



We are the link  
between the real and  
the digital world.

Enabling safe & trusted mobility  
towards automated driving by radar

Infineon's virtual show 2020

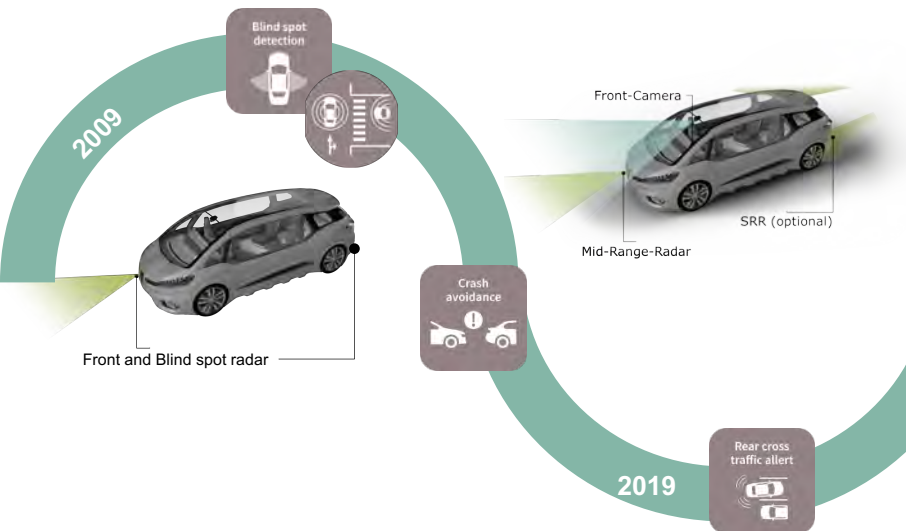


# The evolution of ADAS/AD\* demands for more radar

## ADAS

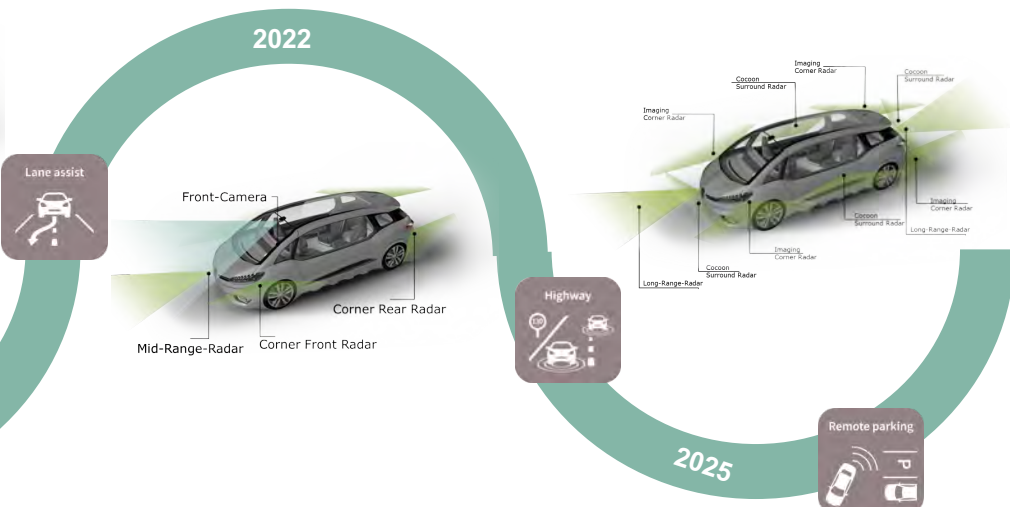
Making driving safer

Radar and camera sensors needed to support increasing number of use cases/test cases



## AD

Driver becomes a (trustful) passenger



Additional sensors (as Lidar) and **multiple** radar sensors with higher performance are needed to support **complex** use cases

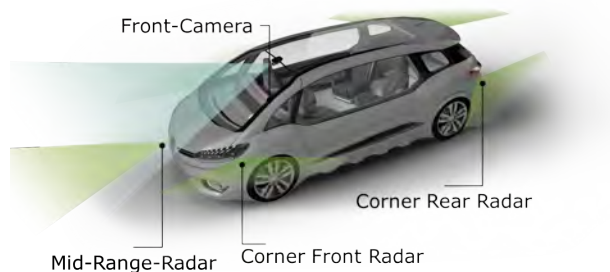
\* ADAS = Advanced Driver Assistance Systems AD= Automated Driving

# Why is the ADAS market growth accelerating?

## NCAP 5 Star 2025 (L1-2)

Addition of 2 front corner radars to handle junction crossing assist (JCA) test case

Rear Radar Upgrade to 77/79GHz (LCA/rear AEB pedestrian/cross traffic)



EURO NCAP and C NCAP AEB for Pedestrians & Cyclists

## Level 3/4/5

L3+ environment perception requires different sensor set:

- › Cocoon/Surround Radar (>4)
- › High Performance Corner Radar (1-3)



New functions:  
e.g. Junction Crossing Assist

2018

EU Legislation 24GHz to 79GHz

2020

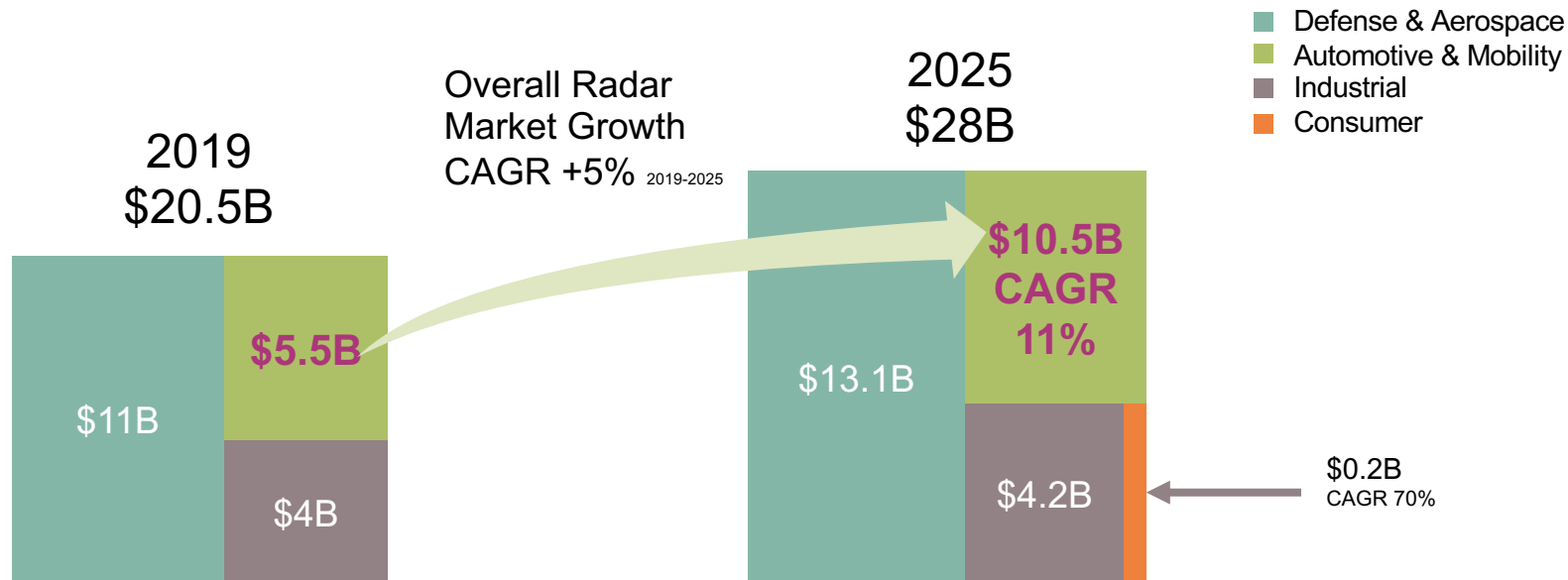
2022

NHTSA – 20 car makers in US voluntarily at 100% AEB

2024

AEB mandatory in EU

# Radar market growth chart



01




Radar market dominated by Defense & Aerospace Automotive has a significant portion

02

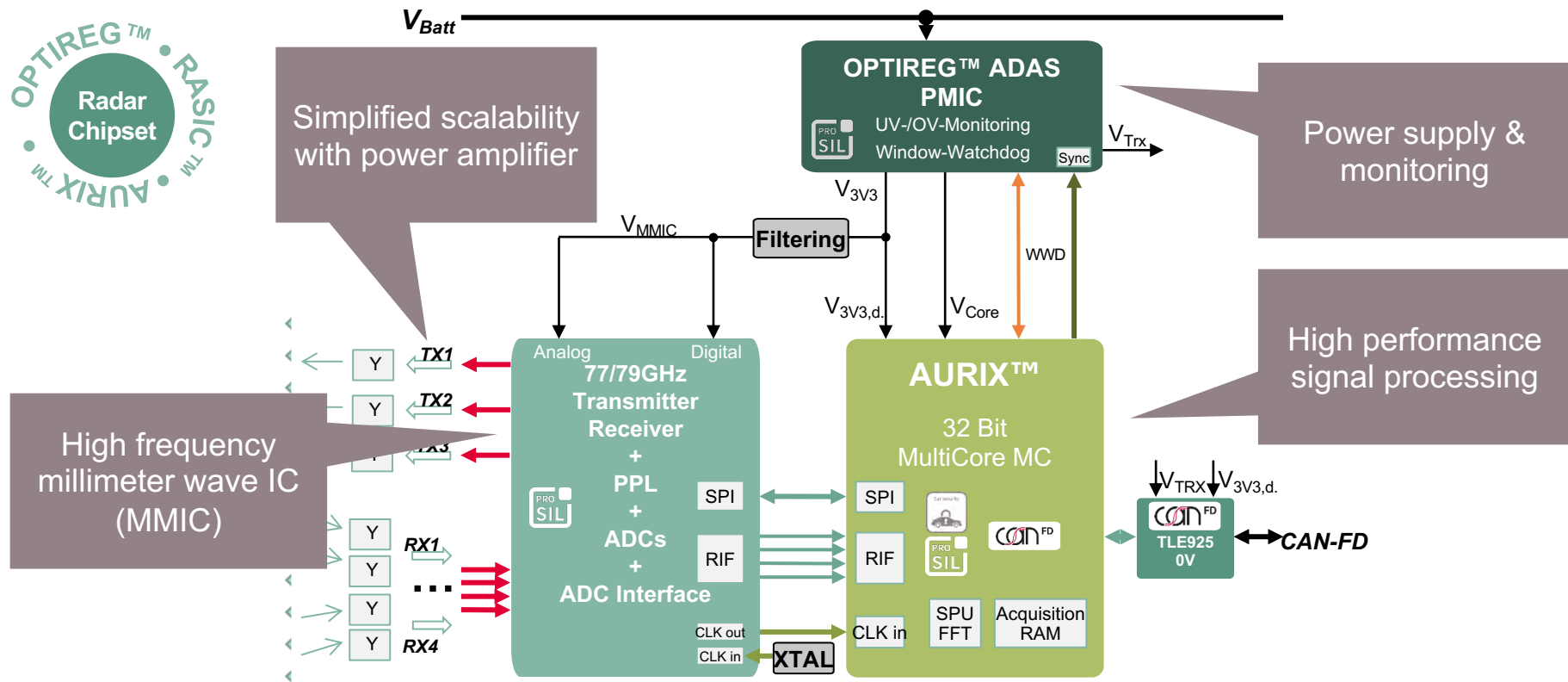
**Automotive market growth twice** that of overall radar market by and emergence of Consumer

Source: Yole Status of Radar Industry Report 2020

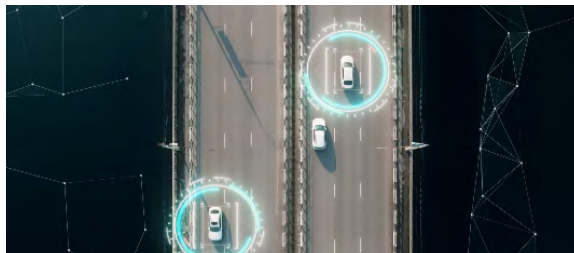
# Why radar over other sensing technologies?

		Key strength		Environmental factors		Implementation cost	
	RADAR	Distance, velocity	✓	Minor limitations	✓	Mass production Mature tech. nodes	✓
	CAMERA	Object classification, angle, color, marking, & structure	✓	Rain, fog, ambient light	✗	Mass production Mature tech. nodes	✓
	LIDAR	High-resolution angle, lane marking, distance	✓	Rain, snow	✗	Solid state solutions Emerging phase	✗

# What makes up a radar chipset?



# Trends in radar systems



## Strong volume growth

More radar modules per car  
(equipment rate)

Radar entering new car  
markets and segments



## New radar application areas

77GHz radar de-facto  
standard for **external** sensing  
(front, corners) extending to  
76-81GHz

60GHz radar opening new **in-  
cabin** applications required for  
L2+ automation within the next  
5 years



## Preparing for complex urban driving scenarios

xCruise / xPilot configuration  
(from 1+2 to 1+4 radars)

Robo taxi & Robo delivery  
services



# Areas of work for next generation Infineon solutions in radar



**Increased angular resolution**

More antenna means higher computing performance

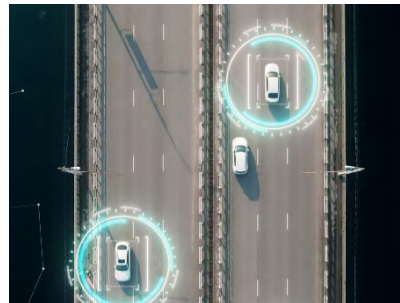
More complex beam forming (azimuth, elevation)



**Interference mitigation**

Increase width of shared, usable frequency band

Introduce numeric compensation + filtering methods



**Faster reaction time**

Provide more radar computational power

Enhance radar specific accelerators



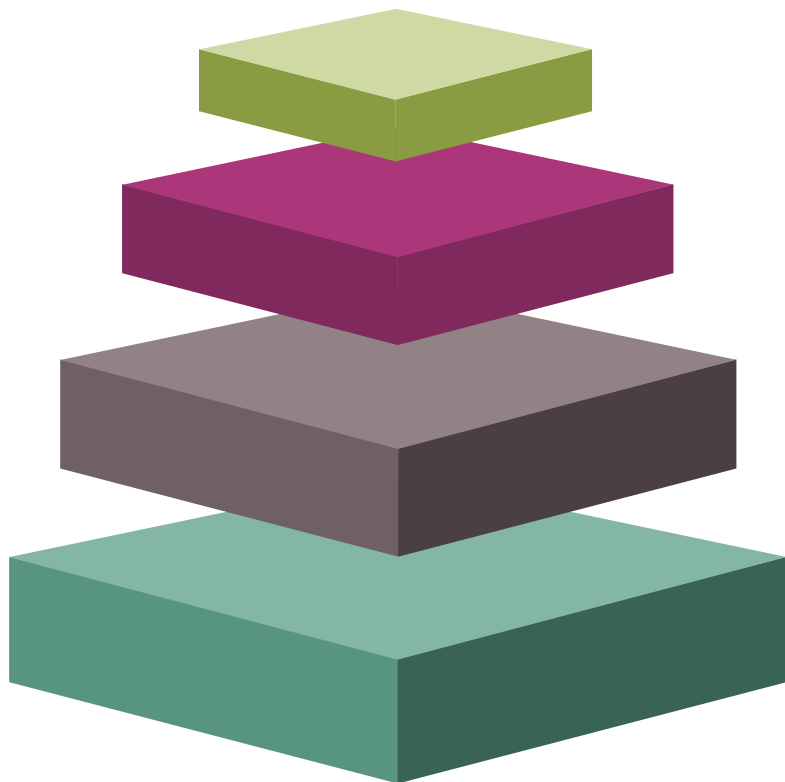
**Busy environments for L3+ driving**

Efficient filtering / detections in noisy environments

Machine learning support



# Dependability-the foundation of trust



## Successful Driver of the AD market

Having established trust enables you to become the default choice of many who want to try a proven and trusted technology for AD solutions.



## Trusted Solution provider

Creating a dependable system and placing it in your vehicle wins you the trust of the market place. You become the market place's trusted choice.



## Fast & Agile Development

Time to market decides who wins the race. Building fast and agile developments on a foundation of dependable electronics gives you the confidence in your design and frees you up to speed up your time to market.



## Dependable Electronics

A foundational element of building a trusted system. It needs to meet the requirements, be scalable and enable a life time of working correctly.

## Summary and key messages

- › ADAS is the foundation to automated driving
- › Radar is the **cornerstone** of ADAS sensor suite in most new cars
- › Infineon provides a scalable radar chipset which address the full range
- › Radar growth seen in two main directions:
  - High performance / comfort function
  - Increasing NCAP function support
- › With radar working invisibly in the background as an external "safety belt" around the car, we increase **safety**
- › Enabling new comfort functions that are **dependable** builds **trust** in the user base





Part of your life. Part of tomorrow.