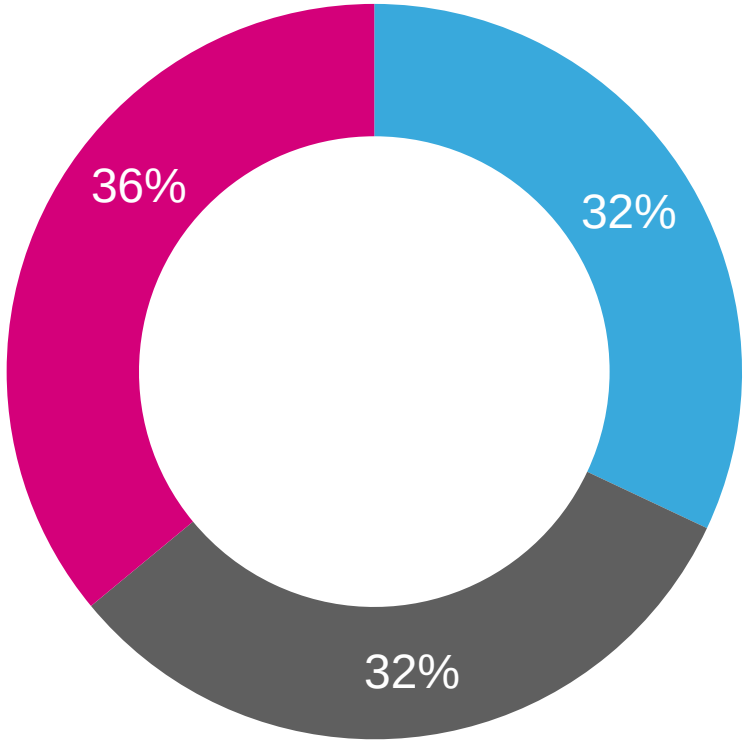
Revenues by location of shipment (%)



2015: $6.9B



Revenues by region of origin (%)



2015: $6.9B

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

Internet of Things

Smart Driving

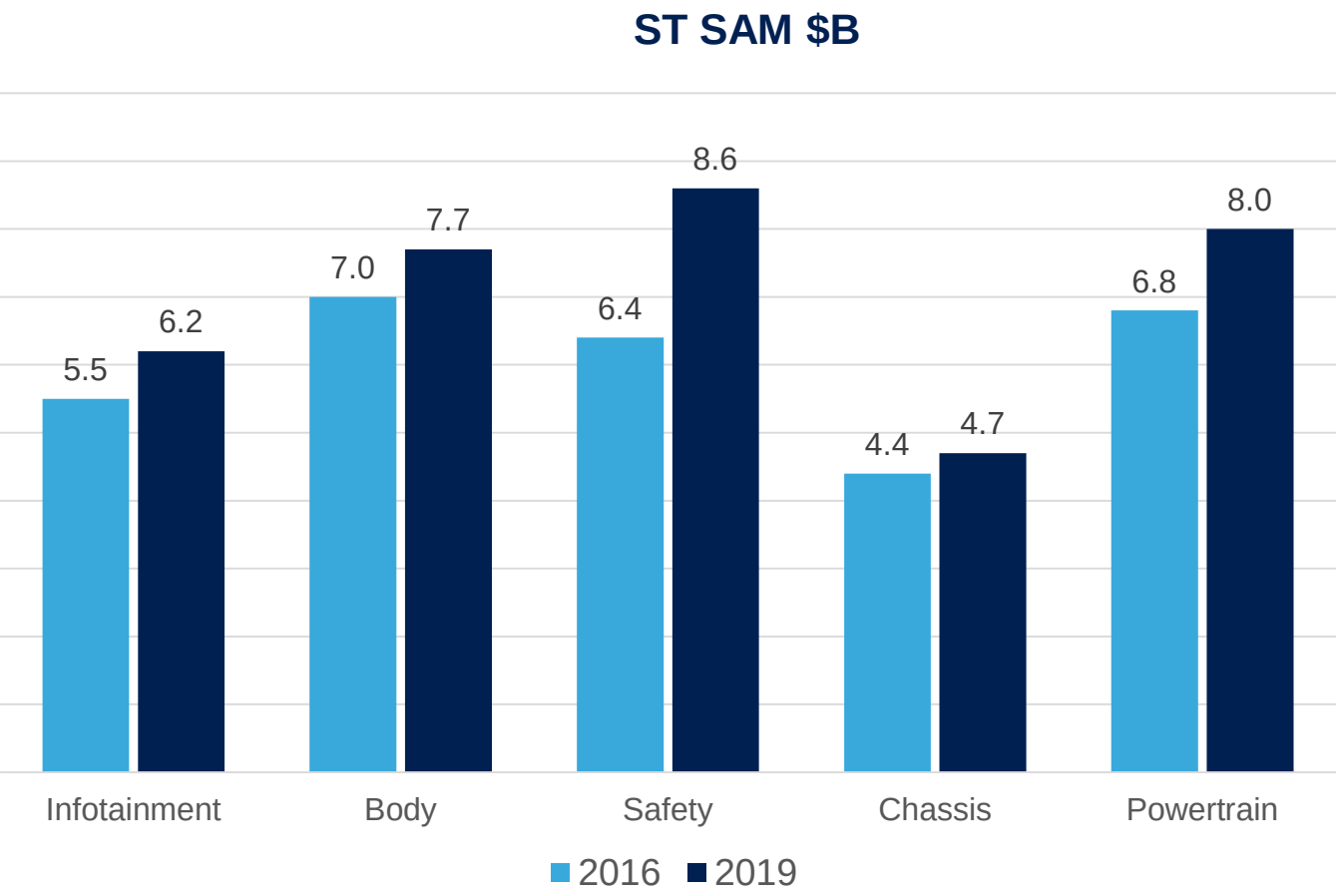
Smart Things

Smart Home & City

Smart Industry

Smart Driving

Smart Driving



Key Applications

- Active Safety - Passive Safety
- Electric & Hybrid Vehicle Electrification
- Infotainment - Telematics
- Powertrain
  - Direct Injection Engine
  - Automatic Gearbox
  - Braking - Steering

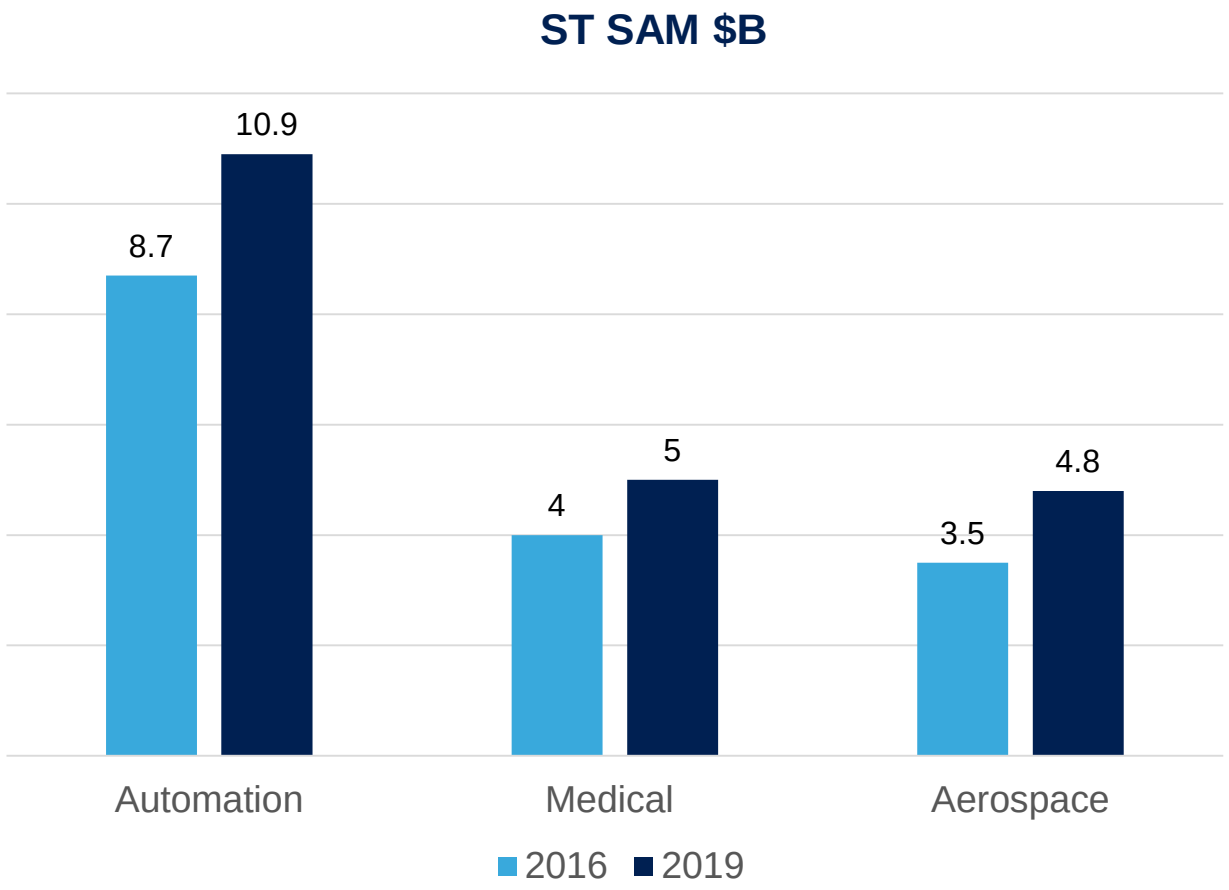
Source: Strategy Analytics

Smart Industry

Key Applications

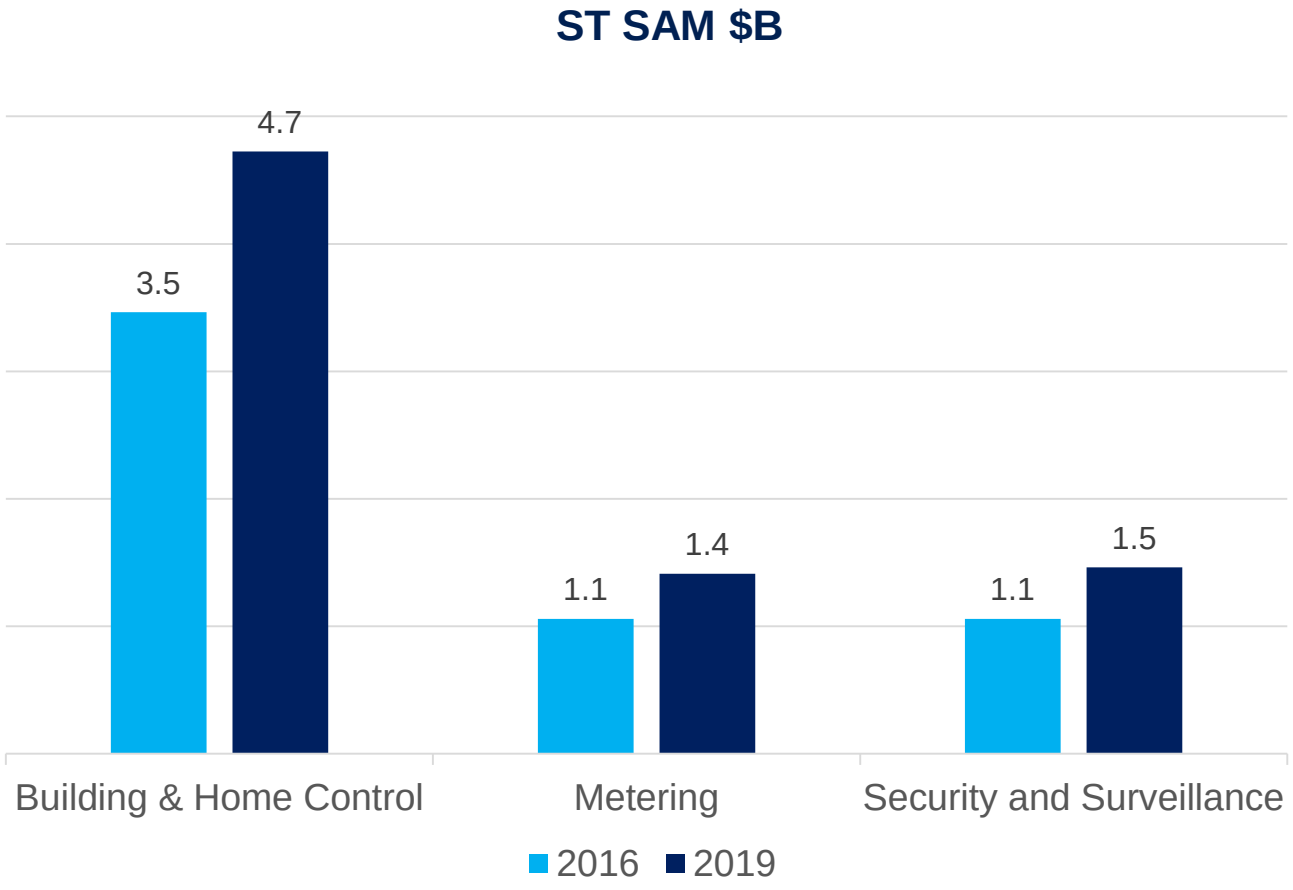
Smart Manufacturing
Factory Automation
Smart Motion Control

Industrial Robots
Industrial Lighting
Sensors for Industrial, Medical, Aerospace & Defense



Source: IHS

Smart Home & City

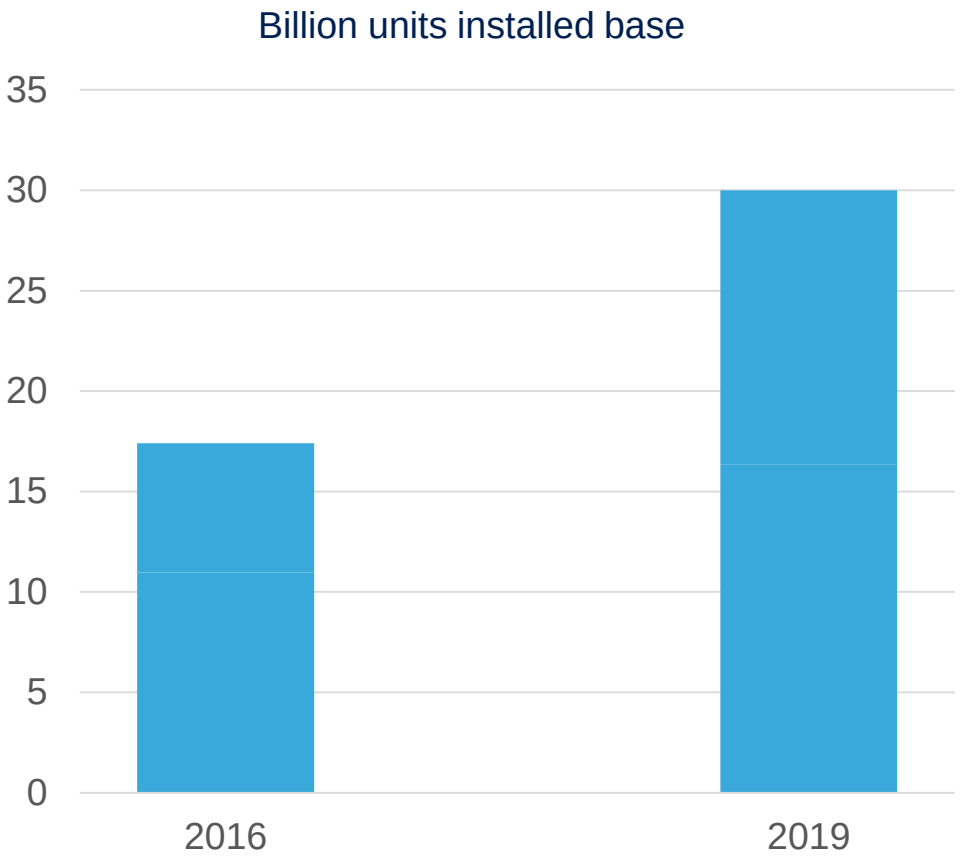


Key Applications

Smart Transportation
Home & Building Automation
Smart Metering
Security & Surveillance
Smart LED Lighting
Heating & Energy Control

Source: IHS, ABI Research

Smart Things



Key Applications

Smartphones

Tablets

Wearable

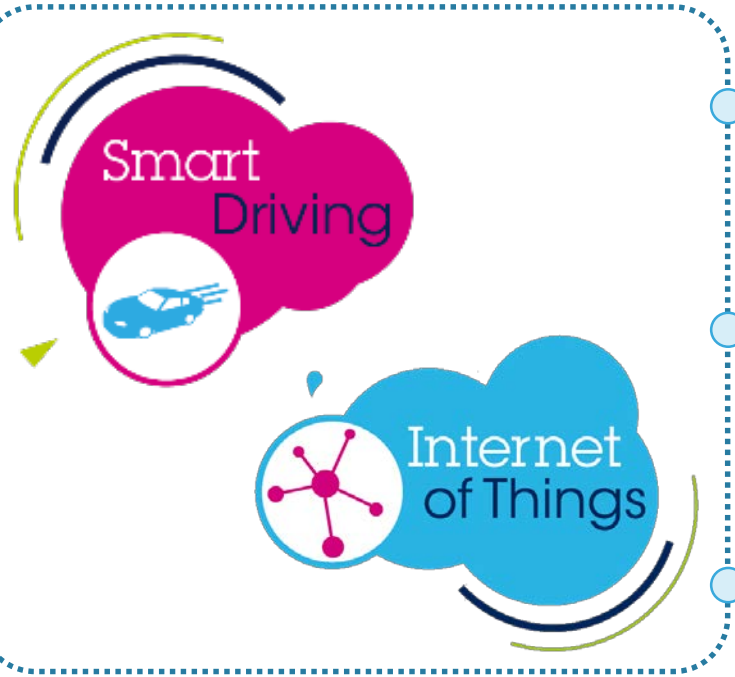
Smart Things

Source: IHS

Product Family Focus

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

- Dedicated Automotive ICs
- Discrete & Power Transistors
- Analog, Industrial & Power Conversion ICs



- MEMS & Specialized Imaging Sensors
- Digital ASICs
- General Purpose & Secure MCUs EEPROM

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

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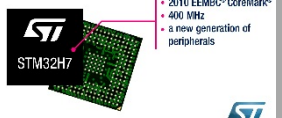
New STM32 high-perf MCU series
Advanced 40nm Flash technology



Accelerating Electrification
Silicon-Carbide Power Devices

Bluetooth® low energy System-on-Chip

All-in-one eCompass
enhances Dead Reckoning

Intelligent motion control
for Smart Industry

ICs for 48V isolated resonant
multiphase power conversion

LoRa™ and ultra-low-power
STM32 Nucleo Pack

Automotive 77GHz radar chip
for long-range applications

- Multi-channel single-chip transceiver
- Enhanced object recognition and resolution
- Smaller and lower-cost systems

Secure MCU
for eSIM & Secure Element

World's smallest ToF ranging sensor

Enabling new scenarios
USB Type-C™ and Power Delivery

Ultra-low-power 6-axis iNEMO® inertial module combines OIS and motion-tracking

TSX7 series
Precision 16V CMOS op amps

STM32F7 MCU series
High performance, rich connectivity

SPC57 S Line Automotive MCUs
for safety-critical applications

Miniature Multi-Sensor Module
Jumpstarts IoT and Wearable Designs

Open.MEMS simplifies
detection of human activity

- Free software libraries
- Activity recognition
- Carry position
- Gesture recognition

World's First Integrated EMI Filter
Automotive Ethernet Connectivity

- Highly integrated solution designed to suppress EMI noise
- Automotive applications employing BroadR-Reach® interfaces

STM32L4 MCU series
Available from 128KB to 1MB

Sub-1GHz transceiver connects
Smart Things to the Cloud

Satellite navigation and V2X
Combined

- V2X-Enhanced GNSS
- Security, accuracy and reliability
- Long-standing cooperation between Autotalks and ST

ST Boosts Trusted Computing
with New Advanced Security Modules

Battery-charger IC
High integration and low power consumption

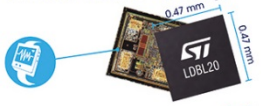
Industry's highest-frequency, widest-range
microwave integrated RF synthesizer

- STuW81300
- 1.925GHz to 16GHz
- BiCMOS SiGe technology

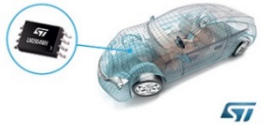
World's smallest full-featured motor drivers
for battery-powered devices

New 36V ST op amps
raise ruggedness & efficiency

New Low-Dropout Regulator
Ultra-small ST STAMP™ package

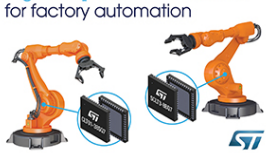


Op Amps and Comparators in miniSO8
operate up to 150°C



Save your energy with
STM32L0 MCU series

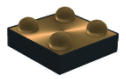
Digital-input current limiters
for factory automation



EyeQ®5 System-on-Chip
Towards full autonomous driving

- 5th-generation System-on-Chip
- Long-standing cooperation between Mobileye and ST

4-Ball WLCSP EEPROM
with multiple I²C addresses



TSX low-power comparators
better performance and robustness

STM32F413 MCU
The new King of STM32F4 Access lines

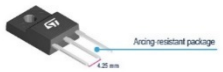
- Up to 1.5MB Flash / 320KB RAM
- 2x DACs / 3x CANs / 10x UARTs
- 125°C qualified

Optimized secure element for
IoT-device and brand protection

Best-in-class infotainment processor
for all classes of vehicles

Free STM32 development tools
now available for OS X

World's first 1500V device in
TO-220FP wide creepage



STM32F412 MCUs
expand STM32F4 Access lines

- 1MB Flash / 256KB SRAM
- QSPI / FMC memory interfaces
- Microphone MEMS/ADC interface

High-voltage power converter
for Smart Homes and Factories

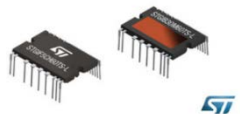
Automotive multi-regulators
for car-infotainment systems

- Compact solution
- Maximum flexibility
- BCD8 Automotive technology
- Reduces cost and PCB area

Wireless battery-charging chipset
for wearables

STM32Cube Low-Layer APIs
MIN footprint, MAX performance

SLLIMM™ 2nd series
Intelligent Power Modules



Secure solution
for wearables

SPC58 C Line Automotive MCUs
for car body and security applications

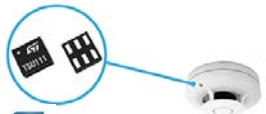
800V SCRs
for miniaturized power converters

New graphics-centric STM32 MCUs
Brings Cortex®-M7 to more applications

- Up to 1082 EEMBC® CoreMark®
- ST's Chrom-ART Accelerator™
- Up to 2MB of dual-bank Flash

New STM32L0 MCU lines
and Ecosystem available now

Tiny nano-power op amp
Enables longer battery life



New STM32L4 MCUs extend choices
Deliver best energy efficiency

Tiny micropower comparator
targets space-constrained applications

More HMI and IoT applications
with STM32F769 Discovery kit

Tiny micropower comparator
targets space-constrained applications

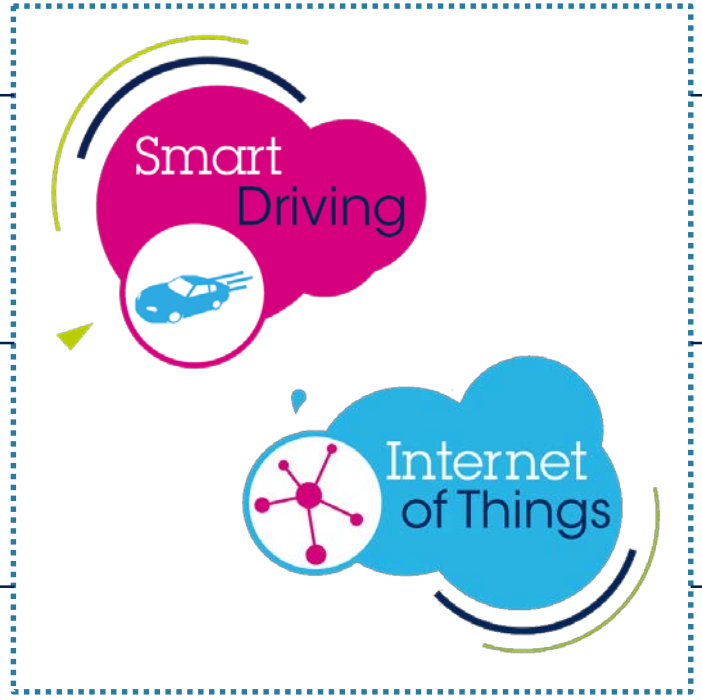
40V automotive-grade
MOSFETs in PowerFLAT™ 5x6

Security in Smartgrid

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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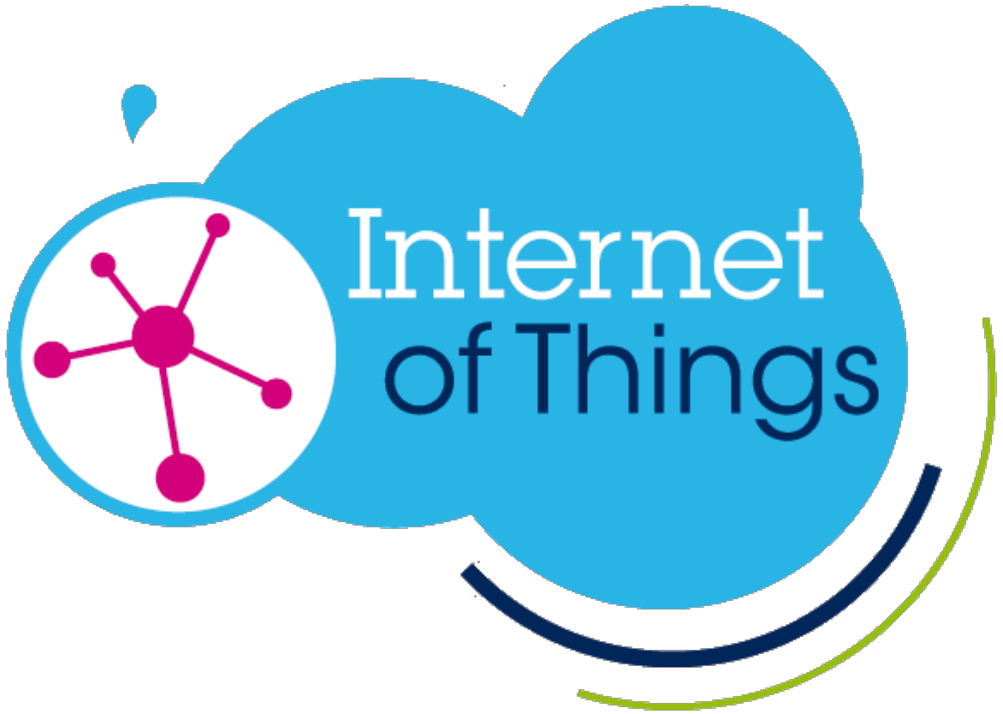
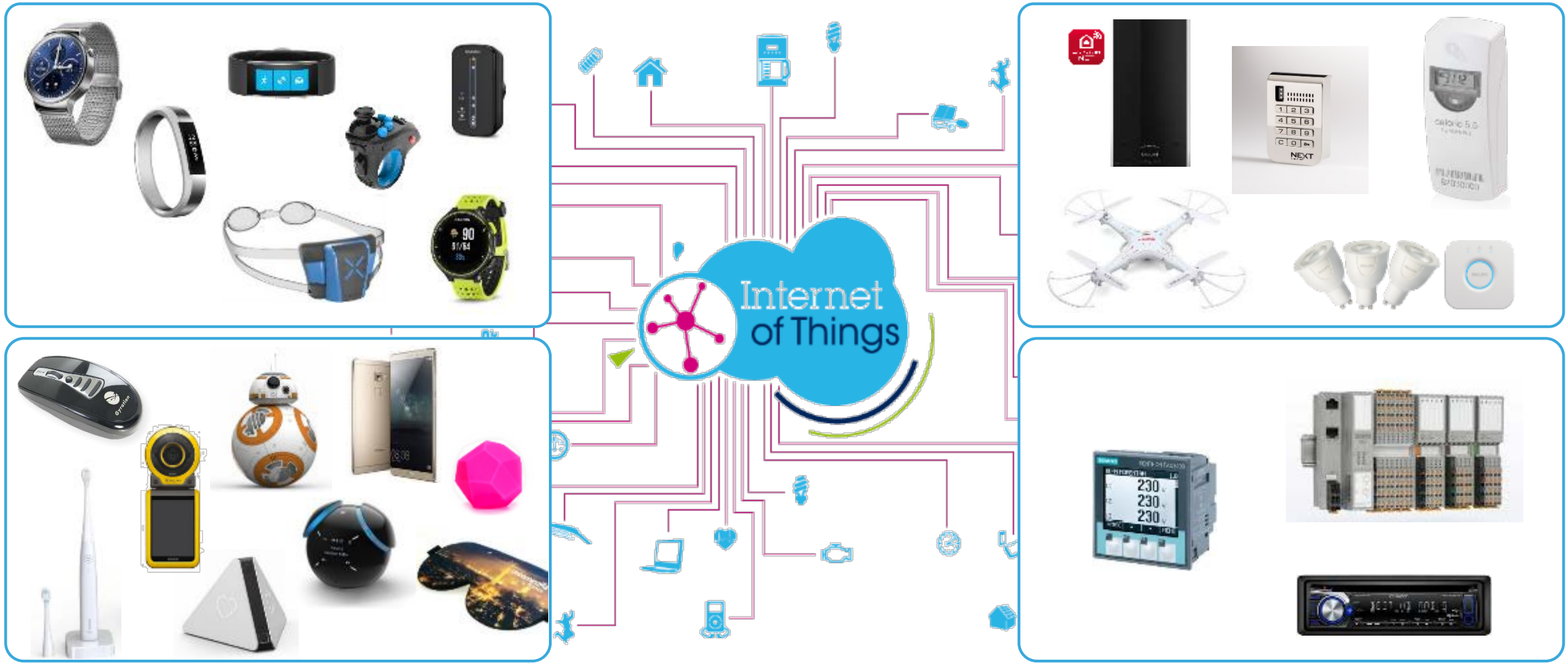

Internet
of Things

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	Motor Control	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	Power conversion Monitoring Drivers	Nano Watt to Mega Watt
Smart Home & City							
Smart Industry							

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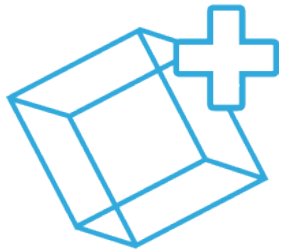


Smart Things

Fitness & Sport

Drones

Multimedia & Accessories

Healthcare & Wellness

Processing	Ultra low-power 32-Bit Microcontroller
Sensing & Actuating	Accelerometer Pressure Sensor
Connectivity	Bluetooth Low Energy
Signal Conditioning & Protection	Balun

Microsoft Band 2

Sensing & Actuating	Accelerometer & Gyroscope Pressure Sensor
Signal Conditioning & Protection	Battery Monitoring Gas Gauge
Power & Energy Management	DC-DC for AMOLED display

HMicro
Sense More

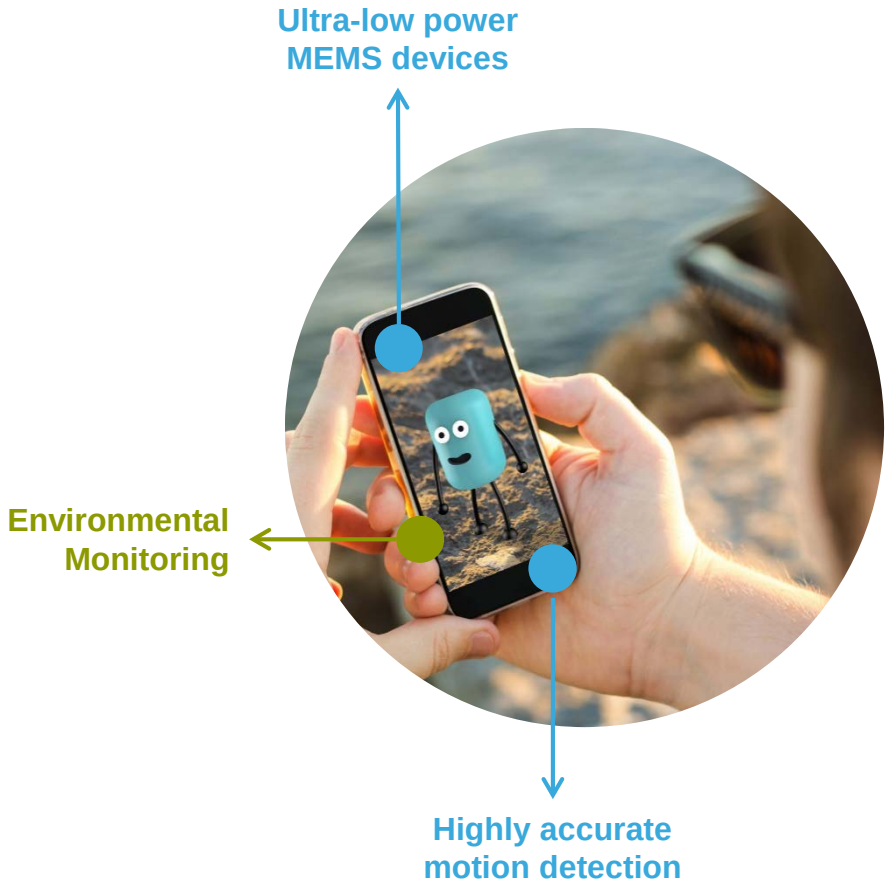
Smart Healthcare

Low power Wi-Fi technology suitable for a broad range of applications

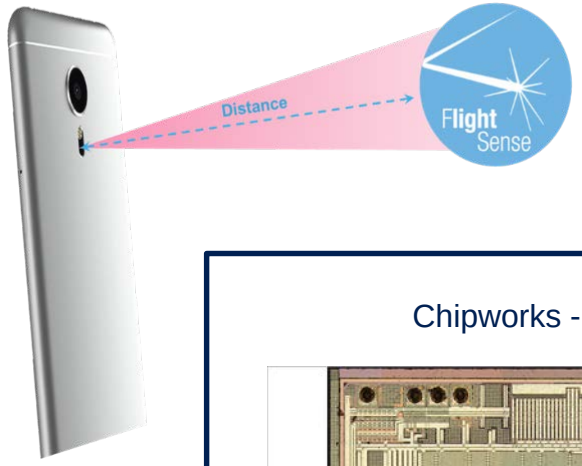
Processing	2 Microcontrollers
Connectivity	2 RF Transceivers (M-band, Wi-Fi 11Mb/sec)
Signal Conditioning & Protection	High resolution Analog Front End

The only wireless biosensor platform
for disposable medical applications

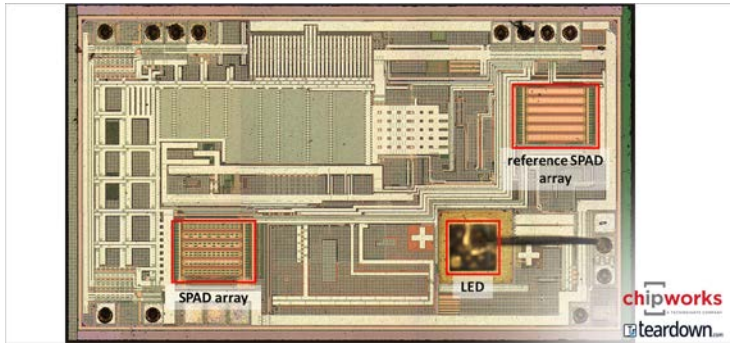
Sensors for
Virtual & Augmented Reality



Laser Ranging, Proximity & Autofocus



Chipworks - Iphone 7 Teardown



"Based on this we think it is safe to conclude that the proximity sensor is now a ToF sensor that can also act as an accurate rangefinder for the selfie camera. It was also in the 7 Plus, so a good design win for **STMicroelectronics**."

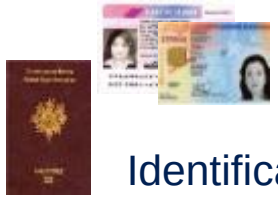
http://www.chipworks.com/about-chipworks/overview/blog/stmicroelectronics-time-of-flight-sensors-and-the-starship-enterprise

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 ↔ ST SAFE

STM32

STM32 MCU

STM32 MCU

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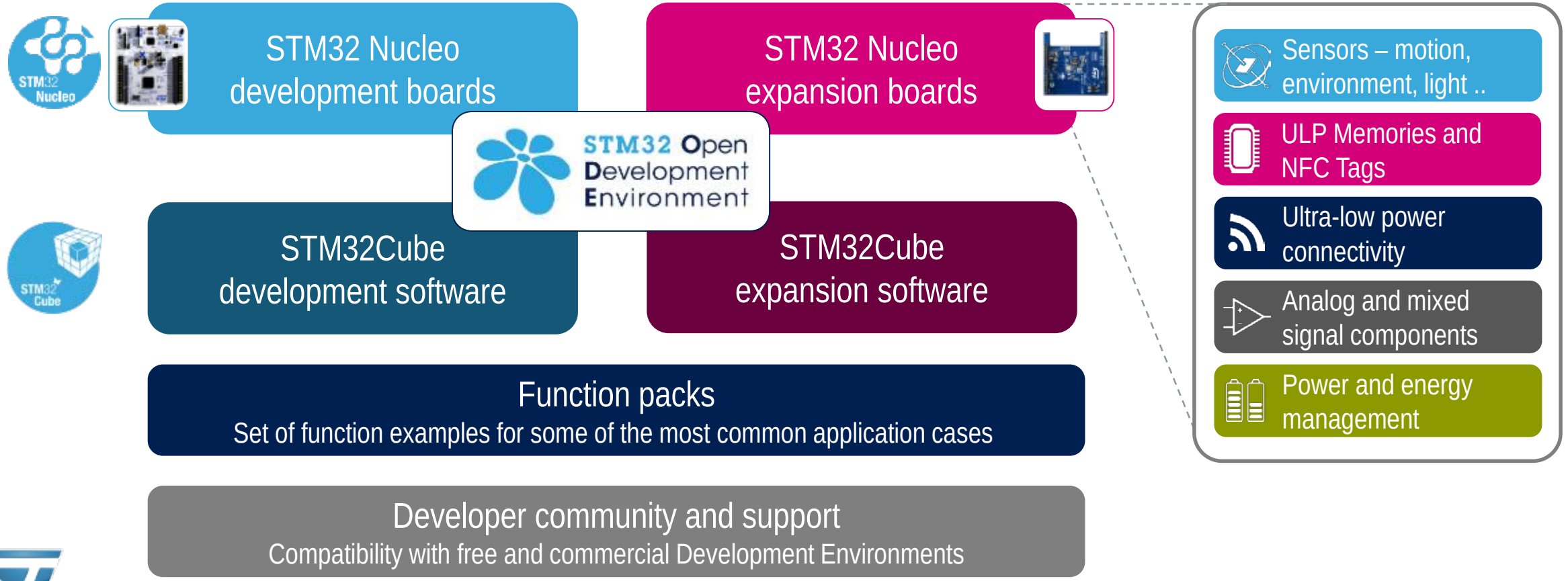
STM32 Open Development Environment

Flexible, easy and affordable way to develop innovative applications using ST components



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ST Developers Conference
Santa Clara

STM32 Summit
Shenzhen

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Smart City

Why Smart Cities?

Demographic Dynamics

7.7 billion people in 2020
More than 60% living in the cities
65+ generation will nearly double

Scarce Resources

Finite oil and gas reserves
Waste treatment & disposal challenges
>6 M tons of rubbish produced every day in 2025

Energy management and climate Change

Cities account for 2% of world's land area, but responsible for >60% of energy consumption
Electric lighting uses 20% of global electricity
Cities account for about 75% of world's CO2 emissions

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Smart Transportation

Improve public transport, reduce inner-city traffic congestion

Technologies to make public transport better and more efficient.
Infrastructure for electric vehicles. Smart parking.

- More environmentally friendly public transport
- Better information for users through connected applications and panels
- Electric vehicle charges
- Smart Parking places improve driving efficiency

Smart Parking

30%

of inner-city traffic congestion is the result of drivers searching for somewhere to park.

With smart technologies, drivers can **know in advance** where an **available parking spot** is located and will not have to drive around at random looking for one.

Smartphone App

Cloud Server

Car detection sensor embedded in the road

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Wireless Charging for EVs

Power & Energy Management

STMicroelectronics and WiTricity to Develop Integrated Circuits (ICs) for Resonant Wireless Power Transfer

•Chips to accelerate the adoption of wireless charging, with ability to efficiently charge metal-body consumer electronics
•Opportunities include consumer electronics, Internet of Things, mobile computing, automotive, medical, and industrial applications

Geneva, Switzerland, and Watertown, MA / 04 Oct 2016


Smart Home

Smart Home

Self-sufficient, environmentally friendly and connected

Smart Sensing	Processing
Motion and environmental sensors, microphones	Low power, high performance microcontrollers
Connectivity	**Energy management**
Sub-GHz Bluetooth Wi-Fi	Digital power management Energy Harvesting

Smart homes are self-sufficient, environmentally friendly and connected to offer new services improving the quality of life and resource management

- Energy-efficient lighting
- Smart appliances and efficient power supplies
- Electric vehicle charger
- Smart Meters for electricity, gas and water
- Improved security

Household Robots

Smart Appliance

Smart Home Control

Smart Lighting

Home Multimedia

Smart Door Locks

Connectivity required everywhere

ARISTON THERMO GROUP

Smart Water Heater

Connectivity

QUNDIS™ ADVANCED MEASURING SOLUTIONS

Heat Cost allocator

Wireless Connectivity Module

Digilock Security Simplified

Smart Lock

Connectivity

NFC/RFID Reader

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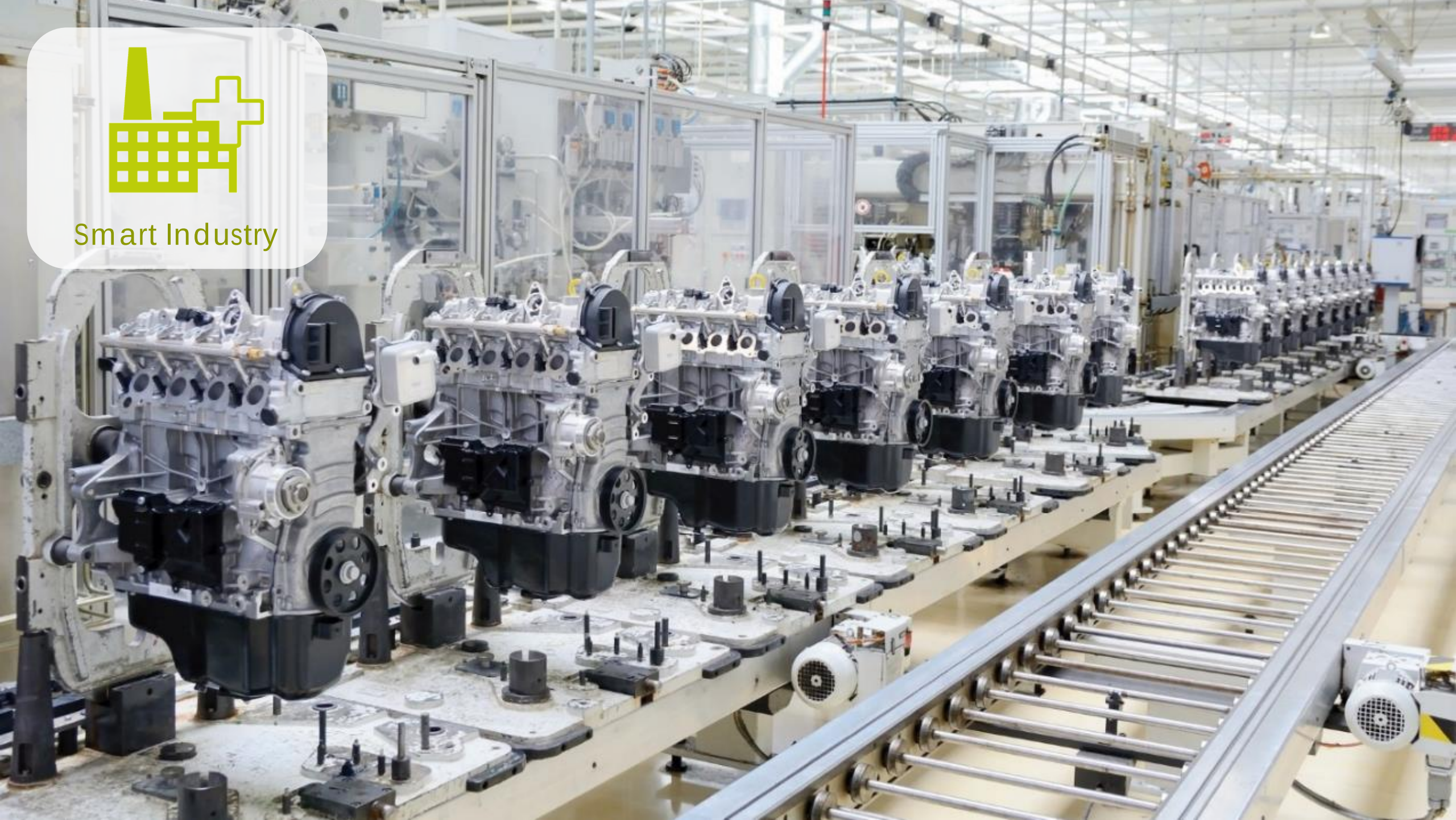
Smart Industry

Smart Industry

More efficient, safer and flexible factories

Producing more **efficiently** and in more **environmentally friendly** manner

Responding to demand more **flexibly** and with more **customization**

With a better and safer **human** experience

Collecting and using manufacturing and supply chain **data** better

Smart Industry

Standardized production environments

SIEMENS

Factory Automation
Motion Control
Smart Industrial Meter
Industrial Power Supply

PHOENIX CONTACT

Programmable Logic Controller

Processing

Connectivity

Power & Energy Management

Signal Conditioning & Protection

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TRAXENS
advanced cargo monitoring

Processing	32-Bit Microcontroller
Sensing & Actuating	Motion MEMS
Connectivity	RFID Reader
Signal Conditioning & Protection	Protections & Balun

Internet of Things

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Smart
Driving

Smart Driving

Safer

More Connected

Greener

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

Greener

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

More Connected

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

Semiconductors Driving the Change


Audi
Mercedes-Benz
BMW
RENAULT
HYUNDAI
TOYOTA
TESLA
DENSO
Visteon
TRW
DELPHI
BOSCH
Continental
LEAR CORPORATION
Autoliv
HYUNDAI AUTRON
MOBILEYE
Valeo
Autotalks
AISIN
MAGNA
BOSE
Better sound through research.
SiriusXM
KOSTAL
Pioneer
HITACHI
Inspire the Next
SONY
HARMAN
JAC MOTORS
广汽集团
GAC GROUP
吉利汽车
GEELY AUTOMOBILE
KEBODA
Creating Value , Sharing Progress
UAES
ALPINE
DAESUNG
kyungshin
Mando
LG
SEOYON
CHERY
CCAG
中国长安
SAIC
上汽集团
SAIC MOTOR
Coagent
DONGFENG
DONGFENG MOTOR CORPORATION
BYD
Build Your Dreams
USI
Realizing IDEAS Together
SAMSUNG
MITSUBISHI ELECTRIC
Nidec
OMRON
Panasonic
HYUNDAI MOBIS
YURA
유라코퍼레이션
FAW
FORYOU
长安汽车
CHANGAN
Great Wall
Focus Dedication Specialization
DESAY

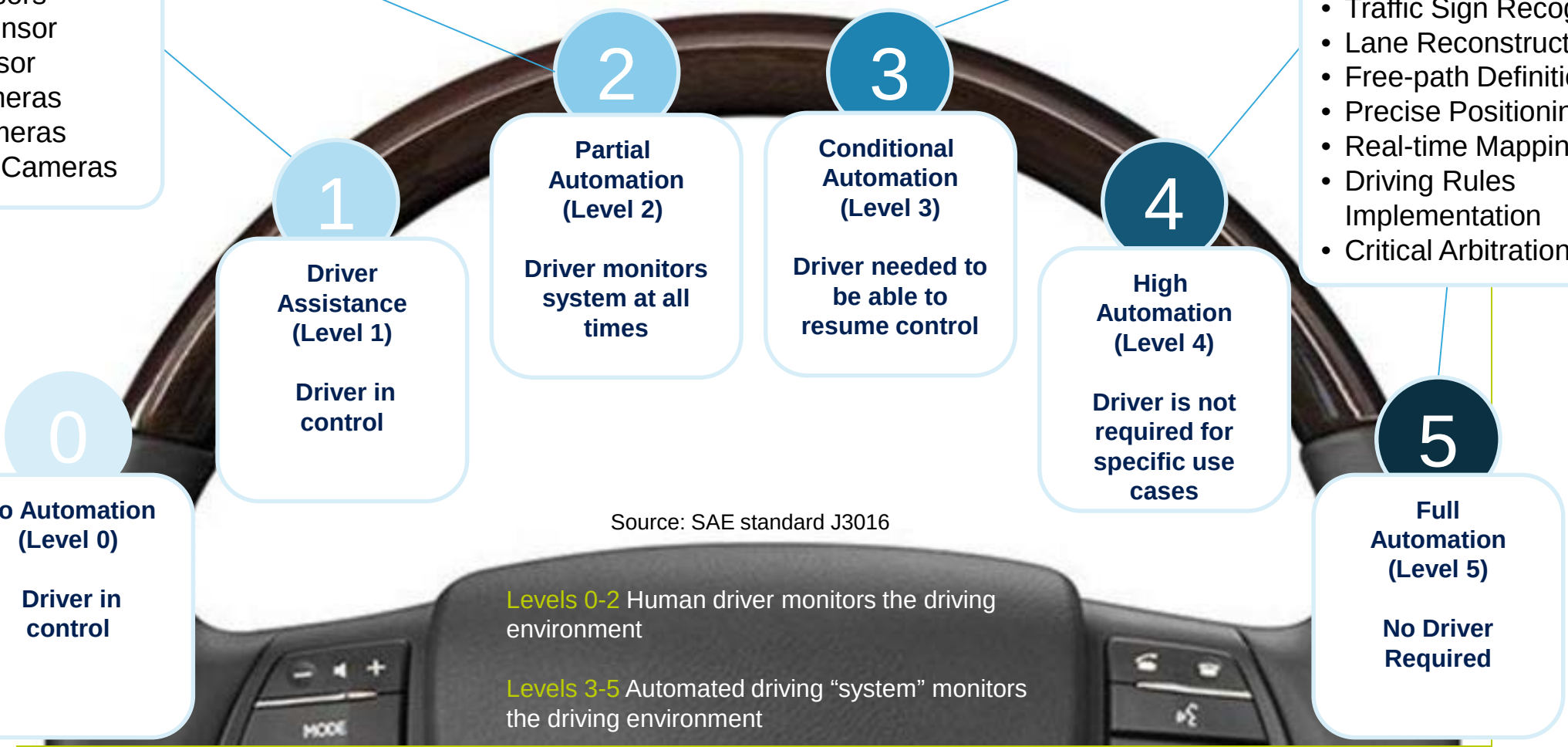
The 5 Levels of Vehicle Automation

Adding Senses

- Accelerometers and Gyro
- Steering Wheel Angle
- Ultrasonic Sensors
- Front Radar Sensor
- Blind Spot Sensor
- Rear View Cameras
- Front View Cameras
- Surround View Cameras

Learning to Drive

- Systems Networking
- Sensor Fusion
- Distance Measurement
- Traffic Sign Recognition
- Lane Reconstruction
- Free-path Definition
- Precise Positioning
- Real-time Mapping
- Driving Rules Implementation
- Critical Arbitration



0 — **No Automation (Level 0)**

Driver in control

1 — **Driver Assistance (Level 1)**

Driver in control

2 — **Partial Automation (Level 2)**

Driver monitors system at all times

3 — **Conditional Automation (Level 3)**

Driver needed to be able to resume control

4 — **High Automation (Level 4)**

Driver is not required for specific use cases

5 — **Full Automation (Level 5)**

No Driver Required

Source: SAE standard J3016

Levels 0-2 Human driver monitors the driving environment

Levels 3-5 Automated driving “system” monitors the driving environment

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ST Leadership in ADAS

Vision Processing

Over 10 million vehicles worldwide equipped

68%

Market share 2015

60%

Market share 2015

EyeQ4 ---------- Assisted Driving ---------->

EyeQ5 ---------- Fully Autonomous Driving ---------->

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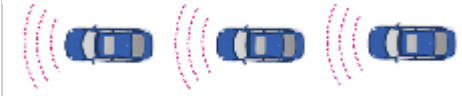
MOBILEYE

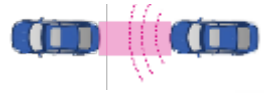
Short Range Radar

ST leading in short range Radar
Now deploying long range Radar

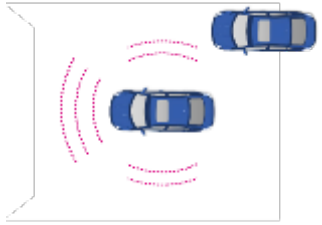
Adaptive Cruise Control



Collision Warning



Blind Spot Detection



24/77 GHz
Radar System

Source: Strategy Analytics, ST

First in adding Security to car body applications

Model Audi A4

Safer

ST's SPC56EC 32-bit automotive microcontroller was the first Body Controller IC to embed a Cryptographic Service Engine (CSE). Ideal for central vehicle body controller and gateway applications, as used in the Audi A4.

Driving Top Safety and Class-leading Energy Efficiency

Model Audi Q7

Safer

The new Audi Q7 series features Mobileye's EyeQ3 Vision SoC, providing unparalleled driver assistance. EyeQ3 processing efficiency is accompanied by our system basis chip L99PM72.

Leopard Unleashes Safe Power

Model BMW i8

Safer

The Leopard family SPC56EL of 32-bit automotive microcontrollers, developed for functional safety, empowers the first generation of the all electric BMWi range with high-voltage (400V) battery management.

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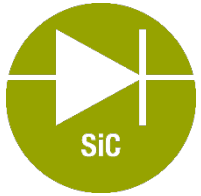
Increasing Electric Vehicle Autonomy

Faster charging

Greater freedom

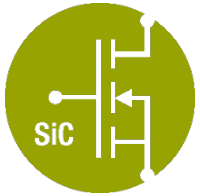
Increased Efficiency, Minimum Power Dissipation, Reduced Size, Cost Saving

SiC Diodes



SiC MOSFETs

4X more efficient than IGBT



Smart Power ICs

Innovative active cell load balancing

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To be America's #1 Sports Car for over 45 years requires continuous evolution

Model Ford Mustang GT

Greener

Within the ultimate American-at-heart icon, ST's 32-bit Automotive MCUs and M05 ViPower technology helps to maximize the experience, but make it greener too. As cars evolve so does our technology…continuously.

Keeping the Energy Balance for a Longer Trip

Model Chevrolet Volt

Greener

Both the GM Volt and Opel Ampera hybrid vehicles use the highly sophisticated ST battery monitoring system IC to control and perfectly balance the 288 cells of the T-form battery used in these cars.

Accelerating Automotive Electrification

Model Confidential

Greener

ST's advanced Silicon-Carbide (SiC) automotive grade solutions boost the efficiency of Hybrid and EVs main electrical blocks, such as the traction inverter, on-board battery charger, and the auxiliary DC-DC converter.

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A/C
REST

V2X Solutions

Automotive grade design for Autonomous vehicles

V2X solution designed for safety-grade reliability

- Automotive qualified across hardware and software
- Designed to meet the rigorous requirements for sensor fusion systems and autonomous vehicles
- ST's top Automotive quality secure outstanding product reliability and supply

V2X : 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

life.augmented | Autotalks

Vehicle Connectivity

Enabling the volume deployment of the features that matter, when they matter

Teseo III

The only open GNSS chipset just got even better

- Outstanding positioning accuracy, assisted GNSS libraries
- Turnkey multi-sensor Dead Reckoning
- Open Platform approach for hosting customer FW

Accordo 5

The latest in the Accordo family

- Display Audio Applications
- Digital Instrument Clusters
- Full HD, Smartphone Mirroring, Many software partners

TELEMACO3

New in the Telemaco line

- High-end Telematics & Connectivity controller
- Ideal for remote service and emerging gateway applications
- Scalable performance, enhanced security

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One of the great driving experiences, with enhanced in-car entertainment

Model Cadillac ATS - V

More Connected

ST has been delivering the technology to provide the unique SiriusXM Satellite Digital Radio Service (SDARS) experience from the beginning. We are now on our 3rd generation chipset.

The Art of Positioning Performance for Agile Cars

Model Jaguar F-Type

More Connected

ST's Teseo II equips Jaguar's navigation system with our multi-constellation automotive GNSS receiver, capable of simultaneously decoding GPS, GLONASS, and GALILEO satellite signals.

Lots of fun & personality

Model Jeep Grand Cherokee

More Connected

Within the brains and brawn of this SUV ST enables more secure connectivity, with our SP56CB 32-bit microcontrollers providing encrypted communications for the vehicle bus architecture plus SiriusXM Satellite Radio that adds entertainment connectivity.

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Internet of Things

Smart Driving

Smart Things

Smart Home & City

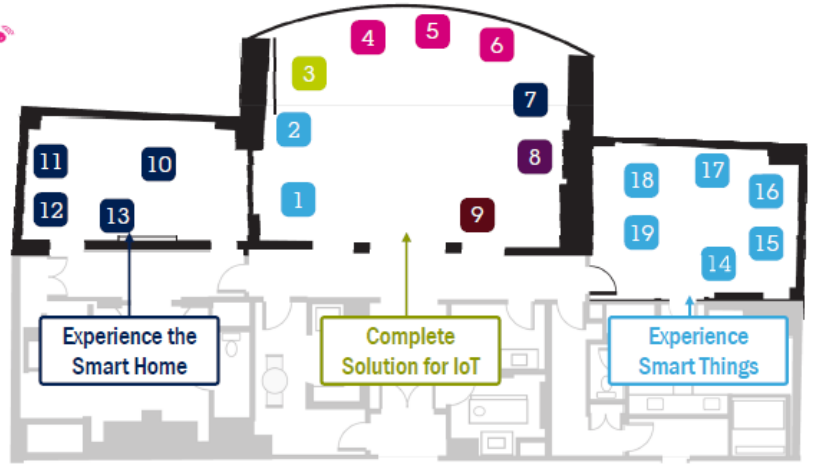
Smart Industry

Smart Driving

Takeaways

- It’s all about Growth!
- Our focus on Growth Markets, Internet of Things and Smart Driving is delivering tangible results
- ST has all the key ingredients: Technologies, Products and Partnerships to continue fueling our growth
- We are excited about our future, join us and see our latest exciting products and demos

Internet of Things



Sense

1. FlightSense™ and Smart Cameras
2. SensorTile + Audio

Power

3. Dual-Band Wireless Charging

Process

4. STM32 High Performance
5. STM32 Ecosystem
6. STM32 Low Power

Connect

7. NFC Solutions

Secure

8. Real-World Solutions

9. Smart Industry
10. Smart Home: Security, Lighting & Energy
11. Smart Home: Audio Solutions
12. USB Type-C™ and Power Delivery
13. Remidi: Wearable IoT Instrument
14. Pedestrian Dead Reckoning
15. Contextual Awareness
16. Virtual Reality with SensorTile
17. Hmicro: Body-Worn Biosensor
18. Chirp Virtual Reality Headset
19. Microvision Interactive Pico Projector

Smart Driving

1. Remote Tuner Module (RTM)
2. V2X-Intersection Movement Assist
3. V2X - Scoop Demonstration
4. The Teseo GNSS Measurement Engine
5. Valens HDBaseT Technology
6. MicroVision Virtual Image HUD
7. ST Wall of Cars
8. Connected UAV Auto-Pilot
9. Automotive Front Lighting
10. Flicker-Free Image Sensors for ADAS
11. More Connected Driving Pod
12. MEMS Microphone Array
13. Class D Audio Amp - Digital Impedance Mete
14. SW Updates Over-the-Air ST & Airbiquity
15. eCall with Telemaco
16. Display Audio and Cell Phone Mirroring
17. Accordo 5
18. SiC Traction Drive
19. SiC Electric Vehicle Charging Solutions
20. Smart Parking Solution
21. Resonant Wireless Charging

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